



#### Proceeding of the

### REGIONAL WORKSHOP ON COASTAL FISHERIES MANAGEMENT BASED ON SOUTHEAST ASIAN EXPERIENCES

Chiang Mai, Thailand, 19-22 November 1996

TRAINING DEPARTMENT
SOUTHEAST ASIAN FISHERIES DEVELOPMENT CENTER
Samut Prakarn, Thailand, 1997

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#### **FOREWORD**

The deterioration in fisheries resources is a fact faced by fishing communities, the fishing industry and the consumer alike. The need for fisheries management has never been as great as it is now, not in any one country in particular, but in every country of this region. This workshop held in Chiang Mai in late 1996, highlighted the underlying importance given to the problems of management by the high calibre of the participants. The objectives of the workshop ranged over the need to improve sustainability of the resources as a key factor in management proposals to the need for accurate and practical information dissemination by way of human resource development with sustainability as the watchword of progress and a definition of national purpose and interest in coastal fisheries management.

During this workshop it became quite evident that the implementation of Fisheries Management is fragmented in the region. The papers presented during the workshop reflected the various aspects of the problems in resource management and the socioeconomic changes required to sustain the industry at coastal levels. The closely argued premises contained in the wide ranging experience of the presenters indicates the complexity of the difficulties and some of the suggestions made give pointers and guidelines for management schemes at both national and local levels. The quality of the papers presented an excellence that only a profound and deep understanding of the subject matter can give.

The presentations have highlighted the need for human resource development in contributory fields to sustainable development. Clearer policies in community structuring should be promulgated. More scientific investment and monitoring is necessary in resource evaluation, social impacts and cultural areas. The adoption of a consultative body composed of both national and local level interests and authority should be considered to improve resource management through cooperation. A particularly strong recommendation reflected the need for the role of women in the communities to be strengthened and enhanced on the grounds that they have a responsible approach to financial matters and a grasp of detailed management as these are in many ways silmilar to household management and vary only in degree.

In conclusion, it is my pleasure to compliment the presenters for their erudite and excellent papers and my thanks to the international participants and observers from many countries for their concentration and eventual comment and discussion throughout the whole workshop. Also to the SEAFDEC staff who made every effort to ensure the success of the workshop. Before closing this foreword I should like to offer my most heartfelt thanks to Dr. Masahiro Yamao, Associate Professor, Kagoshima University, who was assigned as JICA's short-term expert on the socio-economic aspect, for his invaluable and tireless help in both the preparation and execution of this workshop.

Dr. Maitree Duangsawasdi

Secretary-General and Chief of the Training Department, SEAFDEC

# PROCEEDINGS OF THE REGIONAL WORKSHOP ON COASTAL FISHERIES MANAGEMENT BASED ON SOUTHEAST ASIAN EXPERIENCES

#### CONTENTS

	Page
PART 1. REPORT OF THE WORKSHOP	1
OPENING OF THE WORKSHOP	1
CONCLUSIONS AND RECOMMENDATIONS	14
APPENDIX A. List of Participants	17
APPENDIX B. Prospectus	25
APPENDIX C. Provisional Agenda and Timetable	27
APPENDIX D. List of Documents	31
APPENDIX E. Opening Address by the SEAFDEC Secretary-General	34
PART 2. PAPERS PRESENTED AT THE WORKSHOP	.36
COUNTRY PAPERS	37
Experiences in Coastal Fisheries Management in Brunei Darussalam ( Haji Ajamain Haji Sawal )	37
Coastal Fisheries Management in Cambodia (Heng Sok)	44
Brief Description of Coastal Fisheries Management in Indonesia ( Ketut Widana )	50
Review of National Fisheries Management Policy-Implication for the Malaysian Fisheries Sector (Abdul Hamid B. Yasin)	63
Interchange and Outcome in Coastal Fisheries Management ( U Khin Maung Aye )	73
Coastal Resource Management in the Philippines ( Jessica C. Munoz )	80

Coastal Fisheries Management in Phang-Nga I ( Jate Pimoljinda )	-
Sustainable Management and Development Fis near shore Areas of Vietnam (Vu Huy	
Coastal Fisheries Management Issues and Opp ( Md. Masudur Rahman and Md. Giast	
Fiji's Inshore Fisheries Resources and Manage (Malakai Tuiloa and Ram Lakhan)	
An Approach to Coastal Fisheries Managemen (T. K. Behera)	
Management of Coastal Fish Resources ( H. V. C. Fernando )	143
EXPERIENCE PAPERS	147
A Review and Evaluation of Community-Base Management Programs and Projects in 1984-1994 ( Robert S. Pomeroy and M	the Philippines,
Economic Concept of Community-based Mana Fisheries (Ruangrai Tokrisna)	_
Community Fishery Resources Management ir (Renato F. Agbayani)	
Awareness Building and Participatory Approach Pilot Projects for Community-based Fi Thailand (Pongpat Boonchuwong)	sheries Management in
Attitude of Small-scale fishermen toward the F Chantaburi Province (Pouchamarn Wo K. Juntarashote, S. Aujimangkul and N	ongsanga, P. Suanrattanachai,
Perceptions, Values and Attitudes of Fisherfoll Stakeholders Towards Ownership of I its Exploitation, Management and Sust ( Kee-Chai Chong )	Fisheries Resources and tainability
Effective Investment In Community-based Infi Prerequisite for Coastal Fisheries Man	

Effective Investment In Community-based Infrastructures as a	
Prerequisite for Coastal Fisheries Management: Malaysia (Haji Mohamed Bin Ismail)	238
( Haji Wollaned Bili Ishlan )	236
Provision of Locally-based Fishery Infrastructure: The Philippine	
Experience (Nelson M. Davila)	246
An Effective Investment in Coastal Fishery Management:	
Thailand's Experience (Sakul Supongpan)	256
Community-Based Fisheries Management System under	
a Limited Entry ( Tadashi Yamamoto )	267
a Difficultation ( Tauasiii Tamamoto )	207
The Role of Fishery Co-operatives in Coastal Fisheries	
Management (Theo Visser)	279
Natural Partners for Coastal Fisheries Management: Community-Based	
Natural Partners for Coastal Fisheries Management: Community-Based	
Fisheries Management and Integrated Coastal Management ( Donna J. Nickerson )	280
( Dollia J. Ivickerson )	209
Perspective of Fishers Organizations Integrated to Coastal Fisheries	
Management: Through Experiences Gained in Thailand	
( Masahiro Yamao )	295
	)
Coastal Fisheries Management interrelated to Environmental	
Aspect ( Ampan Pintukanok )	313
Encouraging Coastal Woman Participation In Eigharias	
Encouraging Coastal Women Participation In Fisheries  Management In Indonesia (Tuti Susilowati)	322
Management in indonesia (Tuti Sushowati )	322
Towards a Gender Approach: Placing Women at the Center of	
Fisheries Community Development (Anselma S. Legaspi)	332
Women as Workers in Fishery Activities	
(Abha Sirivongs Na Ayudhya)	343

# PART 1. REPORT OF THE REGIONAL WORKSHOP ON COASTAL FISHERIES MANAGEMENT BASED ON SOUTHEAST ASIAN EXPERIENCES: SOME IMPORTANT ISSUES OF SUSTAINABLE FISHERIES MANAGEMENT AND DEVELOPMENT

#### Chiang Mai, Thailand, 19-22 November 1996

#### **OPENING OF THE WORKSHOP**

- 1. The Regional Workshop on Coastal Fisheries Management Based on Southeast Asian Experiences was held at the Chiang Inn Hotel, Chiang Mai, Thailand, from 19 to 22 November 1996. Mr. Kachornsak Wetchagarun gave a report of the purposes of the workshop and invited Dr. Maitree Duangsawasdi, the Secretary General of SEAFDEC to inaugurate the event.
- 2. The participants were welcomed by Dr. Maitree Duangsawasdi, Secretary General of SEAFDEC.
- 3. The purpose and background of the Workshop were as follows: (see Prospectus)
- 4. The Workshop was arranged into six general sessions and one special session:
  - Session 1 Toward Sustainable Development of Coastal Fisheries: Framework of Effective Management and Concept of Participatory Approach
  - Session 2 Fishermens' Understanding and Attitude toward Community-based Fisheries Management
  - Session 3 Country Paper Presentation: Interchange of Experiences and
    Outcomes in Coastal Fisheries Management by Member
    Countries
  - Session 4 Effective Investment in Community-based Infrastructures as a Prerequisite for Coastal Fisheries Management
  - Session 5 Organization and Operation of Fishermens' Groups for Their Participation in Coastal Fisheries Management
  - Session 6 Toward a Gender Approach: Placing Women at the Center of Fisheries Community Development
  - Special Session Coastal Fisheries Management Interrelated to Environmental Aspect

#### ADOPTION OF THE AGENDA

5. The agenda and timetable proposed by the Secretariat were adopted. The list of Documents is given in SEAFDEC/CFM/96inf.3 Rev.1.

SESSION 1: TOWARD SUSTAINABLE DEVELOPMENT OF COASTAL FISHERIES: FRAMEWORK FOR EFFECTIVE MANAGEMENT AND THE CONCEPT OF THE PARTICIPATORY APPROACH.

Moderator: Dr. Kungwan Juntarashote Rapporteur: Ms. Jessica C. Munoz

- 6. The objectives of Session 1, which was an introductory part of the Workshop, were: 1) to review the framework of new approaches in coastal fisheries management: 2) to discuss the advantages and disadvantages of community-based management, mainly from an economic point of view: 3) to examine adequate measures of encouraging fishermens' participation in fisheries management: 4) to discuss the recent trends and lessons of development programs for coastal fisheries management in Southeast Asia.
- 7. Dr. Robert S. Pomeroy, senior scientist of ICLARM, gave a presentation entitled "A Review and Evaluation of Community-based Coastal Resource Management Programs and Projects in the Philippines, 1984-1994" (WP1). He points out that community-based resource management has re-emerged as a way to involve resource users and to utilize indigenous institutional arrangements in coastal fisheries management. The future of community-based resource management will lie in a form of co-management, a sharing of responsibility and authority for resource management users of communities. By referring to experiences in the Philippines, his presentation shows the results of a review and evaluation of community-based coastal resource management programs and projects.
- 8. Dr. Ruangrai Tokrisna, associate professor of Kasetsart University, presented an analytical paper entitled "Economic Concepts of Community-based Management for Coastal Fisheries" (WP2). Conventional management schemes by central authority are inefficient among tropical coastal state countries. Community-based fisheries management is an option for more cost effective management schemes. In the economics of community-based fisheries, management is the distribution of control power on fishing to the community. In adopting this approach, maximizing resource rent must be combined with minimizing transaction costs for an optimum fishing level.
- 9. Mr. Renato F. Agbayani, associate scientist of SEAFDEC/AQD, gave a presentation with the title "Community Fishery Resource Management Projects in the Central Philippines: Research and Development Framework" (WP3). He describes the objectives of a study launched in Malalison Island (the Philippines) in 1991 as being to support and learn from peoples' organization collaboration, biologists and social

scientists in applying community based management techniques in fisheries. He also describes the phased introduction of seaweed farming as an alternative employment for fishing communities. He goes on to outline the introduction of fishing rights and the tests of the deployment of artificial reefs in 1994. His description includes impact assessment in the spheres of economic, social and environmental effect. His paper also touches upon the institutional arrangements on fishery co-management, ethnographic assessments, the economics of seafarming techniques and the management of fishery cooperatives.

- 10. The discussion of Session 1 included a wide variety of topics covering:
  - 1) the concepts and implementation procedures of co-management and community-based fishery management
  - 2) the establishment of the fishing rights system
  - 3) the conflict of interests among fishermen in the fishing rights system
  - 4) the contradictions of open access fishery and the possibility of limited-entry.
  - 5) the problems that may arise when the management policy changes from "top-down" to "bottom-up"
  - 6) the disadvantages of CBFM from economic point of view.
  - 7) the Government has a strong commitment to give a greater role to fishing communities in coastal fisheries management, being more attuned to the importance of responsible fisheries.

# SESSION 2: FISHERMENS' UNDERSTANDING AND ATTITUDE TOWARD COMMUNITY-BASED FISHERIES MANAGEMENT

Moderator: Mr. Kachornsak Wetchagarun Rapporteur: Mr. Ibrahim Bin Johari

- 11. The purpose of this session was to discuss how to enhance fishermens' awareness of regimes and regulations of sustainable fisheries management. The first part of this session consisted of two presentations. Based upon research activities conducted in several fishing communities. The second part included a presentation which would focus on the importance of education and training programs for fishermen.
- 12. Mr. Pongpat Boonchuwong, senior economist, Department of Fisheries, Thailand, gave a presentation with the title "Awareness Building and Participatory Approach in Ongoing Pilot Projects for Community-based Fisheries Management in Thailand" (WP4). In Thailand, community-based, self-regulatory management

regimes based upon exclusive use rights are regarded as a key factor for effective, and more sustainable natural resource utilization. He analyzes the substantial factors that would influence the fishermens' awareness toward a new regime of coastal fisheries management, through a case study of ongoing pilot projects.

- 13. Ms. Pouchamarn Wongsanga, socio-economist and researcher of SEAFDEC/TD, conducted a field survey in Chantaburi Province, Thailand, in order to understand the attitude of small-scale fishermen to the fishing right system and the factors influencing their attitude to it. She presented a paper "Attitude of Small-scale Fishermen Toward Fishing Right System in Chantaburi Province" (WP5). According to the survey, a great majority of fishermen agreed that a fishing right system would be able to ease the conflict problem between them and commercial fishermen by taking responsibility for conserving and managing the fisheries' resources. The fishermen recognize that the government should urgently issue laws and regulations for the new regime.
- The Director of BOBP, Dr. Kee-Chai Chong, reported with a paper 14. "Perception, Values, and Attitudes of Fisherfelk and other Coastal Stakeholders Towards Ownership of Fisheries, Fisheries Management and Sustainability" (WP6). He outlines the BOBP program which shows a swing from being fish oriented to being people oriented with a creation of awareness for fishermen to fisheries management. He postulates a total review of fisheries dependents from fishermen through the chain to the consumer who by purchasing choice can influence the market, and thus the resource demand. He further advocates a new assessment of how resource levels are determined. The need for education and information for the stakeholder is essential, how to advise, how to educate and how to disseminate from grass roots upward. Government must also be aware that information to the fishermen is vital. He also makes the point that there is still some value in older methods of management and not necessarily the newer CBFM approach. Another point made is that governments are reluctant to devolve authority in decentralization. The theory of management is well ahead of practice with management driven from the top as opposed to from the bottom up. The locals understand their problems well enough.
- 15. The discussion of Session 2 first focused upon lessons gained from experiences of on-going projects of Thai Coastal Fisheries. Not only the Thai Government but also NGOs have made great efforts to make plans for pilot projects. However, they still face some dilemmas in both planning and the implementation process. Dilemmas are found in the selection of areas and the degree of people's participation, in particular. The case studies show that fishermen in the pilot projects have a positive attitude to the introduction of the fishing right systems. The studies also touch on the fact that gender is a factor and women indicate a positive approach to the new regimes of sustainable fisheries management.

The discussion covering the second session included:

- 1) How not only governments and NGOs encourage continuous participation of fishermen in community-based fisheries management and/or co-management.
- 2) Government instructions are often ignored by fishermen.
- 3) Fishermen are generally poorly educated. In some countries, there is mistrust of new schemes as the people are essentially conservative. Therefore, the transfer of knowledge and understanding is difficult.
- 4) There is a need for leadership from within the communities, since their own motivation encourages their participation in fisheries management.
- 5) Granting of fishing rights should have priority together with awareness for creating their own community-based fisheries management.
- 6) Government sponsored schemes have been inconsistent with many fresh departures made. This is an important reason that does not encourage fishermen to participate in the schemes. They often fail.
- 7) The Philippines have decentralized resource management to the local government units for the effective implementation of community-based resource management. However, it will take some time before total authority is delegated to the local communities.
- 8) The CBFMs in Japan range from simple ones, such as establishing close seasons and areas, to comprehensive ones such as catch limitation with the help of prefectural fisheries experimental stations.

## SESSION 3: COUNTRY PAPER PRESENTATION: INTERCHANGE OF EXPERIENCES AND OUTCOME IN COASTAL FISHERIES MANAGEMENT BY MEMBER COUNTRIES

Moderators: Dr. Maitree Duangsawasdi and Mr. Masao Shimomura

Rapporteur: Ms. Supaporn Anuchiracheeva

The objectives of Session 3 were 1) to review the current situation in fisheries such as problems, conflicts, socio-economic status and management; 2) to exchange with, and the need of participation by each member country to identify the trends of coastal fisheries management in the Southeast Asian Region.

- A representative of Brunei Darussalam, Mr. Haji Ajamain Haji Sawal, describes how the Fishery Department manages one coastal fishery in Brunei Darussalam. The artisanal fishermen are not restricted in their areas of operation (CP1). However, the commercial fleets are bound by licensing regulations issued in accordance with resource availability in Brunei Darussalam's waters. There is considerable evidence of encroachment by foreign fishing vessels in the waters and these are being strictly dealt with. There are also cases of transgression of fisheries regulations. On local fishermen, action is taken including a warning, impounding and in some cases being taken to court for repeated offenses.
- A representative of Cambodia, Mr. Heng Sok, presented a country report that outlined the present complex management that exists there (CP2). The government have instituted controls but enforcement is problematic. The resources are not yet fully exploited but there is some evidence of habitat damage by trawlers. He states that fisheries sciences have only lately developed so no results are yet available from marine research. The Fisheries Department is urgently preparing project plans but funding constraints are hindering implementation.
- A representative of Indonesia, Mr. Ketut Widana, presented a country report entitled "Brief Description of Coastal Fisheries Management in Indonesia" (CP3). There is a shared authority between central and provincial government. Several types of traditional community-based management still exist. The Government has set up a particular fishing zone for small-scale fisheries. It also bans trawl fishing in territorial waters. To increase the income of fishing households, government has implemented a number of development programs, and organized a Coordination Forum for Fishing Management. This new arrangement is to keep resource sustainability, to avoid social conflict and to protect the environment.
- The representatives from Malaysia, Mr. Abdul Hamid B. Yasin & Mr. Sani B. Mohd. Isa state that fisheries resources are being heavily overexploited and threatened by pollution degrading the aquatic environment (CP4). Various stratagems are being employed to ensure the sustainability of the resources. Sound management models are being developed together with coastal management plans, rehabilitation of resources through deployment of artificial reefs and through restocking programmes. Such measures are predicted to ensure the increase in productivity the fishermen need. Rational exploitation and effective management are cited as the means to give maximum sustainable yield. Fishermen will also be encouraged to exploit the high seas in the Indian Ocean as an alternative to local exploitation.
- The representative of Myanmar, Mr.U. Khin Maung Aye, takes the view that the future demand for fish will exceed supplies causing over exploitation (CP5). The demand for exports gives an excessive pressure on the resources. Fisheries management is regarded as a tool for the achievement of sustainable growth of the fishing industry. It is estimated that fisheries production has not yet reached the level of MSY, but it is prudent to invest in good management systems now before yield is exceeded by demand. The national trend is to open collaborative projects with other countries and agencies.

- A representative of the Philippines, Ms. Jessica C. Munoz, gave a presentation with title "Coastal Resource Management in the Philippines" (CP6). She presented the status of coastal resource management in the Philippines after some 7 years of implementation. She discusses the positive and negative impacts of community-based resource management (CBRM). Her paper emphasizes the devolution of management where the local community actively participate in CBRM. She cites that strategies to solve issues and problems should be on a case to case basis with the approval and concurrence of the coastal communities. The success or failure of any CBRM project will depend upon the attitude and acceptance of the community toward it. The sustainability of the project must also be considered to accrue long term benefits.
- A representative of Thailand, Mr. Jate Pimoljinda, mentions that the Thai DOF places special emphasis on the important role played by fisheries management systems (CP7). However, as degradation of the marine environment cannot be blamed upon fisheries alone, there are some difficulties in addressing the problems. A rehabilitation programme has been approved at top government levels and is presently under formulation. The aim is to achieve greater participation in fisheries management short of total development of authority. In some areas the CBFM has been introduced as a precursor to full territorial rights awards.
- The representatives of Vietnam, Dr. Bui Dinh Chung & Dr. Vu Huy Thu, presented a report citing the present state of fisheries in Vietnam with the additional comments concerning the presently advancing technology and strategies for enhancing the fisheries programme of the country (CP8, CP8 Rev.1). Also recognized in the paper is the need to strengthen education and knowledge of fishing communities in the conservation and husbandry of fisheries stock and breeding. He also cites that government recognize the need for fisheries law that includes the protection of fisheries resources and the marine environment. It is reported that the Vietnamese Government is promulgating strict policies for encouraging organizations and individuals to participate in activities to protect resources. Dr. Vu Huy Thu stresses the need for a detailed evaluation of fisheries resources and their state of condition throughout the coastal areas of the country. At this time the CBFMs in the country are poor in operation.
- A representative of Bangladesh, Mr. Md. Masudur Rahman, identifies the decline of penaeid shrimp to the indiscriminate development of marine artisanal fisheries (CP9). The blame for this is laid at the door of the push netters and beach seiners that harvest shrimp at different stages of development, overfishing of these in one area affects other areas. It is suggested that research should be devoted to the artisanal fisheries sector. An alternative to the present methods is envisaged in hatchery development. Further expansion of shrimp culture is not suggested due to the reduced seed availability. A change in gear type is cited as a possible saviour in resource rehabilitation and also to enhance sustainable production. Since the fishery dynamics are now better understood, changes in the marine fisheries ordinances are required. An expansion in information achievement and a strengthening of the marine sector are identified, and coastal zone management has been suggested.

- Representatives of Fiji, Mr. Malakai Tuiloa and Mr. Ram Lakhan, explained the recent trends of export-oriented and domestic-oriented fisheries in their presentation (CP10, CP10, Add.1). There has been no sharp change in direction of fisheries development. However, the rapid development of commercial fisheries has necessitated a gradual change in the balance of emphasis put on different objectives. A strong inducement to increase catch efforts has come from foreign markets. Exportation brings an increasing revenue to the country. In 1995, small-scale fisheries faced a reduction of production due to a large decrease in fin-fish catch. There have been increasing worries about the status of inshore fishery resources. Recently, Government priorities have been directed to the management and control of the inshore fisheries resources with increased involvement of the owners (chiefs) of the customary fishing rights areas, the encouragement of fishermen to exploit offshore resources, the development of exports, mainly tuna, marine products and the development of aquaculture and mariculture.
- The representative of India, Mr. T. K. Behera, in his country paper, indicates that there are special management problems in his country due to its size and length of coastline (CP11, CP11, Add.1). He specifies the actions taken to identify the main problem areas and the points of emphasis for the country's needs. The trend in control leads to promoting inshore fishermen to go offshore, regulations covering marine fishing, research into by-catch utilization, more shrimp culture depending upon seed availability, disease control and a new protocol introducing coastal trawling management. This includes awareness building of fishermen in coastal fisheries management, diversification in fisheries, diversification of income sources for present small-scale fishermen, mesh size regulations, closed seasons, selective fishing gear, reduction of post harvest loss and the introduction of artificial reefs.
- A representative of Sri Lanka, Mr. H.V.V. Fernando, gave a presentation with a paper entitled "Management of Coastal Fish Resources" (CP12). Fisheries development during three decades have passed through several stages. Government's subsidy schemes for modernization of fishing apparatus led a rapid increase in production. On the other hand, lobster, shrimp and purse seine fisheries have depleted resources. Government has made great efforts to implement rehabilitation and conservation programs successfully. In 1996, a new fisheries law was enacted to give licenses of 17 fishing methods through village based fisheries inspectors. Sri Lanka fisheries have reached a new phase of development.

## SESSION 4: EFFECTIVE INVESTMENT IN COMMUNITY-BASED INFRASTRUCTURE AS A PREREQUISITE FOR COASTAL FISHERIES MANAGEMENT

Moderator: Dr. Masahiro Yamao Rappoteur: Mr. Renato F. Agbayani

The objectives of Session 4 were 1) to exchange the experiences of many successful projects of locally-based infrastructure; 2) to evaluate the outcome and problems of fishermens' and residents' utilization; 3) to question the efficiency of

cooperative-management of infrastructures. This session focused mainly on the roles of infrastructures in community development but also in coastal management.

- A representative of Indonesia, Mr. Saut P. Hutagalung, presented a paper with the title "Effective Investment in Community-based Infrastructure as a Prerequisite for Coastal Fisheries Management: from Indonesian Experiences" (WP7, WP7 Rev.1). He gives a brief explanation of the on-going Sixth Five-Year Development Plan with special attention given to the sustainable resource management of coastal fisheries. An effective community-based resource management would result in resource regeneration and rehabilitation as well as sustainable utilization of fishery resources. He stresses that community-based fishing ports act as not only landing sites but also centers of community development and economic activity in the coastal areas. He suggests that development of infrastructure should be in such a way that for:

  1) those coastal waters with development potential would support further rational utilization of the resources: 2) those coastal waters with high fishing pressure would provide less incentive to increase catch because of better handling, processing and marketing. He refers to the need for effective management of infrastructures and pinpoints some substantial factors to successful investment.
- A representative of Malaysia, Mr. Haji Mohamed Bin Ismail, reported a paper entitled "Effective Investment in Community-based Infrastructures as a Prerequisite for Coastal Fisheries Management" (WP8). Fisheries Development Authority Malaysia (FDAM) has a responsibility for building infrastructures in strategic locations. Another task of FDAM is to set up an effective distribution network in collaboration with area fishermen associations (AFAs). Infrastructure investment will be effective through a community-based approach. In Kedah, North Malaysia, an AFA has flourished in business activities after FDAM built basic infrastructures for it. His suggestion is that infrastructure investment within localities is necessary in order to make area fishermen associations actively conduct business activities.
- A representative of the Philippines, Mr. Nelson M. Davila, gave a presentation with the title "Provision of Locally-based Fishery Infrastructure: The Philippine Experience" (WP9). He clearly explains some important lessons obtained from successful and unsuccessful experiences in the operation of basic facilities. He touches on reasons for the under, and non-utilization, of the facilities. His presentation places great emphasis on how to secure economic efficiency in the operation of facilities. A certain size of fishing communities is required. The Philippines has given special attention to the promotion of cooperative ways for sound operation of infrastructures.
- A representative of Thailand, Mr. Sakul Supongpan, explained the outcome of the recent programs for community development in his presentation, " An Effective Investment in Coastal Fishery Management: Thailand's Experience" (WP10). The Thai government has made great efforts in constructing fisheries-related facilities while implementing coastal rehabilitation projects and extending non-destructive fishing gear. Promotion for fishers' participation in groups has been conducted. These projects have been well-accepted by small-scale fishermen,

although there are still some constraints in the management of infrastructures. The government is trying to develop the fishing right system in some pilot projects.

- The discussion following the presentations touched on not only central government, but also local governments are making provision for infrastructure investment to be expanded all over the country. On both small and medium scale facilities conducted at local levels. These local level investments have become substantial elements in the development of small scale fisheries. In this process, if left to local judgment some of the infrastructures may not prove successful. In order to gain effective utilization, user groups should be established, alternatively, local government must oversee activities. Some successful projects have been implemented in member countries, however, there are some recorded failures.
  - 34.1 Effective use of infrastructure can be achieved by users participation in the projects, selection of location, operation, maintenance and size is paramount in the framework of successful operation. These infrastructures act not only as an improvement in locality but also as a focus for local social development.
  - 34.2 Artificial reefs have proved to be a point of contention, however, there defined benefits to their deployment. The experiences of some countries prove that new sustainable habitats have been created by their presence. To extend these experiences to member countries some research both into design and into placement would be advantageous.
  - 34.3 Hygiene was raised in respect of a recent EU ruling on conditional import of fisheries products being only acceptable if the guidelines of hygienic product handling and transportation are met. Both small and medium scale facilities are cited as targets for improvement. Public awareness on improved hygienic and environmental conditions of the fishing port is emphasized.
  - Artificial reefs have little or no impact of the environment. However, before deploying, the communities were asked if they wanted them or not. Another contributor gave the experience from SEAFDEC research that the use of tyres is dangerous and harmful to the environment. The sea bottom should be surveyed before deployment. Some participants stressed the importance of research on what lessons may be learned from users experience.

### SESSION 5: ORGANIZATION AND OPERATION OF FISHERMENS' GROUPS FOR THEIR PARTICIPATION IN COASTAL FISHERIES MANAGEMENT

Moderator: Dr. Masahiro Yamao Rapporteur: Ms. Phattareeya Suanrattanachai

35 Session 5 focused on the roles of fishermens' organizations in coastal fisheries management. Policy for the promotion of whatever type of fishermens' groups often becomes a controversial issue. This is because there have been a

tremendous number of failures in establishing and operating cooperative activities. The discussion of this session covered 1) what viable model of fishermens' group will be adequate in coastal fisheries management; 2) what operational principles groups will adopt; 3) what responsibility sharing will be established between government and groups.

- Dr. Tadashi Yamamoto gave a presentation with a paper entitled "Community-based Fisheries Management System under a Limited Entry" (WP11, Add1). Community-based fisheries management can be developed only when fishermen understand that fisheries resources are owned by the fishermen themselves. Although the negative situation of fishermens' organizations in Southeast Asia, granting fishing rights to fishermen can be the best opportunity for fishermen to establish their own organization. All Asian countries must revise national fishery laws to develop community-based fisheries management.
- Mr. Theo Visser, Statistics and Information Officer of FAO Regional Office for Asia and the Pacific, presented a paper entitled "The Role of Fishery Cooperatives in Coastal Fisheries Management" (WP12). Community-based approaches through fishery co-operatives may offer important opportunities, but that socioeconomic oriented co-operatives need to be transformed and guided to a more managerial task. He concluded that Governments have to decentralize authority over coastal marine areas and initiate programs to give fishing communities authority over adjacent resources. Limited access is the singlemost important measure to be implemented in coastal fisheries management. His concluding remark is: fishery cooperatives can work, if they are allowed to work.
- 38 Ms. Donna J. Nickerson, Coastal Zone Management Advisor, FAO BOBP, gave a presentation entitled "Natural Partners For Coastal Fisheries Management: Community-Based Fisheries Management and Integrated Coastal Management" (WP13). In her paper the definition of community-based fisheries management is stressed as a delegation of trust, authority and responsibility in self governance. Local customs and past histories in countries having traditional systems, e.g., Indonesia, Fiji and Micronesia among others, either supersede central government or have its support. The determination of the direction of local management is best left to local people who understand well their own problems. While the local communities are best to take a leadership role in resource management, information and support from both local and national government is critical to ensure the success of CBFM. Solutions outside the fisheries sector involving the environment, multi-use conflicts and habitats need the advice and support of a multi sectoral approach. Integrated Coastal Management (ICM) provides a broader base of support from wider communities, NGOs, private sectors and government agencies. The paper discusses the complementary nature and interdependence of the management approaches and a potential avenue for the integration of CBFM and ICM.
- In the discussion of this session, many aspects of preferred function for fisheries co-operative were considered. There were discussions about the functioning and framework scope of ICM relative to CBFM. Roles and responsibilities should be

clearly defined with a four or fivefold composition, national governments, interventions groups, NGOs, municipal groups and community managements with another possible input from land owners, managers and others affected by community decision making.

- 39.1 In some areas the name co-operative has become synonymous with credit but more responsible fishermen feel they are not yet ready to use credit either rationally or wisely. There is a need for impartial advice in this field, and training for fisheries co-operatives to prepare them for these responsibilities is necessary. Cooperatives, in time, should become entrepreneurial obtaining credit from commercial banks.
- 39.2 The ties and dependence of fishermen and middlemen were considered; what area should have priority in operational management. There were statements that defined the breaking of the now traditional ties between middlemen and fishermen should come before cooperatives are implemented. There is little wrong with the cooperative of themselves but that they would, or might, be betrayed by the middlemen. The middlemen should be brought into the decision making process. Vested interest of middlemen may swamp cooperative decision making out of financial strength. The policy should be one man one vote.
- 39.3 Although the ideal of ICM is widely accepted, land owners and managers find difficulty in adapting themselves into ICM. They must be brought into the management process and accept consensus-based decisions of the groups.

### SESSION 6: TOWARD A GENDER APPROACH: PLACING WOMEN AT THE CENTER OF FISHERIES COMMUNITY DEVELOPMENT

Moderator: Dr. Somying Piumsombun Rapportuer: Mr. Ketut Widana

- The objectives of Session 6 were 1) to exchange the experience of women's role in coastal fishing communities in Southeast Asia; 2) to develop participation of women in fisheries management; 3) extension of the role of women in fisheries development and management.
- A representative of Indonesia, Ms. Tuti Susilowati, pointed out the womens' abilities and roles of participation in fishing community development in Indonesia, in her presentation with the title "Encouraging Coastal Women Participation in Fisheries Management in Indonesia" (WP16). Fishers participation was greatly emphasized by showing several cases of traditional community-based fisheries management. Women in fishing communities are much concerned about the sustainable use of resources and have enough ability to participate in the decision-making process of community development.

- A representative of the Philippines, Ms. Anselma S. Legaspi, described how coastal womens' participation in fisheries development and management could be developed and extended in her report entitled "Towards a Gender Approach: Placing Women at the Center of Fisheries Development" (WP17). The role and participation of the Filipino women was recognized in the Medium -Term Philippine Development Plan (MTPDP) 1993-1998. Her paper focuses on the role of women in the household and in community development and management. She recommends the mainstreaming of womens' concern in fisheries development programmes by institutionalizing gender sensitivity and by providing appropriate technology and support services.
- Ms Abha Sirivongs Na Ayudhya, associate professor of Chulalongkorn University, describes the discrepancy between the reality of the womens' role in the fisheries sector and the reporting on fisherwomen by official sources (WP18). Women in Thailand play a more decisive role in communities than is generally appreciated. However, she stresses that there is a need for more representative and in depth studies on the socio-economic status of women in the fisheries sector factored upon a solid data base. She specifies the role of government in womens' ability development and the need for specific education and training before project implementation.
- According to the three presentations, the participants recognize that women do not take part directly, but indirectly they are close to resource management. The focus of women is changing and gradually the role of women is coming more into balance with the men. Principally the role of women will be increased when the running of a household is understood. Women can play a significant role in fish handling and marketing which would contribute substantially to income generation in fisheries households. The role of women in fisheries cannot be wholly continuous as they will return to the household when children are born and during their formative years. It is ideal that some form of social and economic development be achieved to encourage the sharing of responsibilities between husband and wife (men and women) in household and fisheries activities.
  - 44.1 Women are rather better in financial management than men. They make greater effort to ensure that loan repayments are made on time, and pay more respect to financial responsibilities.

### SPECIAL SESSION: COASTAL FISHERIES MANAGEMENT INTEGRATED TO ENVIRONMENTAL ASPECT

Moderator: Dr. Ruangrai Tokrisna Rapportuer: Mr. Haji Ajamain Haji Sawal

Dr. Ampan Pintukanok, in her paper describes the role of the fisheries sector in Thailand's economy, and goes on to describe how illegal practices have seriously damaged the marine environment and resources (WP15 Rev.1). The loss of diversification and declining catches are reducing yields. She discusses a national policy to manage coral reefs in ecological and economic viewpoints in order to

maintain a balance. Zoning of reefs is provided, together with measures to control environmental impact. Similarly, public awareness building is suggested to fill a gap between implementation and the lack of law enforcement.

- The discussion in this session covered a wide variety of topics. The first concerns the impact of the growing tourism industry. This contributes foreign exchange earnings to the benefit of the national economy. Since both the community groups and tourism are important they must be sustained to exist side by side, but must also be balanced. Fisheries activities must be of a non-destructive type.
  - 46.1. In Phuket province (Thailand), where the tourism industry has rapidly developed, it has increasingly provided alternative employment opportunities to fishermen. This is especially so in the "high season". During the "low season", they return to fishing as their major occupation. Although coastal areas have been destroyed by the tourism industry, there is a need for strategies to maintain both industries in harmony.
  - 46.2. In Thailand, a project concerning coral reefs, "The Coral Reefs Resources and Management Program" was implemented in 1995. The year 1997 will be "coral year". There are various agencies involved, being the DOF, the Royal Thai Navy and the Forestry Department. There are ministerial regulations concerning coral. Of course, trawling is not allowed within the 3 km zone because of possible damage to coral.
  - 46.3 In the Philippines, a coastal resource management (CRM) project by ASEAN-Australia was implemented in the Lingayan Gulf some years ago. CRM efforts are in place and local governments have been working on them. A year ago, a 15 billion Pesos cement plant complex was proposed in the same area. However, residents opposed this project because of a severe environmental threat. The project was finally rejected.

#### CONCLUSIONS AND RECOMMENDATIONS

#### 47 Conclusions

Based on the presentations made and the subsequent discussions of the papers, The workshop has finalized the list of recommendations as follows:

- 47.1 The workshop recognized the increasing necessity of action for sustainable coastal management systems, such as community-based fisheries management (CBFM) and co-management.
- 47.2 The participants agreed that the improvement of sustainability is a key element in coastal fisheries management. They understood, both theoretically and empirically, that the introduction of CBFM and/or comanagement approaches become a substantial element to keep sustainability, equity and effectiveness of coastal fisheries resources.

- 47.3 Useful information and training programmes concerning suitable methods of sustainable coastal fisheries management should be provided. More collaborative research and evaluation must be conducted.
- 47.4 Participants recognized that more and more fishermen have a positive attitude to the introduction of community-based fisheries management. It is considered vital to educate and train not only fishermen but the whole community including children and fisheries associated allied workers in order to heighten awareness of the benefits of self governance activities in fisheries operation.
- 47.5 Participants should interchange their useful experiences in terms of new approaches to coastal fisheries management between member countries. Country report and discussions provide profound insights into the future direction of coastal management in southeast Asia. They also understood that many member countries have succeeded in implementing CBFM programs and projects.
- 47.6 The workshop gained a consensus that the participatory approach must be given high priority in coastal fisheries management. It is necessary for member countries to develop their own and diversified models to facilitate fishermens' participation.
- 47.7 The participants agreed that effective investment in locally-based infrastructures would be a base for improvement in local fisheries and act as a center of local social development. Effective handling and profitable marketing may provide coastal fishermen with greater incentives to reduce their exceeding catch effort.
- 47.8 In some countries, investment in locally-based infrastructures has been implemented, which is more attuned to the promotion of cooperative ways for sound operation. The participants recognized that encouraging users participation in planning and management will facilitate effective investment and the use of locally-based infrastructures.
- 47.9 The participants were much concerned about the deployment of artificial reefs. A number of trials have just been started in order to introduce well-defined fishing rights. The workshop placed great emphasis on the importance of further research and evaluation of artificial reefs in relation to CBFM and co-management approaches.
- 47.10 The participants realized that whatever the type, fishermens' organizations (FOs) have the potential to contribute to the operation of sustainable fisheries management, although there is still much disagreement over the appraisal of cooperative ways.

- 47.11 The introduction of fishing right systems will possibly be achieved well, accompanied by the establishment of FOs the membership of which is based upon a limited entry framework. The workshop recognized that member countries must search for viable and applicable models of FOs functioning as a management body.
- 47.12 The gender aspect is required not only for community development but also for suitable use of resources. The participants agreed that women have ability in any decision-making process in fishing communities.
- 47.13 It was generally acknowledged that there are still some constraints in improving the socio-economic status of women in fishing communities. The participants realized that governments should devote themselves in solving gender conflicts and to make programmes that place women at the center of fisheries community development.
- 47.14 Integrated Coastal Management (ICM) is necessary for sustainable use and conservation of coastal resources. Cooperation among people concerned in coastal resources gives incentives to sustainability of resources and the environment. Groups of fishermen consist of a part of the ICM approach.
- 47.15 The expansion of industrial zones and the growth of tourism have seriously damaged marine coastal resources. The participants agreed that destructive fishing behavior and over exploitation of resources lead to the deterioration of the coastal environment as a whole. The workshop concluded that environmental aspects steer a new direction of coastal fisheries management.

#### 48 Recommendations

- 48.1 A clearer direction in community-based fisheries management frameworks, also in the community should be started.
- 48.2 Each country should clarify and define its national purposes in fisheries management and resource objectives
- 48.3 Greater scientific study and monitoring is necessary in resource evaluation and socio-cultural impacts.
- 48.4 The creation of a coordinating body composed of both national and local level interests, should be considered to improve resource management through the cooperation of the people concerned.
- 48.5 Gender approach is essential in ensuring the acceptance of coastal fisheries management in the communities.
- 48.6 A defined mechanism for Integrated Coastal Management is needed.

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# REGIONAL WORKSHOP ON COASTAL FISHERIES MANAGEMENT BASED ON SOUTHEAST ASIAN EXPERIENCES: SOME IMPORTANT ISSUES OF SUSTAINABLE MANAGEMENT AND DEVELOPMENT

Chiang Mai, 19-22 November 1996

#### **PROSPECTUS**

#### 1. BACKGROUND

The deterioration of coastal fisheries resources and the conflicts among different groups of fishermen are increasingly felt by most countries in Southeast Asia. The rapid development of fishing industries with inadequate and ineffective management methods to control fishing efforts and together with the coastal environmental degradation are the major causes. There is a pressing need to solve these problems not only by maximizing fish utilization on a sustainable basis but also by achieving a more equitable income distribution among all concerned.

To establish effective management strategies for the sustainable use of coastal resources, the SEAFDEC Training Department will organize a Workshop which will focus upon some important issues of coastal fisheries management mainly from a socio-economic view point. The Workshop will arrange the exchange of experiences of coastal fisheries management in member countries and examine the applicability of the lessons learned to other areas and countries.

#### 2. OBJECTIVES

The workshop will be convened with the following objectives:

- 1) To provide practical information and an understanding of coastal fisheries management with emphasis on sustainable development of small-scale fisheries;
- 2) To interchange experiences through different approaches/ procedures for coastal fisheries management, i.e. central-oriented, comanagement, and traditional community-based systems;
- To provide a forum for discussion on coastal fisheries management among the countries of the region;

- 4) To promote international cooperation and coordination in supporting and supplementing the members' effort to establish efficient coastal fisheries management; and
- 5) To provide training opportunities in coastal fisheries management as member countries require.

#### 3. AGENDA ITEMS

- (a) Toward Sustainable Development of Coastal Fisheries: Framework of Effective Management and Concept of Participatory Approach
- (b) Fishermens' Understanding and Attitudes toward Community-based Fisheries Management
- (c) Country Paper Presentation: Interchange of Experiences and Outcome in Coastal Fisheries Management by Member Countries
- (d) Effective Investment in Community-based Infrastructures As a Prerequisite for Coastal Fisheries Management
- (e) Organization and Operation of Fishermens' Groups for Their Participation in Coastal Fisheries Management
- (f) Towards a Gender Approach: Placing Women at the Center of Fisheries Community Development
- (g) Coastal Fisheries Management interrelated to Environmental Aspect

#### 4. PARTICIPANTS

Participants of the Workshop will be Senior fishery officers of SEAFDEC member countries, countries in Southeast Asia region, countries under the Colombo Plan and representatives from regional and international organizations.

#### 5. DOCUMENTATION

It is expected that the documents prepared for the Workshop will provide information and understanding of coastal fisheries management with an emphasis on sustainable development of small-scale fisheries in Southeast Asia and that the lessons learned from the Workshop will provide a forum for further thought and discussion for the future. The documentation will be in two major forms, namely, country papers and experience papers.

#### PROVISIONAL AGENDA AND TIMETABLE

#### Tuesday,19 November 1996

0800-0900	Registration	
0900-0915	Opening and Assignment of Moderators and Rapporteurs	
0915-0930	Coffee break	
Toward Sustainable Development of Coastal Fisheries: Framework of Effective Management and Concept of Participatory Approach		
0930-1005	A Review and Evaluation of Community-Based Coastal Resource Management Programs and Projects in the Philippines, 1984-1994	
1005-1040	Economic Concept of Community-based Management for Coastal Fisheries	
1040-1115	Community Fishery Resource Management Project in Central Philippines	
1115-1200	Discussion	
1200-1400	Lunch Break	
Fishermen's Understanding and Attitudes toward Community-based Fisheries Management		
1400-1430	Awareness Building and Participatory Approaches in Ongoing Pilot Projects for Community-based Fisheries Management in Thailand	
1430-1500	Attitude of small-scale fishermen toward Fishing Right System in Chantaburi Province	
1500-1530	Values, Perceptions and Attitudes of Fisherfolk and other Coastal Stakeholders Towards Ownership of Fisheries, Fisheries Management and Sustainability, including CBFM Systems	
1530-1545	Coffee break	
1545-1700	Discussion	

#### Wednesday, 20 November 1996

### Country Paper Presentation: Interchange of Experiences and Outcome in Coastal Fisheries Management by Member Countries

0900-0920	Country Paper of Brunei
0920-0940	Country Paper of Cambodia
0940-1000	Country Paper of Indonesia
1000-1020	Country Paper of Malaysia
1020-1040	Coffee break
1040-1100	Country Paper of Myanmar
1100-1120	Country Paper of Philippines
1120-1140	Country Paper of Thailand
1140-1200	Country Paper of Vietnam
1200-1400	Lunch Break
1400-1420	Country Paper of Bangladesh
1420-1440	Country Paper of Fiji
1440-1500	Country Paper of India
1500-1520	Country Paper of Sri Lanka
1520-1535	Coffee break

### Effective Investment in Community-based Infrastructures As a Prerequisite for Coastal Fisheries Management

1535-1555	Mr. Saut P. Hutagalung
1555-1615	Effective Investment in Community-based Infrastructures as a Prerequisite for Coastal Fisheries Management

1615-1635	Provision of Locally-based Fishery Infrastructure: The Philippines Experience
1635-1655	An Effective Investment in Coastal Fishery Management: Thailand's Experience
1655-1800	Discussion

# Thursday, 21 November 1996

# Organization and Operation of Fishermens' Groups for Their Participation in Coastal Fisheries Management

0900-0930	Community-Based Fisheries Management With Fishermen's Organization.
0930-1000	The Role of Fishery Co-operatives in Coastal Fisheries Management
1000-1030	Natural Partners For Coastal Fisheries Management: Community-Based Fisheries Management and Integrated Coastal Management
1030-1045	Coffee break
1045-1145	Discussion
1315-1355	Special Session: "Coastal Fisheries Management interrelated to Environmental Aspect"
1355-1415	Discussion
1415-1430	Coffee break

# Towards a Gender Approach: Placing Women at the Center of Fisheries Community Development

1430-1500	Encouraging Coastal Women Participation In Fisheries Management In Indonesia.
1500-1530	Towards a Gender Approach: Placing Women at the Center of Fisheries Community Development
1530-1600	Women as workers in Fishery Activities
1600-1700	Discussion

# Friday, 22 November 1996

0900-1030	Summary of the Session by Rapporteurs & Moderators of each Session
1030-1100	Coffee break
1100-1145	Conclusions and Recommendations
1145-1200	Closing

# APPENDIX D

# LIST OF DOCUMENTS

1. <u>Country papers</u>	
SEAFDEC/CFM/96/CP.	Experiences in Coastal Fisheries Management in Brunei Darussalam
SEAFDEC/CFM/96/CP.	Coastal Fisheries Management in Cambodia
SEAFDEC/CFM/96/CP.	Brief Description of Coastal Fisheries Management in Indonesia
SEAFDEC/CFM/96/CP.	Review of National Fisheries Management Policy- Implication for the Malaysian Fisheries Sector
SEAFDEC/CFM/96/CP.	Interchange and Outcome in Coastal Fisheries Management
SEAFDEC/CFM/96/CP.	6 Coastal Resource Management in the Philippines
SEAFDEC/CFM/96/CP.	7 Coastal Fisheries Management in Phang-Nga Bay
SEAFDEC/CFM/96/CP.	Sustainable Management and Development Fishing in near shore Areas of Vietnam
SEAFDEC/CFM/96/CP.	9 Coastal Fisheries Management Issues and Opportunities
SEAFDEC/CFM/96/CP.	10 Fiji's Inshore Fisheries Resources and Management Strategies
SEAFDEC/CFM/96/CP.	An Approach to Coastal Fisheries Management in India
SEAFDEC/CFM/96/CP.	12 Management of Coastal Fish Resources
2. Experience pape	<u>ers</u>
SEAFDEC/CFM/96/WP.	A Review and Evaluation of Community-Based Coastal Resource Management Programs and Projects in the Philippines, 1984-1994

SEAFDEC/CFM/96/WP. 2	Economic Concept of Community-based Management for Coastal Fisheries
SEAFDEC/CFM/96/WP. 3	Community Fishery Resources Management in Malalison Island, Philippines
SEAFDEC/CFM/96/WP. 4	Awareness Building and Participatory Approaches in Ongoing Pilot Projects for Community-based Fisheries Management in Thailand
SEAFDEC/CFM/96/WP. 5	Attitude of Small-scale fishermen toward the Fishing Right System in Chantaburi Province
SEAFDEC/CFM/96/WP. 6	Perceptions, Values and Attitudes of Fisherfolk and other Coastal Stakeholders Towards Ownership of Fisheries Resources and its Exploitation, Management and Sustainability
SEAFDEC/CFM/96/WP. 7	Effective Investment In Community-based Infrastructures as a Prerequisite for Coastal Fisheries Management: Indonesia
SEAFDEC/CFM/96/WP. 8	Effective Investment In Community-based Infrastructures as a Prerequisite for Coastal Fisheries Management: Malaysia
SEAFDEC/CFM/96/WP. 9	Provision of Locally-based Fishery Infrastructure: The Philippine Experience
SEAFDEC/CFM/96/WP. 10	An Effective Investment in Coastal Fishery Management: Thailand's Experience
SEAFDEC/CFM/96/WP. 11	Community-Based Fisheries Management under a Limited Entry
SEAFDEC/CFM/96/WP. 11 Add. 1	Fundamental Difference in Fisheries Management between Japan and the Western Countries
SEAFDEC/CFM/96/WP. 12	The Role of Fishery Co-operatives in Coastal Fisheries Management
SEAFDEC/CFM/96/WP. 13	Natural Partners for Coastal Fisheries Management: Community-Based Fisheries Management and Integrated Coastal Management

SEAFDEC/CFM/96/WP. 14	Perspective of Fishers Organizations Integrated to Coastal Fisheries Management: Through Experiences Gained in Thailand
SEAFDEC/CFM/96/WP. 15	Coastal Fisheries Management interrelated to Environmental Aspect
SEAFDEC/CFM/96/WP. 16	Encouraging Coastal Women Participation In Fisheries Management In Indonesia
SEAFDEC/CFM/96/WP. 17	Towards a Gender Approach: Placing Women at the Center of Fisheries Community Development
SEAFDEC/CFM/96/WP. 18	Women as Workers in Fishery Activities

# 3. Information papers

SEAFDEC/CFM/96/Inf. 1	Information Notes for Participants
SEAFDEC/CFM/96/Inf. 2	Information Notes for Workshop Speakers
SEAFDEC/CFM/96/Inf. 3	List of Documents
SEAFDEC/CFM/96/Inf. 4	Information for Participants
SEAFDEC/CFM/96/Inf. 5	List of Participants

#### **OPENING ADDRESS**

# DR. MAITREE DUANGSAWASDI Secretary-General and Chief of the Training Department Southeast Asian Fisheries Development Center (SEAFDEC)

Mr. Deputy Secretary General, Distinguished guests, participants and observers, ladies and gentlemen.

It is my great pleasure to welcome you to this Regional Workshop on Coastal Fisheries Management which will focus on the Southeast Asian Experience. This workshop is organized by the Southeast Asian Fisheries Development Center or SEAFDEC. SEAFDEC is a regional organization in Southeast Asia in which fisheries is a most important source of animal protein and also creates more income to the countries. SEAFDEC by its mandate aims to facilitates member countries in Human Resource Development in various areas of fisheries. Our SEAFDEC departments, namely: the Training Department (TD) in Thailand, the Marine Fisheries Research Department (MFRD) in Singapore, the Aquaculture Department in the Philippines and the Marine Fishery Resources Development and Management Department (MFRDMD) in Malaysia are providing training, research and information programmes on marine capture fishery, post harvest technology, aquaculture techniques and resource management respectively.

As the fisheries developments in the region are starting to expand some evidence of resource overexploitation and impact from environmental degradation is seen to be increasing. The issues of sustainable development and optimum resource utilization are more recognized by organizations and countries. Many initiative on responsible fisheries and environmental protection are suggested. These should be considered, not only by large fisheries industries but also down to traditional fishermen themselves. Coastal fisheries are considered a most productive area and any impact on these resources will of course affect the marine capture fisheries. At present, many activities are recorded from the various groups of people that are deteriorating the coastal fisheries resources. Sound management programmes for sustainable development and utilization of these resources are needed. The exchange of experiences, of procedures for coastal management among the countries in the region are timely and necessary so that we may find solutions that are suitable for individual country conditions. I believe that this workshop will promote further cooperation and coordination among member countries to establish efficient coastal management systems. I should like therefore, to suggest that all of you exchange ideas in the discussions that follow the presentations of our distinguished speakers. They have a lot of experience in these areas. You will also learn from the efforts that have been made by the various countries in the region to solve the problems that beset their fishing communities and industries. You will gain an overview of the region as

a whole and you will be able to compare the difficulties of others with those of your own countries. We have the opportunity to open our minds to new avenues of exploration. Let us now use this short period of time to listen, learn and digest what is happening, what has been tried and what is new to us. I believe that within the next few days we can sum up with a set of recommendations that will be necessary as a foundation for further deliberations.

I should like to thank all of the distinguished resource persons, organizations and nations for giving your valuable time to attend this workshop. I hope that you will have a very pleasant stay in Chiang Mai, one of our most attractive cities. Please also feel free to approach our workshop secretariat if you think we can make you stay here more comfortable or productive. I now take great pleasure in announcing that this workshop is open for business.

Thank you, I wish you every success in your deliberations.

# PART 2

# PAPERS PRESENTED AT THE REGIONAL WORKSHOP ON COASTAL FISHERIES MANAGEMENT BASED ON SOUTHEAST ASIAN EXPERIENCES

Chiang Mai, Thailand, 19-22 November 1996

# EXPERIENCES IN COASTAL FISHERIES MANAGEMENT IN BRUNEI DARUSSALAM

by

# Haji Ajamain Haji Sawal Brunei Darussalam

#### 1. Introduction

Brunei Darussalam lies close to the equator on the northwest coast of the island of Borneo, between latitude 4 08 N and 5 05 N longitude 114 04 E and 115 22 E. Brunei Darussalam has a land area of 5,765 Sq Kilometres with a coast line of 130 kilometre bordering the South China Sea (Map 1).

In 1982, following many other coastal states, Brunei Darussalam declared a 200 nautical miles Brunei Fisheries Limits. This covers an area of about 35,600 Sq kilometres. With this large fishing area under the control of Brunei Darussalam, the Department of Fisheries have extensive fishery resources to manage.

The Fisheries Department was established in 1966. The Department is responsible for providing the infrastructure which are essential for the development of capture fishery such as the building of the Fish Landing Complexes.

The purchase of the 27 metre of a new fisheries research and training vessel which are capable of going to the 200 nautical miles limits as in the current 5 Years Development Plan emphasis has been placed towards further commercial exploitation of the marine fish resources and also other sectors such as aquaculture development.

In capture fishery, the strategy has been directed mainly towards increasing fishing effort and increasing effectiveness of the various fishing units. This would include exploiting offshore fish resources like tuna and other small pelagic fishes.

In 1995, the number of fishermen licensed by the Fisheries Department are 1,412. These include the part time fishermen, though the actual number of part time fishermen is suspected to be much higher. This is because under the present Fisheries Acts, only fishermen who intended to sell their catches are required to be licenced by the Fisheries Department.

Table 1. Number and age structure of fishermen in Brunei Darussalam in 1995

Age	Full-time	Part-time
Less than 20	13 (2.2%)	62 (4.4%)
20-40	230 (39.8%)	612 (43.3%)
40-60	224 (38.7%)	494 (35.0%)
Over 60	102 (19.3%)	138 (17.3%)
Total	579	1,412

### 2. Current status of the capture fishery

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Since the purchase of the 15 metre research and training vessel, KP Lumba-Lumba in 1978, the Fisheries Department have conducted a comprehensive demersal survey (1979-1981) in which the results were used as a guideline to develop the demersal fishery. In 1984, four licenced trawlers started operation in Brunei Darussalam waters. Further demersal survey were conducted in 1990-1991 to reassess the status of the demersal stocks after the introduction of the initial batch of trawlers. Further assessment of the stocks were made through log books supplied by the operators and through trawl monitoring surveys in selected areas.

The first pelagic survey was conducted in 1989 to assess the pelagic stocks, its status and potential for development. Prior to this, a few purse seiners had already been licensed using the extrapolated data from the neighbouring countries. In 1996 (March and September), another survey was again conducted to assess the present pelagic stocks.

With these survey results, the Fisheries Department has been able to develop and manage the capture fisheries through phased introduction of trawl and purse seine licenses. Since 1984, after the proclamation of the Brunei Fishery Limits Act in 1983, the Fisheries Department have drawn up 3 zones to cater for the different types of fisheries, according to either engine power or size of the fishing vessels. These zones are further subdivided into demersal and pelagic sectors with allocations of fish resources in each zones according to maximum economic yield (MEY) of the resources in each zone are as follows:-

Type o	f fishery	MEY (Metric tons)
Coasta	1	
-	Zone 1 (0-3 nm)	3,800
	(exclusive for artisanal fishermen using	
	outboard powered fishing boats)	
Demer	sal	
-	Zone 2 (3-20 nm)	5,570
	(with engines of less than 350 hp)	
-	Zone 3 (20-200 nm)	3,030
	(with engines of more than 350 hp)	
Pelagio	;	
-	Zone 2 (3-20 nm)	2,700
	(vessels with LOA of less than 20 metres)	
-	Zone 3 (20-2000 nm)	4,900
	(LOA of more than 20 metres)	
	Total	20,000

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# 3. Future strategies and programmes in the capture fisheries

The present contribution from the commercial capture fisheries is still below the Department possible calculated level. The Department has looked into two methods in which the Department can assists the local fishermen in increasing the local fish landings from the capture fisheries.

- 3.1 Increasing effort
- 3.2 Increasing effectiveness
- A. Increasing effort for the artisanal fishermen
  - i. Construction of artificial reef
  - ii. Construction of a number launching landing facilities for outboard powered boat around the country.
  - iii Resource assessment of untraceable grounds and identification of new reefs area.
  - iv. Introducing new fishing method using baited traps and vertical handline.
- B. Increasing effectiveness for artisanal fishermen
  - i. Assisting the local fishermen in overcoming their present problems of not catching fish as expected.
  - ii. Assisting the fishermen in catching fish using ring-net at night by means of light.
  - iii. Assisting the local fishermen with the labour saving devices to assists them in their operation. The devices include line hauler, net hauler, Global Positioning System (GPS) and fish finder.
- C. Increasing effort for the commercial fisheries
  - i. Encouraging more fishing days
  - ii. Introduction of freezing and storage facilities
  - iii. Introduction of Squid fishing in Brunei Darussalam waters
  - iv. Deployment of fish aggregating devices (FADs)
  - v. Developing the deep sea fishing

# D. Increasing effectiveness for the commercial fisheries

- i. Assisting the purse seiners operators in the technical know-how for right operation.
- ii. Utilization of new marine engines for trawlers.

# 4. Present management practice of the coastal fisheries in Brunei Darussalam

#### 4.1 Agencies responsible for the fisheries sectors

Since 1966, all fisheries matter were under the supervision of the Fisheries Department, headed by the Director. This is the beginning of the new era of the fisheries activities. In 1972 and 1973, the Fisheries Act and Regulations were gazetted. In 1982, Brunei Darussalam proclaim the 200 nautical miles Brunei Fishery Limits Act.

# 4.2 Other agencies responsible in enforcing the Fisheries Act of Brunei Darussalam

Apart for the Fisheries Department, there are two other agencies which are empowered to enforce the Fisheries Act. The Royal Brunei Police Force and the Royal Brunei Navy have the capability in terms of man power and equipments such as patrol vessels.

# 4.3 How do we manage the coastal fisheries resources

The main instruments for managing the fisheries resources are the Fisheries Act, Chapter 61 and Fisheries Limits Act, Chapter 130.

The Fisheries Department as gazzetted with in the Fisheries Act, uses the licensing of fishing gears as one of the management measures within Brunei Darussalam. The licensing chargers for each fishing gears are different and are not related to the amount of resources available. The Department of Fisheries also enforce closed areas for certain fishing operation.

The area for the small scale artisanal fishermen are not restricted. However the commercial trawlers, purse-seiners and other inboard engines vessels are restricted and the number of licenses issued are in accordance with the availability of the fisheries resources in Brunei Darussalam waters.

Following this management practices, the Fisheries Department is administratively zoning the Brunei Fishery Limits into 3 zones as in **Map 2**. Zone 1 (0-3 nm) is for the artisanal fishermen. Zone 2 (3-20 nm) are allocated to trawlers, purse-seiners and other fishing vessels with engine power of less than 350 hp and

purse-seiners of less than 20 metres in overall length. Zone 3 (20-200 nm) is for fishing vessels higher engines and size than zone 2.

### 4.4 Past experiences in enforcing the fisheries acts and regulations

#### 4.4.1 Encroachment of foreign fishermen

Since 1984, there are about 38 foreign fishing vessels have been caught fishing in Brunei Darussalam waters. This involves about 246 fishermen, most of them comes form neighbouring countries. However, there are also cases where the fishing boats came from Taiwan, Vietnam and Indonesia.

Most of the foreign fishing encroachments are being dealt with tough action such as refer to court and normally with higher fines to the master. Boat, fishing appliances and fish caught is most ordered to be confiscated.

# 4.4.2 Various offenses by the local fishermen

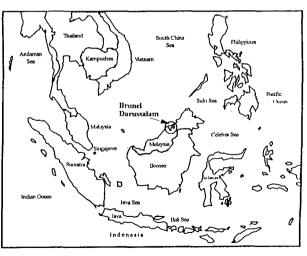
The local fishermen have also been apprehended for various offenses under the Fisheries Act. Normally actions taken, depending on the offenses are by means of warning, compounding and court action for repeated offenses. Since 1990 the Department have only 9 cases involving the local fishermen.

#### 5. Discussion

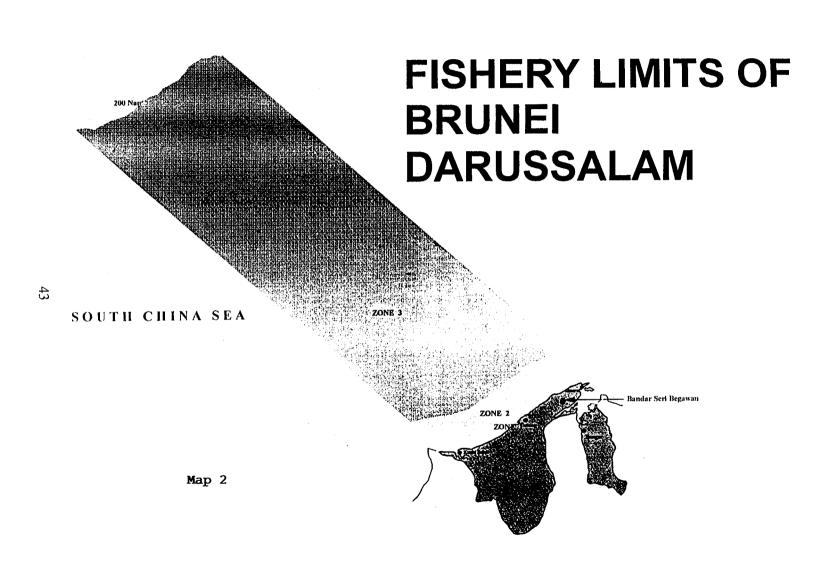
The Fisheries Department, Ministry of Industry and Primary Resources, Brunei Darussalam continues to manage the resources while at the same time tries to increase the development of the capture fisheries. The main strategy has always been exploitation up to the MEY which is taken at about 20% below the MEY. In this regard a lot of work still has to be done in order to reduce imports. The Department have identified a few problems and a number of projects are currently being implemented to increase production.

# Bandar Seri Begawan SOUTH CHINA SEA BRUNEI & MUARA DISTRICT Kuala BELAIT DISTRICTS TEMBURÓNG DISTRICT **SARAWAK** (MALAYSIA)

# BRUNEI DARUSSALAM



Map 1



#### COASTAL FISHERIES MANAGEMENT IN CAMBODIA

by

# Heng Sok Department of Fisheries, Cambodia

#### 1. Introduction

Cambodia has 1/6 of boundary is coastline that stretch for 435 km from the Thai border to the Vietnamese border. The coastal provinces are Koh Kong, Kompot and Sihanouk Vill. Cambodia had declared its Exclusive Economic Zone in 1978 (FAO) with an area of 69,000 sq. miles.

The average depth of Cambodia's sea is 50 m and the maximum of about 75 m but the seabed is flat. There is a great deal of island near the coast. The marine science was late developed in the past. Surveys have been carried out by the former Soviet Union scientists from 1983-1986, stocking assessment had only 50,000 tones per year. Even though the marine fisheries is located in the Gulf of Thailand which is endowed with rich fisheries resources if we compare to other parts of the Gulf of Thailand.

# 2. Marine Capture Fisheries

The marine capture fisheries are carried out by a wide range of small-scale and mid-scale gears including gill nets, seines and long lines used by inshore fishermen. The industrial fisheries further offshore uses motorized boats in the range of 10 hp to > 50 hp with trawls, gill nets, seines and long lines.

There aren't activities of the marine capture fisheries and even fisheries science during the period 1975-79. Moreover, the oceanography institute and other marine fisheries infrastructure were completely destroyed during the same period.

The marine capture fisheries activities restarted in 1979 with very few fishing boats, but the number rose up very fast to 4,000 motorized and unmotorized boats in 1990's then stabilized until today.

Coastal communities are less crowded than inland communities and the people devoted in the marine fisheries is rare. The number of fishermen and other fisheries employees record in 1994 were not higher than 10,000 persons. The fishing activities in coastal areas in Cambodia are mostly inshore rather than offshore since the majority of fishing boats are low power and unmotorized.

Unmotorized boats are used to operating in beach seining, fishing barrier, gill nets, crab traps, lift nets etc. The fishing operation are less than one day period. The production of this sub-sector was steadily increased since 1987 while the last record

in 1995 was reached to 30,500 tones. We estimated that in the year 2000 the fishing capacity will be 35,000 tones because we strongly effort to protect the illegal fishing.

There are little fishing activities by Cambodian boats in offshore areas because Cambodia boats are not equipped for staying there overnight and can not reach these areas in one day round trips. These areas are under-exploited. There are little patrolling or monitoring in the Exclusive Fishing Zone by the Cambodian authorities.

Following are the catching record of fish production and fishing boats for the past few years:

#### <u>Fish production</u> (Marine, tones)

year	Komport	Sihanouk Vill	Koh Kong	Total
1990	3,030	9,300	22,570	34,900
1991	8,100	8,300	20,000	36,400
1992	8,100	8,600	17,000	33,700
1993	7,940	8,560	16,600	33,100
19 <b>9</b> 4	7,600	8,700	13,700	30,000
1995	7,300	9,200	14,000	30,500

### Fishing boats (Marine)

1990	1991	1992	1993	1994	1995
1,985	1,667	632	882	746	733
1,176	1,357	632	882	746	423
809	310	0	0	0	310
2,236	1,372	1,527	1,959	2,427	1,406
903	590	0	1,082	1,267	260
489	263	1,162	601	705	658
413	200	187	163	273	245
431	319	178	113	182	138
	1,985 1,176 809 2,236 903 489 413	1,985 1,667 1,176 1,357 809 310  2,236 1,372 903 590 489 263 413 200	1,985 1,667 632 1,176 1,357 632 809 310 0 2,236 1,372 1,527 903 590 0 489 263 1,162 413 200 187	1,985     1,667     632     882       1,176     1,357     632     882       809     310     0     0       2,236     1,372     1,527     1,959       903     590     0     1,082       489     263     1,162     601       413     200     187     163	1,985     1,667     632     882     746       1,176     1,357     632     882     746       809     310     0     0     0       2,236     1,372     1,527     1,959     2,427       903     590     0     1,082     1,267       489     263     1,162     601     705       413     200     187     163     273

#### 3. Management of Exploitation in Marine Fisheries domain

All kinds of fishing in marine fisheries domain of Kingdom of Cambodia can be taken place on the contingency that the permission is available except small scalefamily fishing.

- Small scale-family-fishing gears and other fishing gears allowed to operate in the marine fisheries domain of Kingdom of Cambodia must be defined by the proclamation of the Ministry of Agriculture Forestry and Fishery.

Fishing boats or vessels of local fishermen must additionally have licenses allowed to operate in the sea issued by the fisheries authorities after technically controlled.

The foreign fishing activities in the Cambodia's marine fisheries domain must have the permission after approving from the Council of Ministers.

- Fishermen who are permitted to do fishing in the marine fisheries domain must:
  - (a) respect the order as mentioned in the fishing license.
  - (b) regularly record the fishing yield caught daily in the statistic books and monthly report to the provincial-urban fisheries authorities.
- Locating all kinds of fishing gears extended and caused the obstruction to the boat navigation are forbidden.
- Locating all kinds of fishing gear extended across the streams, inlets or navigable channels of the coastal zone must keep free space of 1/3 of width during low tide to enable the navigation of all kinds of vessels.
- The location of fishing or all kinds of fishing gears must dismantle at a longest date for 15 days after cease-fishing.
- Mackerel (Camong or Pla Thu) fishing in the sea during spawning season from 15 January to 31 March are forbidden.
- Trawling in the shallow depth from inshore up to 20 m of depth line are absolutely prohibited, except a special permission of the requirement of the Department of Fisheries for doing the experimental research.
- Using the electrocuted fishing gears, all kinds of explosives or modern fishing gears not yet mentioned in the proclamation of the Ministry of a Agriculture Forestry and Fishery are absolutely forbidden.
- Hiring of marine fisheries domain for exploitation must be up to the size of fishing gears and the horse power of fishing boats.
- Coastal Marine Aquaculture that have bigger than 0.5 ha of the pond areas must have the permission and the statistic books for recording all the production. The book must be signed monthly by the provincial urban fisheries authorities.

#### 4. Coastal Aquaculture

At present, a relative small proportion of the world aquatic production comes from marine Aquaculture; most of this is centered on coastal water, estuaries, lagoons and semi-enclosed seas (FAO, 1996). Shrimp farming are the recent activities initiated in coastal areas in Koh Kong, Kompot and Sihanouk Ville.

Presently, most of shrimp farming activities are concentrated in Koh Kong. An estimated 598 ha of land is reported to be under shrimp culture. There are similar environmental concerns about this fishery as in neighboring countries particularly with conversion of mangroves to shrimp ponds and uncontrolled development leading to water and disease problems.

#### 5. Inundated Forest in coastal areas

Inundated forests in Cambodia have been operated by the fisheries authorities especially mangrove forests that have an important role for fish sanctuaries and nurseries. Mangroves are now found mostly in Koh Kong province with an estimated for about 16,000 ha among the total of about less than 60,000 ha in Cambodia's coastal areas (FAO 1960).

So far, there have been illegal destroying of mangroves for making charcoals, firewood and rice growing.

# 6. Problems of the coastal fisheries management in Cambodia

The fisheries management and fishermen communities in coastal areas have faced the following condition:

- Most fishermen families incomes have declined since 1990 because of law harvested technology and transportation, depletion of stock resources and security.
- Fish maintenance system of the fishing boats have used only ices from inland. So the duration of fishing is only one night.
- The fishing boats have difficult been harboured at a few small wooden fishing ports because we haven't got a suitable concrete one. As a result, most of the fishermen have sold their yields directly to neighbouring countries' boats at offshore.
- There are illegal fishing in Cambodia sea, including neighboring countries' fishing boats. The local fisheries authorities are unable to police and arrest those illegal fishing boats because of haven't high speed petrol boats.

- There are little fishing activities by Cambodian boats or vessels in offshore because those boats or vessels do not equipped to stay there over night and can not reach these areas in one day round trips. There are little patrolling or other monitoring of the exclusive fishing zone by the Cambodian inspectors.

There are a great deal of fishermen anarchy houses in any places of coastline caused the water in those areas to become stagnant.

# 7. Marine Fisheries Planing Projects of Socio-Economy During 5 years (1996-2000)

# 7.1 Construction of Marine Fishing Port in Sihanouk Ville

Present situation of marine exploitation has more developed than in the past and the average total fishing boats are 40,000. All fishing boats are difficult to harbor because of our Government not yet construct the suitable fishing port as international style. At the present time we have had only small wooden fishing ports and the boats has been able to harbor only small numbers. A large numbers of fishing boats have harbored every places without tidy. In 1992 the Department of Fisheries had made a construction project of Fishing Port in Sihanouk Ville but the fund has not yet been available.

### 7. 2 Establishment of Oceanography Institute in Sihanouk Ville

Previously, Fisheries Department existed an Oceanography Institute in Sihanouk Ville but presently, every kinds of the laboratory facilities have lost, so it also necessarily demands to rehabilitate and reconstruct in order to study and research the marine resources, Aquaculture and processing technology of marine fisheries.

# 7.3. Establishment of Marine Aquaculture Research Station

The establishment of this station for researching the technology of fish, shrimp, crab and mussel culture and breeding etc.

To promote the technological documents which are relevant to the aquaculture task in order to spread out the information to the people to promote the Marine Aquaculture without affected to the environment.

#### 8. Conclusion

Coastal fisheries in Cambodia is complicated in management. The Government regulation have been instituted but enforcement is difficult. Marine fisheries resources have not much deteriorated but the seabed have little destroyed with trawl nets on the bottom. So far marine fisheries science have late development, so there are no results in marine resource research as well as other practice technology. Even though, Fisheries Department has special consideration of project

preparation plans and marine science development, but until right now all the projects have not yet been implemented because of lacking funds.

# 9. References

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# BRIEF DISCRIPTION OF COASTAL FISHERIES MANAGEMENT IN INDONESIA

by

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#### **ABSTRACT**

Indonesia is an archipelagic state, which comprise of large and small islands and has long coastal zone. There are great opportunity for castle fisheries development. However, coastal area has multi function. beside for fisheries activity, there are also purposed for many sector activities, which usually undermine for fisheries activity, especially due to environmental degradation. Therefore, in order to overcome it, there are need integrated land use planning adequately. In term of fisheries resources management included for coastal fisheries management principle, there are shared authority between central and provincial government, which fishing activities of < 30 GT/90 HP and non power boat are regulated by provincial government. Same management action have been taken in order to keep fisheries resources sustainability, social conflict avoiding and environmental protection. Some of there have shown a good impact, however, the other still in inefficient implementation.

#### 1. Introduction

Indonesia is an archipelagic state, which comprise of large and small islands and has long coastal line. Indonesian territorial is consist of approximately 70% sea and 30 % land territorial. Based on the condition, there are great opportunity for coastal fisheries development in Indonesia.

However, coastal area has multi-function. The area is purposed for many sector activities and of course has wide range of economic value. The situation may cause conflict of interest among sectors, which undermine each others. Fisheries activity has great risk depending on environmental condition. So, the development in coastal area face some difficulties, due to negative impact caused by other sector and fisheries activity itself.

Fisheries development, including fisheries in coastal area has objectives for increasing of people earning and job opportunity by pay attention to environmental sustainability. For the purpose, Indonesia has developed several activities, which can support it, including preventing of environmental degradation.

The paper is mainly prepare and focus to fisheries aspect of coastal fisheries in Indonesia, such as fisheries development policy, existing condition and fisheries

resources management, including some management action has been taken by Indonesian Government e.g. Directorate General of Fisheries and its result.

### 2. Management Policy for Coastal Zone Fisheries Development

# 2.1 General description of coastal zone

Physically the coastal area is the interface between the land and the sea and may extend inland and seaward to a variable extend, depending upon the objective and needs of particular purposes of which reflected to it's programme. It is therefore the boundaries of the coastal zone depend on political, administrative, legal, ecological and pragmatic consideration.

In term of fisheries in Indonesia administratively and legal view coastal zone authority may extend referring to the mandate of local government in fisheries management of which there have authority to manage fishing effort of certain level of < 30 GT/90 HP and register for small scale fishing (non required license fishing). For this authority, principally assumed that vessel just have their ability operate limited in coastal area, eventhough in reality they can cover in broad area for fishing.

# 2.2 Fisheries development policy

#### (a) General policy

As the continuation of previous fifth five years development plan, fisheries development in sixth five years development plan is aims to:

- Increasing human resources quality and earning of fishermen and fish farmer through sustainable fisheries resources utilization.
- Increasing productivity and distribution of fisheries commodity in order to increasing people nutrient quality.
- Expand employment opportunity.
- Increasing domestic industry development through providing raw material and increasing foreign earning exchange

# (b) Fisheries development policy for coastal zone

The objectives of coastal zone development is to ensure optimum sustainable use of coastal natural resources, to keep biodiversity and coastal habitat protection.

In regard with fisheries sector which is in the coastal area generally of dense population with heavy pressure of exploitation, accordingly one of the goal is protection and supporting to fisheries activity development outward of in the area.

The effort is also taken into account to other sectors interest, such as tourism, mangrove protection, etc.

The policy is designed simultantly with other sector, which is to integrated land use planning, and also lead to integrated development, (which pay attention to all interest sector). Recently, in order to strengthen the legality, the government formulate coastal land use planning and jurisdiction for provincial government.

In fisheries sector, there are an authority delegation from central government to provincial government on fishing regulation. The provincial government has full authority to regulate fishing activity which use < 30 GT/90 HP and non powered boat, and fish culture in coastal area. This policy taken, for fisheries activity in coastal zone is dominated by artisanal fisheries (which has limited their capability and fleet size providing for artisanal fisheries, especially in developed their fishing ground). It is therefore to improve the small scale fisheries, the government invite fishing companies to invest and stimulate local fisherman or fishing venture in coastal waters under nucleus estate small holder system (NESS). Under the system, fishing in coastal waters just limited conduct by local fishermen as plasms and the company acting as nucleus which assists the plasms by providing facilities such as: credit, production inputs, and training for them to improve their capabilities, and production market insurance.

# 3. Existing Condition

# 3.1 <u>Significance of coastal zone relating to fisheries</u>

#### (a) General situation

Indonesia is an archipelagic country, made up more than 17,000 island and coastal length of approximately 81,000 Km. The total of Indonesia fishing zone is approximately 5, 8 million sq. Km, consisting of 3.1 million sq. Km Nusantara and Territorial zone, and 2, 7 million sq. Km. EEZ.

Indonesia territorial is consist of 27 provincials, 49 municipals, 3,625 subdistricts and 67,439 villages. Approximately 9,261 villages are lied in coastal area, which inhabited by 60% of people, especially in northern coast of Java, eastern coast of Sumatera, coastal of Kalimantan, Bali, Sulawesi, NTB and Maluku.

# (b) Significance for fisheries

In regard with fisheries aspect, coastal area is a buffer zone for many marine species and as spawning/nursery ground for them i.e. for shrimp species and other marine living resources. So, in ecological term the coastal zone has important of ecological term the coastal zone has important of economic value.

The other side, the coastal area itself very important to other sector also, because of this area has wide range of economic value. Accordingly, the condition

may cause conflict of interest among sectors, and finally the condition may undermine fisheries sector.

And afterward followed by management action such as:

- Increase fishermen participation and role for protection of indangerous coral reef species, such as Kima (*Tridacna sp*), Trochus (*Trochus niloticus*, etc.).
- Increase rehabilitation of coral reef in critical condition through artificial reef installation.
- Coordination among institutions involved in planning, organization, actuating and controlling of management measurement of coral reef area.

#### Mangrove area

Mangrove area has many functions such as spawning ground and nursery ground, for fish species, water pollution absorbent, land builder, coastal protection etc.

Mangrove area in Indonesia approximately 4.25 million Ha in 1982. However, in 1987 the data indicate that the mangrove area has been degraded to 3.24 million Ha, due to change their function for, mining, tourism, fisheries etc. However, mostly the degradation indicated caused by illegal utilization, mainly for charcoal product (home industry) aside foam abortion and pollution.

# (c) Legal aspect dealing with coastal zone management

There are law and regulation relating to coastal management have been issued, by the government. In brief term as follows:

- The law No. 11/1967 on Mining, which determine that whole continent area under Indonesia waters principally is under authority of mining law. However, in the implementation faced several problem, to other sector such as to the fisheries which develop fastly and consequently need more over access for fishing and culture activity, regulation facilities, law enforcement personal etc.
- The law No. 9/1985 on fisheries management
  Main objectives of the law is stressing for fisheries resources
  management, which consist of exploitation, conservation and law
  enforcement regulation.

- The law No. 5/1990 on conservation of natural resources and its ecosystem. The law regulate living and nonliving resources, ecosystem and law enforcement.
- The law No. 9/1990 on Tourism

  The law regulation tourism activity regarding to natural resources and its environment, culture, etc.

# 3.2 Fisheries Condition

#### (a) Potential yield and environment

The total of Indonesia fishing zones is approximately 5.8 million sq. Km, consisting of 3.1 million sq Km Nusantara and territorial zone and 2.7 million sq. Km EEZ. There have marine potential yield of 4.5 metric ton and 2.1 million metric ton respectively.

Furthermore, Indonesia as an archipelagic country, approximately comprise of 17,000 island and 81,000 Km coastal area. There are high potential area for brackishwater pond culture of 840,000 Ha and mariculture of 114,325 Ha.

#### (b) Production

During the last ten years (1985-1994), the development of total fisheries production which was 2,395,562 in 1985 increase to 4,013,831 tons in 1994, increased annually by 5.91%. Data also showed that marine fish capture increased by 6.02% fish capture in open water by 2.53% and fish culture by 7.86%.

Among fish culture, brackishwater pond and paddy field showed a good increase in production. Brackishwater pond production was 156,367 tons in 1985, and 346,214 tons in 1994, increase annually by 9.42%. While cage culture production increased annually by 70.55%, from 746 tons in 1985 to 33,011 tons in 1994.

In the same period, the number of marine fishing boats which was 316,446 units in 1985 increase to 396,185 units in 1994, with an average rate of increase of 2.56% annually. Further analysis showed that the structure of marine fishing boats in 1994 was more developed comparing with marine fishing boats in 1985. Number of non powered boats increased from 220,823 units in 1985 to 245,486 units in 1994, with an average increased of 1.22% per annum. While the number of outboard powered boats increased from 61,887 units in 1985 to 87,749 units in 1994, increased annually by 4.02%, and number of in-board powered boats from 33,756 units in 1985 to 62,950 unit in 1994, increased annually by 7.26%.

Indication showed that fisheries activity is concentrated in the area of dense population. Commonly, Western Indonesia more dense than Eastern. The situation cause several problem, such as interest concurrence between fishermen and

degradation of fisheries resources quality. Several action have been taken to prevent and solve this problem by the government. First, issued Minister decree No. 607/1976 on fishing zone, which regulate fishing activity based on fishing zone and size of fishing vessel (as point 4.2). Second, western Indonesia waters to be priority allocated for artisanal fisheries. Third, industrial fisheries activity can be developed in this region through NEES (point 2.2).

# (c) Export

During the period of 1990-1994 export of fisheries products increased by 14.85% per annum, from 320,241 mt in 1990 to 545,371 mt in 1994. While its value increased by 13,01% per annum, from US\$ 1,039.680 million to US\$ 1,678,720 million in the same period.

By commodities, during the same period shrimp and tunas/skipjack showed dominant contribution to the total export. In 1990 shrimp (unfrozen, frozen and canned) export reached 29.36% of the total volume or 66.39% of the total value. While in 1994 shrimp export reached 18.25% of the total volume and 59.80% of the total value. In 1990 tunas/skipjack (fresh/chilled, frozen and canned) export accounted 22.72% of the total volume or 12.0% of the total value and 1994 reached 14.61% of the total volume or 10.85% of the total value.

# 4. Fisheries Management in Coastal Zone

# 4.1 <u>Authority</u>

# (a) Formal authority

Basically fisheries management measurement established under the law No. 9/1985 on fisheries. There are several authorities regulation based on the law.

Based on Minister decree No. 15/1990, licensing for fishing vessel < 30 GT./90 HP is issued by Province Fisheries Service and for > 30 GT issued by Directorate General of Fisheries. Whereas, there are no fishing license for small boat/canoes of < 5 GT/unmotorized, due to the fishing activities only appraised as subsistence activity only. For the last category, the fishermen should reported their activity for statistic data and fisheries resources management measurement.

In term of mariculture licensing, President decree No. 23/1982 state that the license is issued by provincial fisheries service if it is supported by the national enterprise, if it is operated by joint company (Indonesia and foreign) enterprise, the license is authorized by Directorate General of Fisheries.

# (b) Informal Right

Beside formal authority, there are still exist several traditional convention law in several region, such as: Panglima laut (marine command) in Aceh, Sasi in Maluku etc.

Based on the traditional law, local people/fishermen has exclusive fishing right on the adjacent area. Accordingly fishing activity in the area should be permitted or refer the local convention.

The regulation do not under mine effectively of resources management measures under formal/national law. It is caused that the national law formulated with pay attention to traditional law.

# 4.2 Fisheries Resources Management

#### (a) Fishing zonation

Based on Ministry of Agricultural decree No. 607/1976, fishing operation has been regulated based on size of vessel, fishing gear and fishing zone. The aims of the regulation, such as: protecting of small scale fisheries and protecting of fisheries resources of coastal area and protecting other coastal area function referred point 3,1 etc.

Based on the decree, fishing area is divided in to 3 zones, as follow:

- Zone I: 0 to 3 n.m from coastal line, is closed for fishing

vessel in board > 5 GT/10 HP, purse seiner, circling

gill net, drift gill netter.

Zone II: 3 n.m to 7 n.m from zone I line, is closed for fishing

vessel in board > 25 GT/50 HP, purse seine

(length > 300 m).

- Zone III: 7 n.m to 12 n.m from zone II line, is closed for

inboard fishing vessel >100 GT/200 HP.

The decree implemented is not in whole area of Indonesian water however in several coastal area of determined potential likely for rising conflict of interest, such as Eastern coast of Sumatera, North coast of Java, Southern coast of Central Java, coast of Bali, coast of West, Central and South Kalimantan, Western coast of south Sulawesi and coast of North Sulawesi which have dense population and dense fishery activities especially artisanal fisheries.

### (b) Trawl banned

Based on President decree No. 39/1980, trawl is not allowed to operated more in whole Indonesian water. The decree has several objectives as follow:

- To keep sustainability of fisheries resources, mainly for demersal
- To encourage increasing of fisheries production of artisanal fisheries
- To prevent social conflict possibilities among fisheries (small and medium scale)

The action has good impact to the resources condition. It is shown by the result of trawl Banned Impact Evaluation (DGF 1995), as follow:

- In Cilacap (Central Java), level of exploitation of shrimp stock had achieved fully exploited in 1979 (>100%) and however it decreased to 50% in 1989. Also CPUE of trawl net increased from 48.4 Kg/year in 1984 to 79.4 Kg/year in 1990.
- In west Kalimantan, level of exploitation of shrimp stock had achieved fully exploited (>100%) in 1980, however in 1990, it is still in below its potential yield (96%). In addition, potential yield of shrimp also increased from 10,866 ton/year (1969-1980) to 12,246 ton/year (1980-1990).

In spite of that, implementation of this President decree still faced some violation, such as:

- Illegal trawl or fishing gear like trawl are still operated in some area
- Modified fishing gear to be like trawl

The condition cause conflict with other fishermen which use legal fishing gear.

# (c) Establishing artificial reef

Artificial reef have been established in certain area, as a pilot project by the Directorate General of Fisheries, such as: North Sumatera (Nias), Riau, Lampung, Jakarta, West Jawa, Central Java, East Java and Bali. The activity has several purpose, such as:

- Improving of environmental condition of degraded coral reef,
- Stimulating fish stock to be increase in it's density in this area, especially coral reef species.

- Increasing earning of fishermen who inhabited near the area, as an effect of good fish population.
- Increasing fishermen awareness concerning the importance of coral reef.

The artificial reef to be lied in water of near fishermen villages in order to easily for utilizing and may stimulate to them to developed the artificial reef.

The activity indicated has positive impact for the environment, stock density, fishermen earning and fisherman awareness, however presently the quantitative data are still difficult to obtain, due to several weakness, such as:

- Man power skill
- Monitoring system
- Fishermen participation in catch data recording

# (d) Mangrove rehabilitation

Program of rehabilitation of mangrove principally is under authority of Department of forestry, however, for limited purpose, such as fisheries culture, the Directorate General of Fisheries has certain program for mangrove protection (in the area of bordered with brackishwater pond).

4.3 <u>Action program and implementation for increasing income generate</u> of fishermen, included for coastal area

There are several program for increasing income of fishermen:

# (a) Coastal fisheries development

The objectives of this program are : to increase coastal productivity, to increasing of sustainability of coastal ecosystem function and to controlling coastal degradation

The program took in their sites: Northern coastal Java: (Subang, Kerawang, Pemalang and Demak), Sulawesi (Bone, Binjai) and Sumatera (Lampung)

In order to take a success, there are institution support to the activity, such as District Fisheries Service, District Forestry Service, village cooperative, extension personal.

The program started in 1994 and, it will be finished in 1998.

The result of the program are: inventory and take measurement for coastal regulation (Lampung, Serang, Tanggerang, Bekasi, Kerawang, Subang, Indramayu, Cirebon and Pemalang), fishery activities (Kerawang, Subang, Demak, Pemalang and Lampung), brackishwater culture canals rehabilitation (Kerawang/10 Km, Subang/8 Km).

# (b) Commercial fishing development programme

The objectives of the program in general are: providing information fisheries resources and investment opportunity, to increase people nutrient through fish protein consumption, to increase fisheries product quality, to increase fisheries product marketing through information and promotion, to strengthen joint cooperation between large/medium scale company and small company, to increase fishermen and fish farmer income, especially small scale fisheries.

The program took in their sites in 27 Provincial. Because of parties concerned the program has involved institutions, such as: government personal, private company state companies, cooperative, fishermen, fish farmer and fish processing, and conducted since 1994.

Result of the program, has been achieved such as international standard for Indonesian fisheries product, marketing diversity, fisheries information easily, due to facilitated by radio/SSB equipment, however, it is still limited in certain area of important location.

# (c) Development of utilizing of marine fisheries resources

There are several objectives of the program, such as: to increase fisheries resources utilization in term of harmonize and sustainable pattern, (in order to increase fishermen welfare), to implement MCS, to provide data and information on potential yield and its distribution of marine resources.

This program located in all Indonesian territory and for conducting in field because of cover many aspect, it is therefore involved several institutions, such as: Universities, Department of Defense, Department of Foreign Affairs, National Oceanography Institute. The program has been conducted since 1992.

# (d) Development of Brackishwater fishculture

There are objectives of program, such as: developing of human resources, biophysical resources, applied technology, institution, increasing of productivity of fisheries activity, in order to development of village community economic, etc.

The program is conducted in West Kalimantan, North Sumatra, Bali, Lampung, East Java, West Java, Central Java, West Nusa Tenggara. In order to take a success, the program has involved some institution, such as Department of Transmigration, Department of cooperative, and Nucleus Companies.

# 4.4 <u>Institutional development</u>

Marine fishing activities are developed fastly in the last decade. It is caused by the development of fishing technology and size fishing vessel. Consequently, the fishing ground is also developed wider than before, due to the fishermen increase their ability to fishing far away from their homebase in accordance with fish migration.

The situation cause fishing to be concentrated in a certain fishing ground in a certain season. Level of exploitation could more over than its carrying capacity. Finally, the situation tend to decrease sustainability of fisheries resources.

In addition, the situation also cause some conflict between migraine and local fishermen.

Taking into account the authority for managing fishing activities shared to local government as told in point 4.1, in order to overcome the problem, the Directorate General of Fisheries create to established Coordination Forum for Fishing Management. The member of the forum is Province Fisheries Service. The forum is coordinated by the Directorate General of Fisheries.

Several objectives of the forum, such as:

- Sincronishing of perception in fisheries resources management measures among members.
- Establishing fisheries resources management measures aim to get harmonized implemented and optimal effort, in order to keep the sustainability of fisheries resources.

Based on the consideration mainly of fish migration and fishing pattern, the Indonesia fishing zone are divided into 8 groups fishing management region, such as:

- Malacca strait
- South China Sea and Natuna Sea
- Java Sea, Sunda Strait and Karimata Strait
- Flores Sea and Makasar Strait
- Maluku Sea, Tomini Sea, Halmahera Sea and Seram Sea
- Banda Sea, Arafura Sea, Timor Sea

Indian Ocean

#### Sulawesi Sea and Pacific Ocean

The implementation of this coordination, by conduct meeting regularly which attended by members: DGF, research center and other institution involved. The target of the meeting principally get a consensus among members an taking problem solving concerning to fisheries resources management, such as:

- Formulating fisheries resources and it's potential yield, effort allocation for each provincial.
- Migraine fisheries regulation
- Important commercial species fishing regulation
- Conservation measures
- MCS implementation
- etc.

Referring to the objectives of the forum, several action has carried out well, such as: Same perception fisheries resources management measures among members and determining of effort allocation for each member. However, there are still face some problem mainly migraine fisheries regulation, and MCS implementation.

#### 5. Conclusion

- Indonesian fisheries dominated by coastal fisheries, majority could be categories as artisanal fisheries that lacking their ability of skill, capital and technology.
- The coastal area has multi function in their utilization. There exist as wide range of economic value. Consequently the area steeled to economic variety purposes. Finally the area to be a accumulate of damage factors as waste and other degradation cause factors.
- Because of multi function, it is potential raise a conflict of interest. Presently government taken a program to solve the problem by i.e. taken measurement on land used integrated program to be reference for all institution dealing with their program development.
- In term of fisheries, the definition of coastal area principally is not limited to the physically approach, however it may extent to administrative and legally term, because of the configuration of this country is archipelagic state, of which the area mainly could be categories as coastal area. Considering that, local government has their authority for fishing license issue of certain fishing

criteria (< 30 GT. and non power boat and aqua/mari culture), although their fishing ground may over lapping one to the others.

- The Forum Coordination on Fisheries (fishing) management created by government is a policy taken, with main goal to over come the problem raised as a consequent of shared fishing management authority above mention.
- As a whole of government policy in fisheries management, presently has been taken practically regulations i.e.: Trawl banned in whole of Indonesian water, fishing zonation in certain area of bordered with dense population, rehabilitation of environment (mangrove and artificial coral reef), conservation and protection of certain species, implementing MCS program.
- The development program would be continuous i.e. by establishing activities: coastal fisheries development, commercial fishing development program, Development of utilizing fisheries resources, Development of Brackishwater culture etc.

For implementing that, it would be conducted by coordination collaboration among parties or institutional concerned.

# REVIEW OF NATIONAL FISHERIES MANAGEMENT POLICY-IMPLICATION FOR THE MALAYSIAN FISHERIES SECTOR

by

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#### 1. Introduction

- 1.1 The marine fisheries subsector plays an important role in the national economy and contributes significantly towards providing income, employment opportunities and foreign exchange gains to the rural population in the country. Fish constitutes 60-70% of the national animal protein intake with per capita consumption of about 39.5 kg per year. The rate of demand for fish as the main source of protein is expected to increase from an annual consumption of 630,000 metric tons to over 1,579,800 metric tons by the year 2010 (by an estimated population of 26,330,000 at per capita consumption of 60 kg/year). In 1994 the total marine fish landings was around 1,181,763 metric tons with a value of about RM2.99 million. The total revenue accounted for about 1.61% of the Gross Domestic Product (GDP). The marine fisheries subsector employs 1.3% of the total labour force in the country.
- 1.2 The development of the marine fisheries subsector has long been restricted to the territorial waters but after the proclamation of her Exclusive Economic Zone, the Department of Fisheries is not only given the opportunity to exercise resource management to ensure sustainable exploitation and equitable allocation of her natural marine resources within the area of extended jurisdiction but also to increase production and at the same time protecting the marine environment from pollution and degradation which will result in loss of aquatic habitats.

#### 2. The Marine Capture Fisheries

2.1 The marine capture fisheries can be categorized into two main types namely

#### Coastal or Inshore Fisheries

Coastal or inshore fisheries, where the fishing vessels operate within 30 nautical miles from the coastline, is the most important subsector of the fisheries industry from the socio-economic point of view. These fishing vessels ranged from the traditional type to the commercial vessels of less than 70 Gross Registered Tonnage (GRT). The coastal fisheries have always been the main focus of the fishing activities and there is general consensus that the coastal fisheries resources are currently intensively exploited. Currently the inshore fisheries contribute about 87.3% towards the total marine fish landings of the country.

#### Deep Sea Fisheries

The deep sea fishing vessels operate beyond 30 nautical miles from the shore line. Presently, deep sea fisheries contribute about 12.7% of the total marine fish landings in the country. The fishing vessels in operation are fairly large, of 70 GRT and above. Basically commercial gears such as trawlers, purse seine and hooks and lines are operated. In 1994, a total of 31,403 fishing vessels were licensed, out of which 520 unit were deep sea fishing vessels.

2.2 The marine capture fisheries are characterized by various types of fishing gears that are being employed by the fishermen to harvest the large selection and diversity of fish species that are found in Malaysian waters. These fishing gears are classified into commercial fishing gear consisting of trawl, fish purse seine, drift/gill nets and the traditional fishing gear like the hook and lines, bagnets, trammel nets, lift nets and traps. However, the major fishing gears that contribute to the bulk of the landings are the trawl nets, purse seine nets and the drift/gill nets.

#### The Trawl Fishery

The otter bottom trawl net is the main fishing gear used to harvest the demersal finfish and penaeid prawn resources in the waters of Malaysia. The trawl fishery contributed 587,928 metric tones (55%) of the total marine landings in 1994, of which 540,392 metric tons (50.6%) were mainly finfish and cephalopods and the balance of 47,536 metric tons (4.4%) being penaeid prawns.

A large number of fish species are landed by the trawlers. While demersal finfish still remain as the dominant catch of the trawl nets, the development of "high opening" trawl nets have resulted in the ability of trawl nets to catch pelagic finfish, mainly the Indo-Pacific mackerel *Rastrelliger brachysoma*. This has resulted in the Indo-Pacific mackerel being caught mainly by these "high opening" trawl nets, particularly on the west coast of Peninsular Malaysia.

Penaeid prawn constitute an important component of the catches of trawiers operating in the inshore waters, particularly on the west coast of Peninsular Malaysia. Although the penaeid prawns landed by trawl nets contribute only 8% to the total marine fisheries landings in 1994, they are the mainstay of the trawl fishery by virtue of their high commercial value and market demand. The rapid development and concentration of the trawl fishery within the coastal waters has resulted in the current intensive exploitation of the coastal demersal finfish and penaeid prawn resource. While the total production from the coastal demersal finfish and penaeid prawn fisheries may appear to be sustained or even increased, the disappearance\_of certain species, notably that of *Lactarius lactarius* from the coastal waters of Peninsular Malaysia, indicates that over-exploitation of the resource exists. This is further evidenced by the relatively high catch of trash fish consisting of young immature juveniles of commercial fish landed by the coastal trawlers.

#### The Purse-Seine Fishery

The purse-seine net is the major fishing gear used to exploit the pelagic fish resources. Two main types of purse-seine nets are being employed by the fishermen to harvest the pelagics resources, namely fish purse-seine which is used to catch small pelagic, and the anchovy purse-seine which is employed to fish for anchovies in the coastal waters.

#### Fish Purse-Seine

The fish purse-seine nets which are operated with or without fish aggregating devices (FADs) contributed 156,246 tons (14.7%) towards the total marine fish landings in 1994. The catching efficiency of this fishing gear has been increased through the years with the development of new techniques like the use of spotlights as FADs and fish sonars to locate fish schools. These new fishing techniques have contributed substantially to the increase in fishing pressure on the small pelagic fish stocks. The purse-seine using spotlights as FADs catches more fish per haul of operation compared to the purse-seine which employ "tuas" (coconut frond lures) as FADs, and also catches more species of fish relative to the "tuas" and the night free-school scouting purse-seines. The fish purse-seine fishery has been mainly supported by catches of the small mackerels *Rastrelliger*, which remain the dominant catch of the fishing gear.

#### Anchovy Purse-Seine

The anchovy purse-seine nets are operated in very coastal waters, targeting mainly on anchovies of the genus *Stolephorus*. In 1994 the landing of anchovies by purse-seines amounted to 19,599 tons. Although anchovies contribute only 1.8% to the total marine landings, the anchovy purse-seine fishery is an important and valuable fishery, particularly on the west coast of Peninsular Malaysia, where the fishery is well developed on the northern part of the coast at Pulau Pangkor, Tanjung Dawai/Sungai Batu in Kedah and Pulau Langkawi.

#### The Drift/Gill Net Fishery

The drift/gill nets are another group of important fishing gear that are being employed by the fishermen to harvest the coastal fisheries resources. In 1994, the drift/gill nets contributed 145,657 tons to the total marine fish landings of the country. These fishing gear are selective and are operated in the coastal waters, and hence account for 13.7% of the coastal marine fish production in 1994. Two main types are being employed by the coastal fishermen; one targeting at finfish and the other, penaeid prawns.

The finfish drift/gill nets mainly target the higher-valued commercial pelagic fish species. However, the set gill nets that are also used by the coastal fishermen mainly catch demersal fish species like marine catfish and Jewfish. The prawn drift/gill nets are actually trammel nets which are employed to catch the more valuable species of prawns like *P. merguiensis*.

In Sarawak, the gill net fishery also target the *Tenualosa* (locally known as "ikan terubok"). The fish is being exploited primarily for its roe, and the spawning adult is the target, which has resulted in the fishery being threatened by over-exploitation. The landing of this species has also been declining for the past few years.

#### Other Traditional Fisheries

The other traditional fishing gears which are employed by the coastal fishermen include hook and lines, bagnets, lift nets, seine nets, traps, barrier nets and scoop nets. Together they contributed 132,051 tons (12.4%) to the total marine fish landings in 1994. These are very passive fishing gears which are operated by the smaller fishing crafts in the coastal waters and harvest a large number of demersal as well as pelagic fish species, prawns and cephalopods. In Sarawak, a number of traditional fishing activities are also being conducted in the mangrove areas of Kuching, Sarikei and Lawas.

#### 3. Mission, Vision and Objective of the Department of Fisheries

It is the mission of the Department of Fisheries Malaysia to bring about changes in the country's fishery sector in order that it will evolve into a commercial, modern and progressive sector, and to ensure the sustainability of the fisheries resources for the needs of the nation. With Vision 2020 in focus, the fishing industry will be developed into a modern, efficient and highly commercial industry. Coastal fisheries will be rationally managed to sustain optimum production while deep sea fishing will be fully developed to exploit the resources in international waters. Aquaculture development will also be given greater emphasis. Malaysia will also be exporting fish and its by-products and at the same time increasing the standard of living of the fishing community. To fulfill its mission, the Department of Fisheries Malaysia has identified five (5) main objectives that need to be achieved, namely:

- to increase the national fish production
- to rationally manage fishing resources
- to develop the deep sea fishing industry
- to speed up the growth of the aquaculture industry

to maximize the income of the fishing industry

#### 4. Management of the Fisheries

In order to achieve its mission, vision and objectives, the Department of Fisheries Malaysia has established an appropriate legal framework as well as formulated and implemented various strategies for the sustainable development and management of the fisheries.

#### 4.1 Legal Framework

- 4.1.1 The 'Fisheries Ordinance 1909' was the only ordinance used to regulate the fishing industry in the early 1900's. This Ordinance was subsequently amended in 1912, 1924, 1926 and was finally repealed in 1951. The Fisheries Rules of 1951 was then enforced on 10 August 1951. During this time there were also 7 Fisheries Ordinances/Enactments enforced by the various states. The fishing industry at that time was mostly traditional fisheries and regulation of the industry then was minimal.
- 4.1.2 However, in the 1960's and 1970's the introduction of trawling in the coastal waters created much conflict among the traditional fishermen and the trawlers. This led to the formulation of Fisheries Act 1963 which provided a more comprehensive legal framework to manage the fisheries in Malaysian waters. This Act was formulated to integrate and strengthen the legal framework relating to marine and inland fisheries; to protect the natural living resources; to protect the interest of the fishermen; to ensure equitable allocation of fisheries resources; and to strengthen administrative activities to reduce conflict among the fishing communities. This Act was subsequently repealed and replaced by the Fisheries Act 1985.

#### 4.2 Management Measures

The Department of Fisheries has formulated a number of management measures which has been implemented through its legal and institutional framework. The measures implemented include:

#### **Director Limitation of Fishing Effort**

A moratorium has been placed on the issuance of new or addition fishing licenses for vessels to fish in the coastal waters. This is to ensure that the current high fishing pressure on the limited coastal fisheries resources will not be increased, to prevent over exploitation.

#### **Closed Fishing Areas**

Commercial fishing vessels like the trawlers and the fish purse seiners are prohibited from fishing in waters less than 5 nautical miles from the shore. The waters less than 5 nautical miles from the shore is the nursery ground of juveniles of

prawns and fish. This will reduce fishing pressure from the trawlers and fish purse seiners.

#### Management Zones

Four fishing zones have been established through a licensing scheme whereby zones were designated for specific fishing gears, class of vessels and ownership. The four management zones were aimed at providing equitable allocation of resources and to reduce conflict between the traditional and commercial fishermen. Basically the 4 zones were:

- Zone A less than 5 nautical miles from shore, reserved solely for small scale fishermen using traditional fishing gears and owner-operated vessels.
- Zone B beyond 5 nautical miles where owner-operated commercial fishing vessels of less than 40 GRT using trawl nets and purse seine nets are allowed to operate.
- Zone C beyond 12 nautical miles where commercial fishing vessels which are more than 40 GRT using trawl nets and purse seine nets are allowed to operate.
- Zone C<sub>2</sub> beyond 30 nautical miles where deep sea fishing vessels of 70 GRT and above are allowed to operate.

#### Conservation of Resources

Conservation of marine resources has always been the primary concern of the Department. Marine Parks and Marine Reserves as well as fisheries protected areas have been established under the Fisheries Act 1985 as one of the Department's management measures. This is to protect, conserve and manage in perpetuity the marine environment in order that it remains undamaged for future generation. Public awareness on the need to protect the corals and other marine flora and fauna in the waters surrounding the islands off the coast is being promoted to ensure their conservation. At present 4 Marine Parks which group the waters of 35 islands off the west and east coasts of Peninsular Malaysia have been gazette. The waters of three (3) islands off Labuan have also been gazettes. In Sabah itself, 3 Marine Parks have been established consisting of about 10 islands. The waters around five (5) islands in Terengganu and Sarawak namely Pulau Nyireh, Pulau Tenggol, Pulau Talang-Talang Besar, Pulau Talang-Taland Kecil and Pulau Satang have also been gazetted as fisheries protected areas where by collocation of marine fauna and flora is prohibited. Fishing in the fisheries protected areas is also prohibited unless licensed to do so.

#### Rehabilitation of Resources

Artificial reefs have been established in Malaysian fisheries waters as a marine resource enhancement as well as one of the steps to alleviate the problem of

depleting fish resources in the coastal waters. They are used as a possible tool for fisheries management in maximizing exploitation, resource conservation, habitat rehabilitation and mitigating the effects of overfishing. A total of 54 artificial tyre reefs, 10 boat reefs and 10 concrete reefs have been constructed. An experimental reef using PVC pipes has also been set up to study the effect of the artificial reef.

#### Monitoring, Control and Surveillance (MCS) Programme For Fisheries Management

Foreign fishing in the Malaysian Exclusive Economic Zone has always been a problem especially in the waters off the East Coast of Peninsular Malaysia, and off the coast of Sabah and Sarawak. Illegal fishing activity can result in economic losses to the country in the long run, negative impact on the socio-economic status of the local fisherfolks, and is also a threat to the security of the nation. The introduction of a Monitoring, Control and Surveillance programme for the management of fisheries is another measure taken up by the Department of Fisheries to overcome the problem of illegal foreign fishing in the Malaysian waters. This programme provides for effective and efficient scientific data acquisition for resource evaluation. It also provides for the design of effective monitoring and control of fisheries enforcement activities to ensure that only authorized fishing vessels conduct their fishing activities within designated areas in the Malaysian fisheries waters.

#### 5. Implications for the Fishing Industry

- 8.1 Rational fisheries management strategies will help to reduce conflict between the traditional and commercial fishermen. They will also ensure the sustainable exploitation of the fisheries resources and at the same time, increase the productivity of the fishermen.
- 5.2 In the case of the inshore fisheries, the main strategy will be geared towards a reduction in the fishing effort in inshore waters. This will address the need to reduce over-capitalization in the coastal fishing industry which is one of the current problems faced by the world fishing industry. In this respect, fishermen will be given the opportunity to leave the fishing industry and participate in other economic sectors of the country. Participation of the fishermen in the down stream activities of the fishing industry (fish food processing) and also the opportunity to participate in development projects related to the aquaculture subsector will also be given more emphasis in the future. This will help to sustain fish production in the inshore waters as well as maximize the income of the industry.
- 5.3 Fishermen with advanced training conducted by the Department's Fisheries Training Institute in Terengganu will be encouraged to venture into deep sea fisheries. currently the Department is giving emphasis to the development of the deep sea fisheries to increase production from the offshore areas especially in the waters off Sarawak and Sabah, as well as in the Indian Ocean.

- 5.4 The establishment of Marine Parks and Marine Reserves is also being given emphasis as one of the conservation measures to ensure sustainability of the fish stocks in the coastal waters. Marine Parks also contribute towards the conservation of biodiversity of the marine ecosystem.
- Apart from the current implementation of the various management strategies and measures, the Department's Fisheries management policy will also include the following in the near future:
  - 5.5.1 Strengthening and intensification of research into the biology and assessment of fisheries resources, and fishing gear design and selectivity in line with the growing global concern on sustainable development and degradation of the environment.

It is recognized that limited access through licensing alone does not effectively control the fishing effort. With mechanization, greater use of sophisticate fishing aids and more efficient fishing gears, the fishing effort has actually increased with time. The increase in landings of trash fish, especially the juvenile of commercial fishes, is of great concern to the Department, and research in the design and use of selective gears will be conducted to address this issue. although necessary research on the biology, population ecology and resource assessment has been implemented, it will be intensified under the Seventh Malaysia Plan to provide comprehensive data and information for the formulation of management plans for the different types of fisheries and fishing gears. This will also include research on selective and environmentally friendly gears which will contribute towards a reduction in by-catch. Such efforts will be further supplemented by a research monitoring programme whereby the state of the fisheries resources will be monitored to support the various management plans. Such research monitoring programme will be conducted by research vessels as well as by an observer programme where observers are placed on board deep sea fishing vessels.

- 5.5.2 Provisions of more efficient and effective extension services to educate the target group on fisheries management needs and benefits derived from such management strategies will be implemented. It is necessary for the fishermen to be fully conversant with the concept, need and benefits that would accrue to them, their families and community in order that they fully support and participate in the management strategies.
- 5.5.3 The Department has also proposed to resettle surplus fishing labour under the Seventh Malaysian Plan (RM7). Under the 4th Malaysian Plan (1981-1985) a 'buy-back scheme' was implemented to reduce the number of fishermen in the fishing industry. However, the 'buy-back scheme' was not successful at that time due to the unsuitable economic condition of the country which was affected by the global economic recession. However, with the last eight years of high economic growth and projected growth in the

future, it is envisaged that the 'buy-back scheme' to be implemented under the 7th Malaysia Plan will be an attractive incentive for the fishermen, especially those from the over-capitalized inshore fisheries to leave the fishing industry. This scheme will be undertaken together with the provision where possible, for the fishermen to participate in aquaculture development projects as an added incentive.

5.5.4 In the international arena, the Agreement to Promote Compliance with International Conservation and Management Measures by fishing vessels on the high seas was finalized and approved at the 27th Session of the Food and Aquaculture Organization of the United Nations Conference, Rome in 24th November 1993. This Agreement will be enforced upon the 25th instrument of acceptance and as of May 1995, 6 countries (Georgia, Myanmar, Sweden, Madagascar, Canada, St. Kilts and Nervis) have agreed to be a party to this Agreement. This Agreement calls on all states that fish in the High Seas to be responsible to their own vessels and shall practice international conservation and management measures to conserve and manage the living resources and ensure that their fishing vessels do not engage in any activity that undermine the effectiveness of such international conservation and management measures. Records have to be kept and there shall be freedom of information exchange through international cooperation. Settlement of disputes is also provided for in this Agreement.

In addition of the above Agreement, the Agreement for the implementation of the provisions of the United Nation's Convention on the Law of the Sea (UNCLOS) of 10 December 1982 relating to the conservation and management of straddling fish stocks and highly migratory fish stocks will probably be open for signature in December 1995. The Agreement also deals with conservation and management of highly migratory and straddling fish stocks, mechanisms for international cooperation, duties of flag states, compliance and enforcement by flag states, dispute settlement and also requirements of developing states. With these two Agreements, there are opportunities for Malaysia's fishing industry to expand and develop further to fish in the high seas, as well as in the Indian Ocean.

However, there are implications in relation to the legal framework as well as to the marine fishing industry of Malaysia. It is envisaged that, if Malaysia wants to develop her own distant water fishing fleet, additional/supplementary national fisheries legislation will be required to manage this distant water fishing fleet in accordance with the two international Agreements. In addition, to safeguard Malaysia's participatory rights to tuna resources in the Indian Ocean, Malaysia should endeavour to be a founder member of relevant regional fisheries management organization such as the Indian Ocean Tuna Commission (IOTC) that will be established for the conservation and management of these resources.

#### 6. Conclusion

The fisheries resources in the coastal areas are not only being intensively exploited by the fishermen but also threatened by pollution which degrades the aquatic environment and destroys the aquatic habitat. Currently various management strategies and measures have been applied to ensure the sustainability of the inshore fisheries production. Efforts to further enhance the fisheries resources have also been implemented. Measures such as better management of coastal habitat through the formulation of sound management models, coastal zone management plan, rehabilitation of resources through the establishment of artificial reefs and also through restocking programme, will help in ensuring fishery resources are exploited rationally and managed effectively to ensure that the resources are exploited at a maximum sustainable level. Such management measures will also ensure the increase in productivity of the fishermen in line with the mission and vision of the Department of Fisheries; Malaysia. With the implementation of the international agreements relating to high seas fisheries and management of the straddling fish stocks and highly migratory fish stocks, our fishermen could be encouraged to exploit the fisheries resources in the high seas especially in the Indian Ocean, IMT-GT and the BIMP-EAGA growth development areas as Malaysia has the financial, and technological capability.

# INTERCHANGE AND OUTCOME IN COASTAL FISHERIES MANAGEMENT

by

# U Khin Maung Aye Department of Fisheries, Union of Myanmar

#### 1. Introduction

The coast line of Myanmar is about 2831.84 Km long. The continental shelf covers about 36000 square Km in Rakhine coast, 105000 square Km in Delta region and 84000 square Km in Tanithayi coast, totally 225000 Km<sup>2</sup>.

Since history could remember, Myanmar people, as other neighbouring Asian people, have traditionally and customarily taken fish as their esteemed food. In the past, the exploitation of our fishery resources was comparatively less due to our low population. Production was also limited only for local consumption. Fishery management was virtually unknown in the fishery sector. Now, Fisheries is one of the most important sector in the economy of Myanmar, providing protein food and employment to the people and earning foreign exchange through export on shrimp, fish and fishery products.

#### 2. Structure of Fishery Management System

Ministry of livestock Breeding and Fisheries took the responsibilities for the development of fisheries in Myanmar. There are Three Departments are Enterprise and one Bookkeeping Division. Two department are directly concerned with fisheries. They are Department of Planning and Statistics, and Department of Fisheries.

The Department of Planning and Statistics is directly responsible to the minister, and co-ordinates, supervises, monitors and evaluates the manual performances of the departments and enterprises. This department also gives advises on formulation of projects and foreign economic relations. Department of Fisheries is responsible for the management of fisheries, conservation of resources, providing extension services, conducting research, and compilation of the national statistics in fisheries.

As the population is booming day by day the exploitation of aquatic resources is naturally getting interest as well. Moreover current high export demand for shrimp, prawns and certain species of fish is major course of pressure leading to over investment in fisheries.

In the future the demand for fish will exceed potential supplies creating over exploitation subject to this, effective appropriate management measures are required to promote the objective for optimum utilization of aquatic resources.

Management should be conceived and understood not as a constraint upon national exploitation, but as an essential tool for the sound, sustained development of fisheries. Hence, management of fisheries is an integral part of the development process. There is a need to introduce effective management mechanisms at all stages and particularly at the beginning of fisheries development rather than wait units the effect of overfishing have begun to be felt.

The setting of that objective should be based on assessment of the fishery resources available, existing technology, market to be served, social and economic conditions, the potential impact of other economic activities, and other relevant factors, including foreign operations, where applicable. The objective, it appears, is to provide a legislative framework for a fisheries management system, and to ensure, as far as possible, that both the fishery people and responsible authority concerned perform their roles within that frame work. Thus new impetus has come a new and broader view of the role of Law in fisheries management of all renewable natural aquatic resources.

The economy of the Union of Myanmar, under centrally planned economic system in the past, has been changed into a market oriented system since 1988. The Government had envisaged such policy objective as exploitation of abundant resources of the country with a view to catering to the needs of the nation in the first instance and exporting whatever surplus available. Furthermore the extension of Myanmar Jurisdiction to 200 nautical miles according to UN Convention on Law of the Sea also present a new and unprecedented opportunity to reap the full benefit of the living aquatic resources. At the same time attention has been drawn to the potential roles of inland water fisheries and aquaculture as food supplies within the overall socio-economic context of national development.

In this respect a reassessment of strategies and policies for fisheries development and management from time to time need to take full account of the present and potential contribution from marine fisheries as well as from inland water fisheries and aquaculture.

In order to fulfill the need, the DOF, playing major roles in fishery management, is conducing acquisition and analyzing of information implementation of fishery policy and design and exercising of management measures and the continuous evaluation of results of management activities.

Obviously, the DOF always conducts the management and conservation of aquatic resources, licensing, surveillance and enforcement of existing fisheries law as its main responsibilities. To render assistance and to support the efforts exerted by DOF on fishery management the government has promulgated four fisheries laws, namely: The law Relating to the Fishing Rights of Foreign Fishing Vessels, Myanmar Marine Fisheries Law, Freshwater Fisheries Law Relating to Aquaculture.

#### 3. Fisheries Management Measures in Myanmar

To solve the problem of over-fishing and declining productivity in coastal regions, various measures have been adopted according to the fisheries law.

#### (a) Closed area

To conserve the juveniles fish and shrimp and to avoid conflict between the artisanal fishermen and the trawler. Rakhine coast five miles from the shore line, for Ayayerwady and Tanintharyi coast 10 miles from shore line. The trawlers will not allowed to fishing operation in those areas.

#### (b) Closed season

June, July and August, the three months are closed seasons. That season most of the Juveniles come back to the mangrove area (feeding ground). The fishing boats must stop fishing operation.

#### (c) Limitation of mesh size and license system

As the major portion of marine product came from artisanal fishermen, it is important to fulfill needs of small scale and indigenous fishermen by increasing the income, improving their lives and those of their families, as well as their environment. Accordingly, this zoning of fishing is entirely based on policy of protecting our local fisheries. Under these circumstances the Department of Fisheries gives first priority to local fishermen by permitting them to operate in all zones. In addition to this and as declared in the Territorial Sea and Maritime Zone law the waters between the baseline and the coast are reserved entirely for local fishermen.

The rapid increases in demand for quality marine products significantly accelerated momentum on shrimp and other demersal resources exploitation, resulting in resources use conflict and violence between trawlers and small scale fishermen. To ensure a more equitable exploitation and distribution of resources and to support the sustainability of small-scale artisanal fisheries, efforts have been made by DOF by limiting the size and engine power of fishing boats in inshore areas. For effective management and control the DOF also determines the type of fishery, volume of business method of fishing, species of fish permitted to exploit, size of fish fishing implement and fishing grounds and these conditions are attached to all fishing licenses.

Minimum mesh size and minimum catchable size for main economic fish species have been established based on Rule of expansion and protection of fishery resources. For instance, the mesh size on fish trawl codends is not allowed smaller than 2.5 inches and 2 inches for the shrimp trawl codends, The large mesh drift net, the minimum mesh size shall be 8 inches and for small mesh drift net are 3.5 inches mesh size.

#### 4. Marine Fishery Management

Myanmar as a developing country has to have comprehensive and placid management scheme with objective for optimum utilization of natural marine living resources. To achieve this, the DOF has determined the total allowable catch (TAC) on the concept of insurance that the TAC is not set too high as to do damage to the resources potential (MSY) and also not too low as to waste resources is optimum utilization. The data and information in calculating TAC are based on the present status of marine fishery and scientific evidence and various surveys.

There have been infrequent surveys of living resources in Myanmar marine fisheries waters in the 1980's. Three research surveys, the last in 1989 were undertaken and it was found that our M.S.Y. can be safely estimated as a little over 1 million M.T. noted that estimated possible yield of marine fish and shellfish is approximately 1 million tons.

According to DOF catch statistics, nearly 0.6 million mt; of fish or about 60% of the MSY has been harvested in 1991-1992. The indication is that under-exploited living resources exist in the marine waters of Myanmar and that quantity would allow fishermen to have more opportunity for sharing these resources. The extension of national jurisdiction to 200 miles also presented a new and unprecedented opportunity for Myanmar Naing Ngan to reap the full benefit of the living resources of marine potential. Table (1) show. Trawling survey estimate of biomass fish and maximum potential yield of 550,000 MT.

#### 5. Activities with the International Agencies

To achieve our aims and objectives, the Departments and Organization concerned are Collaborating with international and regional organizations, such as UNDP, FAO, NACA and BOBP. The major activities are imparting of technologies to local fishery industries and to people who are involved in fisheries aspects through extension and training.

#### 6. Conclusion

The fisheries sector is considerably important in Myanmar's economy, as fish constitutes a major source of animal protein in the diet of the people. It is the fourth largest source of foreign exchange earnings after timber, minerals and rice. The above mentioned data and information express that Myanmar Naing Ngan is endowed with rich and diverse fishery resources.

Reliable and timely data on all aspects of fisheries are needed for the development planning, implementing and subsequent monitory of fishery management. National capability to collect data and information should be developed and it is most essential to enhance the capability of the state in monitoring control and management measures.

It is our sincere urge to the worship to deal in equal depth on management spects, so that more efficient and effective management systems could be formulated nd practiced because poor management will certainly lead to dwindling industry.

# TRAWING SURVEY ESTIMATE OF BIOMASS OF DEMERSAL FISH AND MAXIMUM POTENTIAL YIELD OF 550,000 MT.

#### Breakdown calculation in Mt.

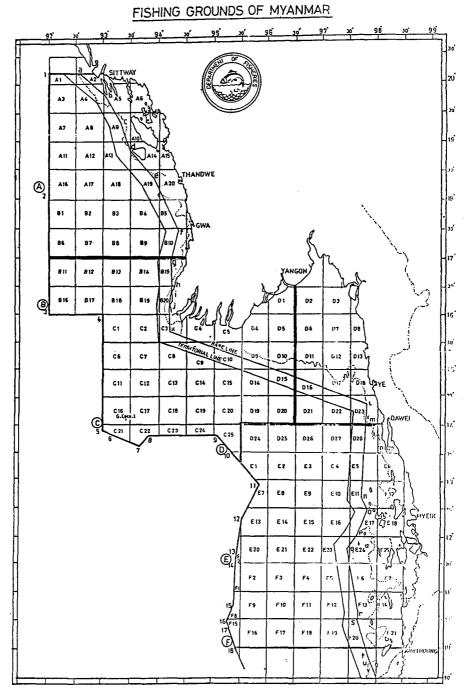
AREA	DEPTH Mtr	FISH BIOMASS TON	MSY TON	NUMBER OF VESSELS 100 GRT/360 TON/YR
RAKHINE	10-50	171650	120753	335
	51-100	55550	39235	109
	101-200	37650	27012	75
· · · · · · · · · · · · · · · · · · ·		264850	187000	519

AREA	DEPTH Mtr	FISH BIOMASS TON	MSY TON	NUMBER OF VESSELS 100 GRT/360 TON/YR
AYEYARWADY	10-50	222800	158338	440
	51-100	49350	34904	97
	101-200	14500	10258	28
	<del></del>	286650	203500	565

AREA	DEPTH	FISH BIOMASS	MSY	NUMBER OF VESSELS	
	Mtr	TON	TON	100 GRT/360 TON/YR	
TANINTHAYI	10-50	134650	92163	256	
	51-100	87050	59370	165	
	101-200	11650	7967	22	
		233350	159500	443	

GRAND TOTAL	784850	550000	1527

# DEPARTMENT OF FISHERIES



#### COASTAL RESOURCE MANAGEMENT IN THE PHILIPPINES

by

# Jessica C. Munoz Department of Agriculture, Philippines

#### **ABSTRACT**

Major problems that beset the Philippines fisheries sector are degradation of coastal habitats and environmental damage; depleting of marine resources; poverty among municipal fisherfolks; low productivity of aquaculture; and limited utilization of the offshore waters by Philippines commercial fishermen. The Government as well as the academe, NGOs/POs and the local government units (LGUs) is implementing integrated Coastal Resource Management (CRM) programs to address the problems of the sector. Policies related to resource management have been instituted to assist the different agencies and organizations in carrying out their roles and responsibilities in CRM. There is no straight rule in implementing an integrated CRM program. Its success depends upon the infractions between and among the stakeholders of the coastal area. CRM components such as credit for alternative/supplemental livelihood and law enforcement do not fare well in some coastal communities, while components such as public education, capability building, habitat enhancement/rehabilitation and people's participation are carried out successfully. Experiences of the government sector, LGU, NGO/PO and the academe show success stories that inspire them to continue with CRM initiatives while failures encountered serve as reminders of the pitfalls to avoid when implementing an integrated management of coastal resources.

#### 1. Overview of the Philippines Fisheries Sector

The Philippines Archipelago is composed of about 7,100 islands with marine waters expanding up to about 2.2 million square kilometers. The Philippines ranked 12th world fish production and produced about 2.7 million metric tons in 1995. Foreign earnings in 1995 amounted to P15.6 billion. About 1 million people are employed by the fisheries sector. Through the years, however, a decline in fish production especially from the coastal areas have been observed. The per capita fish availability of 30.5 kg in 1987 dipped to 28.8 kg. in 1994.

An assessment of the Philippines fisheries sector identified resource depletion and environmental damage, poverty among municipal fisherfolks, low productivity in aquaculture, and limited utilization of the offshore waters by Philippine commercial fishermen, as the major problems. At present, there is no substantial increase from the capture fisheries especially at the nearshore area because of overfishing and habitat degeneration. Increment is expected to come from the aquaculture sector.

### 2. Coastal Resources Management (CRM) as an Approach to Address the Fisheries Sector Problems

As early as 1970, resource management efforts have been initiated by the academe, NGOs/POs, local government units (LGUs) and the government sector. Some of these initiatives worked and became the basis for the development of more CRM projects at various levels and magnitude. The biggest CRM programs are the Fisheries Sector Program (FSP) of the Department of Agriculture that was launched in 1990 and the Coastal Environment Program of the Department of Environment and Natural Resources in 1993. Both programs consider coastal resource management the centerpiece component.

Coastal resource management (CRM) is based on holistic approach that considers the interactions between and among resource systems and populace in the sustainable management of the economically and ecologically valuable resources in the coastal area. There is a need, therefore, to integrate the various factors affecting the resources. An integrated CRM subscribes to the concept of community-based resource management that recognizes the capacity of the coastal community to implement resource management in their area. Since the fisherfolks are the direct beneficiaries, their understanding of the project spells its success or failure.

The approach in the implementation of CRM involves processes leading to the formulation of options to achieve CRM goals and objectives. These processes are cyclical but not necessarily sequential.

Evaluate	Determine and assess problems and issues
(6)	(1)
Implement plans	Set goals for management
(5)	(2)
Formulate plans	Determine management options and strategies
(6)	(3)

#### 3. CRM Strategies and Actions

There are many management strategies in CRM implementation. However, these strategies are site specific and would depend upon the particular problem of the coastal area. Some of the strategies used are the following:

#### 3.1 Information dissemination, education and communication

Raising the awareness of the coastal community on resource and environmental protection, conservation and management is a paramount concern when implementing CRM. Twelve partner NGOs were engaged to conduct community organizations and development in major bays and gulfs. Women's role in

community enhancement and development have been given emphasis in the course of CRM implementation.

#### 3.2 Creation of resource management councils

An integrated CRM encourages the active participation of the local government and community-based organizations of the area. Bay management councils have been established in major bays and gulfs. These councils facilitate the implementation of CRM projects. The councils are also good fora for discussion concerns relevant to resource management. Corollary to the bay management councils, fisheries and aquatic resource management councils (FARMCs) are being established at the barangay level, the Philippines' lowest political unit.

#### 3.3 Limitation of fishing effort

Arial and temporal closed season, ban of certain gears and restricted entries into municipal waters are some ways of limiting the fishing effort of overexploited fishing grounds. In one bay area, selective fishing gear like the shrimp gill net, was accepted by fishermen to replace shrimp trawlers. The strategy also relies on strict enforcement of fishery and environmental laws, rules and regulations.

#### 3.4 Marine habitat protection and rehabilitation

There are 52 fish sanctuaries/marine reserves covering about 8,936 hectares. About 6,402 hectares of mangrove area were reforested through a community-based scheme. There are 2,941 artificial reef modules deployed. However, prudence has been taken when establishing ARs because of its misuse as a way to rehabilitate degraded coral reefs. Coral transplantation have also been done in coordination with the academe.

#### 3.5 Shoreline habitat rehabilitation

Most coastal areas have been damaged due to reclamation, conversion to fishponds, urbanization and industrialization. Most mangrove forests have been cut in an unsustainable manner. The Government initiated mangrove reforestation programs through community-based scheme. A moratorium on mangrove conversion to fishponds is in place. Undeveloped fishponds (FLAs) are to be converted back to the original use and reforested.

#### 3.6 Monitoring of water quality

Pollution is becoming a major problem in coastal areas. The quality of water affects mariculture activities as well as other water uses in the coastal area. There is also the annual occurrence of red tide in most shallow bays. This had affected the livelihood activities of fisherfolks as well as shellfish farmers. Oftentimes, crisis situations occur due to delayed response. To avoid such situation, inter-agency task forces have been created to monitor water quality.

#### 3.7 Promotion of alternative/supplemental sources of income

Most of the municipal fisherfolks live below the poverty line. To alleviate the poverty, alternative/supplemental sources of livelihood were provided to fisherfolks and their families. Fisherfolks who are affected by the limitation of fishing effort are being provided with viable livelihood projects. Shellfish farmers who have been affected by shellfish ban due to red tide occurrence are also given other livelihood projects. Ideally, livelihood projects must be land-based to lessen stress to the marine waters. At present, however, fisherfolks can not be totally separated from the sea. Livelihood projects identified were livestock raising, cottage industry, retail store and mariculture.

#### 3.8 Development of coastal zone plan

The coastal use plan is a useful tool when delineating the use of specific areas. The plan is also being used by the local government council in the enactment of municipal ordinances related to fisheries management. Most coastal municipalities have enacted coastal zone plan which helps when settling resource use conflicts.

#### 4. Impacts of CRM of the Fisheries Sector Program (FSP) in Coastal Areas

CRM/FSP implementation was a big pioneering effort on the part of the Department of Agriculture. It was also a big learning experience for all organizations and institutions that participated in the implementation of the Program. Local NGOs/POs, the academe, research institutions and LGUs participated in undertaking the various activities of the Program.

The success or failure of any CRM project should be evaluated in terms of the impacts and benefits derived. Upon evaluation, CRM/FSP attained the following:

- 1. Policy directions provided the framework for sustainable fisheries development to guide and advice government policy makers, planners and legislators.
- 2. Organizational and institutional reforms within the agencies were brought forth to build capability and strengthen the various agencies to be able to perform the task under an integrated CRM.
- 3. Policy initiatives in regulating fishing effort within the limits of maximum sustainable yield (MSY) started to put to an end the open access policy in fishing.
- 4. The pre and post comprehensive resource and ecological assessments of the major bays and gulfs showed the return of economically important fish species, thus, a greater biodiversity of fish species.

- 5. There is an improvement in income levels of municipal fishermen by about 30-40% derived from increased catch supplemented through alternative/supplemental livelihood projects. As a consequence, there is a decreased incidence of poverty especially in areas where resource management efforts have been made.
- 6. The Program invested much on public information, education and communication. This resulted to a much higher awareness and better appreciation of the need for resource management and conservation. Individual fishermen have been formed into associations or cooperatives playing active role in resource management.
- 7. Fisherfolks were assisted in improving the quality of their fish catch by providing infrastructure (municipal and regional fish ports, refrigeration and individual quick-freezing facilities) and marketing support (market matching).
- 8. An information/database management system (PHILFIS) was established to store, analyze and consolidate all data and information relevant to the fisheries sector. Some information gathered were first time ever.
- 9. There was a defined and streamlined focus for research studies towards a unified direction of resource management. Funding was provided to research projects with impacts on CRM.
- 10. The design of a fisheries monitoring, control and surveillance (MCS) was established to improved law enforcement capability of enforcers. MCS system has been established in 4 strategic areas.
- 11. Scholarships were granted to implementors under degree and non-degree programs to enhance their research capabilities.

There were also negative effects which came with the implementation of the integrated resource management.

- 1. There was an alienation of fisherfolks who were not members of the association and cooperatives established under the Program.
- 2. Social problems spawned from the strict enforcement of fishery and environmental laws
- 3. Not all intended beneficiaries of the credit facility under the Program were able to avail of the assistance.

#### 5. Conclusion

FSP made a significant achievement to initiate activities that would bring about the responsible management of coastal resources in the Philippines by using an integrated Coastal Resources Management as an approach for a more effective and efficient program implementation. It was also successful in laying the foundations for sectored change and in initiating the long process of reforming the fisheries sector.

For the past five years, the Philippines Government has intensified its efforts towards the management of its marine resources. Local and international agencies and organizations have extended assistance in implementing CRM programs and projects. In the midst of the overwhelming support given to CRM, the gains of the initial efforts of must be sustained and reinforced by continuing the efforts to educate the coastal communities, the LGUs, NGOs/POs, the academe and the government sector.

#### COASTAL FISHERIES MANAGEMENT IN PHANG-NGA BAY

by

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#### 1. Introduction

Phang-Nga Bay was once abundant with natural resources, dense mangrove forests, plentiful aquatic resources and a scenic environment. Utilization of these resources was not as high as present. Fisheries resources were harvested just to feed the family and for sale in the market for local consumption. Also, mangrove trees were utilized for housing, making charcoal and constructing artisanal fishing gear. Fishing gear used in the Bay were all artisanal, selective and not harmful to aquatic resources.

During the last three decades, the demand for marine products has rapidly increased due to economic and population growth in Thailand. Land encroachment, particularly in the coastal belt within 60 km. from the sea for new community settlement has been initiated, followed by infrastructure construction to support the communities and economic development. The industrial sectors from congested areas like Bangkok have also decentralized. Coastal areas have therefore been degraded, huge mangrove areas were cut and destroyed, sea water along the coast polluted by discharged urban and industrial waste and an increased tourism business. Fisheries resources have also suffered due to overfishing, illegal and destructive fishing was introduced to catch more fish, new recruitment of aquatic resources could not survive in such conditions with the mangrove areas, the main nursery grounds destroyed and the water polluted. Traditional coastal populations living by small scale fisheries, aquaculture and agriculture similarly suffered from less income, which has become insufficient for their living. They have recently been overwhelmed by migrant workers following the economic development. These workers compete with them and indiscriminately exploit coastal resources to supplement their low wages or temporary unemployment. Land has been sought by urban investors and developed indiscriminately for shrimp aquaculture which obtains relatively a high return in a short time, mangrove areas have also been encroached upon for shrimp culture purposes. Basic commodity prices have increased and growing social conflicts have led to great difficulties in solving the problems.

#### 2. Problems to be addressed

In the past, fishing operations in Phang-Nga Bay depended on the capability of each fisherman and had no indiscriminate affect on the resources. Now the changes have not been taken into consideration. As a result, many problems have been created and are very difficult to solve. The most serious problems can be identified as follows:

#### 2.1 Degradation of Fisheries Habitats

The fishing gear that was used in the Bay such as trammel nets, several types of gill net, traps and hook and line etc. are considered as relatively non-destructive fishing gear. When the trawler was introduced to Thailand, the coastal fisheries resources were rapidly depleted and finally became over exploited during the last decade. The catch recorded by the research vessel of AFDEC showed decreasing CPUE trends, from 160 kg/hr in 1969 to 38 kg/hr in 1988, comprising of 33.3% of commercially valuable species and 66.7% of trash fish, of this percentage of trash fish, 30.1% are of small economic species (Chantawong 1993). If the trawlers continue trawling, it can be predicted that in the near future Thai waters will have nothing left to be caught.

#### 2.2 Fishing Conflicts

The encroachment of commercial trawlers to fish illegally in the Bay has created many problems for the small scale fishermen. Competition on fishing, scrambling for fishing grounds are a considerable problem. As the efficiency of the trawler is much higher than those of artisanal ones, the small scale fishermen lost their fishing grounds and even their fishing gear is sometimes swept away by the trawlers. Apart from the conflicts between commercial fishermen and small scale fishermen, there are also conflicts among the small scale fishermen themselves; push net and trammel net fishermen. It was observed that the areas where push nets operated at night will become less productive areas for trammel nets the following day and it was considered as a strongly destructive gear, similar to the trawler. This is the reason why small scale fisherfolk attempt to ban, or keep the trawler and push netters, out from Phang-Nga Bay.

#### 2.3 Degradation of coastal environment

Coastal environment can be degraded by several kinds of activity which can be identified as follows:

- 2.3.1 Discharged waste water from urban and industrial areas into the Bay: as mention before, the economy of Thailand has grown very fast and many human settlements, communities and industrial activities have been decentralized to the coastal belt and of course all untreated waste water from these urban and industrial sites find their way, or are discharged into rivers or channels and flow into the sea. The geographic layout of Phang-Nga Bay is somewhat closed in, circulation or exchange of water in the Bay is not adequate to push the wastes and other pollutants out to sea. Continuous accumulations of these pollutants will ultimately cause water quality deterioration in the Bay and will affect living fauna and flora found in these waters.
- 2.3.2 Destruction of mangrove forests: mangrove forests not only help to filter or absorb toxic substances dissolved in the waste water discharged but is

also an important nursery ground for the larvae and juveniles of aquatic organisms such as finfish and shellfish. When mangrove is destroyed, it also affects directly, the other resources and coastal environment in that area, thus losing its healthy condition and biodiversity.

2.3.3 Garbage and wastes from tourist services: in Thailand, the tourist business has expanded rapidly. Every kind of human comfort and pleasure has been sought to entertain the tourists, for instance, tourist barges, floating restaurants and shorebased resorts and restaurants on land etc. These indiscriminate entertainment facilities are all sources of waste and garbage and some of these are discharged into the sea as can be seen at present on many beaches, particularly on some isolated island beaches that are covered with accumulated garbage coming from the sea by wave and wind action, especially plastic bottles, plastic bags, etc.

These problems can not be solved by any one single organization individually. It needs a good organizational set up and cooperation from both the government and private agencies concerned, including the tourists and all other beneficiaries.

#### 3. Coastal Fisheries Management Policy and Strategies

The Department of Fisheries recognizes all these problems and has attempted to study them to obtain more information in order to set up the necessary management measures and strategies to reduce pressures and degradation of the coastal environment and fisheries resources. Many management measures and mechanisms have been established for the management and rehabilitation of coastal fisheries resources as follows:

- 3.1 National legislation on Fisheries: many fishery laws, ministerial acts and regulations have been implemented for controlling fisheries in Phang-Nga Bay to promote orderly and sustainable production without destroying the young population of aquatic organisms, for instance, the regulation on prohibiting of any kinds of trawlers and push nets in a 3000 m area from the shoreline; prohibiting of any kinds of trawler and push nets to operate in Phang-Nga Bay; prohibiting of some types of fishing gear such as trawls, purse seniers, to operate during spawning and nursing season in the area of Phang-Nga and Krabi from 15 April to 15 June, each year, etc.
- 3.2 Law enforcement: to strengthen the enforcement of fisheries management measures, the conservation units equipped with patrol boats have been stationed in many coastal provinces to carry out surveillance on illegal fishing boats in the Gulf of Thailand and on the Andaman Coast.
- 3.3 Implementation of small scale fisheries development projects: in order to upgrade the standard of living of small scale fisherfolk who live in poverty, many activities have been implemented in the fishing villages, for example, the provision of

essential infrastructures like landing sites, piers, gear repair halls, fresh water stocking tanks etc. as basic amenities.

- 3.4 Demonstration and training: new technologies on fishing operation, boat engine repairing, fish processing, and other topics concerning fisheries have been introduced to the fisherfolk by regular training schemes. Posters, VDO and media to help give a better understanding in conservation have also been disseminated in the fishing communities.
- 3.5 Installation of artificial reefs: two types of artificial reefs have been installed along the coast. The first type is a small cluster of reef to cover an area of about 0.125 km<sup>2</sup> constructed in front of a fishing village to serve as a new fishing ground for the fishermen. The second type is a large cluster of reef to cover an area about 15 km<sup>2</sup> constructed along the shoreline about 3-5 km offshore as a barrier to prevent encroachment of trawlers to fish illegally in the prohibited areas, and also to serve as a fishing ground for small scale fishermen. Several clusters of reefs have already been installed in Phang-Nga Bay.
- Closed areas and seasons: Phang-Nga Bay has been considered as one of the most important areas for producing new recruitment of pelagic and demersal resources. The Bay is currently being impaired by various kinds of fishing activities. Thus, closed areas and seasons during the spawning and nursing of larvae from 15 April to 15 June every year have been declared in Phang-Nga and Krabi since 1982 (Figure 1). This measure is generally used to restore pelagic species, but it was found that demersal resources have similarly been effected. The catch rate recorded by AFDEC research vessel shows a very satisfactorily increasing trend from 34.66 kg/hr in 1986 to 136.77 kg/hr in 1995 (Table 1).
- 3.7 Limited entry of fishing boats: to reduce the pressure of overfishing and degradation of fisheries resources, registration of fishing boats and fishing gear (fisheries census) especially trawlers and push netters has been implemented to determine the actual number of fishing boats and fishing gear with the aim to control the number of these gear.

#### 4. Constraints on Fisheries Management in the Past

- 4.1 Weakness in law enforcement due to a limited number of personnel and patrol boats caused rampant illegal fishing in Phang-Nga Bay. Surveillance by patrol boats seems to be not so successful because most of the fishing boats have installed modern communication equipment like radios and mobile telephones etc. to evade patrol boats. When the patrol boats start moving, all illegal fishing activities also stop their operation and disperse.
- 4.2 Limited fishermens' participation in implementing small scale fisheries development activities in the past is partly due to insufficient public relations efforts of the project. The objectives of project activities, responsible government implementing agencies, project maintenance and management authorities, fishermen

beneficiaries, were not well specified and remain unclear to the target beneficiaries. A good illustration of this lack of clarity is the use of DOF constructed facilities in the fishing villages. The fishermen were not using the DOF facilities even though they were available for their use. Furthermore, extension workers did not spend enough time in the communities as they worked according to official working hours which are too short compared to the working styles of the NGOs who work full time with fishermen. The difference in working style also leads to unsuccessful implementation.

- 4.3 Educational opportunities for the old generation of fishermen were very low. In general, they studied only up to primary school level, some even had no opportunity to study due to the poverty of their families. Moreover, most of fisherfolk still respect or believe the knowledge transferred from the older generations. Therefore, to change their attitude or to introduce some new fishing technology seems to be very difficult and takes a long time unless they have the opportunity to learn at first hand and practice by themselves.
- 4.4 Limitation of investment capital: many fishing communities live in poverty, their earnings are just enough for their daily needs; there is no extra money for saving. Expenses for fishing are provided by the investor who is able to provide everything for them, boat, engine, gear, oil, fuel and even medical fees and other family expenses when they face a money shortage. The only commitment is that all the catch has to be sold to the investor according to a price determined by the investor. Therefore, the investor looks like a permanent supporter of the fisherfolk. To change their way of living, government has to subsidize huge amounts of budget to recover their debt and provide long term support.
- 4.5 Limited entry of new fishing boats in the country could be considered not as successful because the authority to license the building of new boats rests with the Harbor Department. DOF is responsible for issuing fishing license only; fishing boats that want to apply for a fishing license must show a boat license and this causes an uncontrolled entry of new boats. Some fishing boats are constructed even without permission and fish illegally. The up-to date records of the number of fishing boats shows only one third having registration.
- 4.6 Extension workers who are responsible for implementation are not clear in their responsibilities and act as the leaders of fishermen instead of as supervisors and allow the fisherfolk carry out activities by themselves. Thus, participation of fisherfolk in implementing activities is not as high as it should be. Extension workers in fact, have to encourage fisherfolk to be involved in implementing all the activities and try to increase their responsibility in implementation. Those activities should come from the needs of fishermen and not be imposed by extension workers, convincing them on conservation measures, stimulate them to show some initiatives on resource conservation management and when they realize that those activities are beneficial they will feel a sense of ownership and learn how to sustain the utilization of coastal resources in their responsible area. This is a indicative sign of community-based fisheries management.

#### 5. Community-based Fisheries Management

The small scale fisheries development schemes, initiated since 1985 have met with some success. Facilities constructed, and artificial reefs provided to the fishing communities are tangible benefits. However, the benefits of resource management and conservation are not as clear or as understandable. Failures of fishery management programmes in the past were due to the fisheries resources being considered as common property. In discriminate exploitation in the past has degraded them. Thus, the strategy on a community approach initiated and improved upon community-based fisheries management has been implemented in many different areas particularly in the Phang-Nga Bay under collaboration with the Bay of Bengal Programme. The project has been conducted since late 1995 for a five year period. This project is aimed to change the perceptions and attitudes of fisherfolk from being a user to being a manager of the future. Activities on grouping, training, social development programmes (such as reforestation of mangrove, replanting of sea grass, fish stock enhancement/sea ranching, etc.), fish landing site management which unites fisherfolk, including awareness building to build up their awareness and participation in resource conservation have been implemented in the target villages. Regular meetings among the working committee of each village have been organized every two months to monitor the progress and problems of implementation in each village. Visits to the target villages have also been carried out regularly. When the fisherfolk learn how to manage and conserve the fisheries resources for sustainable utilization in the near future, laws governing the provision of fishing grounds in front of their village or group of villages as part of village property as a source of their livelihood, in other words, certain fishing rights, will be extended to them.

#### 6. Conclusion

DOF continues to pay special attention and place emphasis upon the important role of coastal fisheries management from the beginning. As resource degradation is not only caused by fisheries, it is rather difficult to address just this problem alone. A sea rehabilitation programme has therefore been proposed and has been approved by the Prime Minister early this year and is now under detailed formulation of the work plan and mechanism. This integrated programme aims to achieve greater participation of all concerned agencies to cooperate in the management and rehabilitation of coastal resources and environments. In the field of fisheries, community-based fisheries management has been implemented in many fishing villages along the coast to prepare the fisherfolk for the new Territorial Use Rights in Fisheries (TURFs) management system which will be enacted in the near future.

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**Table 1**. CPUE of trawler in Phang-Nga Bay in 1986, 1990, 1993, 1994 and 1995 surveyed by AFDEC Research vessel, Pramong 10

Year	Total	val. Fish	trash fish	mackerel	mackerel	No.
	CPUE	-		(big)	(small)	operation
1986	34.66	16.42	18.25	0.15	-	119
1990	39.95	15.36	24.60	0.29	-	. 39
1993	49.9	22.53	27.38	0.54	-	38
1994	55.95	19.68	36.31	0.77	0.04	32
1995	136.77	34.28	102.49	0.98	0.07	44

Note: val. fish - valuable fish

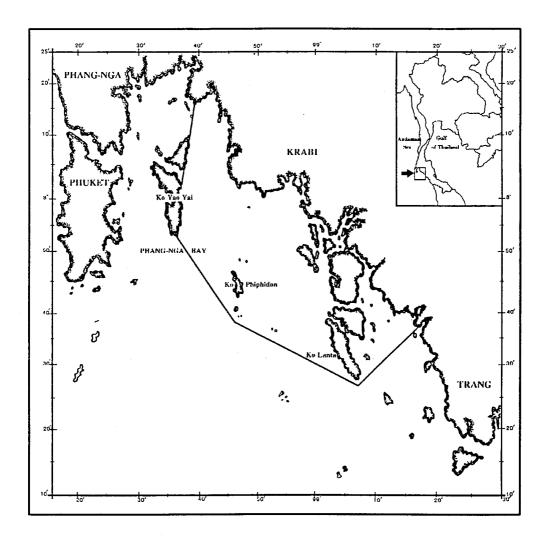


Figure 1 Illustration of close area for all kinds of trawlers, purse seiners, gill netters of mesh size less than 4.7 cm. during 15 April to 15 June each year (Ministerial Regulation issued 11 April, 1985).

### SUSTAINABLE MANAGEMENT AND DEVELOPMENT FISHING IN NEAR SHORE AREAS OF VIETNAM

by

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#### 1. Fisheries Sector of Vietnam

Fisheries sector of Vietnam has been considered as a spearhead sector of national economy, in recent years it has made important contribution to national economic development:

1.1 According to 1995 statistic date, Vietnamese Fisheries Sector has reached total fisheries production of 1.3 million ton, among 2/3 is from marine resources and has an annual per capita supply of about 11 Kg of fish, which accounts for about 30% of the total animal protein intake of population.

Also according to 1995 statistic date, there are 800,000 people directly engaged in fish catching and Aquaculture operations, comprising 3% of country's labour force. At the same time there are 3.2 million people living in the fishermen's families and in other supporting areas such as fifth processing, mechanical repair etc. will reach the figure of 1.8 million equaling 4.7% of country's labour force.

Beside above mentioned people, Vietnamese fisheries sector has employment opportunities no full-time for 20 million people.

During the past ten year, export volume from fishery products reached US\$ 2.9 Billion. Out of which the figure for 1995 was US\$ 620 million.

1.2 In addition to great impact of policies and mechanisms under the subsidized economy, the fisheries sector has always been influenced by climatic and weather changes. However, the fisheries sector has gained fast growth rate and managed to keep the growth rate at 6-7% per year.

Besides, the fisheries sector also is significant in regard of several sauce-economic sector such as health, some industries, tourism and culture.

#### 2. Fishery Resources of Vietnam

Vietnam is situated in the tropical monsoon, effected area rich in aquatic fauna and flora generally bioproductivity is at a high level. Particularly in red river and Mekong river estuaries which are important, if not the only bases, for the development of fisheries economy.

Vietnam's Marine fishery resources assessed as abundant in the region. The data obtained from investigations and surveys performed up now show an estimated stock of over 3 million MT with a total allowable catch (TAC) of 1.2-1.4 million MT.

#### 2.1 Marine fish

- The species composition is plentiful and diversified. About 2,038 species have been identified, of which about 130 species are of commercial value. Demersal and subdemersal fish species take advantage (about 70.1%) compared with pelagic fish species (29.9%). The number of species having inshore ecological features (67.8%) is greater than of oceanic species.
- Life cycle of Vietnam's marine fish species is relativity short, normally 3-4 years, some species have the life cycle of 7-8 years or more. Fish species has a short life cycle of 2-3 years. The growth rate during the first years is relatively high.

Reproduction: It clearly reflect tropical feature. Spawning occurs almost all around the year. Main spawning season of many species concentrated in April-June period. Spawning ground in shallow waters along the coastline, some species can move out to the offshore areas such as ocean tuna and flying fish, mackerel etc. The juvenile fish lives near the shore and when grown-out moves to the offshore areas water.

- Number of fish schools varies by season around the year, concentrated in big schools during the monsoon period, some species can moves so far offshore such as: Ocean's Tuna, flying fish etc.

#### 2.2 Crustacean

In Vietnam's seawaters 1,647 Crustaceans species have been identified, of which shrimps play the most important role with 70 species of 5 families. Annual shrimps catch ranges from 40-60 thousand tons, mainly from Southern Sea waters.

#### 2.3 Molluscs

Names of about 2,500 species have been identified, many of which are of economic value such as squid (loligo), cuttlefish (sepia), scallop (chlammys), oyster (ostrea) etc. These resources are important next to shrimps resources, annual molluscs catch ranges from 40-50 thousand tons.

#### 2.4 Seaweeds

Name of 638 species have been identified, of which Gracillaria genus is the most attractive with the popular Gasiatica species.

Besides, fisheries Vietnamese resources including some of another special species.

#### 3. Present status of fishing activities in coastal water areas of Vietnam

The coastal areas of Vietnam (depth <30 m for the coastal are of East West of South Vietnam, Bacbo Gulf and <50 m for the central coastal area) is about 106,000 km<sup>2</sup>. Equal to 11% Economic Exclusive Zone. According to the estimates that the coastal reserves of fisheries Resources is about 1.5 million tons and the total allowable catch is 0.6 million tons, but in fact over recent years, the total of exploiting fish in nearshore is reached 660-680 thousand tons. That is over the limited exploitation 10-12%. Respectively fisheries of high economic value is used as raw material for export processing, special fishery as shrimp, fish living under reef, coral, squid etc. In some areas in the state of emergency and endangered resources. The reason of the status is:

3.1 The fishing means developed rapidly in the 10 recent years at the end of 1985 there were 53,561 fishing boats (31,906 motorized boats), but at the end of 1995, according to statistic, there were 95,700, among 68,000 motorized boats (see Table 1).

A large number of motorized boats has been equipped with a small power, the units <30HP occupy over 80%, which lack of necessary equipment, and supplies. Therefore, only operating nearshore (the density of the fishing boats were concentrated in some areas over 100 units per km<sup>2</sup>.

Table 1

	S.N	Items	Unit	1985	1990	1995
	Ĭ	Total fisheries production	Ton	628,000	672,000	928,000
	II	Fishing boats	piece	53,561	72,323	95,700
	1	Motorized			-	
		- Total engine power	-	494,507	727,582	1,500,000
		- The average engine power	HP/piece	16.86	17.63	22.06
	2	Artisan boats	piece	24,468	31,068	27,700
13	3	Catch productivity	T/HP	1.27	0.92	0.58
	III	Fishing labour	People	220,770	253,287	420,000
	· · · · · · · · · · · · · · · · · · ·	Labour productivity	T/People	2.84	2.65	2.10

Fishing in Vietnam is using about over 40 kinds of gears, belonging to 2 groups:

- Subjective group, including Trawlers and purse seining. This group of gears occupy about 29% of total fishing means of Vietnam.
- Passive group, including liftnet, handline, long line, gill net, trap and fixed gear, occupies about 71%.

All kinds of gears using in Vietnam at present bare a characteristic that the scale is small, operating mainly in the near shore along the coastline, only gillnet and longline, some unit have operation range far from the shore.

Among above mentioned kind of gears, the trawlers, other combining with light source and fixed gears (trap setters etc.) near the river mouth, near shore are impacting on the resources and Environment of the fisheries resources, catching of juvenile fish, changes the habitats of the fisheries resources (Bottom Trawlers).

- Number of fishermen in Vietnam is about 420,000 people, number of fishermen is trained through regular schools is small, the remainder has been trained within their family inherited from fathers to sons, mainly operating with their experiences without scientific knowledge often causing harms to the environment and habitat of the fisheries resources, the acting of violation of law commonly occur such as using dynamics, nets with smaller sizes than regulated ones and so on regularly taking place at sea.
- 3.2 The waste environment of Vietnam, though until now still considered as clearer compared with many countries in the region, but with current development of some sectors, such as: Oil exploitation, forestry (Exploitation of mangrove forest and watershed forest), Agriculture (using pesticides, treatment of environment), tourism. Oceanic transportation and especially aquaculture in brackish water, mangrove forest, using industrially processed food, medicinal drugs and chemicals used for treatment of waste water, all these factors may cause pollution to the environment of water near the coastal areas.

# 4. Management measures of fishing in shore areas water along coastline of Vietnam

As the practical status of the economy of the country, and of the sea fishing of Vietnam which in next few years still mainly depend on the fisheries resources of near shore water along coastline, therefore, in order to maintain the sustainable growth, at the same time to protect sustainable the resources of near shore water, Vietnam has managed and continues to manage the coastal fishing by the following measures:

#### 4.1 Continue the coastal fishing planning:

Arrange, adjust the structure of fishing fleets, kinds of gears in near shore water along coastline such as: The fishing vessels motorized with engine <20 HP are not permitted; limit development fishing vessels motorized with engine<30 HP, especially with the facilities of trawlers, reduce and stop the operation of small fishing means operating in the waters of over 5-7 m deep and firstly decreasing the number of bottom mouths in the river mouths.

Encourage development of offshore fishing on by applying the policy mechanism like: exemption of some taxes, preferential credit for investment in development of means for catching fishes far from the coastline. The Government of Vietnam has been having programmes with large credit amounts in support of offshore fishing activities.

Import some advanced fishing techniques, exploit with careful selection fisheries with the aim at protecting sustainably coastal fisheries resources.

- Promote development of investment for a fishing in shore of which priority should be given to development of aquaculture and supporting activities in order to reduce the pressure of exploitation of marine products in the waters near the coast.
- Increase investment for construction of technical and material basis, for which there are 6 centers for fishing, fishing labours, water and oil supplying systems and so on in service of the program of offshore marine products exploitation and reducing the pressure of exploitation of coastal fisheries resources.
- 4.2 Strengthening the monitoring and supervision of law implementation:
- Strengthen the capacity of the organizational system for protection of fisheries resources, firstly fisheries protection forces at sea in terms of number as well as the quality of officers, facilities (fisheries checking vessels) and equipment needed for controlling and observation of law implementation.
- Strictly apply different forms of treatment against violation of the law, causing harms to the resources and living environment of fisheries, especially activities of using dynamics, toxic chemicals, electricity and fishing nets with eyes smaller than regulated ones, exploiting unmatual sea products and species endangered to extinction and so on.
- The Government of Vietnam has promulgated and will promulgate different policies and legislation of r encouraging organizations and individuals to participate actively in activities aimed at protecting sustainable fishing resources and their habitats and marine resources in particular.

- 4.3 Gradually increase the people's knowledge and social and cultural life for fishing community
- Increase the propagation and education of the community on law, common knowledge on aquatic resources, habitat, relationship between different coastal ecological systems and so on.
- Increase the investment for technical and material basis, creating favorable conditions for production development and social and cultural life of fishing villages, islands near the coast, labour bridge, fishing landing area, markets, schools, hospitals, transport etc.
- Continue testing and expansion of joint management models, the Government and the people together participate in management of fishing resources and living environment.
- 4.4 Strengthening the protection of fisheries resources and coastal water environment
- Demarcation of important fishing area, defining the restricted areas, reducing exploitation; prohibited and limiting of using some fishing gears, methods and establish the marine protected areas.
- Make use of international cooperation and development potential at home; continue the research and surveying reevaluate the coastal fisheries resources and offshore adjustment and redistribution of production forces to conform with the present situation of marine resources in each area will be made.
- Study and reproduce different varieties of sea products endangered to extinction, implementation the program of renewal of fisheries resources.
- Continue and improve the registration and issuing the permits for fisheries catching, firstly for the key areas; concentrating shrimp and fish yards and economic value.
- Apply measures to protect fisheries species endangered to extinction.

#### 4.5 Perfectization of fisheries law system

In line with the national development, after 35 years of construction and development of fisheries sector, encouraging achievements have been made, fisheries law system has been established, gradually entering into social life, of which there existed the fisheries resources protection and development legislation, contributing and creating conditions for fisheries sector to develop and catch up with the general development of the country. Vietnam is constructing the state of jurisdiction, the law system is being perfectized. After the birth of the new constitution in 1992, many new laws have been promulgated or amended or added, from which there are many

other related laws as: land law, navigation, foreign investment law, civil law etc. With open-door policy, Vietnam has signed and will study to sign or participate in many international convention on Sea Law in 1982, international trading endangered species (CITES), Marpol Convention 1974, Convention on biodiversity conservation, Mekong Agreement. However, in order to observe the constitution of 1992 and over come the limitation of current legal documents, Vietnam has now program of formulation of fishing law system like the project in cooperation with Norway, FAO on formulation of fisheries resources development and protection law.

### 4.6 Strengthening International Cooperation

As mentioned above, Vietnam in the past years, has carried out the investigation and study on fisheries resources, however, collected data from these activities are still in preliminary form, chiefly data of offshore surface fisheries resources and bottom fisheries resources with over 100 m deep, shrimp of the deep water areas of above 30 m and lacking of the thematic surveys in direct support to production and protection of resources, as well as in depth study of biology and ecology in the oceanic zones including nearshore areas.

To manage sustainable the coastal fisheries resources Vietnam has been continuing to courage with all countries inside and outside the region in investigation, surveying and assessment of the fisheries resources over the Vietnam water territories, especially the overlapping areas between Vietnam and neibouring countries. While continuing and strengthening further the exchange of information. Staff training on the fields relating the management of oceanic environment and Resources.

by

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#### **ABSTRACT**

Management of the industrial trawl fishery largely depends on the management of the artisanal fishing gears which restrict greatly the recruitment of the penaeid shrimps in the trawl fishery as adults. Trawlers harvest the spawners in peak spawning season, which greatly reduces in turn the chances of an enhanced stock in off-shore water. Since the exploitation of the penaeid shrimp stock is a multigear function, the cumulative affect were considered and in various ways it has been discussed that the same stock can provide a few times higher production if managed scientifically. Marine artisanal fisheries have so far been allowed to develop irrationally and as a result many of the fish and shrimp stocks have declined. One single stock of fish or shrimp is harvested by a number of fisheries at different stages of life cycle. Hence overfishing in one fishery has affected the others. Here the Push net fishery for tiger shrimp PL and the ESBN and Beach seine fisheries for juveniles have been identified as the destructive fishing methods. These fisheries restrict recruitment in the industrial fishery and hence results in over all lower catch rate and production. These fisheries need to be stopped. But since 55,000 full time fishermen are engaged in ESBN fishery, rehabilitation of them would be necessary before withdrawal. So main research and management thrust need to put on the artisanal fisheries sector. Since coastal shrimp culture industry is solely dependent on the push net fishery, rapid hatchery development is suggested. Meanwhile diversified technique for selective PL. Collection and reduction of induced mortality is proposed for research and extension. Further expansion of the coastal shrimp culture is not recommendable on the basis of natural seed supply. Trammel fishery has been proved to be biosocio-economically most suitable fishing gear and if expansion & extension takes place vertically and horizontally it can be used as a major source of rehabilitation and also to enhance additional but sustainable production. Amendment of the rules under the Marine Fisheries Ordinance 1983 is required on the basis of present knowledge about the dynamics of the fisheries. DOF Marine Fisheries Survey & Management Unit need to be strengthened as to the manpower and facilities, to be able to independently handle the task of achieving information for management and advise the govt. of measures for rational management on a continued basis. Functions of different ministries, agencies and institutions in fisheries management and development have been reviewed and the need for strengthening of the marine sector have been identified including creation of a separate directorate for marine fisheries. To integrate and control all activities in the coastal areas, creation of Coastal Zone Management Authority has been proposed.

Bangladesh declared an Exclusive zone of 200 nautical miles in her sea waters in 1974. As a result an area of about 1,64,000 sq. km. is now under the economic jurisdiction of the country for exploration, exploitation, conservation and management of its living and non-living resources. In addition to the prevailing artisanal fishing fleet the first offshore commercial fishing operation was started with the public sector trawlers in 1974-75 catalyzed by the positive findings of PAK/22 survey. After successful operation of these trawlers joint venture commercial fishing agreement was signed with Thailand for white fish fishing in 1977-78. Meanwhile a Bangladesh-Japan joint venture shrimp survey programme was carried out during 1977-79 and as a result of its positive findings joint venture commercial shrimp operation commenced in 1978 with Japan and later with Kuwait. Thereafter local private fishing entrepreneurs became increasingly interested in this venture and in a short passage of time the size of the offshore fishing fleet radically increased, mainly because of the presence of valuable penaeid shrimp species.

The resources of the near shore waters of the Bay of Bengal region countries are in near the extinct condition due to growth overfishing and recruitment overfishing and as a result the income of fishermen has gone below the poverty line. Fishery resources are limited by biological and ecological factors. But a common belief that the resources are "unlimited" has repeatedly lead to production oriental development plan. So, awareness on the actual fisheries position need to be built-up at all levels.

Strategies for marine fisheries would include adequate policy supports for continued survey for finding new fishing ground and to keep the harvest at maximum sustainable yield level. In this respect, emphasis was given on technological improvements of the artisanal sector in marine fishing technology instead of highly capital intensive trawler fleet. Improvements in fish processing technologies, distribution and marketing channels, infrastructure, adequate credit facilities and security of the fishermen are other areas where policies would focus.

The main research thrust is given on semi-intensive fish and shrimp culture integrated with livestock farming and agriculture, development of effective fish and shrimp feed, intensive nursery rearing, fish disease control, new fish product development and open water fisheries management.

Fisheries sector still prevails as the major activity in the coastal zone. Other sectors have very few activities but they interact with the environmental condition as well as management of the fishery resources.

Fisheries sector provides about 80% of the animal protein consumed in the country. But despite continuous increase in fish production it has not been able to coped with the fast growing population. In 1975-76, country's fish production from all sources was 6.40 lac mt. In 1993-94 this production rose to 10.87 lac mt. Wherein the per capita fish consumption has gone down from 33.4 g to 21 g. This has happened because of the fact that fish production increased at arithmetical rate whereas the human population increased at geometrical proportion.

The marine fisheries sector of Bangladesh currently contributes around 28% of the total production of fish in the country and with a coastline of 480 km<sup>2</sup> and an exclusive economic zone of 1,64,000 km<sup>2</sup> has the potential to make a greater contribution to fish production and export earnings of the country. Out of the production in the marine fishery sub-sector more than 90% comes from the artisanal fisheries which constitute the main part of the coastal zone. This area is the nursery ground of the marine animals where serious overfishing is done.

Fishes, shrimps and other aquatic animals are naturally renewable resources. Their population is subject to natural mortality which is caused by various factors, such as changes of environmental parameters (e.g. temperature, salinity, dissolved oxygen, turbidity etc.) diseases, old age, perdition by other animals etc. On the other hand these population are subject to changes due to fishing mortality in the exploited fishery and due to bio-diversity/succession of species. Determination of these factors which constitutes basis for formatting management options, needs continuous study even after the details and first hand surveys complete. So the marine fisheries monitoring survey and the study of the oceanographic parameters is a continuous process.

#### 1. Fishery Resources Potential

A number of surveys have been conducted since 1958 in the marine waters of Bangladesh. Most of these surveys are of exploratory nature and oriented to studies of fishing feasibility. Some surveys, however, have been conducted to assess the standing stock of the marine resources, particularly the demersal part of it.

The demersal fishery assessment survey results varies to a great extent. West (1973) through a desk study estimated the standing stock of demersal fish at 2,64,000 mt.-3,74,000 mt. and a shrimp standing stock of 9,000 mt. However, the recent results i.e. "R.V. Dr. Fridtjof Nansen" (FAO/NORAD) survey and "R.V. Anusandhani" (DOF/GOB & FAO/GOB) surveys before and after 1984 brings out the closer results. Therein the standing stock of demersal fish was estimated at the range of 150,000 mt. to 160,000 mt. within three surveys.

During R.V. Dr. Fridtjof Nansen survey (Saetre, 1981) through an acoustic study the pelagic stock was estimated to be from 90,000 mt. to 1,60,000 mt. but at the same time it was discussed that the estimate may be an underestimate.

Parameters of fish population dynamics for various commercial species of shrimp and finfish were estimated and results of stock assessment studies so far achieved have been treated with them to find out the fisheries potential for different resources, At this stage it has been estimated that 55,000+mt. of demersal finfish can be harvested annually from the present trawling ground. The maximum sustainable yield of shrimp has been estimated as 7,000 to 8,000 mt. Annually (Khan *et al* 1989).

The finfish species that are presently exploited consists mainly of the demersal fishes and shallow water estuarine species and also some midwater species. These include about 100 commercial species of which the most commercial or abundantly exploited species are as follows which constitute about 75% of the total production from demersal trawling.

1. Pampus argenteus Silver Pomfret 2. Pampus chinensis Chinese Pomfret 3. Pomadasys hasta White grunter Lutjanus Johini 4. Red snapper 5. Polynemus indicus Indian Solman Lepturacanthus savala 6. Ribbon fish/Hair tail 7. Arius spp. Cat fish Johnius belangerii 8. Croaker 9. Otolithoides argenteus Croaker Japanese threadfin bream 10. Namipterus japonicus Upenus sulphurus 11. Goat fish 12. Saurida tumbil Lizard fish 13. Ilisha filigera Big eve ilisha 14. Sphyraena barracuda Great barracuda 15. Muraenesox telabonoides Indian Pike conger

Among the surveys the Bangladesh - Thai joint survey, however, mentioned a good abundance of large pelagic i.e. tuna & tuna like fishes and sharks in Bangladesh marine waters. This survey was also aimed at demersal studies and some extra efforts were made for pelagic studies with offshore drift gill net. In the course of these studies the following species of tuna and skipjack were identified which accounted for about 40% of the experimental drift gill net catches.

## Tuna and skipjack:

Euthynnus affinis
 Katsuwonus pelamis
 Eastern little tuna/Kawakawa
 Skipjack tuna

3. Thunnus maccoyii - Southern blue fin tuna

4. T. obesus - Big eye tuna
5. T. tonggol - Longtail tuna
6. Auxis rochei - Bullet tuna
7. A. thazard - Frigate tuna

## **Small Pelagic:**

The drift gill netters of Bangladesh also catch mackerels as a by-catch of Hilsa. Four types of Mackerel (e.g. King Mackerel, Spanish Mackerel, Indian Mackerel & Short bodied Mackerel) were recorded from the Bangladesh water. These species also occur in the trawl catches accidentally.

Other than the species mentioned above a number of important species available in the marine waters of Bangladesh are either not exploited or exploited only as by-catch or as incidental catches of the existing bottom trawl, shrimp trawl or gill net fisheries. The most mentionable species are listed below;

## Mackerels:

Scomberomorus guttatus
 S. commerson
 Rastrelliger Kanagurta
 King mackerel
 Spanish mackerel
 Indian mackerel

4. R. brachysoma - Short bodied mackerel

### Non Conventional Resources:

Bottom trawlers and shrimp trawlers catch cephalopods as a by-catch. These are also available in some artisanal fishing gears at younger stages. Three species of cephalopods (Sepia officinalis, Loligo spp., Octopus sp.) were recorded.

Sharks & Rays are exploited by drift gill net as well as long lining. The species recorded were Sphyrna blochii, Stegostoma fasciatum, Chiloscylium punctatum, Mustelus kanekones, Scoliodon walbeehmii, S. sorrakowa, Carcharhinus menisorrah, Negogalus balfouri, Pristis cuspidatus, P. zizsron, Rhynchobates djiddensis, Rhinobates gramulatus & Dasyatis warrak.

## Major Shrimp Species Exploited:

Bangladesh off shore commercial trawl fishery have developed on the basis of the valuable exportable penaeid shrimp resources. The commercial shrimp species are listed here.

Penaeus monodon
 Penaeus semisulcatus
 Penaeus japonicus
 Penaues indicus
 Tiger
 Penaues merguiensis
 Giant tiger
 Tiger
 White
 Banana/White

6. Metapenaeus monoceros - Brown
7. Metapenaeus brevicornis - Brown
8. Metapenaeus spinulatus - Brown
9. Parapenaeopsis sculptilis - Pink
10. Parapenaeopsis stylifera - Pink

Among them *Penaeus monodon* is the most valuable and hence the targeted species. The penaeus group (tiger shrimp) accounts for <10%. The highest contribution in the total production however is made by *Metapenaeus monoceros* (brown shrimp). The Metapenaeus group (brown shrimp) accounts for >65% in the trawl fishery.

## 2. Degradation of Coastal Zone Environment

Brackishwater estuaries are the meeting point of the fauna from three different ecosystems. Brackishwater species eg. *Acetes indicas*, *Raconda russeliana*, etc. live, grow and spawn in the same environment, while the marine and freshwater fauna use the brackishwater low saline, nutrient rich area as nursery ground and visit for a short time.

#### Artisanal fisheries restricting offshore recruitment

The artisanal fishing gear operated in the open brackishwater environment, particularly the estuarine set bagnet (ESBN), the push net and the beach seine catches only the post larvae and juveniles of the marine fauna in huge numbers which restricts their recruitment in the open sea at adult stage. The degree of such restriction by size and number is immense. *P. monodon* the tiger shrimp harvested by different interactive fishing gears, were seriously over exploited.

More than 2,035 million Bagda post larvae are collected annually which is only over one percent of the total catch of the fishery. The rest of the catch is thrown on the sand to die which is equivalent to about 200 billion PL of the shrimps/fishes and zooplankton. This is considered as a serious growth overfishing imbalancing the food chain and upsetting the coastal environment.

The extensive use of set bagnets in near shore fisheries has resulted in over-exploitation. In the absence of sufficient hatcheries, collection of wild tiger shrimp post larvae in estuaries and near shore waters has led to severe destruction of larvae & juveniles of other shrimp, finfish species and zooplankton which imparts adverse affect on food chain, ecology and environment.

The situation in Bangladesh coastal shrimp fishery is as such and the penaeid shrimp stock is under pressure form all sides. ESBN, push nets and beach seine harvest the members of the same population at sizes much lower than the size at first maturity and as a result about 99% of the population do not get a chance to participate in the spawning process. It was estimated that out of the total penaeid shrimp harvested, ESBN takes 55.87% trawler fleet 29.70%, MSBN 14.30% beach seine 0.09% and the push net take only 0.04% by weight. The same production if converted in number the situation is just reverse i.e. trawler fleet takes only 1%, ESBN 3.4% and the push netters alone take 94.6% (Khan et al 1994). Thus it is evident that the enhanced production in the trawl fishery largely depends not on the trawl fishery alone but on the management of the three artisanal fisheries such as the ESBN, push net and beach seine.

#### Industrial fishery reducing recruitment and killing spawners

The trawler fleet although not permitted by rules and the ordinance to fish at depth shallower than 40m but they normally fish up to 30 m and even up to 20 m depth. Since the gear is non-selective they also harvest sizes of fishes and shrimps

which fall under the post juvenile and preadult categories which restricts adult recruitment of a part of the population. The number & production of trawlers is given in the table.

The penaeid shrimps spawn throughout the year with two peck season (January-Feb. and July-August) when more than 90% of the population in the spawning ground show the signs of full ripeness. To ensure the larval population for the next generation the brooders need to be saved from fishing mortality during that time. But the trawler fleet also randomly harvests the brood shrimps during the peak spawning season. Thus the larval population is getting reduced year after year.

# 3. Other national agencies and institutions responsible for degradation of Coastal Zone & their linkage to fishery

Many water resources project have recently been developed to protect the inhabitants from devastating floods and to increase food grain production. As a result of these projects free movement of fauna from freshwater to brackishwater is being hampered. Changes have been caused in the aquatic ecosystems and fish production has been affected. The migration of hilsa and other anadromous and catadromous species has, for instance, been obstructed.

The sunderban forest in the south-eastern part of the country is the largest single compact mangrove resources in the world, but in 1985 survey showed that standing volume of the main species had declined alarmingly since an inventory 20 years earlier. Destruction of mangrove and other forests impact on fisheries resources and environment.

Besides overcutting and overestimation of regeneration times, diversion of river waters have impaired the growth of mangroves. The mangrove forests are being removed for aquaculture. There is an increasing conflict between mangroves forests, shrimp farms and rice cultivation.

Industrial pollution in the country however, has grown 150 percent over the last few years, but since there is no treatment of waste products before their discharges local environmental degradation has occurred. This, together with lack of sewage treatment plants, has resulted in fish mortality as well as occurrences of toxic substances in fish and shrimp.

Since the introduction of HYV's by farmers, the annual transport of pesticides into the Bay of Bengal has been estimated at 1800t. There are few studies on the impact of agrochemical residues on fisheries, but toxic residues have been recorded in both shell and finfish.

Situation has increased exponentially over the last century at the month of Ganga-Brahmaputra-Meghna river systems and has actively reshaped the coastal and nearshore habitats, with consequent impact on fisheries, changes in bottom topography, increased turbidity and entrapment of pollutants are some of the

detrimental effects. Sometimes waste products such as oil is discharged in the Bay of Bengal impacts on marine fisheries resources.

The ministry of Environment is directly concerned about the follow-up of the UNCED. But of fisheries purpose fisheries ministry is directly concerned and need coordinated interministerial effort from the other related ministries e.g. Agriculture, Forestry, Science & Technology, Shipping, Industry etc.

## 4. Impediments to Fisheries Development & Management

There are various impediments to fisheries development some of which are particular to the sources of fisheries. In case of capture fishery inadequate knowledge and know how, overfishing and indiscriminate killing of juveniles and destruction of spawning grounds, obstruction of migration routes due to unplanned construction of dams and embankments, degradation of water quality, lack of proper management policy and credit facilities, defective fish conservation laws and inadequacy of proper processing, marketing and other facilities are some of the major factors affecting proper development.

The major constraints to the development of closed water culture fishery in Bangladesh relate to problems of property rights, competing water uses and related conflicts, lack of trained manpower and quality fish seed and lack of finance. The problems are diversified in nature and vary not only with the type of water bodies but also from place to place.

In case of marine fishery at present the marine fisheries wing is managed by only a very limited people which is too inadequate for maintaining the ongoing work of resources survey, monitoring and law enforcement. Moreover out of the present manpower all are not adequately trained in marine fisheries aspects. Licensing system of the mechanized fishing boats is to impose the rules of the Marine Fisheries Ordinance is yet to implement adequately due to lack of adequate manpower. Fund constraint for applied research and survey.

Pollution of water and the aquatic environment caused by (i) the discharges of toxic industrial wastes(ii) the discharges of raw organic and domestic wastes, and (iii) release of agrochemical through run-off are making the aquatic environment uninhabitable for fish, prawn and other aquatic life.

Use of land for brackishwater shrimp and finfish culture in the South-west region has given rise to social tensions and conflicts with other land uses. In the South-east region, some mangrove forests have been converted into brackishwater shrimp culture ponds, upsetting the mangrove ecology.

Introduction and expansion of improved aquacultural practices are progressing at a comparatively slower rate due, in part, to the inadequacy of fisheries extension services. Adequate manpower with practical knowledge, skill and experiences in advanced aquacultural techniques and practices is lacking. Lack of

proper management organization for establishment of a management unit and unit and its strengthening to sufficient degree of specialization on the subject matter. Conflict exists between the industrial and artisanal fishing fleet.

No restriction exists on harvesting the oyster, blood clam, green mussel, sea weeds, coral reef etc, as a result these resources may extinct in near future.

In the planning, designing and implementation of projects on Flood Control and Drainage (FCD), Flood control, Drainage and Irrigation (FCDI), construction of Cross Dams, River Closure etc. the needs of fish, prawn and other aquatic living populations for water as habitat are not considered and accommodated. This results in the reduction of aquatic bodies for fish causing reduction in species diversity and quantity of fish and prawn in the open waters of the country and obstructing the route of spawning, feeding & over-wintering migration of the anadromous and catadromous fishes.

#### 5. Legal and Institutional Frame Work

#### Marine Fisheries Ordinance 1983 and its present situation

In 1983 the Government of the Peoples Republic of Bangladesh enacted the Marine Fisheries Rules, 1983 in accordance with the provisions of the Marine Fisheries Ordinance, 1983. Under the provisions of the ordinance the Marine Fisheries Wing of the DOF is authorized to deal with the matters relating to marine fisheries exploitation including licensing and monitoring of operation of fishing vessels. The marine fisheries rules amended in 1993 provide for licensing and monitoring of artisanal mechanized fishing boats. Under the ordinance the officers of the Marine Wing of DOF have been empowered to check, seize or take appropriate actions required for surveillance and enforcement of the rules of the ordinance. These activities are performed from the Marine Fisheries check post established under DOF Marine Wing at Patenga bay front, Chittagong.

The Ministry of Industry is currently authorized to accord permission for acquisition of fishing trawlers in consultation within MOFL. The mechanized fishing vessels are registered with Mercantile Marine Department (MMD). For patrolling of the EEZ the DOF procured two modern gun boats and placed under the operational control of Bangladesh Navy. Besides MOFL other ministries directly involved are the Ministry of Land, Ministry of Industries, LGRD, MOEF.

# 6. The agencies and institutions involved in development and management of the marine fisheries resources

Fisheries administration and management primarily remain under the control of the MOFL. The Department of Fisheries (DOF) is the line agency responsible for development and management of fisheries. Bangladesh Fisheries Development Corporation (BFDC) was established in 1964 with a view to promoting fishing industry, landing, preservation and processing facilities particularly in the marine

sector. A part of the survey and exploratory work was once included in the mandate of BFDC which is now carried out by the Marine Fishery Survey Project DOF.

Fisheries Research Institute (FRI) was established in 1984, an autonomous body under the administrative control of the MOFL. Research stations and ancillary facilities of the DOF were subsequently transferred to FRI by an administrative order of the govt. The mandate of FRI is to plan and undertake adaptive research programmes to develop suitable technology for the fish farmers and fishery managers (Rahman 1993). But the survey work producing information on resource monitoring and management remains with the DOF for practical reason. Now this work is done under a permanent setup of the DOF called Marine Fishery Resource Survey & Management Unit based at Chittagong having in possession of two marine and brackishwater research vessels and other equipments for this purpose, but manpower & facilities are inadequate. Creation of a separate directorate for marine fisheries would gradually remove these bottlenecks.

Several NGO's and fishermen cooperatives are involved in the marine fisheries development activities in the country. Bangladesh Jatiyo Matshyajibi Samabay Smity (BJMSS) for example had direct involvement in the marine fisheries development, now not that effective. Among the NGO's the CODEC, CARITAS, Proshika-MUK are mentionable who are directly involved in the development of the coastal fisherfolk community.

#### 7. Infrastructure and Service Facilities

Infrastructure and service facilities are too inadequate. In absence of proper landing centers artisanal fishermen land their catches at scattered places without processing marketing and fast transportation facilities. Only the industrial trawler fleet (public and private) lands at defined places, mechanized boats for hilsa to some extent land at the few landing centers of BFDC. The other private landing places also not have adequate ice. Freshwater, berthing and bunkering facilities. BFDC operated four landing centers in Cox's Bazar, Khulna, Barisal and Patuakhali. It has modern landing preservation, Ice, water, berthing and bunkering facilities at Chittagong used for its own fleet as well as extended services to the private operators. Such landing centers need be developed in every coastal districts and other important landing areas.

### 8. Issues and Opportunities for Management of Coastal Zone

#### Fisheries Sector Issues and Opportunities

Increased production and exports and creation of employment opportunities have been the main focus of development activities in the sub-sector over the years. In order to achieve the objective of fisheries development, the following strategies and policies is emphasized.

- development of skilled manpower, appropriate research and technologist loges, expanded institutional/organizational capabilities to plan and implement development activities;
- community based integrated development approach for artisanal fisheries with improvement in technology, processing, marketing and distribution facilities;
- continuation of the marine fishery resources survey for its development and management to achieve yield at MSY (Maximum Sustainable Yield) and identification for new fishing grounds and preparation of extension materials on resource position, more effective fishing and resource conservation;
- gradual intensification of aquaculture practices to obtain increased production per unit area;
- policy support for improving quality of fish and fish products;
- adequate infrastructure to support planned expansion of shrimp culture in the private sector;
- adequate polices and measures to harness the export potentials of fisheries.

Strategies for marine fisheries would include adequate policy supports for continued survey for finding new fishing ground and to be the harvest at maximum sustainable yield level. In this respect, emphasis will be given on technological improvements of the artisanal sector in marine fishing technology instead of highly capital intensive trawler fleet. Improvements in fish processing technologies, distribution and marketing channels, infrastructure, adequate credit facilities land security of the fishermen are other where policies would focus.

The main research thrust is given on semi-intensive fish land shrimp culture integrated with livestock farming and agriculture, development of effective fish and shrimp feed, intensive nursery rearing, fish disease control, new fish product development and open water fisheries management. Among the above mentioned research programme, the problem oriented basic and adoptive research and basic fishery biological research is under the jurisdiction of the Fisheries Research Institute. Applied and management oriented research/ survey would particularly on stock assessment, biology and the fishery data base statistical source & resource monitoring work is the responsibilities of the Directorate of Fisheries since it is directly involved for implementation of the management plan and policy including law enforcement according to the ordinance.

The number of offshore trawlers operating at this moment are believed to be quite enough to harvest the demersal shrimp and finfish resource because irrespective of the landing data the supplementary data cross-checking records available with the DOF Marine Fisheries Survey Management and Development Project through sampling from research vessel indicates that the present annual catches of fish and

shrimp are at about the same level of maximum potential yield, as expressed in the relevant section. So the government at this stage have no plan to further increase the number of trawlers in the demersal fishing and shrimp sector.

The government has plan to conduct stock assessment and feasibility survey in the inshore and offshore pelagic resources area in order to harness the under-exploited/unexploded resources like tuna, mackerel, cephalopods, lobsters etc. In this connection some project synopsis are under consideration for inclusion in the fourth five year plan.

The government has also plan to establish a permanent center based at Chittagong for monitoring and management of the marine fishery resources on a continued basis. The Marine Fisheries Survey, Management and Development Project after completing of the development phase in June/1991 was supposed to from the base for the proposed establishment in the name "Marine Fishery Resources Monitoring and Management Center".

## 9. Cross Sectoral Issues and Opportunities

The Ministry of Industry is currently authorized to accord permission for acquisition of fishing trawlers in consultation with MOFL. The mechanized fishing vessels are registered with Mercantile Marine Department (MMD). For patrolling of the EEZ the DOF procured two modern gun boats and placed under the operational control of Bangladesh Navy. Besides MOFL other ministers directly involved are the Ministry of Land, Ministry of Industries, LGRD, MOEF.

Several NGO's and fishermen cooperatives are involved in the marine fisheries development activities in the country. Bangladesh Jatiyo Matshyajibi Samabay Samity (BJMSS) for example had direct involvement in the marine fisheries development, now ineffective. Among the NGO's the CODEC, CARITAS, Proshika-MUK are mentionable who are directly involved in the development of the coastal fisherfolk community.

As part of the global initiative taken by the coastal zone management subgroup (CZMS) of the inter-governmental panel on climate change (IPCC),. Bangladesh center for Advance Studies (BCAS), in collaboration with Resource Analyst (The Netherlands) and Approach Consultants (Bangladesh), undertook a pilot study on the assessment of the vulnerability of coastal to climate change and sea level rise. The results of the study were presented on behalf of the Ministry of Environment & Forest, Government of Bangladesh, at the World Coast conference.

The objective of the study was to analyze the vulnerability of Bangladesh to sea level rise and global climatic changes and to prepare a vulnerability profile of Bangladesh. Other objectives included identification of the institutional strengths and weakness for implementing integrated coastal zone management (ICZM).

The study focused on assessing the Primary Physical effects (PPE) in terms of changes in inundation, salinity intrusion, droughts as well as cyclones and flesh flood. The study reveals that there is clearly a need for integrated coastal zone management both at the national as well as the local level.

Environmental Survey and Research Unit (ESRU) of the Department of Geography, Dhaka University, is a research and study organization committed to the pursuit of gathering information useful for implementing project of national importance. ESRU also assists development agencies at their request in dealing with development oriented problems, in forms and means best suited to their needs. They have directed and participated in different projects financed by UNDP. HABITAT, UNFPA, World Bank, USAID, ADB, FAO, JICA. Ford Foundation and other organizations.

# 10. Other Related Matter which Interfere with Resource Management and Surveillance Work and Probable Solutions

Other management and legislative measures which are not under the direct-control of the DOF/MOFL need interministerial and inter departmental decision and arrangements. Some of these measures which deserve specification are discussed here.

10.1 There are water bodies under the control and ownership of the ministries other than fisheries. Some of these water bodies/areas are directly "managed" by other ministries such as Ministry of Land. Department of Forest, MOFL. These are the revenue oriented management by collecting tools and by leasing of the water areas. But since fisheries resources are the living renewable resource, biological management based on the research findings and scientific information would be invariable necessary, irrespective of which ever agency/organization own the land, water or the fish. Department of Fisheries must be entrusted with the responsibility for such management for such management it has the capability to shoulder that duty.

As discussed in text, various water development activities have altered much of the ecological habitat concerning Fisheries so any development or management activity (non-biology) in such water bodies, for the purposes other than fisheries should be done only in close consultation with the MOFL/DOF to ensure a healthy environment for the growth of the fish population. A high power steering committee for Integrated Coastal Zone Management with respective position for MOFL/DOF need to be established.

10.2 To minimize the degradation of coastal environment by industrial, agrochemical, oil and other population integrated research to qualify and quantify the toxic effect on fish need be undertaken immediately and should identify the pesticides which are not water soluble or not having a toxic effect on aquatic life, limit the other brands of fertilizer and pesticides. Waste treatment facilities need by established in the coastal districts and rules need be reformulated to take care or aquatic life and

legislation must be improved. A co-ordination is necessary with the MOFL and MOEF.

- 10.3 Mangrove aforestration programme may be undertaken jointly by the DOF and DOF (Forest) to save the environment from further degradation.
- 10.4 In the Marine Fisheries Ordinance subsequent rules have been made for licensing of the artisanal fishing boats with DOF. The Mercantile Marine Department (MMD) deals with the registration of those boats. But it is evident that all boats are not registered and enforcement hardly exists for the registration of the rest. MMD look after the safety of life at sea and issue vessel health certificates by checking the safety equipment. Fishermen are reportedly not interested to observe formalities with two similar departments for registration and for license. DOF has the capability to check the craft health and safety equipments. The two function need to be put under DOF for easy monitoring and enforcement system.
- 10.5 There are gear and area conflicts between artisanal and industrial fishermen, and also there are reports of sea piracy. Resource use conflicts are also there. Coast guard strengthening is required to solve these problems.
- 10.6 Overnight withdrawal of ESBN fishing gear would not be possible forcing 55,000 fisherfolk, who live below the poverty line, to starvation. So, alternate employment for their livelihood need be identified inside or outside the fisheries sector. So, new fisheries development and expansion of presently sustainable fisheries with direct participation of ESBN fisherfolk would be necessary.
- 10.7 Some fisheries are found biologically sustainable but their distribution and effort is limited. Expansion of these fisheries may give enhanced sustainable production as well as create room for rehabilitation of the ESBN fisherfolk. The trammel net fishery has proved to be the biologically most sustainable fishery. At present this fishery is in operation at Teknaf coast only. Feasibility and technical demonstration of this gear in the western part of the coast may help expand this fishery in the other areas to produce more fish and would enhance economic as well as socio-economic benefits.

## 11. Concluding

Competition has increased over the years for investment in the demersal and artisanal fisheries sector which are already over burdened. While the pelagic resources e.g. Tuna and tuna like fishes have remained untapped. Now, ilisha is the only pelagic species categorized in the fish catch statistics of Bangladesh. Eight species of tuna and skipjack and a number of potential species of mackerels, sharks, rays, sardines, anchovies, shads and several species of cephalopods. Soles and flat fishes, lobster etc. are available in our water area (Rahman et al 1995). Development of these resources will open new era for Bangladesh fisheries sector to boost up production sustainable. But detail survey and assessment of stock and MSY would

be necessary along with feasibility and technological demonstration for transfer to the private sector.

The freshwater area is getting reduced and overall ecology of fish habitat and route of migration have altered due to various water resources development activities. So it is far to fulfill the minimum protein requirement of the teeming millions from the freshwater sub-sector alone. But the highest priority has always been accorded to the freshwater fisheries as reflected in the large number of fisheries development project implemented since liberation inspire of the fact that marine fisheries sector holds the lion share in foreign exchange earning and contribute to the development budget at the proportion. If similar level of management and development attention was paid to the marine sector in would possibly be able to give a substantially increased production, manpower and facilities.

The development potential of this sector has not been properly exploited. Rather because of unplanned and irrational increase in fishing effort many of the marine fish and shrimp stocks have already declined. As a result coastal artisanal fishing has become non-remunerative and fisherfolk are getting poorer, thus putting more and more damaging pressure on the resource, a fruitless endeavor for survival. This gives a false impression that the prospect of marine resources exploitation has become saturated. But the story is different, in fact we are killing the goose which lays eggs. Artisanal coastal fisheries management need to be given top priority.

The most valuable penaeid shrimp stocks in particular have been under pressure form three different sides leading to a complete risk of annihilation. Superseding the long-term development objectives by various quick money strategies is a common practice in the tropical developing countries, which has led many fisheries throughout Asia and the Pacific to a total annihilation. This must be taken as a lesson and we must choose the long term but not the short term strategies for management, before we reach at a point of no return. Since the fishery resources are renewable, a diversified judicial exploitation plan may give a production manifold higher than the present from the same stock.

Coastal zone management is a multisectoral activity. Many sectors are usually involved in the use of coastal areas, but not equally paying attention to the interest of conservation of the environment. But coastal fisheries is not a multisectoral business as it appears in Bangladesh (as discussed in the paper). So fishery management should be solely with the DOF/MOFL. Environment in the coastal zone should be well preserved. Research and study in this area need be strengthened. Petroleum extraction in the coastal zone is only in the process of development. So an Integrated Coastal Zone Management Authority (ICZMA) should be established with key role for DOF/MOFL since fisheries sector still play major role in the coastal zone.

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Appendix 1

Marine & Artisanal Fishery production by gear/craft type:

Type of Fishing	Major species/groups exploited	Annual prod(MT)		Number of Unit		Area/Depth(M)	
		Craft	Gear	Shrimp	Fish	of operation	
A. INDUSTREIAL							
1, Trawl Fishing	Metapenaeus monoceros,						
a. Shrimp Trawler	Penaeus monodon, P .	4661	2314	35	_	40-100	
	Semisulcatus, P. merguiensis etc.		,				
b. Fish Trawler	Jewfish, catfish, Indian, Salmon,	212	3146	17	-	40-100	
	Shark & Rays, Pomfret.						
SUB-TOTAL		4893	5460	52	-		
B. ARTISANAL							
1, Gill net			136469		6389		
a. Drift gill net	Hilsa ilisha	-	-	-	-	upto 30.00	
b. Fixed gill net	Hilsa ilisha	-	-	-	-	8-10.0	
c. Large mesh drift gill n	Sharks	-	-	-	-	30.00	
d. Bottom set gill net	Polynemus indicus (Indian Salmon	-	-	-	-	South patches	
e. Mullet gill net	Grey mullet	-	-	-	-	5-10.0	
2. Set bagnet		Shrimp & I	Fish				
a. Estuarine Set Bagnet	Brown and pink shrimp, Bombay						
	duck, jew fish, Anchovies, clupids,	72285.0				5-20.0	
	Hairtail etc.(mostly juveniles)						
b. Marine set Bagnet	Brown and pink shrimp, Hairtail,						
	Bombay duck, Anchovies,	26111.00				10-30.0	
	clupeids, etc.						
c. Large mesh set bagnet	Lates calcarifer (Sea perch)	-				10-30.0	
3. Trammel net	White, Tiger, Brown shrimp-	1753.50				8-20.0	
	Jewfish, catfish.						
4. Bottom long line	Jew fish (like johnius sp.	2853,00				10-30.0	
	pennahia sp., protonebia sp.	÷					
	Otolithoides sp. etc.)						
5. Beach seine	Small brown and pink shrimp,	7319.00			·	8-10.0	
	clupeids, Anchovies, Jewfish,						
	Hairtail, etc.						
6. Char pata jal	Brown, white & Tiger shrimp etc.	-				upto 10.0	
7. Cast net	Brown, white & Tiger shrimp etc.	-				upto 10.0	
SUB-TOTAL		247390					
8. Push net	Larvae of P. monodon as a target						
	species which constitute less than	1294 millio	on			upto 10.0	
	1% of the catch						
9. Fixed Bagnet	-do-	741 millior	1			upto 5.0	
10. Dragnet	-do-	14				upto 2.0	
GRAND TOTAL		257743.50	-				

## FIJI'S INSHORE FISHERIES RESOURCES AND MANAGEMENT STRATEGIES

by

Malakai Tuiloa Senior Fisheries Officer, Fiji Islands and Ram Lakhan Fisheries Technical Officer, Fiji Islands

#### 1. Introduction

#### (1) Background

The development of the inshore and (offshore) fisheries resources have played an important part in the social and economic development of the people of Fiji. During the 1970s and 1980s, fisheries development efforts have concentrated mainly on increased production for imports substitution. However, for the development of the fisheries sector in the 1990s, Government's fisheries development policy shifted from that of import substitution to that of an export oriented economy, with specific objectives: to provide employment opportunities from the exploitation, and processing of marine products; to increase production to satisfy local demands; to increase value-added fisheries products for export; and to manage and control the exploitation of inshore finfish and non-fish resources. Recently, Government priorities have been directed to the management and control of the inshore fisheries resources (IFR), with increased involvement of owners (chiefs) of the customary fishing rights areas (CFRAs) or "qoliqolis", the encouragement of fishermen to exploit offshore resources, the development of exports, mainly chilled tuna and good quality miscellaneous marine products and the development of aquaculture and mariculture.

## (2) Importance of the Inshore Fisheries Sector to the Fiji Economy

The inshore fisheries resources (fish and non-fish) are those that are currently being exploited by the subsistence, artisanal (small-scale) and commercial fisheries sectors. The resources are found mainly in the coastal (inshore) waters, lagoons, estuaries, inland rivers and mangrove areas. Aquacultural and maricultural activities in the marine and inland freshwater areas have also produced inshore fisheries products (fish and non-fish)

The IFR sector has been the major source of employment and income for coastal communities, and has played an important part in the development of Fiji's economy. Recent statistics indicating the importance of the IFR are:

1994 fish production: 4796 mt (fish) and 2531 mt (non-fish) valued at \$23.9 million; 1995 production: \$21 million involving 1774 commercial fishermen.

#### 2. Current Inshore Coastal Resource Management Issues

In Fiji prior to the 19th century each traditional coastal community had its own system to manage its fishing grounds. When Fiji was ceded to Great Britain in 1874 the rights over land and water were lost but later returned in different forms. The water rights have since been controlled under a dual system.

The "dual management system" in Fiji consists of management by the formal governmental management system as well as by the local traditional management system. This "dual management system" consists of the following relevant acts, regulations, and customary fishing rights.

#### The Current Inshore Resource Management System

## (1) Governmental System

## Fisheries Act (Laws of Fiji, Chapter 158, Fisheries)

Authority and responsible agency: Ministry of Agriculture, Forests and Fisheries

In terms of the inshore resource management, the Act describes the following:

- state fisheries regulations:
- state license to take fish;
- traditional fishing areas and customary fishing rights (CFR);
- the responsibility of the Native Fisheries Commission to protect the CFR; and;
- the control fishing activities by Fijian vessels (Fijian Government 1991).

## Fisheries Regulations

Authority and responsible agency: Ministry of Agriculture, Forests and Fisheries

In terms of inshore fisheries, these regulations addresses the following concerns:

- inappropriate fishing methods (i.e. fishing using poison) and areas;
- the mesh limitations for catching various species;
- minimum size limits for certain species; and;

- protection for certain vulnerable species.

### Marine Spaces Act (Laws of Fiji, Chapter 158A)

Authority and responsibility: Officer of the Prime Minister

This Act describes the following items

- fishing by foreign fishing vessels within Fiji's 200 miles Exclusive Economic Zone; and;
- licensing quotas and reporting procedures
- (2) Traditional Management System

### Ownership of Fishing Rights

In 1881, Great Britain returned the traditional fishing grounds and rights of the Fujian people to the "matagali" (sub-clan) or division that owned them prior to cession. From that time, on the Fijian traditional fishing rights were communally owned, not individually owned. Currently, ownership of each traditional fishing right is allocated to tribal group such "matagali" (sub-clan), "Yavusa" (clan) and "Vanua" (province)

## Customary Fishing Rights (CFR)

The Fisheries Division has the authority for all fisheries management and development activities in Fiji based on the above-mentioned regulations. On the other hand, all reefs and lagoons in Fiji are subject to Fijian CFR. There are 411 different CFR areas devised by the Native Lands and Fisheries Commission, basically covering all of the inshore water of Fiji (waters from the shore to the outside edge of the barrier reef). Each is under a separate jurisdiction.

### Jurisdiction by the Local Chief

In Fiji, each local chief still has the following powers and rights:

- restrict the number of licenses issued to commercial fishermen in the CFR area:
- prevent fishing for certain species or in certain areas;
- prevent the use of certain types of fishing gear;
- protect the fisheries for the benefit of his own people's subsistence needs; and

deal with "sedentary" fishery resources (including lobster, giant clam, crab, reef fish, beche-de-mer etc.) by the jurisdiction (Cavuilati, 1993).

## 3. The Human Ecology of Inshore Fisheries

The management of the inshore fisheries is actually under governmental bodies such as the Fisheries Division as well as the Customary Fishing Rights (CFR) system. The complicated relationships between the governmental system and the CFR are shown on Figure. This "dual management system" consists of the following relevant organizations, resource users and other stockholders.

## (1) Governmental System

### Ministry of Agriculture, Forests and Fisheries

This ministry has the authority for all fishing management and development

### Ministry of Fijian Affairs

The ministry has the authority for all native economic and social activities.

#### **Fisheries Division**

The Fisheries Division is given responsibility to manage all fishing activities inn Fiji. The Division has many tasks and responsibilities such as licensing and regulatory activities; advisory services; giving practical demonstrations to fishing groups; ice and fishing gear sales; enforcing the laws; and carrying out Environmental Impact Assessment for the extraction of the commercially valuable species.

The marine resources of Fiji stretch from the coral reefs and mangroves that fringe their shores to the stocks of commercial species that inhabit the open waters of their exclusive economic zone (EEZ).

#### **District** Commission

The District Commissioner, a governmental representative since independence, has the power to veto the CFR system's decision, made by the local chief.

## Local Cooperative Department

The role of the cooperative is to promote and develop the effective income generations activities for the members in the community. This body tries to promote the socio-economic development and improvement of the business skills of the community.

## (2) The Customary Fishing Rights (CFR) System

The following organizations and actors are involved in the inshore resource management in the local fishing villages in Fiji:

The Native Lands and Fisheries Commission: independent body, responsible for

the demarcation of each C.F.R and settlement of any related dispute.

This commission is responsible for all affairs of the native fishing.

## Local Traditional Chiefs - stakeholder

The chief has jurisdiction enforced through the authority to grant permission for licensing. The chief also has the power, in consultation with the Fisheries Division, to restrict the number of licenses issued to native and outside commercial fishermen.

#### <u>Custodians</u> - stakeholder

The custodians are in charge of each of the CFR areas. They question why all revenue from the license goes to the government. They have demonstrated that they have a wide knowledge of the marine environment. The owners of some CFR areas have shown concern about conserving stocks, and have implemented some management regions.

#### Local Fishermen - direct users

The local fishermen claim that their own CFR area is an exclusive fishing ground. They are also wary of the outside commercial fishermen who go past their fishing ground. They suspect many illegal fishing activities by the outside commercial fishermen.

# Outside Commercial Fishermen - Direct users/mainly Indians and other non-Fijian Commercial Fishermen

The outside commercial fishermen, who are mainly Indians and Chinese are legal to use inshore waters as free fishing ground. Some of the outside commercial fishermen are conducting illegal fishing such as full-gear dive fishing, off season fishing, and small-size mesh gill net fishing.

#### Issues for Management of Resource:

- The resources are accessible to the fisheries and are subject to heavy fishing pressure:

- About 2000 vessels (full and part-time) are currently targeting the stocks, using a variety of fishing techniques, including gillnets, handlines, poison and dynamites.
- The increasing population depend on these stocks for subsistence and income generation.
- The absence of restrictions on the mesh sizes of nets being imported. The current restrictions only apply to the use of the size nets.

### Existing Management Regulations:

The 1989 prohibitions or "chiefly bans" imposed in 1990 in the combined quotique of Dreketi, Macuata, Seas, and Mali (Macuata Provincial, Vanua Levu) covered: (1) the use of gillnets; (2) the use of SCUBA diving gear for spearfishing, and (3) fishing on Sundays.

Gillnets have also been banned in the Burenitu fishing rights area(in Bva Province) and include the islands of Lekutu, Galoa, Tavea, and Yagaga, where the commercial fishermen are mostly Indian.

- The imposition of the bans have been successful. This was confirmed by the recent SPC/FD fisheries resources assessment (March 1996) of the Macuata fishing grounds, which indicated that since the ban was imposed (1) the catches of coastal fish stocks have improved; (2) the fishing time taken to achieve good catches of the food fishes (salala, kanace) was also reduced.
- Decree No. 46 of 1991, s3 amended the section of the Fisheries Act concerned with dynamite fishing and imposed fines of F45000 (third offence) and mandatory jail terms for all offences, if successfully convicted for dynamite fishing.
- Despite the above decree and the high fines, fishermen, particularly those in the Western Division (Tavua), continued to use explosives for fishing activities.

#### Proposed Management Measures:

(1) Institute a sound fisheries management system involving an appropriate harvesting regime, which is socially, culturally and biologically acceptable. Such a system might involve:

#### For Subsistence Fisheries:

Imposing no restrictions on the use of gillnets by subsistence fishermen; allow gillnet fishing subject to approval in writing from the owners of the qoliqoli in close consulation with FD.

#### For Artisanal Fisheries:

- Lifting the current ban on gillnets for a year and at the same time impose the following controls for gillnets use: restrict and discourage the use of 2 inches mesh or if using restrict and discourage the use of 2 inches mesh or if using 2 inches mesh to restrict the dimensions to 100 m length and 50 m mesh depth; and allow the use of 3 inches mesh (as recommended by the recent FD/SPC gillnet survey (March 1996)).
- Regulating the above controls through the chiefs with assistance from Fisheries Division extension staff (monitor the resources : collect catch/effort data and provide information on fishing effort).
- (2) The customary fishing rights areas (CFRAs-qoliqoli) have now been demarcated by the Native Lands and Fisheries commission, and the areas (square km) for each qoliqoli have now been estimated. FD should attempt to estimate the potential finfish annual yields (metric tons) for all the qoliqoli. Using these estimates; FD should:
  - (i) Monitor the catches by areas (qoliqoli) and ensure the catches are kept below the estimated yields;
  - (ii) Advise the qoliqoli owners: when the catches are approaching the estimated yields;
  - (iii) Advise the qoliqoli owners of the number of fisheries to be licensed, and number of boats to allow to operate in each of the qoliqoli.
- (3) Establish marine reserves in selected areas. FD should initiate surveys to select and confirm the sites and size of the reserves, in consultation with the qoliqoli owners. With the increase in population, it is likely the fishing efforts will increase and providing pressure on the finfish resources. Establishing marine reserves inside the qoliqoli would serve as a means to replenish the finfish stocks.
- (4) Initiate a cooperative management approach too manage the finfish resources, for example: for mullets (kanace): FD to enforce the regulation minimum size length of 200 mm and at the same time the qoliqoli owners ensure no fishing is carried out during the breeding season (traditional control). FD to continue to provide the scientific information and advice to chiefs or local leaders who have imposed bans on gillnets including those proposing to impose gillnet bans.
  - It is suggested that cooperative management might be an appropriate approach for managing the finfish resources in the Western and Northern Divisions, where the reefs are extensive, and also where most of the licensed commercial fishermen operate.
- (5) Rotational harvesting of areas (area closures) and allocation of time closures (sharing of fishing areas) should also be considered as possible management measures

appropriate for the management of finfish stocks. To implement the measures however, require a combination of goodwill on the part of the industry to continue providing the fishing data, and FD to evaluate the information in order to safeguard the resources.

## <u>Impacts Assessment:</u>

- (1) Imposing no restrictions on the use of gillnets for subsistence purposes will result in increased supplies for community and individual homes consumption.
- (2) Lifting the ban on commercial gillnetting might encourage some current handline fishers to revert to gillnet operations, thus increasing the fish supplies for the subsistence and artisanal fisheries.
- (3) The costs involved in participating in a particular fishery could determine fishermen' participation in that fishery. As such, with the proposed lifting of the gillnet ban, fishermen will not change overnight from their current handling operation to gillnetting. The economics of engaging in a fishery is one possible management tool for some finfish stocks.
- (4) Allowing the use of additional gear under the subsistence and artisanal fishing activities, while imposing the restrictions (proposed), plus the chiefly bans at the same time, reduces the pressure on any one stock of finfish. More fishermen become employed in the fishing and marketing operations resulting in increased income to the fishermen and traders.

# AN APPROACH TO COASTAL FISHERIES MANAGEMENT IN INDIA (A review in the Bay of Bengal Region, India)

by

## T.K. Behera Deputy Director of Fisheries, Marine, India

#### 1. Introduction

India ranks seventh in the world in fish production with an estimated annual production of about 4 million tonnes out of which marine fish production varies from 2.2 million tonnes to 2.6 million tonnes. Marine fisheries play a significant role in India's economy. The production has been rising steadily from 33,000 tonnes in 1950s with increase in fishing fleet, use of mechanised vessels especially trawlers and use of diversified gear, exploratory fishing and research and development programmes of Central Marine Fisheries Research Institute, Fishery Survey of India, Department of Ocean Development and Maritime State Governments. The marine fish production of India crossed the 1 million mark in 1970 and 2 million tonnes in 1989. From the sixties, there is continuous increase in export of prawns, lobsters and frozen fish with development of fish processing facilities along both the coasts. The country earns foreign exchange worth of Rs. 2,320 cores through export of 2,23,665 T of sea food.

More than 70% of the marine fish production of India is landed on the west coast and the rest from the bay of Bengal on the east coast. During the five year period 1984-1988, the marine fish landing on the west coast amounted to 71% and that on the east coast 29%. The trend is similar in the recent five year period 1989-1993, the percentages for the two coasts being 72% and 28%.

## 1.1 Trend of Marine Fisheries from Bay of Bengal:

An estimated 0.54 million tonnes of marine fish were landed annually in the four maritime states of India and the Union Territory of Punditry during the period Pondicherry 1985-1993 of the total exploited marine fish production by the various maritime states, 42.1% was accounted by the artisanal shore seines, gillnets, bagnets, hooks and lines, encircling nets, dip nets etc. followed by trawlers and 16.6% by other mechanised gears such as inboard pablo type gillnetters and outboard engine fitted units operating gill nets, drifts nets, hooks and encircling nets. Table 1 indicates the percentage of catch obtained in the maritime states by different gears during 1985-1993.

The impact of mechanized sector especially trawlers in Tamilnadu, Orissa and Andhra Pradesh for increased fish production in Bay of Bengal is clear.

The traditional sector also continues to play a vital role in Tamilnadu, Pondicherry and Andhra Pradesh.

It has been observed that exploitation of pelagic resources along the southeastern region (comprising Tamilnadu, Pondicherry and Andhra Pradesh) was almost steady while fluctuating trend could be noted along the north eastern region (comprising Orissa and West Bengal) (Table 2).

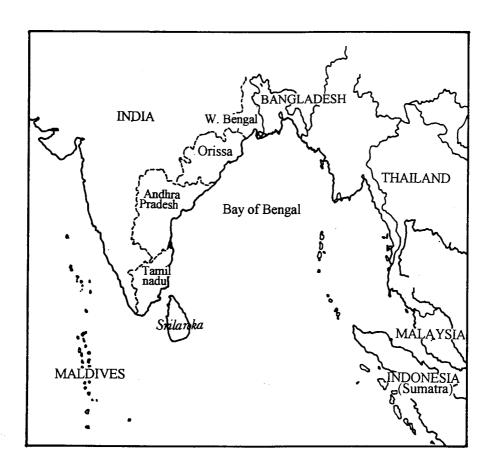


Table 1. Landings by different units (%) in Bay of Bengal during 1985-1993

States/U.T	Trawl net	Other mechanized units	Artisanal units	
Tamilnadu	49.9	11.8	38.3	
Pondicherry	28.3	3.3	68.4	
Andhra Pradesh	32.6	4.2	63.2	
Orissa	49.7	24.8	25.5	
West Bengal	3.4	80.7	15.9	

Table 2. Pelagic and demersal fish production along the southeast and northeast regions of Bay of Bengal

Year	Sout	heast	Northeast		
	Pelagic	Demersal	Pelagic	Demersal	
1985	49.8	50.2	43.9	56.1	
1986	54.8	45.2	43.6	56.4	
1987	52.1	48.9	38.0	62.0	
1988	53.3	46.7	30.1	69.9	
1989	54.8	53.2	50.1	49.9	
1990	51.4	48.6	52.0	48.0	
1991	54.2	45.6	56.8	43.2	
1992	56.7	43.3	58.6	41.4	
1993	51.5	48.5	55.0	45.0	
Average	53.0	47.0	47.6	52.4	

Estuarine systems of southern Andhra Pradesh and Tamilnadu support local small scale fisheries. Resources of pearl oyster, Pinctada fucata are known for beautiful high quality pearls. The Central Marine Fisheries Research Institute has developed technologies for low cost techniques for culture as well as for hatchery of the above mentioned bivalve molluscs which could be utilised for proper exploitation of the molluscan shellfish.

About 12,00,000 numbers of the sacred chank, Xancus pyrum are fished by skin-diving from Raman athapuram-Rameswaram-Tuticorin region in Tamilnadu. The chanks are under the control of the Department of Fisheries, Govt. of Tamilnadu and fishing is done by licensed fishermen skilled in chank fishing by skin diving. Appreciable number of chanks are obtained in trawl nets and boat seines in South Arcot and Thanjavur districts of Tamilnadu. Several others gastropods like Babylonia spirate, Oliva spp, To Tonna spp, Raphana spp, Stombus spp, Turitella spp,

Archactoria sp, Murex ramous, Lambis spp, Cyprea spp etc. are caught in trawl nets or by diving especially along the southeastern region of Bay of Bengal.

### 1.2 Management of coastal fisheries of India

#### **Organizations**

In India various organizations like the Department of Fisheries and Cooperation, Ministry of Food and Agriculture, Government of India, Indian Council of Agricultural Research, Central Marine Fisheries Research Institute, Fisheries Survey of India, Integrated Fisheries Project and Department of Fisheries of maritime states and Union Territories deal with management of coastal fisheries. Recently Bay of Bengal programme is also engaged in management of the coastal fishery resources of India. The different organizations work in co-operation with the objective of increasing marine fish production in the coastal regions.

#### Problems in management

The coastal fishery resources of India have typical problems of tropical regions. It is multispecies comprising of a very large number of species which are exploited with different types of gear, artisanal, trawling with other trawls either with single trawl net or paired trawls, high opening trawls, drift gill nets, bottom set gill nets, boat seines, shore seines etc. throughout the year. Some of the maritime states have attempted restrictions either by enactment of statutory regulations or by orders placing restriction on fishing by mechanised units beyond inshore waters; for example, beyond 5 km from the coast off Orissa, 3 nautical miles off Tamilnadu, beyond 10 km from the coast off Andhra Pradesh and beyond 7 fathoms depth off in Pondicherry. The non-mechanised units are to fish within the limits laid down. But often the mechanised sector conducts fishing in the zone restricted to the nonmechanised sector leading to conflicts. Another problem is incidence of classes between mechanised sector vessels belonging to different states. This causes serious problems which are resolved by the Departments of Fisheries of the concerned states. There is great need for co-operation between non-mechanised sector and mechanised sector as well as vessels of mechanised sectors of the neighbouring states in the implementation of regulations which are in force, so that the production, livelihood as well as the security of the fishing personnel and the fishing units are not jeopardized.

The production potential from the continental shelf of India has been estimated to be 4.5 million tonnes. The estimated marine fish production of India in 1993 was 2.2 million tonnes. Considering this, it could be stated that the production of the different groups could be increased by extending fishing operations to unexploited areas and to depth zones of 70-100 m where fishing is conducted only to a very limited extent.

Mesh size regulation of trawl net to 25 mm is one of the important requirements for obtained maximum sustainable yield. The importance of this aspect has been stressed by Central Marine Fisheries Research Institute and has to be

implemented for achieving the maximum production without affecting recruitment which is of paramount importance. Another management principle to be stressed is the prevention of exploiting breeders of fish and shellfish like prawns and cephalopods which will conserve the resources considerably.

Another problem is that the trawlers which go for long trip fishing cruises throw away large quantities of low quality fish caught and land only prawns and quality species of finfish. It this practice is stopped by increasing the fish hold capacity of the vessels, a substantial rise in production could be obtained.

If appropriate management measures are imposed on the fishing industry, there are possibilities for increasing the fish production from the continental shelf of India to the potential level by the year 2,000.

## 2. Government Policy and Present Management

For managing the marine fisheries, the Govt. of India issued a few guidelines to all the maritime states to formulate rules and regulations to be passed by the respective state legislative. These guidelines are intended mainly to avoid confrontation between mechanised and artisanal sectors rather than intimation suitable regulatory measures for the sustainability of the resources. The guidelines were first issued in 1978 and later modified as follows in 1980:

- a) The non-mechanised artisanal crafts may be allowed to operate exclusively up to a distance of 10 km from the coast.
- b) The small mechanised boats should operate beyond 10 km distance from the coast.
- c) Vessels of OAL 20 m and above should operate beyond 23 km from the coast.

Among the maritime states bordering Bay of Bengal, Tamil Nadu and Orissa have passed Marine Fishing Regulation Acts. Other states are following adhoc measures to prevent or tackle conflicts between the artisanal and mechanised sectors. Tamil Nadu passed the Act in January 1983 and issued the rules in August, 1983. Orissa passed the Act in June 1982 and issued rule in January, 1984.

These Acts provided for (i) the registration of all fishing vessels, including non-mechanized country raft at their respective base ports; (ii) licensing fishing vessels for fishing in specified areas, (iii) regulation, restriction or prohibition of fishing in any specific area by such class or classes of fishing vessels as may be specified; (iv) regulation or restriction of the number of fishing vessels which may be used for fishing in any specified areas, and (v) regulation, restriction or prohibition of catching in any specified area of such species of fish and such period as may be specified.

These acts have thus equipped the State Governments with the authority to regulate and control fishing activities in their respective states according to the specific local needs. The salient features of these measures formulated by some states are briefly mentioned below:

#### Tamil Nadu:

- a) Mechanised fishing vessels shall not be used within 3 nautical miles from the shore.
- b) Non-mechanised vessels shall be used for fishing within 3 nautical miles from the shore.
- c) Mechanised fishing vessels shall have the notified places of berth only after 5 a.m. and should report back at the place of berth not later than 9 p.m. and shall remain there till 5 a.m. of the following day.
- d) As an adhoc measure to avoid clashes between fishermen using mechanised and indigenous vessels for night fishing which is prevalent in the Palk Bay region, the mechanised vessels are allowed to fish only on Monday, Wednesday and Saturday nights while the indigenous boats are operated on the rest of the 4 nights in this week. The mechanised boat owners association is entrusted with the work of issuing tokens to mechanised boats on the allotted day after collecting a nominal fee.

#### Pondicherry:

The Union Territory has not yet formulated any Marine Fishing Regulation Act. However, the following conventions are followed.

- a) Mechanised fishing vessels should operate beyond 7 fathom depth.
- b) Mechanised fishing vessels should operate only between 6 a.m. and 6 p.m. to avoid damage to non-mechanised craft operating during night time.

#### Orissa:

- a) Non-mechanised fishing craft shall be allowed to operate freely without any restrictions. Waters up to 5 km from the shore shall be reserved exclusively for such fishing crafts.
- b) Mechanised fishing vessels up to 15 m of length shall be allowed to operate beyond 5 km limit from the coast.
- Mechanized fishing vessels of 25 GRT and above or above 15 m length shall be allowed to operate beyond 15 km from the shore.

Orissa is the only State which has fixed the optimum number of mechanized vessels of various categories for the different fishing bases.

#### Andhra Pradesh:

Although no Marine Fishing Regulation Act has been enacted, the State Govt. has issued orders to the effect that:

- a) Only non-mechanised fishing craft should be allowed to operate up to 10 km from the shore.
- b) Mechanised vessels should operate beyond the 10 km limit from the coast.
- c) The large mechanised vessels above 20 m length should operate beyond 23 km from the coast.

Although the Government of India in their guidelines have defined these areas in terms of distances from the shore, many States have taken depth as the criterion for the purpose, because the fishermen can easily measure the depth, but not the distance from the shore. The orders of the Andhra Pradesh Government restricting the mechanised vessels to fish beyond the 10 km is unrealistic since the continental shelf is steep on the A P coast and at a distance of 19 km, the depth may be too great for small mechanised vessels to fish.

These guidelines, by and large, are not followed resulting in occasional conflict between the artisanal and mechanised sector, as the mechanised vessels encroach the fishing areas specified for artisanal sector. A recent development has been conflict between fishermen from the contiguous states over fishing rights in their territory.

#### 3. Awareness Building

As there are indications of reduction in the stock of certain major species, it is time to start an act of awareness building among the fishermen, managers and policy makers about the fishery situation in the Coromandal coast and impress upon the need to initiate suitable regulatory measures for the sustainability of the resources.

## 3.1 Closed trawling season:

In Madras coast, trawling is conducted throughout the year. Enforcement of a temporary closure of trawling during the peak spawning season of the major species or when there is high proportion of juveniles in the population may effectively reduce large scale exploitation of spawners and juveniles. Though most of the fish, cephalopod and crustacean species in the tropical region are frequent/continuous spawners, northeast monsoon season is a period of intense spawning activity for most of the species. Hence, trawling may be closed for one month, preferably in November, when cyclone formation is regular over the Bay.

### 3.2 Closed trawling areas:

Encore estuary and Pulicat backwaters serve as nursery grounds for most commercial penaeid prawns. These nursery grounds and the area of configuration of estuary and the sea may be demarcated and trawling may be closed in these areas during and for one month after the spawning season.

### 3.3 Diversified trawling:

As the target of trawl exploitation if mainly prawns, intensification of trawling may pressurise the prawn stock more than any other resource. As the prawns are landed mainly by the shrimp trawl nets, operation of shrimp trawl nets may be suspended in November and December. The fish trawl net alsone may be operated in December.

A very few number of gill nets are operated in Madras. It is advantageous to convert some of the mechanised vessels as trawler cum gill netter, as in the northwest coast of India, facilitating operation of gill nets during November and December. As the gill net targets large fish and spares juveniles of fishes and prawns, increase in the number of gill netters will not be detrimental to the fishery.

#### 3.4 Increase in cod and mesh size:

To reduce the exploitation of enormous quantity of juveniles of finfish and cephalopods, the cod and mesh size of the fish trawl nets may be increased, as a first phase, to 25 mm. This may result in decrease in the catch in the first year. After a time lapse (about 1 year), the non-retained juveniles will have grown to be retained by the larger mesh (25 mm). The increase in individual weight of the fish caught by the larger mesh will more than balance the reduction after the time lapse and the total catch will increase. Second phase in mesh regulation may be implemented after assessing the performance of the 25 mm cod end for about 2 years.

In the prawn fishery, however, increasing the mesh size with a view to catch large sized prawns would prevent capture of adults of the smaller species, which will be lost to the fishery. Hence, mesh regulation may not be applicable to the shrimp trawl net. But in the estuarine prawn fishery, where juvenile prawns are exploited in large numbers by stake nets, the mesh regulation of minimum 29 mm in the cod end of the stake nets may be implemented.

#### 4. Conclusion

Intensification of trawling has reached a stage in which management of the resources has become imperative. Implementation of management measures involving restriction/reduction of effort, enforcement of closed seasons/areas or a

change in mesh size, requires information on the response of the fishermen and on the impact of such measures on their livelihood. Their income from other sources, other income generating activities, the potential for expanding these activities also need to be assessed. Introduction of management measures must be preceded with elaborate dialogue between the managers and the fishermen. This is useful in awareness building and also helps to get their cooperation and support. A meaningful linkage of bioeconomics and socioeconomic parameters may be established by assessing the possible differences in catch rates and species composition in different fishing seasons due to the management measures proposed to be undertaken.

The management measures may be implemented as follows:

- (i) The management plan may be prepared scientifically.
- (ii) Awareness building on the scientific management at all levels.
- (iii) There must be a negotiated agreement between the fishermen and the managers on the proposed measures.
- (iv) The negotiated management has to be legitimised.
- (v) The management plans are time bound and have to be regularly revised and modified.

Acceptance and implementation of fisheries management ideas are slow and gradual process and can take a long time for full implementation. Hence, it is not realistic to be too ambitious and optimistic. However, a socio-economic approach coupled with bioeconomic approach handled with understanding, tact and foresight may help in overcoming the challenge and ensure sustainability of the resources.

# COASTAL AQUACULTURE RELATED FISHERIES MANAGEMENT PROBLEMS

Aquaculture is emerging as a successful bioindustry. The Government of India has categorised it as an "Extreme Focus Sector" for development. Thus land-based aquaculture especially shrimp culture in the coastal zone is poised for rapid growth in India. Planned aquaculture development in the coastal zone, besides augmenting production of organisms of nutritional, therapeutic, ornamental and economic values, helps utilise wastelands and water resources, affords generation of enormous gainful employment opportunities, support growth of auxiliary industries, stimulate a vibrant commercial activity (local, regional and international trade), and substantial improvement in the socio-economic status of the rural and urban beneficiaries.

However, the fast growing shrimp culture sector is a serious concern due to the possible/proven adverse impact on the coastal environment, especially in the nursery grounds of commercially important species, and the fisheries of coastal ecosystems.

## 1. Status of coastal aquaculture

The total area surveyed and identified as potential for culture in the Bay of Bengal coastal zone of India is about 6,43,000 ha. The area under brackishwater culture increased from 27,000 ha in 1985 to about 52,000 ha in 1993, and the total estimated production from 14,875 tonnes in 1985 to 34,500 tonnes in 1993 for the coast (Table 3). West Bengal has the largest area under culture. The average production rate for 1992-1993 is highest for Tamil Nadu (2075 kg/ha/yr) followed by Andhra Pradesh (1,347 kg/ha/yr) due to the adoption of scientific farming (improved extensive and semi-intensive) techniques.

In scientific farming, *Penaeus monodon* and *P. indices* are the two species preferred for monoculture. Mixed culture of the two species is also being done by some farmers. In some low-saline areas, *P. monodon* is also stocked along with carps in a few farms in Andhra Pradesh.

Traditional extensive methods are followed in most of the farms in west Bengal coast. In the Coromondal coast, pump-fed drainable farms are used and scientific extensive and semi-intensive practices are mostly followed, with occasional reports of intensive culture with production rate exceeding 10 tonnes/ha/crop. Farms are operated by individuals or families or small-industrial groups or hi-tech integrated aquaculture units belonging to large industrial houses.

#### 2. Problems

Several environmental and socio-economic problems have been recently reported from areas of large concentration of shrimp farms in the Coromondal coast (e.g. Nellore dist. of Andhra Pradesh and Nagai Qaide Milleth and Thanjavur districts of Tamil Nadu).

- Conversion of agricultural fields into shrimp farms.
- Conversion of mangrove wetlands.
- Conversion of salt pans
- Salinisation of fresh water aquifers due to excessive abstraction of sub-soil water and seepage of saline water from shrimp farms, feeder and drainage canals.
- Discharge of untreated effluents from shrimp farms into coastal water bodies.

- Development of infrastructure for hatcheries and farms affecting free accessibility of the fishermen to transport fishing materials, equipment, fish, and marketing and drying of fish.

The aspects that are of concern and likely to have impact on the coastal fisheries are:

- Indiscriminate collection of seed of desired species of prawns, *Penaeus monodon* and *P. indicus*, from nursery grounds for culture and destruction of "shrimp seed by catch"
- Another area requiring attention relates to wild shrimp spawner collection. At present, hatchery operation of *P. monodon and P. indicus* depends entirely on the spawners collected from the fishing grounds. Large scale exploitation of wild spawners for the shrimp hatcheries is likely to be detrimental to the coastal fishery, especially for species like *Penaeus monodon*.
- Discharge of untreated effluents from shrimp farms into estuarine creeks, backwaters and saline lagoons, which are the predominant nursery grounds for a large variety of commercially important species and the consequent degradation of the environmental conditions, are likely to affect the coastal fisheries as well as aquaculture since many farms rely on these systems for their water input. The characteristics of these effluents are high organic matter, high BOD, COD, H2S, turbidity, nitrogen, phosphorus and trace elements. Such effluents when released into the nursery grounds are likely to reduce the dissolve oxygen levels leading to anoxic conditions, production of H<sub>2</sub>S, plankton and microbial blooms. Such a condition could deter the entry of seed of the commercially important species. Residues of antibiotics and chemicals used in the farms are also likely to reach the environment. The problem is likely to be more pronounced in the Coromandal coast, which has relatively low rainfall, no major rivers, low tidal amplitude, and formation of sand-bar during certain years across the estuarine mouths, which cuts off water exchange between these systems and the sea.
- Recently, there have been several reports on outbreak of diseases in farmed shrimps in the Nellore district and most of the farms in the Khandleru Creek, which sustains the largest number of shrimp farms in Nellore. How far the natural populations in the nursery grounds are affected by disease transmission from farms is not known. While effluent treatment may be made compulsory, greater emphasis should be on pollution reduction methods by improved farm production techniques.
- There should be a ban on disposal of inadequately treated water from disease affected farms as these could transmit the disease into the nursery areas to post-larvae, juveniles and sub-adults and may affect even the coastal fishery.

- Dumping of dead prawns, prawn heads, shells etc. into estuarine creeks and backwaters must be banned and awareness created among the farmers.

#### 3. Government policy and present management

Fisheries is a state subject and most of the regulations are formulated and enforced by the State Governments. The Ministry of Environment, Forest and Wildlife, Govt. of India promulgated an Act in 1986 which was subsequently modified in September 1990. As per these regulations, the coastal stretches of sea, bays, estuaries, creeks, rivers and backwaters which are influenced by tidal action (in the landward side) up to 500 metres from the High Tideline (HTL) and the HTL (Spring Tide) are declared as Coastal Regulation zones. This nitrification applies to rivers, creeks and backwaters as modified on a case by case basis for reasons to be recorded while preparing the coastal Zone Management Plans. However, this distance shall not be less than 100 m or the width of the creek, river or backwater, whichever is less.

The following restrictions are imposed in setting up and expansion of industries. Industries directly related to water front or directly feeding foreshore facilities, hatcheries and natural fish drying in permitted areas, and facilities required for discharge of treated effluents into the water course are exempted.

Discharge of untreated wastes and effluent from industries prohibited. Existing industries must implement these regulations within 3 years.

Harvesting or drawal of ground water construction of mechanisms thereon with 200 m of HTL prohibited; in 200 m to 500 m zone, it shall be permitted only for manual use for fisheries.

Areas that are ecologically sensitive and important such as national parks, marine parks, sanctuaries, reserve forests, mangroves, coral reefs, areas close to breeding and spawning grounds of fish and other marine life, areas rich in genetic diversity, and such other areas as may be declared by the Central Govt. and the concerned authorities at the State/Union Territory level from time to time are prohibited for any industrial activity.

State Governments have been asked to prepare regulation within 1 year of notification.

The Ministry of Environment and Forests and the Governments of State, Union Territories and other designated authorities shall monitor and enforce these provisions.

Govt. of Andhra Pradesh and Tamil Nadu are to shortly issue specific regulations on Coastal Aquaculture and Coastal zone development.

#### 4. Conclusion

Shrimp culture is poised for rapid growth in the Coromandal coast. Govt. of India has identified shrimp culture as a premier sector for development for its enormous positive socio-economic benefits. Recent developments in Nellore. Qaide Milleth and Thanjavur districts on environmental and social issues, however, should be viewed seriously and management strategies should be evolved to promote sustainable shrimp culture. Awareness building is essential on the following issues:

- (1) Sustainable development of the coastal areas for aquaculture, clearly outlining the essential elements of sustainable aquaculture.
- (2) Sustainable exploitation of shrimp seed from nursery grounds and importance of releasing the seed by-catch.
- (3) Regulation of wild spawner collections for hatchery operation.
- (4) Advantages of eco-friendly culture techniques; on farm pollution reduction strategies judicious stocking, application of fertilizers, feed management, water management, disease management.
- (5) Effective effluent treatment and disposal strategies considering the specific problems of Coromandal coast.
- (6) Regulation of shrimp farm effluents into nursery grounds.

# 5. Institutions and organizations engaged in activities related to coastal zone management in India:

#### Ministry of Agriculture, Govt. of India:

Nodal ministry for fisheries and aquaculture development through the respective State Governments have issued guidelines for optimum utilization of the coastal fishery resources; for classifications, use and lease of brackishwater areas; and assistance to set up BFDA's.

#### Ministry of Food Processing, Govt. of India:

Off-shore fishery development, joint ventures with foreign fishing vessels.

#### Ministry of Environment & Forests, Govt. of India:

Regulation relating to coastal zone use and enforcement.

#### Indian Council of Agricultural Research:

Research, technology improvement, training, extension and human resource development for capture fisheries and for aquaculture through Central Marine Fisheries Research Institute, Central Institute of Brackishwater Aquaculture, Central Institute of Fisheries Education and Central Institute of Fisheries Technology.

#### State Fisheries Departments:

Responsible for capture fisheries and aquaculture development within their states in conformity with the policies and regulations imposed by the Govt. of India.

#### Central and State Pollution Control Boards:

Pollution monitoring and control

#### Marine Products Export Development Authority, Ministry of Commerce:

Primary function export promotion of marine products; extension support for capture fisheries and for prawn farming.

#### Brackish water Fish Farmers Development Agencies:

Rendering assistance to beneficiaries in brackishwater farming in conformity with State Govt. policies.

#### Financial Institutions:

National Bank for Agriculture and Rural Development and other nationalized and scheduled banks offer credit facilities. SCICI and ICICI offer credit facilities to promote integrated aquaculture and EOU'S in Aquaculture.

#### Department of Ocean Development:

Development of living and non-living resources National Institute of Oceanography (CSIR) Research on oceanography including living resources.

#### International Organizations:

Bay of Bengal Programme of FAO-Coastal Fisheries Management.

World bank-Schemes proposed by Govt. of India

#### Non-Govt. organizations:

- M.S. Swaminathan Foundation, Madras-Biovillage and sustainable development projects.
- Aquaculture Foundation of India, Madras-Aquaculture Consultancy.
- Center for Research on New International Economic order- Integrated fisherfolk development.

#### Other:

- Fishermen Cooperatives

- Fishermen Federations
- Environmental Conservationists
- Federation of Small Industries Associations.

Table 3. Area utilised for shrimp culture and estimated production in the maritime States of Bay of Bengal

States	Area utilised for culture		Estimated to	tal productio	Averrage production		
	(in ha)		(in T)		(kg/ha/yr.)		
	1985	1992-1993	1985	1992-1993	1985	1992-1993	
West Bengal	25,000	34,050	13,750	16,300	550	478	
Orissa	1,450	7,760	580	4,300	400	554	
Andhra Pradesh	560	9,500	500	12,800	280	1,347	
Tamil Nadu	68	530	28.5	1,100	300	2,075	

#### MANAGEMENT OF COASTAL FISH RESOURCES

by

#### H.V.C. Fernando Sri Lanka

#### 1. Management of Coastal Fish Resources

#### 1.1 Coastal Waters

The continental shelf around Sri Lanka is a narrow platform for the grater part of its extent having a mean width of 20 km. This shelf narrows to a thin strip off the coast of east to 3 km. wide belt. To the North west and the North of the island the shelf widens to an extensive shallow bank and forms the floor of gulf of Manner Palk bay and the Pedro bank before merging in to the continental shelf of the Indian mainland. The region of the sea within this continental shelf area is the Coastal Waters.

#### 1.2 Coastal Fish

Sri Lanka being a tropical country its waters are rich in fish species and much varied in quantity. There are over 500 species of edible fish found in coastal waters. Their size range from 6 cm long Sprats (*Anchoviellaes spp.*) to 2 meter long Marlins (*Histiophoridae spp.*). Nearly 90% of the coastal fish catch is pelagic and consist of herrings, sardines, anchovies, mackerels, barracudas, pony fish, scrombrids and small carnage's. They are caught in the near shore waters with beach seine nets and in further offshore with gill nets. The gill nets catch contribute about 80% to the landings while beach seines account for most of the remainder. The coastal demersal fish resource is mostly found in coral reefs and among the submerged rocky bottoms. They vary from colored parrot fish to large groupers.

#### 1.3 Coastal Fish Resource

The survey carried out by Norwegian research vessel "Dr. Fridjot Nansen" estimated that the total biomes of Sri Lanka's Continental shelf and the area immediately adjacent to it as 750,000 m tons. From this 250,000 m tons could be harvested as the annual sustainable yield (ASY). This yield is said to consist of 175,000 m tons of pelagic and 75,000 m tons of demersal and semi demersal fish.

## 1.4 Fish production in western sector of the island and its effect on the coastal fish resource

In 1995 total marine fish production was 217,500 the coastal sector production was 157,500 m tons. From which 84% or 132,000 m tons was harvested from the coastal belt covering South, West and the North Western provinces. The estimated annual sustainable yield from this region which covers only 30% of the

coastal belt is approximately 75,000 m tons. The harvest from this region was nearly 55,000 m tons over the estimated sustainable yield.

#### 2. Incentives and its effect on the fish resource

In sixties and seventies boats, engines and fishing gear was sold to traditional fishermen at subsidized prices. These subsidies varied from 50-90% for traditional fishing craft without engines and for non traditional craft with engines and gear the amount of subsidy given varied from 30-50%. These subsidies were incentives given to fishermen to harvest more fish specially from the coastal areas which were then lightly fished.

During the two decades intention of giving subsidies to boats engines and fishing gear had its desired effect not he fish production. In 19633 total fish production from coastal waters was only 71,000 m tons. This rose to 184,000 m tons in 1983. A remarkable increase for that period.

The continuation of the incentives given to increase the fish catch saw its bad effects in latter part of eighties and in nineties. During that period results of over fishing appeared to emerge from several sectors of the coastal fishery, such as in lobster, small pelagic and trawl fishery.

#### 2.1 Lobster fishery

In seventies large concentrations of lobsters were found in the south and in the south west region of Sri Lanka. Due to heavy demand from the tourist industry and from the exporters price paid to lobsters were increased. During seventies and eighties these high prices attracted large number of fishermen to this fishery, as a result lobster resource depleted rapidly.

According to Bulletin of the fisheries research station, in sixties average catch realized from lobster fishing in south west region by a skin driver fishermen varied from 24-32 lobsters per day. (The other methods used to catch lobsters produced almost the same amount as a skin diver). The inquires reveal that the present catch from the same region varied from 4-6 lobsters per day, a big drop in the harvest as a result of over exploitation.

In 1993 UNDP funded fishery management project under took to study and to take necessary steps to rehabilitate this fishery.

#### 2.2 Purse seine fishery

In early 80's fishermen on the south west coast of Sri Lanka, began to use the purse seine nets to collect live bait for the pole and line fishery. This was later developed successfully to catch small pelagic such as red bait, mackerels, herrings etc. from the near shore coastal waters. The high income gained led the number of purse seines to increase to 32 in 1984 and 62 in 1991. This rapid increase in number

of purse seniors resulted in several conflicts specially with other resource users employing small mesh gill nets and beach seines. In 1994 ministry had to announce a temporary ban on the use of purse seniors.

#### 2.3 Shrimp fishery

Fishing shrimp on large scale using trawl nets is located near the estuary of Chilaw in mid west coast of Sri Lanka. It was another coastal sector which had to be temporally closed as a result of heavy opposition from the coastal fishermen on charges of over fishing.

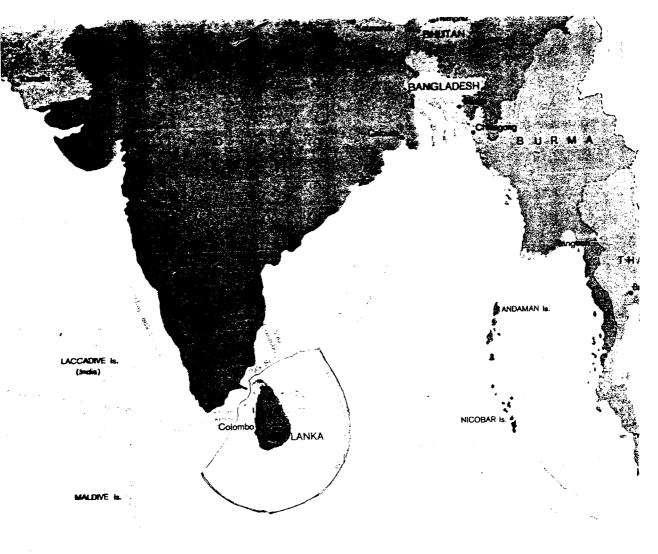
In this fishery trawl nets and trammel nets are the popular gears used to catch shrimps. The landings from trawl nets are mostly small shrimps such as *M. dobsoni* and *P. stylifera* while from trammel nets its mostly the valuable large shrimps such as P indices, *P. monodon*, *P. semisulcatus* and *P. merguensis*.

In late eighties small scale fishermen from neighboring villages of Chilaw leveled charge on the prawn trawler fishermen for over exploitation of the resource. Clashes between the two groups was so frequent that the trawler fishery had to be suspended in 1993 and their gear had to be removed. Their loss was compensated by the department of fisheries by issuing deep sea fishing boats under a special scheme.

#### 3. Management measures in Coastal Fishery

The subsidized boats engines and fishing gear which was given to increase the fish production in sixties and seventies were pruned down gradually in eighties and nineties to move the fishermen away from the coastal waters. During the mentioned decades subsidized deep sea fishing boats were given instead of coastal fishing boats to attract fishermen to fish in offshore and deep sea areas. These incentives although had a effect at the beginning got neutralized by the entry of large number of displaced fishermen with boats from the North and the East of the country due to insecurity.

In 1996 the old Fisheries Ordinance which came into effect in 1941 was repealed and the new act with wide power for management Regulation Conservation and development of the fisheries resources was created. The first regulation under this act to control the fishing operation was drafted to be introduce from 1st of December 1996. In drafting the new regulation the committee appointed identified 24 fishing methods being in use all over the island. Five of these will be completely banned and the rest will be reduced to 17 operations. These 17 operations will be given licenses through the village based fisheries inspectors. It is hoped to control the dwindling fish resources through the controls that will be implemented using the above licensing system.



### SRI LANKA AND HER NEIGHBOURS

RATU IS

MENTAWA! Is.

CHOGOS

**ARCHIPELAGO** 

DIEGO GARCIA

#### A REVIEW AND EVALUATION OF COMMUNITY-BASED COASTAL RESOURCE MANAGEMENT PROGRAMS AND PROJECTS IN THE PHILIPPINES, 1984-1994

by

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#### **ABSTRACT**

There is a growing realization in Southeast Asian of the need for increased participation by resource users in fisheries management and greater localized control over access to the resource. Community-based resource management has re-emerged as a way to involve resource users and to utilize indigenous institutional arrangements and knowledge in coastal fisheries management. In virtually all users, however, the future of community-based resource management seems to lie in a form of co-management, a sharing of responsibility and authority for resource management users of community. The Philippines is a world leader in community-based coastal resource management (CBCRM) between 1984-1994, 43 CBCRM programs and projects with over 105 project units or sites were implemented throughout the 12 regions of the Philippines. This paper will present the results of a review and evaluation of CBCRM programs and projects in the Philippines. Major interventions, Institutions and processes of CBCRM are discussed and general lessons learned are identified.

#### 1. Introduction

During the ten-year period of 1984 to 1994, a large number of locally-and foreign-funded development programs and projects implemented community-based management schemes for various resource systems such as forestry, irrigation and upland areas in the Philippines. Over the same period, a lesser number of community-based coastal resource management (CBCRM) programs and projects were also initiated. Despite the comparative lack of emphasis on coastal resources, the Philippines has still recorded the most number of CBCRM experiences in comparison to other countries of the world.

Undoubtedly, the time, funds and collective efforts put into these programs and projects have allowed implementors and participants to accumulate valuable knowledge and experience in the area of community-based resource management (CBRM). Sad to say, however, there has been no comprehensive documentation and evaluation of the experiences and "lessons learned" from these past programs and

projects. As a consequence, an important source of information which could be used to rapidly improve new community-based management initiatives has been left untapped. This is especially true for fisheries where most CBCRM efforts are still in the developmental stage. Compared to community-based management activities in other resource systems, the number of completed and successful CBCRM efforts is still relatively small.

This paper presents the results of a review and evaluation of CBCRM programs and projects in the Philippines during the period of 1984 to 1994. Through this study, a systematic review of CBCRM programs and projects in the fisheries and coastal resources will allow for the: (1) description of characteristics of programs and projects; (2) analysis of programs and projects over time and space; (3) determination of the major processes, interventions and institutions in CBCRM; and (4) identification of lessons learned from the programs and projects. Policy recommendations are made for the improvement and refinement of CBCRM programs and projects in the future.

This study relied primarily on secondary data sources. The secondary data utilized for this study were gathered mainly from project reports, project evaluation documents, popular publications, scientific journal articles, seminar/workshop papers and proceedings, and other publications. In addition, information was collected through interviews with individuals associated with the program and /or project. All programs and projects that meet three main criteria: (1) fisheries-related, (2) coastal resource-related, and (3) community-based, were considered. This analysis assumes that "past" programs and projects are completed (as of December 1994), while the "total population" refers to the cumulative number of completed, on-going and discontinued or "pull-out" CBCRM programs and projects in the country.

The study has several limitations: (1) it excludes all relevant programs and programs and projects prior to 1984; (2) it cannot claim to be an exhaustive or complete list of programs and projects from 1984-1994 since it is very difficult to accurately account for the number of CBCRM activities in the country. The actual number would be greater; and (3) the analysis was based solely on secondary source information and data were not verified in the field. Thus, results can only be as reliable as the source of information itself.

# 2. A Brief History of Fisheries Development and Management in the Philippines

The island settlers of what became the Philippines had a long history of traditional fisheries rights and allocation before the archipelago was first colonized by Spain in the seventeenth century. The *barangay* (village) had jurisdiction over coastal resources and fishery limits were defined by them. The traditional property rights of barangays over fishing grounds were steadily eroded during the long Spanish colonial period, with community authority and rights superseded by state government control (Kalagayan 1991). Lopez (1985) reports that under Spanish rule, the

barangays were eliminated as administrative entities and with them went the territorial fishing rights claimed by each village. Under Spanish law, the fisheries and other natural resources were declared to be held for the Crown. Under both the Spanish and the Americans, traditional authority and rights were superseded by municipal government control of local fishing grounds. This administrative structure of municipal authority remains in place in the country today. Despite the historical existence of traditional fishing rights and village-based management systems in the Philippines, for the most part these systems have disappeared in the country. This is not to say that community-based resource management systems and fisheries rights do not exist, for localized examples can be found throughout the country.

After the second world war and the Philippine independence in 1945, the country struggled to build its economy and the fishing industry started to develop more rapidly with an increase in the number of commercial fishing vessels. In the sixties, the Philippine government, aided by Japanese advisors, undertook intensive infrastructure, technology, extension and credit programs through the Fisheries Development Program to "develop" the industry (Heinan and Gonzales 1993). In the early seventies, the country fell under Martial Law and the centralized government control of fisheries was further reinforced through Presidential Decree (PD) 704, otherwise known as the Fisheries Decree of 1975. In the mid-1970's, in response to decreasing unit catch of small-scale fishers, the government embarked on fishery policies and development programs concentrated on "use orientation", that is, increasing production and exploitation of the resource base.

In the eighties, the government continued to support the needs of the sector through the Expanded Fish Production Program (EFPP) from 1983-1987. In the small-scale fisheries sector, the strategy of the program was geared towards enabling the small fishers to venture into deeper waters by equipping them with more efficient boats and fishing gears. The underlying assumption was that the fishery could support increased fishing effort despite expert opinion as early as 1980 that it could not. Ironically, it was during this period (1984-1988), that there was a decreased rate in coastal fish production of 1.3% a year, compared to the increasing rate of 6.1% in the preceding five years from 1979-1983 (Agbayani, 1993).

The problems in the fishery continued to worsen throughout the late 1980's and early 1990's. The management (mainly through regulatory instruments) and development (increased fishing effort) measures undertaken by the government have proven to be ineffective in promoting the sustainable management and development of the country's fisheries. Despite the extent and productive potential of the Philippine coastal waters, the coastal fishery continues to decline due to overfishing, compounded by the destruction of critical coastal habitats (coral reefs, mangroves, sea grass), dilatation and pollution. Exacerbation of this condition is predicted to continue due to increasing population, weak administrative capacity, ineffective property rights arrangements, and poverty.

As discussed, for centuries natural resource management in the country has been strongly centrally-determined, top-down and non-participatory (Sajise 1995).

This applies to forestry, fisheries, mines and the irrigation sectors. However gradually, it was realized that with the increasing rate of deterioration of natural resource systems in the Philippines, there was no way the country could pursue a pathway of sustainable development. Starting in the sixties, alternative methods of resource use and management were explored in an attempt to reverse these negative trends. Consequently, there has been a shift to forward-looking policies and strategies that advocate "resource management" over a "use orientation" through community-based initiatives to rehabilitate, conserve and protect the resources based on use and enhancement of local knowledge, skills, responsibility and accountability (Sajise 1995). The irrigation sector was the first to evolve an institutional development scheme for mobilizing the active participation of water users in 1968. People-oriented programs in the forestry sector started in the early 1970's (Serna 1993).

The current efforts in CBCRM in the Philippines emanate from both the government and the NGOs. The past administration provided some impetus when in 1989 President Aquino created a Presidential Commission on Anti-illegal Fishing and Marine Conservation or the Bantay Dagat Committee, which called for increased coordination among government agencies in enforcement of fisheries laws and increased participation of fishers in management (Kalagayan 1991). In 1991, the Government recognized the need to increase participation in management and to devolve control over resource access to local levels through policy and institutional reforms. Among these are the decentralization of the management of nearshore fisheries to municipalities and local fishing communities under the Local Government Code (LGC) of 1991. Through the LGC and several other initiatives, the government now actively promotes community-based resource management to conserve the coastal resources and diversify the income sources of the low income small-scale fishers under the Fisheries Sector Program (FSP) of the Department of Agriculture (DA). These initiatives for fisheries co-management are also embodies in the current 1993-1998 Medium-Term Philippine Development Plan (MTPDP).

# 3. General Overview of CBCRM Programs and Projects in the Philippines

Between 1984 and 1994, 15 CBCRM programs (defined as a large scale development activity with multiple objectives and sites to be achieved over a long time period) and 28 CBCRM projects (defined as a specific and time-bound set of activities to achieve a given objective within a designated geographic location) were implemented. The majority of programs and projects have two or more sites where similar CBCRM activities are conducted. In addition, there are programs and projects which are "community-based" but not all the sites are coastal or fisheries sites. Thus, programs and projects were accounted for using project units by site. The 15 programs can be converted into 68 project units, while the 28 projects would have an equivalent of 36 project units. Combining both programs and projects, a total of 104 project units were accounted for over the study period.

In determining the geographic scope of CBCRM activities, five classifications were used: national, regional, gulf-wide or bay-wide, local, and community. These are defined as follows:

National - refers to programs or projects implemented in two

or more regions

Regional - refers to projects implemented across several provincial

sites within a specific region of the country

Gulf-wide/Bay-wide - refers to programs/projects implemented in specific gulf

or bay areas covering more than one municipality and/or

province but not an entire region

Local - refers to municipal-level or town-level projects having

CBCRM activities in two or more barangays (coastal

villages)

Community - refers to village-level or single barangay-level projects/

activities

Of the 15 programs, 5 were national in scope with an equivalent of 56 project units. National-level programs alone therefore accounted for 54 percent, or more than half, of the total number of project units. Twenty-one (21) p.u. or 20 percent were community-level activities, 16 p.u. or 15 percent were local/municipal activities, and six p.u. or six percent were gulf-wide/bay-wide projects. There was only one regional project, the Central Visayas Regional Project or CVRP-1, which was composed of five project units, accounting for five percent of the total.

Completed programs and projects composed 45 percent of the total number in project units. On-going activities accounted for 54 percent, indicating that the majority of the CBCRM programs and projects are still in progress at the time of this study. In addition, one percent of the activities (1 p.u.) started, were discontinued due to various reasons, i.e. funding and implementation problems due to political and institutional support.

All 43 programs and projects had their own set of objectives. However, in order to get a good overview and comparison of these programs and projects, 14 general classifications of objectives were established. These general categories of objectives are listed in Table 1 below:

Table 1. CBCRM Program and Project Objectives, Philippines, 1984-1994.

Classification of Objective	ACRONYM		
Resource Assessment and Monitoring	RAM		
2. Resource Protection and Conservation	RPC		
3. Resource Rehabilitation	RH		
4. Increased Fish Production	IFP		
5. Alternative Livelihood Opportunities and Poverty Alleviation	ALOPA		
6. Strengthening Community Values on Cooperativism	SCVOC		
7. Education, Training and Skills Development	ETSD		
8. Policy Development and Advocacy	PDA		
9. Research and Extension	RE		
10. Integrated Area Development Planning	IADP		
11. Sustainable Resource Management	SRM		
12. Institutional Capability Development	ICD		
13. Promotion & Development of CBCRM	PDCBC		
14. Improving Equity in Access and Use of Resources	ICR		

Table 2. summarizes the distribution of programs and projects according to the relevant classification of objectives. When ranked, the three most common CBCRM objectives are Resource Protection and Conservation; Resource Assessment and Monitoring; and Resource Rehabilitation. Alternative Livelihood Opportunities and Poverty Alleviation is the fourth most common objective. This is critical since fisherfolks need other sources of income if they are to rely less on the fishery. Such a trend provides a major redirection from the objectives of fisheries development programs and projects in the sixties, seventies and early eighties. During that time period, Increased Fish Production was the main objective of fisheries development in the country. In the past decade, however, this thrust has been relegated to fifth priority. This clearly shows the increased attention given by the country to the resource conservation and environmental aspects of fisheries development. Whereas in the past, the priority was on increasing over-all fishing effort, the recent CBCRM activities have shifted their attention to non-extractive approaches that enable fisherfolks to utilize and manage coastal resources in a more sustainable manner. Further proof of this is that the sixth most common objective is Sustainable Resource Management.

The shortest duration for both programs and projects is 2 years while the longest is 7 years. The mean average duration for all project units is 4.2 years. This reflects the relatively long time period required to implement the various interventions and effectuate change through CBCRM.

The majority of both programs and projects had fishers as the target beneficiary group. Of the 54 project units for programs for which information was available, 38 or 70 percent had fishers as target beneficiaries. Of the 36 project units for projects for which information was available, 26 or 72 percent had fishers as target beneficiaries. Eight programs and two projects targeted fishers and fishing

households. Three programs and five projects targeted coastal communities (including all community residents) in general. Only one project specifically targeted women.

Table 2. Distribution of CBCRM Programs and Projects by Objectives, Philippines, 1984-1994

Objective	Programs	Projects	Total	Rank	
Classification	(All in proj	ect units)			
RPC	60	22	82	1	
RAM	47	22	69	2	
RH	42	22	64	3	
ALOPA	39	19	58	4	
IFP	41 14		55	5	
SRM	31	19	50	6	
ETSD	28		49	7	
PDCBC	30	8	38	8	
ICR	26	5	31	9	
SCVOC	SCVOC 16		26	10	
PDA	DA 17		7 24		
ICD	15 7		22	12	
RE	12	8	20	13	
IADP	12	7	19	14	
		1			

#### 4. Temporal and Spatial Analysis of CBCRM Programs and projects

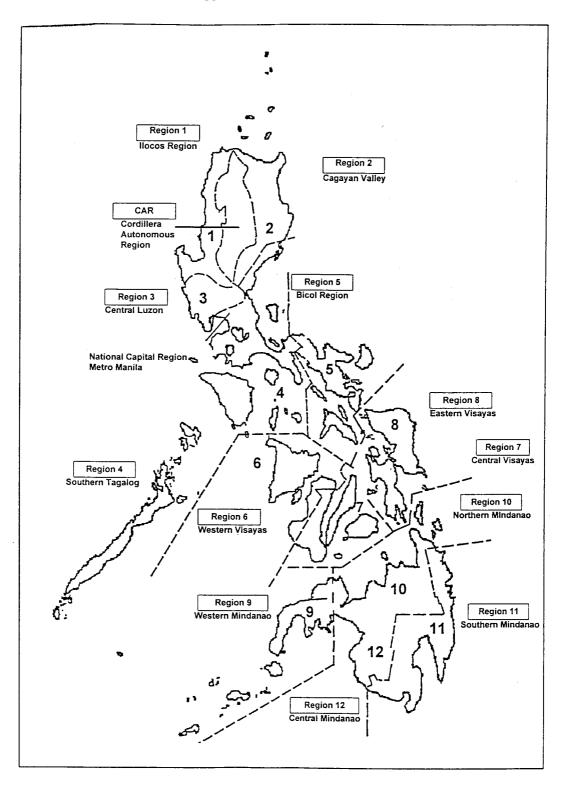
The time line in Figure 1 shows the historical sequence and regional location of the programs and projects from 1984 to 1994 (Figure 2). The first CBCRM initiative was the Central Visayas Regional Project-1 (CVRP-1) in 1984, which had 5 project units under its nearshore Fisheries Component (Figure 2).

Figure 1. Time Line of CBCRM Activities, Philippines, 1984-1994

YEAR	CBCRM PROGRAM/	NO. OF	REGIONAL
	PROJECT	PROJECT UNITS	
1984	CVRP	5	VII
1985	MCDP	3	VII
1986	LG-CAMP	1	ī
1987	-	<u>-</u>	-
1988	FIRMED	1	VIII
	CCMP	1	I
1989	SSIMCP	1	III
	CRCMP	2	VI
·	FSP-CRM	12	IV,V,VIII,X
	SFDP	3	III,V
Ì	CBMMP	1	VII
İ	ENMPP	1	IV
l	CB-CRM/HBRMP	1	IV
	CBMRP	1	IV
1990	ERMP-BBB	1	VII
1	CRCMP	22	I,II,IV,VII,VIII,IX,X,XI
l	CB-CRM PAGBICOL	1	V
1991	RMC	1	V
	CBCRM/MSDP	1	IV
į.	ISSP-CFRM	1	VI
1992	CBZM	1	I
]	SIERLP	1	VIII
ł	LG-CRM	1	VI
1993	MBSIADP	1	VIII
l	SCAD	2	V,VII
1	CEP	9	I,II,III,IV,V,VI,VII,VIII
<b>[</b>	CEP	5	IX,X,XI, <b>XII</b>
1	IARCP	1	I
	NIPAS-CRM	5	III,IV,V,VI,X
	ECAN-CAMP	1	IV
1994	MFFDP	1	XI
	CARMP	1	VIII
	TRIMARRD	1	VIII

Note: Highlighted regional areas denote year of first CBCRM program or project in region

Figure 2. Map of the Philippines



Only 11 project units were initiated from 1984 to 1988, while 78 p.u. were initiated from 1989 to 1993. This increase in CBCRM activity can be explained by the experience that had been gained from previous projects to stimulate new activities; government policies in support of CBCRM, such as the Philippine Constitution of 1987 and the Local Government Code of 1991; more non-governmental organizations were established with the skills to do CBCRM; the need to take more community-level action to manage coastal resources became more critical; and the increased availability of foreign donor funds for CBCRM. The total number of project units reached 33 in 1989. This further increased to 57 in 1990 and reached 60 in 1991. From 1991 to 1992, the total number of p.u. decreased to 53, due to the completion of 5 p.u. from 3 projects.

The first region to implement a CBCRM program or project was Region VII or Central Visayas. From 1984 to 1985, only Region VII had a CBCRM program or project. One important reason for this is that the terrestrial and coastal resources in Region VII were already in an advanced state of resource degradation at that time. In 1989, the biggest wave of new programs and projects were initiated in Regions II, III, IV, V, VIII and X. By 1990-1992, all regions except Region XII-Central Mindanao had an on-going CBCRM program or project.

From 1984-1994, CBCRM programs and projects were implemented in all regions of the Philippines. However, more than 47 percent of programs and projects were concentrated in only three regions - Region IV, VII, and VIII. Region IV-Southern Tagalog, had the largest share of programs and projects, 20 project units, accounting for 19 percent of the total. Region IV had the most number of CBCRM programs and projects for three reasons: (1) it has the most number of provinces and towns in the country; (2) it is nearest the National Capital Region where government, non-government and other organizations are headquartered; and (3) Palawan province alone, which is part of Region IV, had 8 projects. Region VII and VIII in the Visayas regions are equally important since coastal fisheries is a major sector in the local economy.

However, for Mindanao, CBCRM programs and projects have not been widely implemented despite the fact that municipal fisheries in its four regions is a major industry. This is apparently one of the areas overlooked by previous projects. This may be due in part, to the peace and order situation in many areas of Mindanao.

#### 5. Process and Institutional Analysis

#### **Institutional Analysis**

During the ten year period from 1984-1994, more than seventy institutions implemented or co-implemented CBCRM programs and projects all over the country. These institutions fall under three main classifications - government institutions (GLA), non-government organizations (NGOs), and academic (ACA) and research (RES) institutions (Table 3). Local NGOs outnumbered all other types of institutions in the implementation of projects. Based on the secondary data gathered, there were 36 local NGOs, 14 government line agencies, 10 academic institutions, 7 local government units, 2 foreign NGOs (OISCA and GDS) and 2 international research institutions (ICLARM and SEAFDEC) involved in CBCRM. Although there were more NGOs (53%) involved in CBCRM project implementation compared to government (30%), the actual number of project units implemented by all government agencies far exceed the number of project units conducted by all NGOs. One hundred and three project units or 61 percent of the total number of project units were initiated by government institutions. Forty eight or 28% were lead by NGOs. The remaining 18 project units (11%) were implemented by academic and research organizations. This is not surprising because government line agencies usually have regional and/or provincial offices which could carry-out activities. The Department of Environment and Natural Resources (DENR) is the most active government line agency in the implementation of CBCRM activities. DENR's projects are scattered throughout the 12 regions of the Philippines, with an accumulated total of 36 project units. Following DENR is Philippine Council for Agricultural and Marine Resources Development with 24 project units in 11 regions.

Table 3. Summary table of types of institutions involved in CBCRM and Project Implementation Philippines, 1984-1994.

Type of Institution	Number	Percentage		
A. Government	21	30		
1. Line Agencies	14	20		
2. LGUs	7	10		
B. NGOs	38	53		
1. Local	36	51		
2. Foreign	2	2		
C. Academe/Research Institutions	12	17		
1. Government	9	13		
2. Private	1	1		
3. International	2	3		
Total	71	100		

CBCRM activities in the Philippines were first conducted by government line agencies in 1984. Academic institutions initiated projects starting in 1986. However, it was not until 1988 that an NGO undertook CBCRM. This can be traced to the fact that the number of NGOs involved in fisheries grew in number starting in 1987, just after the new Aquino Administration ratified the constitution to allow for more people empowerment and poverty alleviation. In the Marcos regime, NGOs did not flourish because community development initiatives by NGOs were suspected by the military of being communistic and anti-government.

It was found that at least 25 foreign development agencies and seven donor countries (Australia, Canada, Denmark, Japan, Netherlands, UK, USA) provided funds to support various types of CBCRM activities in the Philippines. Region IV has been the most favored area for foreign assisted CBCRM programs and projects. The Overseas Economic Fund funded the most number of CBCRM projects (13 p.u.), followed by World Bank-International Bank for Rural Development (5 p.u.) and World Bank-Global Environment Fund (5 p.u.). United States Agency for International Development and Asia Foundation supported at least 3 project units each, while Canadian International Development Agency and OXFAM each funded 2 project units.

It was noted that many programs and projects were actually funded by foreign donors with counterpart funding from the Philippine government. A number of funding arrangement were noted: (1) foreign funded - government led programs or projects, (2) foreign funded - NGO led programs or projects, (3) foreign funded - academe led programs or projects, (4) government funded - government led programs or projects, and (5) government funded - NGO led programs or projects. All these schemes highlight the critical role of institutional financial support from sources outside the community in the conduct of CBCRM programs and projects.

#### **Process and Component Analysis**

Community-based coastal resource management involves numerous types of interventions. These interventions are specific activities introduced through the program and project are intended to operationalize the objectives of CBCRM. Table 4 lists the important types of interventions recorded in various forms as components to CBCRM programs and projects in the Philippines during the study period. It is not easy to make clear distinctions between all the interventions since overlaps with related or linked interventions are sometimes unavoidable. In other instances, overlaps between component activities are necessary to effectively achieve project objectives. However, it is useful to identify types of interventions so that comparisons could be made across CBCRM programs and projects.

Table 4. List of CBCRM Interventions, Philippines, 1984-1994

Type of Intervention/Activity	ACRONYM	No. of Projects	Rank
Community Organizing	СО	52	1
Education, Training and Skills Development	ETSD	48	2
Technology for Increased Fish Production	TIFP	43	3
Alternative Livelihood Development/Credit Suppo	ort ALDCS	42	4
Artificial Reefs	AR	40	5
Mangrove Reforestation	MR	34	6
Protected Area Management/Marine Sanctuaries	PAMMS	26	7
Resource Assessment and Monitoring	RAM	22	8
Resource Management Planning	RMP	14	9
Legislation/Policy Formulation	LPF	13	10

Community organizing was a component of 52 CBCRM projects, or 50% of the total number (105). The second most common intervention is Education, Training and Skills Development, which was a component of 48 projects(47%). As mentioned earlier, this intervention is also one of the basic and more pervasive of CBCRM components because of its importance in preparing the participant-beneficiaries for their active involvement in CBCRM. The third most popular intervention is Increased Fish Production, which was part of 43 projects (42%). Alternative Livelihood Development and Credit Support was part to 42 projects, accounting for 41% of the total. Artificial Reefs were part of 40 CBCRM projects (ranked 5<sup>th</sup>), while Mangrove Reforestation was an intervention of 34 projects(ranked 6<sup>th</sup>). The seventh most common intervention was Marine Sanctuary Establishment and Protected Area Management with 26 projects. The eighth and ninth ranked interventions are Resource Management Planning and Resource Assessment and Monitoring, respectively. The least common CBCRM intervention is Policy Formulation.

Reviewing the 15 programs and 28 projects, one will discover the wide range of approaches and patterns in the sequencing of CBCRM project interventions. In fact, and initial impression is that there could be as many approaches to CBCRM, as there are programs and projects. However, it is possible to compare various approaches and attempt to trace the similarities by depicting the intervention flows of selected program and projects (Figure 3). Six classifications of CBCRM interventions are used in the analysis: Community Organizing (CO), Education, Training and Skills Development (ETSD), Resource Assessment and Monitoring (RAM), Research and Publication (RES), Resource Management Planning (RMP) and Resource Management Implementation (RMI). RMP includes bench mark surveys, feasibility studies, etc. RMI pertains to the cluster of activities which includes PAMMS, TIFP, AR, MR and LPF.

Figure 3. Sequencing of Selected CBCRM Program and Project Interventions, Philippines, 1984-1994

Component Sequencing	Lead Agency Type
COETSDRES	NGO (TDC)
CORMPRMIRAM	NGO (HARIBON)
CORMPETSDRMI	NGO (CERD)
CORMIRMP	NGO
CORMIRAMETSD	GLA (CVRPO)
CO/RESRAMRMI	ACA (UPLB/SU)
CO/RESETSDRMIRAM	ACA (SU)
CO/RESETSDRAMRMPRMI	ACA (VISCA)
CO/RES/RAMETSDRMPRMI	GLA (DA/DENR)
RES/RAMCOETSDRMI	RES (SEAFDEC)
RES/RMPCORAM-RMI	GLA/FDO (OISCA)
RES/RMPRMIETSDRAMRMP	GLA (PIADPO)

The most common pre-implementation intervention for CBCRM is community organizing. This was noted for at least 44 projects. Thirty-two projects started with research interventions, i.e. benchmark surveys, feasibility studies. Twenty-seven started with resource assessment and monitoring. It may be worthwhile to note that preliminary socio-economic research and bio-physical resource assessment work is the common initial action of academic and research institutions while community organization and advocacy was the typical starting point of NGOs. Most of the pre-implementation activities mentioned above are closely related to one another. For example, community organizing often requires training and advocacy work. In a like manner, research often includes resource assessment and management planning activities. Thus, in many cases, it may be easier to just lump these interventions as pre-implementation activities.

In the majority of CBCRM programs and projects, the implementation phase typically involves one or a combination of the following interventions that are in line with the coastal resource management plans and are participated in by the local fisherfolk themselves.

Technologies for Increased Fish Production (TIFP)

Artificial Reefs (AR)

Mangrove Reforestation (MR)

Policy Formulation on Environmental Protection and Resource Management(LPF)

Alternative Livelihood Development and Credit Support (ALDCS)

Establishment and operation of Protected Areas and Marine Sanctuaries (PAMMS)

Institutional Capability Development (ICD)

Post-implementation of CBCRM interventions usually include with one or a combination of the following activities:

Project Monitoring and Evaluation

Preparation of Area Management Plan

Communication and Information Dissemination, Research Publication

Replication and Extension

**Evaluation and Adjustment** 

Provision of Support Services for Environmental Protection

All CBCRM activities entailed some form of partnership or collaboration between the project initiators, stakeholders and other interest groups. In fact, one observation from the literature review is that linkaging and networking are an indispensable and pervasive activity in the over-all process. As discussed, there are three main types of institutions involved in CBCRM, in addition to the community, these are government (GLA and LGU), NGOs, and academe and research institutions.

During the implementation phase there was a great deal of inter-institution collaboration and joint activities. In fact, for every specific component of a single program or project there can be a separate form of institutional arrangement. Table 5 provides a listing of 13 specific types of institutional role sharing arrangements derived from actual CBCRM program and project files.

Table 5. Typology of Institutional Role-Sharing Arrangements for CBCRM Programs and Projects, Philippines 1984-1994

Institutional	AR	MR	ETSD	TIFP	PAMMS	ALDCS	LPF	RMP
Arrangements		ļ						
LGU-COM					1			1
ACA-COM			1		1			
NGO-COM	5	3	5	4	3	4	2	
GLA-COM		1	2		3	1		
GLA-LGU-COM	1	1		1	2	2	1	
GLA-ACA-COM				1	1			
GLA-NGO-COM	1	1	1	2	3			
LGU-NGO-COM					3			1
LGU-ACA-COM					3			
NGO-ACA-COM			1		2			
LGU-ACA-GLA-COM								1
LGU-ACA-NGO-COM			<del></del>					3
LGU-GLA-NGO-COM								5
	7	6	10	8	22	7	3	11

GLA-gov't line agency; LGU-local gov't unit; ACA-academe; COM-community; NGO-non government organization

Protected Area Management and Marine Sanctuaries (PAMMS), as an intervention, provided the greatest opportunity for inter-institution collaboration in CBCRM programs and projects. This was followed by Resource Management Planning (RMP) and Education, Training and Skills Development (ETSD).

Regarding specific types of institutional arrangements, the most common was the NGO-COM type of partnership. NGOs and community organizations were partners in seven kinds of interventions including AR, MR, ETSD, TIFP, PAMMS, ALD and LPF. Moreover, the NGO-COM type of partnership was the most frequently used institutional arrangement for AR, MR, ETSD, TIFP, PAMMS, ALDCS and LPF. This shows how much the NGOs have been able to link directly with local communities in a wide range of CBCRM activities on their own. The second most common type of institutional arrangement was that between GLA-LGU-COM.

#### 6. Lessons Learned from Past CBCRM Programs and Projects

Considerations in the Design and Implementation of CBCRM Programs and Projects

Designing and implementing CBCRM is a complex process which requires several phases of interdependent activities and interventions. These include planning and preparation, ensuring the involvement of community residents, funding, government support, inter-institution collaboration and co-management, monitoring and evaluation, and staffing. Programs and projects that are weak in any one or several of the above mentioned requirements may fail because CBCRM is a process which has yet to be perfected. There is no standard blueprint for CBCRM.

Planning of all phases of the programs and projects, i.e. program or project preparation, implementation and pull-out, should be through. Good project management starts with well thought-out short and long term plans, clear objectives and a realistic budget (Agbayani and Siar 1994). The base status of the coastal resources have to be determined before undertaking any type of CBCRM intervention. An important aspect of planning is 'project scoping' which involves identifying the "community" boundaries, beneficiaries, interventions, and recognizing the obstacles and limits to CBCRM so that clear and realistic objectives can be set for the project. Coastal community issues and problems are multi-faceted such that needs have to be addressed holistically and in an integrated manner (Magpayo 1995). In terms of beneficiaries, the observation that a small group is more manageable than a bigger one holds true across all programs and projects. In projects where a great number of beneficiaries and participants are involved, it is wise to divide them into smaller groups to facilitate and enhance supervision, control and management (Cimagala 1995).

It is imperative to ensure close partnership between the community and outside institutions in the implementation of project activities. According to many authors, early involvement of community members facilitates the development of this partnership (Calumpong 1995; Cimagala 1995). Community members may not take responsibility for resource management if it is not clear to them how they can benefit from management and be effective in their roles as managers (Bissdorf 1995). Social preparation should always precede technical intervention (Cimagala 1995) and this is accomplished through community integration, education and training, leadership development (Ablong and Waltermath 1995), and organization and formation of core management groups. It was also observed that the more successful programs and projects were those where organizing is not a prerequisite, rather, the community organization evolves after the people themselves recognize the need for it (Sandalo 1994).

Constant feedback and continuous dialogue between community and project implementors is required so that community members are well-informed and updated on all project developments (Magpayo 1995).

Sufficient, timely and sustained funding of project activities is critical to the realization of project objectives (Regal 1993; Agbayani and Siar 1994). A significant number of programs and projects suffered due to various funding problems (Baritua 1995; Cimagala 1995). The accomplishment of planned activities depends a lot on the timely release of project funds (Bolos 1994).

CBCRM programs and projects are more likely to be successfully implemented when government support for local institutions is strong and movement policies and regulations support local needs and initiatives. Community property rights and tenure needs to be supported and enforced with backing from the government.

Strong institutional support is critical for the smooth implementation of CBCRM. The joint undertaking of CBCRM by a combination of institutions has obvious advantages in increasing the financial, logistical and technical (expertise) resources necessary for effective implementation. In addition, inter-institution linkages promotes co-management in the coastal zone. There is a downside to having too many institutions involved; that is, coordination can become very problematic at the project management level.

Clear and measurable indicators of progress should be established and a monitoring system for the project should be put in place as part of regular program and project activities (Bissdorf 1995). A monitoring system will ensure constant feedback not only for project staff but for the community members as well. Regular meetings, sharing sessions and consultations among project team members and collaborators allow all concerned to be updated on project status and problems encountered (Agbayani and Siar 1994).

Adequate technical and social 'inter-personal' skills of project implementors is critical to the successful implementation of CBCRM programs and projects. Heinan and Gonzales (1994) observed that there is a clear relationship between the quality of the program or project and the technical background of the staff.

#### Considerations in the Design and Implementation of CBCRM Interventions

There are also certain factors that affect the implementation and sustainability of each specific intervention. The factors that promote effective implementation of community organizing activities often pertain to the personal qualities of community organizers or their relationship and manner of dealing with the different members of the community. Community organizers should spend a lot of time with the people in order to win their confidence and respect. It has been noted that the most effective way of organizing is to allow the 'self-evolution' of community organizations or fishers associations(Sandalo and Dygico 1993). However, it is important to start with information dissemination, education, contact building and the identification of potential leaders (Alix 1989; Bojos 1994). According to Calumpong (1992), core group formation should be strategic and start with active, educated and respected community members so that other residents will also be motivated to participate in

project activities. Another strategy in organizing is allowing for continuous dialogue, both formal and informal, between project beneficiaries and implementors.

In developing and promoting alternative livelihood options for the community, there are two prerequisites: (1) consultation with the community members on their preferred types of projects; and (2) training of fishers and household members on cooperatives and enterprenuership for alternative livelihood. It is important to remember that different sources of livelihood may be suggested but the choice should be left to the people (Hancock 1993). During the implementation of livelihood projects, some of the critical factors of success identified were the following: (1) extension of technical assistance to guide and/or supervise the projects (Agbayani and Siar 1994); and (2) continuous provision of skills enhancement and capability building trainings and educational programs for beneficiaries and project implementors (Regal 1993; Bojos 1994).

Documentation of experiences shows that it is very effective to train fishers using other fishers (Bojos 1994; Carlos 1993). Locally recruited and trained extension/change agents should be tapped because of their knowledge and acceptance by the community. Cross visits to actual fishing villages and CBCRM sited help greatly in accelerating the appreciation, comprehension and adoption process (Carlos 1993). Community education was also enhanced through information drives, community assemblies and group orientations, as well as, publications and radio.

Several important factors affecting the success of interventions in artificial reef establishment and management have been identified. The planning and implementation of the ARs should be a joint undertaking with the fishers in the community. In the operation and management of the AR areas, there should be restrictions on the types of fishing gears used (de los Angeles and Pelayo 1993). Territorial use rights to the ARs should be granted to the community. The sustainability of benefits from artificial reefs is strongly dependent on their being protected to some extent, ideally as part of sanctuaries or reserves. One major drawback of ARs is that the structures serve very effectively as fish attracting devices which easily result in recruitment overfishing (de los Angeles and Pelayo 1993).

For technologies for increased fish production to be successfully adopted in the CBCRM context, the technology should be well tested and proven to work under actual field settings. Another requirement is the use of indigenous materials whenever possible. Likewise, newly introduced technologies should be simple and complementary to those used by the fishers. The introduction of new technology must be accompanied by training in its use. Any new technology or intervention must produce short-term benefits and serve as an incentive for the community to continue their active involvement and contribution to both the intervention and the objectives of CBCRM. Traditionally, research has been carried out only by project staff or 'specialists', who are non-community members. In more recent CBCRM programs and projects, however, there has been a trend towards involving the community members in the conduct of various research activities (Ybanez 1995). Documentation of such experiences shows that research conducted with fisherfolks provides real and

effective participation from problem and need identification to the evaluation phase. Community members can support program and project staff with their indigenous knowledge of local conditions (Bojos 1994).

Towards the end of the program or project, CBCRM objectives can best be achieved and sustained if: (1) there is a definite and well-prepared phase-out plan to turn-over interventions to local institutions; and (2) local institutions are prepared and ready to take-over the interventions. In the long run, sustainability can be enhanced by providing limited post-program or project institutional support and technical backstopping by non-community institutions in various aspects of CBCRM.

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## ECONOMIC CONCEPT OF COMMUNITY-BASED MANAGEMENT FOR COASTAL FISHERIES

by

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#### ABSTRACT

Open-access fishery has led to problems of overfishing and dissipation of resource rent. Among fishery biologist maximum sustainable yields are preferred. To economists, the optimal level of fishing is at maximum economic yield where resource rent and consumer surplus are maximized. Nevertheless, conventional management schemes by central authority are inefficient among tropic coastal state countries with multi-species, multi-gear fisheries, Community-based fisheries management (CBFM) is then in an option for a a better cost effective management schemes Resource rent can be maximized while resources will be more abundant but at the cost of decreasing consumer surplus. There is a plausible "underfishing" in adopting CBFM, Supportive institutional framework, strong local organization, exclusivity of fishing against outsiders, sedentary/inshore fisheries, and recognition on fisherman social status are positive factors advocating the adoption of CBFM while the negative factors are the opposite, plus heterogeneity of fishermen and problems of equity in access to fishing. Economics of CBFM is actually the distribution of control power due to market failure. There are external elements given to the local fishermen who can only control their internal decisions. The optimum is obtained where marginal benefit of CBFM equals marginal cost. Factors to be considered are transaction costs, including exclusivity and governance costs. In adopting CBFM maximizing resource rent must be combined with minimizing transaction costs for an optimum fishing level.

#### 1. Justification for Community-based Management in Coastal Fisheries

Without an appropriate management scheme, rapid development in the fishing industry can lead to problems of overfishing and finally a degradation in fishery resources. In open-access fishery, fishermen continue fishing as long as the return from fishing can cover the cost. There is no guarantee that if they do not fish today, they can catch tomorrow. Profit maximization where marginal revenue equals marginal cost does not take place in open-acces fishery. Instead, equilibrium will be reached where the total revenue equals total revenue ( i.e. average revenue equals average cost). Resource rent is dissipated as all those returns from fishing are to be paid out in costs of fishing, this does not take into account the cost of the fish

themselves. The society as a whole loses what they should gain from such resource exploitation. At the same time fish abundance is degraded. There will be less fish available for future generations.

Among fishery biologists, maximum sustainable yield may be preferred as the volume of catch is maximized while fish abundance is maintained at its maximum growth rate. Fishery economists favor maximum economic yield where society gets the most from those catches. At maximum economic yield where the return per unit of catch equals its marginal cost, social benefits including resource rent (accrues to the fishing sector) and consumer surplus (accrues to the consumers) are at their optimum.

Various attempts have been carried out in order to manage fishery such that we can optimize exploitation of fishery resources. Often found conventional fishery regulations involve both renewing resource abundance (including closed season, closed area, and gear restriction) and control on fishing effort (including limited licenses, quotas and taxation). In Southeast Asia, long coastlines and scattered landing points make effective fisheries management difficult. There being multispecies, multi-gear fisheries increases the complexity in fisheries management planning. Effective monitoring and enforcement costs are high. Government may not be able to afford such costs. Community-based management of coastal fisheries is proposed as an alternative for a better management scheme. Limited government success in effective fisheries management makes way for community-based management in the expectation of improving efficiency, equity, and cost effectiveness of fisheries management. Nevertheless there are certain costs involved in implementing commmunity-based management in coastal fisheries.

Implementing community-based management in coastal fisheries can be considered an approach to rectify the problems of common property as fishery resource exploitation can be controlled by the fishing community. Property rights on fishery resources is defined at a level. Empowering such management schemes increases recognition of resource value and thus a more careful exploitation. Nevertheless, granting rights over fishing to the fishing community can lead to underfishing equilibrium where the marginal cost of catch equals marginal revenue. The fishermen, with rights over fishery resources, want to maximize fishing profit. In such cases, fishery resources will not be optimally exploited. Catch will be lower than the optimum level while fish stock abundance will be higher. Consumers have to pay a higher price at this lower landing volume while resource rent, accrues to the fishermen as their fishing profit, is at a maximum. Community-based fishery management in fishing villages leads to a greater benefit for local fishermen at the cost of present consumers. Nevertheless, the decrease in today's catch implies that fish stocks can be maintained at a higher level. There will be more resources for the future.

#### 2. Limitation on Community-based Fisheries Management

Inefficiency in central fisheries management among coastal states in developing countries has led to the development of community-based fisheries management (CBFM). CBFM has been thought of as an effective management scheme due to the success in Japanese coastal fisheries management. Nevertheless, there are at least two possible weak points of adopting community-based management schemes which should be considered a priority. First, there were certain costs involved. Second, implementing CBFM can take a long time.

In some cases costs of CBFM can be higher than conventional management schemes. Without an appropriate supporting institutional framework, the success of CBFM can be questionable. Where the local institutional framework is weak, additional investment is needed to strengthen and build up community management capacity. Without strong local organization, it can take a long time to develop local capability and participation in fishery resource management. The longer the time, the worse the resource condition is. There are costs in implementing CBFM. The benefits are fishery resource abundance. Cost-effectiveness of CBFM should be evaluated as a priority of implementation. Given the right institutional framework, if local community can benefit from CBFM, it is likely that they will get involved efficiently and effectively.

By characters, high exclusion cost is one of the most important factors limiting the chance of success in adopting CBFM. In the case of Japanese coastal fisheries, the success can be explained partly by their sedentary species inshore fishery in a confined area. Granting fishing rights to fishing communities where local fishermen are not able to exclude outsiders from fishing in their fishing ground, can be a failure. The management will be more difficult for those highly migratory species. Fishing rights over migratory species on the basis of CBFM can be a locational advantage but cannot be exclusive to fishery resources.

In fishing communities where fishermen are heterogeneous in their fishing skill, cost of internal governance can be high. Fishermen with superior skill earn rent from fishing and are inclined to oppose any regulation as their rent will be cut unless fishery resources are depleted. Once conservation measures have been agreed, these better-off fishermen are the first who can reap benefit from the renewed resource abundance, while the marginal fishermen may not be better off. Moreover, if introduced in communities with varieties of fishing patterns there can be conflicts of interest, thus it is difficult to get an agreement upon management planning.

Equity is another obstruction in implementing CBFM. Granting fishing rights to a specific community may not be acceptable, at least politically. Government may be reluctant in advocating CBFM in the question of equity and access to fishery resources.

In the case of Japan, fishing rights were granted to coastal fishing communities in order to reduce the conflicts among fishermen from different communities, while there was strong local traditions and kinship among fishermen in the same community. Government support (especially on demarcated fishing rights and large scale set-net fishing right schemes) enhanced the success. Recognition of fisherman social status is another factor of success for CBFM in Japan. The conditions may not be the same in the other countries.

#### 3. Economics of Community-based Fisheries Management

Market failure due to fish being common property resources and unsuccessful conventional fishery management by central authority make way for CBFM. We can look at this issue as an attempt to introduce the issue of the distribution of control power. Economics is fundamentally, distribution of power through market functioning. When control structure works perfectly, the market functions. In case of common-property fishery resources, the market fails. Lack of control induces costly races in fishing and depletion of resources. High costs of monitoring and enforcement constrain effective central management. Control structure has to be corrected. CBFM, granting fishing rights thus the control to the community, is recommended as an option.

Institutional environments such as laws and regulations, social norms and customs are given to the community. These are external elements which are out of the community's control. If institutional environments are CBFM friendly, success is more likely. Communities can make decisions on fishery resource utilization and conservation such that control will be exerted until marginal cost of control equals marginal benefit.

In the aforementioned, adopting CBFM can be costly if there is a high cost of exclusion. There are "transaction costs" in adopting CBFM. Transaction costs are defined as the costs that arise when a community exercises ownership rights to resources and enforces their exclusive right. They consist of the cost of arranging an agreement ex ante and monitoring and enforcing ex post. CBFM transaction costs depend on measurability of fishery resources. Recognition and awareness of fishery resource values lowers the transaction costs of CBFM. Another factor determining transaction costs is the nature of transactions. If transactions are voluntary, durable, and simultaneous; CBFM transaction costs can be lowered. Lastly, non-exclusivity and high governance costs discourages willingness of those local fishermen to participate in CBFM schemes. Improving quality of fishery resources will be difficult without active participation among fishermen. Transaction costs are high in such cases.

Maximizing the net benefit from CBFM involves both maximizing resource rent from sustainable stock as well as minimizing transaction costs of the controlled fisheries. Whether it is worthwhile to adopt CBFM depends on costs and returns from fishing and transaction costs of which exclusivity and governance play a key .role. CBFM can be a solution if the net benefit from this management scheme can be

maximized. It is likely that providing an appropriate external environment, where prevention on encroachment by the outsiders is possible and governance costs are relatively low, it is likely that CBFM is recommendable.

Exclusivity and governance costs depend on several factors including natural barriers to entry by outsiders, physical characteristics of fishery resources (being sedentary or migratory), fishing patterns (multi-species, multi-gear, seasonal, fishing gear conflict, inshore or offshore), state of technology (traditional or modern), political support (in favor of uplifting the coastal fisherman livelihood or equity of access to fishing,), laws and regulations, social organization (strong or weak local group: interest, willingness and capacity of the local fishermen in participation on CBFM scheme), norms and customs, and relative prices and value judgment on fishery resources. These factors should be considered before attempting the adoption of CBFM.

Investigation of the economics of CBFM, examining the organization of the control structure including various contractual arrangements and economic activities and economic results (success and failures and development of coastal fisheries), provides basic guidelines in adopting a successful CBFM.

# 4. Key Factors for Community-based Fisheries Management

CBFM can work effectively in coastal fisheries where fishery resources, being the mainstay of the coastal community, are being depleted. Being the only source of income, local fishermen recognize the value of fishery resources and are willing to participate in the renewal of, and sustaining their resource abundance. Fishing boundaries should be identifiable such that the problem of exclusivity can be minimized. Fishermen should be equipped with the capacity of effective management at the outset.

Once CBFM is selected, community participation should be strengthened and built up to adopt their management plan. Government agencies should provide support on community empowerment (including supporting frameworks, laws and regulations, finance, and education). Local fishermen are stakeholders and must be effectively involved in decision making. Management plans should be decided by the local fishermen and worked from bottom-up not top-down. Actions and changes that take place must be agreed at community level. Effective involvement of local fishermen can be increased if the benefits to be received from CBFM can be visible, quick and proportionate to their contributions.

Key factors for successful development of CBFM are as follows.

1. Encouraging participation of local fishermen via participation among relevant agencies in preparation for CBFM, consultation, pilot activities, and structured learning.

- 2. Emphasis on the collaboration at the community level via recognition on the need and interest of the locality, assurance of net benefits to the locality from their involvement in CBFM, embedding socially strong and active local organizations, building up community capacity (including leadership, knowledge and skill for effective fishery resource management), support on community's regulations and enforcement.
- 3. Adoption of appropriate technology that suits the community needs.
- 4. Effective outreach programs with two different approaches, empowerment and extension. The empowerment approach is essential. While the extension approach focuses on increasing efficiency in production (fishing as well as others), the empowerment approach focuses on effective involvement of the locals.

In adopting CBFM, the following checkpoints should be considered.

- Benefits and beneficiaries from CBFM.
- Needs and capacity of the community.
- Needed changes, in the physical sense and capacity, at the community level.
- Key persons and community levels and their roles.
- Roles of supportive agencies, both government and non- government.
- Appropriate outreach programs, empowerment and extension.
- Investment in building up the community capacity for effective management.

#### 5. Conclusion

Given the right community capacity, CBFM can be an answer, giving an effective fisheries management in tropical multi-gear multi-species fisheries. Nevertheless there are certain costs involved in the adoption of CBFM. CBFM should be selective and may not be applicable on a large-scale basis. Careful design for certain success at the initial stage of development can induce more success from this management scheme.

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# COMMUNITY FISHERY RESOURCES MANAGEMENT IN MALALISON ISLAND, PHILIPPINES

by

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#### **ABSTRACT**

The Community Fishery Resources Management Project, launched in 1991 in Malalison Island, Philippines is a development-oriented research project integrating biology, economics, sociology, engineering, and public administration. The general objective is to support, and learn from, the collaboration of people's organization, biologists, and social scientists in applying community-based techniques in fishery management. During Phase I, the Project concentrated on community organizing, institution building, and the introduction of seaweed farming as alternative livelihood. Studies were made on the marine resources of the island, the traditional boundaries and territorial use rights, the economic utilization of resources in the island, and the cultivation techniques for seaweeds. Phase II started in 1994 with the implementation of the territorial use rights in fisheries and the test deployment of prototype concrete artificial reefs. Phase II includes impact assessment (environmental, social, and economic), institutional arrangements in fishery comanagement, ethnographic studies, economics of seafarming techniques, and management of fishery cooperatives.

#### 1. Introduction

The Community Fisheries Resource Management (CFRM) Project was launched in Malalison Island off western Panay, Philippines in 1991 by the SEAFDEC Aquaculture Department with support from the International Development Research Centre of Canada. The CFRM Project addresses two main issues: the degradation of coastal resources and the poverty of fisherfolk (Lacanilao 1989). Declining productivity in marine ecosystems is caused primarily by the conversion of mangroves swamps to ponds, destructive fishing practices, and siltation due to forest denudation. SEAFDEC AQD felt the need to undertake socially oriented developmental research focusing on the issues of poverty and marine resource degradation.

Research conducted under CFRM is development-oriented and multidisciplinary. Biological studies are integrated with economics sociology, enterprise management, public administration, and engineering to accomplish community-based resource management. Fishery co-management through community self-regulation of fishery resources is an alternative strategy to "top-down" policy-making (Hviding and Jui-Larsen 1993, Pomeroy 1993). The active involvement of the community and the legal support of the local and national government in the protection of fishery resources make possible sustained harvests. The CFRM Project provides the poor fisherfolk of Malalison opportunities to improve their livelihood and quality of life through appropriate interventions such as community organizing and institution building, alternative livelihood, territorial use rights in fisheries, deployment of concrete artificial reefs, and searching.

Malalison was selected from among five candidate sites on the basis of socioeconomic and biophysical criteria. Socioeconomic criteria included income and dependence on fishing, (destructive) fishing practices, use of credit for fishing activities, potential for alternative livelihood, and presence of a non-government organization in the locality. The biophysical criteria evaluated were the presence of live coral cover, other hard substrate, seagrass beds, mangroves, water 10-30 meters deep, and protection from the southwest monsoon.

Figure 1 shows a topographic-nautical map of Malalison Island. Under the CFRM Project, socioeconomic and biological studies were conducted to obtain baseline data about Malalison's natural resources and the user community.

#### 2. Socioeconomic Situation

A demographic census taken at the start of the project showed 74 households with an average of 5-6 members (SV Siar, personal communication). About 72% of the households lived below the poverty level of P2,500/month as defined by the National Economic Development Authority, and 52% earned less than P1,250/month (US\$ 1 = P25). Income from fishing accounted for 60-100% of the total income of 65% of the households. About 49% of the households had 1-2 working members, and another 42% had 3-4 working members. Among the household heads, 84% reported fishing and related occupation (net mending, fish vending, boat making) as their main livelihood. The rest of the household heads were engaged in swine-raising, construction work, coconut-lumber making, or farming.

The educational attainment of the household heads in Malalison was very low (SV Siar, personal communication). About 72% reached various grades in elementary school, 15% had two years secondary education, and 5% had three years of college. Of the only two college graduates, one is the incumbent barangay (village) captain.

Malalison has a young population: in 1991, 68% were younger than 30 years, 19% were 30-50 years old, and only 13% were older than 50. The population increased from 431 in 74 households in 1991 to 485 in 94 households in December 1994, a 3% annual growth rate. This is higher than the national growth rate of 2.1% estimated by the National Census and Statistics Office.

#### 3. Economic Utilization of Resource

An agro-fishery village transect was prepared with rapid rural appraisal techniques (Conway 1989. Lamug 1989) to determine the land and marine resources, economic activities, agricultural and fishery products, problems, and opportunities in Malalison. The transect was divided into coral reefs, low land rice fields, upland, village, and nearshore. Some of the economic opportunities identified were capture of ornamental fishes from the coral reefs, vegetable farming and salt-making near the rice fields, planting of fruit trees in the uplands, establishment of a cooperative-managed consumer store in the village proper, and seaweed farming near shore (Agbayani and Siar 1994).

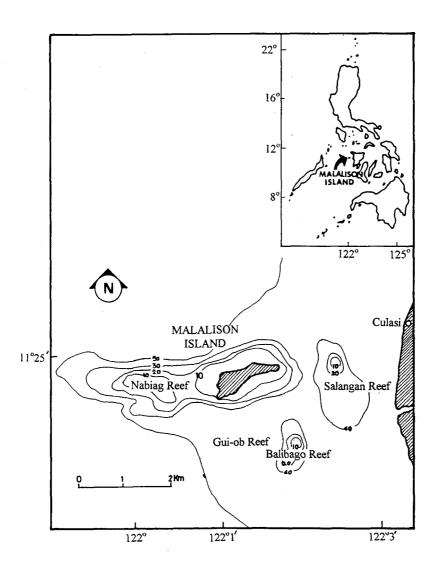


Fig. 1. Map of Malalison Island showing the major reefs.

The waters around Malalison are a shared resource. In 1992, the Malalison waters supported a population of 6,820 in 1,364 households in 16 coastal barangays in Culasi and nearby Batbatan Island (SV Siar, personal communication). Commercial (large-scale) fishers from other provinces have also encroached on the waters of Malalison to the disadvantage of the municipal (small-scale) fishers. Of the 74 households in Malalison, 37% have non-motorized boats and 22% own motorized boats. Hook-and-line is the most common fishing gear, followed by spears and nets. Women and children gather mollusks, sea urchins, sea cucumbers, and other reef products.

Because of the monsoon winds in July-November, fishing is seasonal in Malalison, particularly among the fishers using spears and hook-and-line. Lack of alternative income sources during the off-season has forced fishers to use efficient but destructive fishing methods to maximize the catch during the peak season (SV Siar, personal communication). Blast fishing was rampant during the 1980s until the initiator and source of dynamite died in 1991. Malalison fishers now allege that fishers from other islands and provinces do blast and cyanide fishing around the islands. The Malalison version of the "muro-ami" (locally called "duldog"), introduced by Japanese fishermen before World War II, became a source of conflict both within and outside the island. "Duldog" has been prohibited since 1986, but the ban has been commonly ignored. Overfishing and destructive fishing practices have degraded the marine resources, particularly the coral reefs around the island.

The small-scale reef fisheries in Malalison have been described and the yield of the coral reefs was estimated at 5.8 tons/km<sup>2</sup>-yr (Amar et al. in press). A two-year survey (Apr 1992 to Mar 1994) documented the average monthly catch, sales, net income, number of fishing hours per day and fishing days per month of 38 fishers using different gears (Table 1; Agbayani, unpublished data). In year 2, the average monthly catch of net fishers and hook-and-liners decreased by 17-25% due to fewer fishing days per month and also because of the substantial decrease in "duldog" fishing as a result of the active information campaign in year 1 and the social pressure among the fisherfolk. Sales and net income increased due to the higher value of the species caught in year 2.

# 4. State of Living Marine Resource

The living marine resources in Malalison were assessed during 1991-1994. Many species of mollusks, echinoderms, and other invertebrates are found in Malalison, and many are used as food or sold for additional income. Five species of seagrasses and 74 species of macrobenthic algae were recorded around Malalison (CL Marte, personal communication). The biomass of these benthic plants was highest in March-May.

Table 1. Average fishing effort, catch and income of 38 Malalison fishers in April 1992-April 1994 (Agbayani, unpublished).

Gear	Fishing (d/mo)	Fishing (h/day)	Catch (kg/mo)	Sales (pesos/mo)	Net income (pesos/mo)
Year 1		-			<del></del>
Spear	16	5	38	935	886
Net	11	6	53	1107	916
Hook & line	15	6	28	808	725
Year 2					
Spear	12	5	39	1154	984
Net	10	6	44	1148	1042
Hook & line	11	8	16	949	825

Over 120 species of corals in 49 genera were found in nine sampling stations around the island (CL Marte and YH Primavera, personal communication). Coral reef cover was 5-15% on the southeast (Kawit and Talisay) and 29-58% on the northeast side (Amihanan) (Fig. 1). The fish census along 50-meter transects at the 10-meter depth contour showed over 70 species (LMB Garcia and EC Amar, personal communication). The highest number of fish species (85) was seen in Amihanan and the highest standing biomass (67 t/km<sup>2</sup>) in the southwest side (Nablag).

# 5. Causal Model of Poverty

The fisherfolk are among the poorest of the poor in developing countries like the Philippines. Their incomes almost exclusively depend on the fishery resources adjacent to their village. Such is the case of the Malalison fisherfolk. In order to improve the social and economic conditions of a poor fishing community, developmental projects like CFRM must examine the causes of such poverty.

During the past three years of immersion in the community, the CFRM research team built a causal model of poverty in Malalison (Fig. 2). A causal model is a simplified representation of reality; it is a communication tool for use in identifying the causes and mechanisms of a problem under consideration (Eusebio et al. 1991). Such models are often site-specific and may be changed or improved during the course of a project. The causal model of poverty in Malalison has been discussed in several meetings and workshops in and outside Malalison and SEAFDEC/AQD in order to reach a consensus.

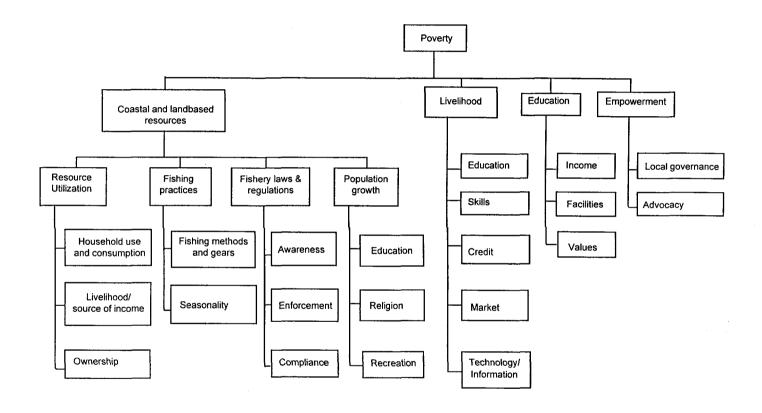


Fig. 2. Causal model of poverty in Malalison Island, Philippines

The direct causes of poverty in Malalison are: (1) the degraded condition of marine and land resources, (2) limited livelihood opportunities, (3) low educational attainment of the island residents, and (4) lack of people empowerment. The marine and other natural resources have been degraded because of the high rate of use, high population growth destructive fishing practices, and poor enforcement of fishery laws and regulations.

The direct causes of the high population growth are the low educational attainment of household heads, the religious prohibition against artificial birth control, the lack of recreational facilities in the island, and the tendency to view children as workers, caregivers, or insurance against adversity. High population growth is thus both an effect and a cause of poverty.

Lack of alternative livelihood is another direct cause of poverty in Malalison. Residents lack education skills, information, and technology. Lack of credit prevents or limits other economic activities. The inability to access the market for non-traditional products, e.g. shellcraft has prevented the community from pursuing some alternative livelihood.

Low educational attainment limits the ability of the Malalison fisherfolk to understand and properly use their resources, do business, learn new skills, get what they want, and rise above poverty. The children are unable to go to school because of lack of funds and educational facilities on the island, and because many parents undervalue education.

The passive posture of the fisherfolk in managing the coastal waters is due to the 'top-down' strategy of policy formulation and implementation (Agbayani and Hurtado-Ponce 1993). The fisherfolk are not educated about their natural resources and are not trained in local governance and policy advocacy.

# 6. Logical Framework of the Interventions under CFRM

Research and development projects such as CFRM require a conceptual model or logical framework to focus on the effects of interventions on the resources and on the socioeconomic status of the target beneficiaries. In 1991, several development interventions were formulated for Malalison (Fig. 3). Foremost was the social preparation through community organizing and institution building to empower the fisherfolk. The community was to be encouraged to lobby for territorial use rights in fisheries. Seafarming and other livelihood were to be introduced to improve incomes. Artificial reefs were to be deployed to increase underwater habitats and increase fisheries production. Finally, searching was to be done also to improve the fisheries.

Effective evaluation of the CFRM Project requires identification of realistic environmental, social, and economic indicators (Ramos and Garcia 1993). These qualitative and quantitative indicators allow us to determine whether project objectives are met, and if not, to analyze the reasons for the failure so that corrective

steps can be made. Analysis of the impact of CFRM will use the following indicators:

# Social and economic

- Active participation of FAMI members in the organization
- Self-reliance of FAMI as an organization, e.g., in financing livelihood projects and making representations with government agencies on their own
- Elimination of illegal fishing
- Increased incomes
- Diversified income sources
- Higher average education of the children
- Increased knowledge
- Improved job skills
- Better health

#### Environmental

- Increase in fish stocks and other fishery species
- Regeneration of corals
- Conservation of seagrass beds
- Reforestation of the uplands

# 7. Community Organizing

Community-based resource management highs on the formation of a strong and sustainable fishers' association. In 1991, the Fishermen's Association of Malalison Island (FAMI) was organized with the support of the Culasi municipal government. PROCESS Foundation, Inc., a non-government organization was tapped to facilitate the community organizing and the training of FAMI members since 1991. At first, coordination between PROCESS and SEAFDEC/AQD was ineffective but this was soon corrected. The problem now is that FAMI members expect too much too soon in terms of improved livelihood and incomes under CFRM (Agbayani and Siar 1994).

A Resource Management Committee has been created comprising representatives of different groups of fishers (hook-and-line, net, and spear), the local government units and concerned agencies, SEAFDEC/AQD, and PROCESS Foundation. FAMI is expected to: (1) improve enforcement of fishery laws through self-regulation and vigilance, (2) stop illegal fishing, (3) develop skills in alternative livelihood, and (4) improve access to appropriate technology.

FAMI's plans, targets, accomplishments, and gaps are assessed in annual seminar-workshops. At these workshops, the FAMI members assess and evaluate the strengths, weaknesses, opportunities of, and threats to, the CFRM Project.

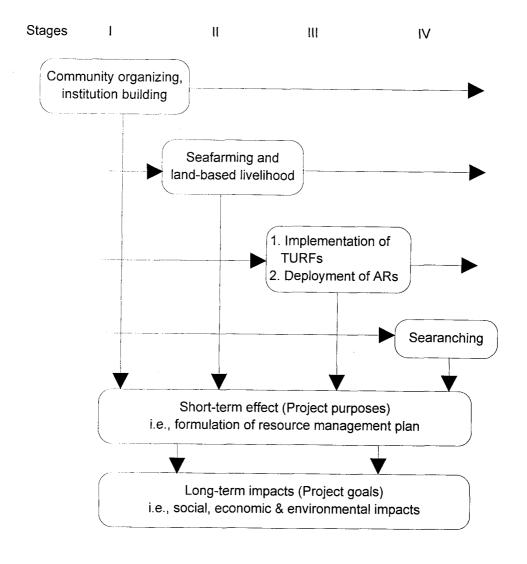


Fig. 3. Logical framework of the developmental interventions under CFRM in Malalison Island, Philippines

#### 8. TURFs in Malalison

Resource ownership is a burning issue in resources management. The open access character of a resource leads to uncontrolled and destructive exploitation and environmental deterioration (Ostrom 1990, Oakerson 1992). As a management strategy, the granting of territorial use rights in fisheries (TURFs) to a community provides them a sense of ownership of, and responsibility for, the fishery resource (Lacanilao 1989, Siar et al. 1992, Bojos 1992, Garcia 1992, Fellizar 1992).

The Local Government Code of 1991 includes the policy delegating the local government units and peoples' organizations to manage their own resources. "Municipalities have the exclusive authority to grant fishery privileges in the municipal waters (15 km from the coastline) and impose rentals, fees, or charges."

The Culasi Sangguniang Bayan (Municipal Council) passed Municipal Ordinance No. 5-90 designating a 1 km<sup>2</sup> area between Malalison and Culasi as a TURFs area. This version of the ordinance was questioned by the Provincial Council of Antique because of its 'class' character, i.e., the ordinance favors the Malalison community over other communities and sectors in the town of Culasi. There is also a need to recommend to the municipal government a modification of the ordinance: the actual TURFs area in Malalison waters must be specified.

The Resource Management Committee will prepare a resource management plan that defines the rules and rights of the members of the community in the use and management of the resources in the TURFs are. Effective implementation of TURFs will help ease the fishing pressure and ultimately increase the catch and income of *individual* fishers, if not the total for all fishers.

# 9. Artificial Reefs and Searanching

Prototype concrete artificial reefs or ARs were deployed in Guiob (Fig. 1) in May 1994 (CL Marte, personal communication) to test the technical feasibility in terms of design, strength, and deployment with local labor. At the initiative of its members, FAMI will declare Guiob as a fish sanctuary where no fishing will be allowed. ARs in a fish sanctuary will help rehabilitate the coral reefs and lead to increase in fish stock. Full deployment of concrete ARs will be done at selected sites in 1995, taking into consideration the biophysical characteristics and the socioeconomic effects on the resource users. As a complementary strategy, searanching of appropriate species in the ARs will increase the fish stocks.

# 10. Seaweed Farming and Other Livelihood

FAMI cooperated with SEAFDEC/AQD researchers in culture trials with the seaweed *Kappaphycus*. Seaweed farming was generally successful in terms of production, profit, and FAMI management. FAMI also revitalized a consumer store in the island. Management of the enterprise, particularly of the finances, was improved.

# 11. Conclusion: CFRM to 1997

The CFRM project will continue the capacity-building activities of FAMI members during the next three years. Needs assessment by the FAMI members will guide the types of training activities to be undertaken. The sustainability for the community-based approach to coastal resource management will depend largely on the capacity of the fisherfolk organization to implement the provisions of the resource management plan. The supportive roles of government, non-government institutions, and other stakeholders as co-managers of the resource will greatly influence the success of community-based resource management.

Economic activities will be both marine and land-based and will be determined by the FAMI members. Capture of coral reef fishes with environment-friendly techniques was suggested during the last assessment forum as another potential livelihood as the demand for marine aquarium fishes continues.

Research will focus on the analyses of the social, economic, institutional, and environmental impacts of the development interventions.

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# AWARENESS BUILDING AND PARTICIPATORY APPROACHES IN ONGOING PILOT PROJECTS FOR COMMUNITY-BASED FISHERIES MANAGEMENT IN THAILAND

by

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#### **ABSTRACT**

The problem of fisheries regulation is essentially one of assigning property right to a scarce resource. Community-based, self-regulatory management regimes based upon exclusive use rights accorded to artisanal fishermen are regarded as a key factor in this search for an effective, more sustainable natural resource utilization in Thailand. Community-based Management (CBM) as strategy emphasizes the significance of considering or specify a particular local or setting where people-resources interaction takes place. This paper describes the substantial factors that influence the fishermens' awareness toward the new regime of the coastal fisheries management, and the advance and difficulties of operational methods in ongoing pilot projects for promoting CBM in the coastal fishing communities.

#### 1. Introduction

As fisheries were developed over the last four decades in Thailand, most policies increased the role of national government in managing fisheries; the role of local level control through traditional management and control has correspondingly diminished. The effort to integrate traditional management into resource management regimes has not been successful since it could not be completely applied. Therefore, the policies of nationalization could not solve the problems of deterioration and over-exploitation of resources. At present, more attention is drawn to the development of Community-based Fisheries Management (CBFM) and its application to coastal fisheries management in Thailand.

CBFM is an effective and fair management system. It is also beneficial to economic administration and makes monitoring and enforcement more effective than central government management system. Fisheries Community-based management leads to responsibility and awareness building of fishermen as the resource owner which bring about longer utilization of resources. Awareness building on the obedience of rules and regulations which are regarded as a part of community culture would be useful for individual fishermen as well as the community as a whole. CBFM also provides an opportunity for communities to develop strategies of management which are consistent with community conditions and need because fisheries

communities are regarded as mechanism and tool of management measures which is more acceptable and easier to monitor and evaluate. CBFM is a method which fully utilizes traditional local knowledge and skill so that basic resource information can be used together with biological information in management. Moreover, the method can reduce social conflict and keep society in the communities united.

# 2. Awareness Building and Participatory Approaches

Community awareness building and participation in problem solving are essential fundamental factors in community-based management especially in coastal fisheries resource management which requires community-wide awareness building that leads to more participation in fisheries management.

# **Awareness Building**

Awareness building encourages people to have intention to, pay attention to a knowledge about and be sensitive to something. Awareness building is a process of creating requisites in a person or community. If such requisites do not exist, they must be created by systematic planning.

Awareness building enables fisheries communities to clearly understand the need for greater equity of access to fishery resource which is consistent with community socio-economic desirability. In addition, all parties in the fishery industry and trade including policy makers, scientists, technicians and consumers must get involved in the awareness because they all benefit from resource management.

The objectives of awareness building in resource management are as follows:

- 1. To encourage the modification and improvement of existing formats, processes and policies which may be harmful to long-term sustainable development of fishery resource.
- 2. To improve and procure the knowledge, criterion and regulations which can provide strong support to coastal resource management process.
- 3. To initiate and search for new policies and plans which can help making decisions of any fishery management plans.
- 4. To motivate the officials or concerned parties to appreciate the community need for participation in management.
- 5. To improve resource management initiatives which are consistent with the community need.

6. To search for the process of developing the moral initiatives and norms which can provide strong incentives to the obedience of community regulations.

An important factor in awareness building for management is the stakeholders who are government officials and NGOs concerned with fisheries sector and have different skill and implementation method. However, different levels of the officials and colleagues will be adjusted by using inter-disciplinary approach which employs different forms such as conference or seminar and necessary instruments which can be used as tools for awareness building.

The result of awareness building will benefit all parties concerned with fishery. Therefore, awareness building is the process of gathering the brave which are now lack of. Facilitators in awareness building and the leaders have to work specifically in awareness building by using new techniques which is less available in Thailand.

Other parties other than the government officials have to play an important role. In Thailand, NGOs have already worked closely with fisheries communities. They specialize in community organization and motivation. This can be the means of initiating awareness building for resource management. However, these organizations will require assistance in terms of equipment for specific task. Such assistance could be supported by government organizations and international bodies.

However, the creation of resource management facilitators should be done by training new young people who are willing to work in the rural area with fishermen and can also play an effective coordinating role between stakeholders.

Meanwhile, government organizations should adjust their role and responsibility by shifting form development-mode to management-mode and modifying official training courses to be consistent with management approach.

# Participatory Approach

From the result of fisheries development in the past, it indicates close relationship between people and natural resource which was often seen as a barrier or source of conflict which took place in each levels of fisheries production in the coastal fishery. This relationship between people and natural resource leads to higher level of technology employed and deterioration of the resources too. However, current management approach takes into account the relationship between communities, fisheries resources and ecosystem which they relate to in order to lessen the use of technology and place more emphasis upon the institutional and regulation arrangements to raise the level and quality of management participation. Only such involvement can create the requisite conditions to ensure that the fisheries occupation is survived and the resource is sustained by allocating rights and responsibilities to all parties concerned.

# 1. Pre-condition for Participation

Participation does not occur autonomously. It is a behaviour which has to be created or pushed. Participation process in fisheries resource management may be easily established in some communities and not in the others. Therefore, certain preconditions for participation are:

- 1.1 Physical features: communities located on small bays may be more open to participatory process than those scattered along a long open beach.
- 1.2 Size of community: small communities can be more easily and effectively encouraged to participate than large villages.
- 1.3 Social homogeneity: communities exhibiting greater social and cultural homogeneity tend to exhibit greater affinity towards community participation. Leadership: communities with able leaders can be mobilized more easily.
- 1.4 Presence of facilitators: the existence of creative facilitators, such as NGOs, with a history of involvement in the community can accelerate the participatory process.
- 1.5 Enabling government: the government should not threaten or interrupt the participatory process but it should provide great impetus to participation.

# 2. Level of Participation

In application of participation process to coastal fisheries resource management, a study must be conducted and a spectrum of participatory approach must be visualized which is indicative of the range of possibilities that can be adopted in new coastal fisheries management. It depends on ecosystem, socio-economic and political conditions which vary from country to country. This spectrum can commence with consultation, then move towards involvement and end at empowerment which can be explained as follows:

- 2.1 Community consultation relates to management since it promotes the respect of each other. It also helps to remove the barriers of mistrust and suspicion which exist between communities and government organizations.
- 2.2 Involvement of the community in the planning and implementation of management measures ensures resource sustainability.
- 2.3 Empowerment of the community to manage the resource will contribute to a more realistic, cost-effective and decentralized

management regime in which rights and responsibilities are allocated such that it becomes cooperation between stakeholders which is a pre-requisite of management. It is a so-called co-management, the creative partnership in which rights, aspirations, knowledge, resources and responsibilities of all parties in the partnership can be fully respected and enhanced.

# 3. The Case Study

In implementing community-based fisheries management in Thailand, pilot projects are undertaken in the coastal areas of the Andaman Sea and the Gulf of Thailand. The result of the experiment will be used for adjusting management methods and regulations to determine future fisheries management plans. The pilot project in Sikao Bay in Trang province is the case study for examining the differences and the difficulties of awareness building and participation of the communities which are the fundamental factors or essential conditions in community-based fisheries management.

# State and Problem of Resource Utilization in Sikao Bay Area

Sikao Bay in Sikao district of Trang province is the location of traditional fisheries communities which engage in fish catching and aquaculture. The communities comprise of 14 villages, 1,790 households and 9,099 people. Previously, fishery was the main occupation of these communities using simple own-made fishing gears. Fisheries resources were plentiful since there were numerous mangrove forests. Sea grass and coral reef were also in good condition. Most fisheries output were used for household consumption and the rest were processed and bartered for agricultural products from nearby communities.

The transition of resource management can be summarized as follows:

<u>First period</u>: Prior to the second World War, Chinese people who migrated from Malaysia set up a business for exporting mangrove bark which create the need for labour employment. The fishermen were motivated to be hired labour for peeling of the mangrove bark. This business was shut down when the second World War had taken place.

Second period: After the year 1941, National Forestry Act was promulgated and mangrove foresting was permitted. There were concessions for foresting in Sikao Bay area which create labour employment for cutting wood to serve charcoal industry. Fishermen were then turned to be hired labour in charcoal factory.

Third period: During the year 1982-1986, the depletion of mangrove forests, which leads to the decrease in woods for charcoal industry, and the establishment of fish traders, who provide credits on fishing gears and equipment to the fishermen, motivated the fishermen back to fisheries.

At the time when the fishermen got back, the fisheries resources were no longer plentiful because the coastal mangrove forests were deteriorated after the concession. Meanwhile, coastal fisheries resources were also destroyed by illegal fishing, for examples, using fishing gears such as push net and small trawler in restricted area, the area within 3 kilometers from the shore, or using explosive or poison which substantially decrease the number of coastal marine animals to critical level. As a consequence, fishermen had to modify their fishing gears efficiently and sail further away from the shore which causes daily fishing time to increase. Finally, most fishermen inevitably had liabilities to fish traders and had no freedom in decision making. These direct impacts from the deterioration of coastal resources occurred in almost every coastal communities in Trang province especially fisheries communities in Sikao Bay area which engage in fisheries only.

# Starting Point of Awareness and Participation in Resource Management

During that period, the NGOs came in and played and effective role as advisor and coordinator between government organizations and communities. It created the confidence of the communities on problem solving by their own. Prior to the year 1985, some communities in Sikao Bay attempted to conserve coastal resources including fisheries resources, mangrove forests, sea grass and coral reef since they realized that destructive use of resources would cause long-term problems to individual and communities. Resource problems motivated conservation awareness and participation in resource management. Therefore, most fishermen in the communities refused to use destructive fishing gears and started to resist those within or outside the communities who use such fishing gears.

Community awareness motivated the communities to manage the resources in Sikao Bay area by their own commencing from the conservation of mangrove forest in surrounding areas which was done by cooperating between community religion leaders, forestry officers and foresting concession beneficiaries. Until the year 1984, most forests were exploited and rapidly deteriorated leading to the intrusion to restricted forests. The protection and suppression induced the killing of a community leader so the forest conservation had to be ceased. Meanwhile, coastal resource conservation was operated by campaigning, begging, prohibiting and constructing sea to prevent coastal fishing by trawlers.

The community effort to conserve the resources was not successful due to some difficulties. Firstly, the communities had no legal rights to protect or manage the forests since the foresting was legally conceded to the private. Secondly, the law is not effectively enforced in some respects, for examples, there are illegal wood cutting in the conceded area and illegal fishing in the restricted area. Thirdly, the community organizations have not yet been strengthened so their bargaining power is not recognized. Moreover, some people in the communities still exploit the resources or protect the interest of the groups outside the communities so the community resolution about resource conservation is not unanimous and the communities operation is on their own without support.

# An Adjustment of Community Participation Process for Coastal Resource Conservation

Having experience from resource conservation in early stages, the community leaders can visualize the root of problems so they adjust their operation process in order to get more realistic solutions. The NGOs start implementing community development extension activities in 7 fisheries communities in Sikao Bay.

At the beginning, the emphasis is placed upon the establishment of community groups to solve specific problems such as powered boat acquiring group to assist fishermen in owning factor of production, fish culturing group to increase fishermen income and oil trading group to reduce oil price and other product price in the village. The concrete results make the role of community leaders more acceptable. The groups of community leader are then gradually developed to be community organizations having meeting and activities regularly.

In 1991, NGOs extended the operation to another areas in Trang province with the support from government organizations in the province and the central administration. The discussion and exchange experience between community leaders of Sikao Bay area and the extended area enable people in the extended area to quickly understand the problems and solutions and then participate in coastal resource conservation. The outstanding activities are as follows.

# 1. Community Mangrove Forest Management

Commencing from a village with the area 587 rai, the project is extended to another 6 villages during the year 1990-1992. The extension of community mangrove forest is initiated from the consultation of people in the communities. In fact, every village would like to have their own community mangrove forest but only 6 villages are implemented. According to the community leaders, the problems are the unclear government policy and the government regulations which discourage people to conserve the forest. However, after the seminar between community leaders from 75 villages, forestry officers, NGOs and government officials from the province and central administration, there is an agreement that forestry officers will cooperate in verifying mangrove forest for the villages who would like to have community forest. Meanwhile, Trang Provincial Office will incorporate the agreement to provincial development plan and NGOs, together with other concerned organizations, will cooperate in implementation which consistent to people demand.

# 2. Sea Grass and Fishing Ground Conservation

For the rehabilitation of fishing ground to be complete, sea grass, situated next to mangrove forest, has to be rehabilitated too. This is because sea grass is depended on by marine animals and it is also a fishing area. At that time, sea grass has been widely destroyed by trawler and push net. Initiated by the fishing communities surrounding Sikao Bay, sea grass conservation activities are then organized during the year 1991-1992 with the support from various organizations

including educational institutions and government organizations such as the Royal Forestry Department, the Department of Fisheries and various foundations. To conserve sea grass, fisheries using trawl net, push net, lift net, block net and surrounding net must be completely prohibited within 3 kilometers from the shore. In addition, the villagers must be empowered to manage the village territorial water so that they can supervise along the seacoast effectively.

Since 1991, Sikao Bay and nearby areas have been free from destructive fishing gears. Even though there are some fisheries using push net, lift net and block net, the situation is under control. Meeting and discussion between communities are conducted regularly. There are several concrete results from the conservation such as the recovery of sea grass, the increase in the number of coastal marine animals, the increase in the number of simple traditional fishing gears resulting from the alternation of fishing gear size. Finally, coastal villager thought of sustainable fisheries become more distinct.

# Changes after Co-Management

# 1. Physical Change

There are concrete results from the conservation during the last few years. Firstly, the expansion of sea grass area for more than 100 rai in Sikao Bay alone and more than 50 rai in nearby areas. Secondly, the number of community mangrove forest increases from 1 forest covering the area 587 rai in 1989 to 6 forests covering the area 3,057 rai in 1993. There are also the potential areas for another 65 community forests covering the area 27,163 rai. Lastly, the number of coastal marine animals increases including Swimming Crabs, Squids, Breams, Sergestid Shrimps, Grouper and Snappers which are available along the coast and can be caught by simple fishing gears such as hand line, trap, crab hook and scoop net.

#### 2. Income Distribution

More fertility of the sea enhances more caught fishes, lower fishing costs and higher income. It provides and incentive to people who are never interested in resource conservation to get involved since they realize the benefits from participation. The results are concretely visualized and beneficial to all parties concerned.

# 3. Democratic Process at Community Level

Conservation awareness and working experience including discussion, exchange of ideas, sharing the responsibilities, connection between coastal communities to protect the territorial water obviously demonstrate community power and role in public interest protection. In addition, the success of community-initiation and self-reliance operation draws more attention of government organizations to community development.

### 4. Cooperation and Learning Mean

Coastal resource conservation activities are mean of cooperation and learning between government and private operation and coastal fisheries communities. It encourages understanding and trust and could be a mean of continuous cooperation in the future.

# 5. Policy Responses

Sustainable coastal fisheries community development is recognized and utilized as a model for another communities in the province. The province sets up plans and budget for conservation of several coastal resources including mangrove forest, sea grass and coral reef.

In addition, the province supports the fishermen in the area by strictly suppressing the violation of fishery law. Trang Provincial Fisheries Office prohibits some more fishing gears in response to people demand. Government organizations provide more cooperation to the communities, for example, the establishment of additional village patrol.

#### 4. Conclusions

The result from awareness building which brings about the participation in coastal resource conservation of fisheries communities in Sikao Bay and nearby areas in Trang province has been successful locally. The advice and consultation from NGOs and the involvement of government agencies from different sectors contribute to the success of conservation and resource management activities to some extent. Nevertheless, the essential successes which are the prerequisites of community-based management are 1) the awareness of fisheries communities as the owner of coastal resources including forestry and fisheries resources which makes them realize that the resources will be longer utilized if they are properly managed and 2) the establishment and development of community organizations.

The operation mentioned above is only a part of essential conditions which must be established within the communities by the cooperation between the government and NGOs. Moreover, the government must take part in decentralization and law amendment so as to empower the communities to manage the resources. Regulations on resource management within communities must be initiated by the communities. The regulations should be flexible so that they can be modified according to the situation with minimum complexity of legal process.

Therefore, the implementation of community-based fisheries management should follow the project in Sikao Bay area but it has to be adjusted according to the geographical condition, fisheries resource status and socio-economic condition of the area. The government should support from the beginning in terms of budget, equipment, facilities and academic advice for the success of the project and the maximum achievement of the objectives.

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# ATTITUDE OF SMALL-SCALE FISHERMEN TOWARD THE FISHING RIGHT SYSTEM IN CHANTABURI PROVINCE

by

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#### ABSTRACT

The main theme of the study was to understand the attitude of small-scale fishermen to the fishing right system and the factors influencing their attitude to it in Chantaburi Province. The perception of information of the small-scale fishermen was also determined together with their relationship and attitude toward the fishing right system. The study area was Chantaburi Province in the Eastern Part of Thailand. Data were collected randomly from 300 selected fishermen of 4 Sub-Districts in Chantaburi Province during May, 1995, using personal interview schedules in one on one situations. Product Moment Correlation Coefficient (r) has been used to define the correlation among the variables. Findings showed that 79 % of fishermen agreed that the system will ease the conflict problems between them and the commercial fishermen. Data also showed that the fishermen believed that the system will lead to fishing cost reduction and an increase in their catch. 82 % agreed to take responsibilities on conserving and managing the fisheries resources while 79 % agreed that the government should continue law enforcement. The majority of them also agreed that the government should urgently issue laws and regulations that are required for the system and most of them accepted the need to establish a fishermen group. 74 % of them had an intention to participate in the activities of the group. The 'r' values indicate that the perception of information was highly significantly related to the attitude toward the system.

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#### 1. Introduction

The marine fishery industry of Thailand has been playing a significant role in supplying high grade animal protein, creating employment, encouraging related industries, creating a high gross domestic product and additional foreign exchange earnings for the Thai people. While this type of the industry has been rapidly developed during recent years, the Thai marine fishery has also encountered difficulty as its fishery resources have been heavily exploited and this has resulted in a state of depletion. In seeking new fishing resources, some large-scale commercial fishing fleets have set themselves to fish legally and illegally in the waters off the neighbouring countries, although the practices became operational both under a series of fishing agreements and joint venture fishery programmes.

However, there is still a large proportion of the Thai commercial fishing boats remaining to fish within Thai waters and who compete with each other in exploiting these very limited fishery resources. They sometimes encroach upon the prohibited 3-km area from shore. In this respect, the small-scale fishermen who engage in fishing along the coastal areas have suffered strong adverse affects from this practice. The present small-scale fishermen have thus inadequate resources to exploit for their living and livelihood. The conflict among groups of fishermen over the available resources is therefore a critical and growing problem. From an analysis point of view, the small-scale fishery can collapse, if the problems are left unattended.

The Department of Fisheries of Thailand (DOF) has realized this critical situation and has tried to impose several management measures, such as area and seasonal closures, gear restriction, mesh size limit and limited entry, aiming to solve these problems. However, since these measures have not made any progress in overcoming the problems, the DOF has therefore broadened its policy by welcoming new initiatives from fishermens' participation in the decision making process. The new open policy for the management of small-scale fishery has therefore been established under the fishing rights and community-based fishery management scheme aiming to alleviate the problems of severe depletion of coastal fisheries resources and the growing conflict among different groups of Thai fishermen. Through this scheme, the small-scale fishermen will be granted exclusive rights to utilize the fishery resources in their fishing grounds. They will also have responsibilities in managing the coastal fisheries resources which are not common properties by themselves. The sustainable development for the small-scale fishery sector is believed to be possible through the management of these owner groups.

In order to encourage and support this new concept of coastal fishery management, a series of important data on socio-economics and attitudes of fishermen are required to assist policy-makers of the DOF in the planning and implementation processes. The project on the attitude of small-scale fishermen towards the fishing rights system originated by SEAFDEC researchers in cooperation with Kasetsart University is therefore necessary for the new management policy aiming to benefit the Thai small-scale fishery sector.

# 2. Objectives

The objectives of the study were as follows:

- i) To study the attitude of small-scale fishermen towards the fishing rights system; and
- ii) To study the factors influencing the attitude of small-scale fishermen toward the Fishing Rights System; and
- iii) To study the socio-economic conditions of small-scale fishery households in Chantaburi Province.

# 3. Methodology

# Study Area and Data Collection

The study area was Lamsingha District of Chantaburi Province which is located in the Eastern Part of Thailand (shown on map).

The targeted population for the study are small-scale fishermen. The sample fishery households were from the fishery households in Lamsingha District by the cluster random sampling method using Sub-districts as cluster. In each cluster, the small-scale fishery households were selected by a simple random sampling method. In total, 300 fishery households were selected as the representatives of the fishery households in study area.

The data were collected by interviewing through a structured personal interview schedule. The questionnaire was tested with some fishery households as a pretest before use with the target group. The data were collected during 7 to 15 May, 1995.

# Variables of the Study

The structure of the questionnaire can be divided into three parts i.e., Socio-economic conditions, Perception of information and Attitude of small-scale fishermen toward the Fishing Right System. In this study, the work on attitude is a problematic variable which was defined as the dependent variable. On the other hand, Socio-economic conditions and Perception of Information were defined as independent variables of the study.

# Definition of Some Key Terms

Attitude: It is a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related. (GORDON W. ALLPORT, 1935)

Attitudes have three components: a) cognitive component, b) affective component, and c) behavioral component.

**Small-scale fishermen:** The fishermen who utilize the coastal areas as their fishing grounds for capture/coastal aquaculture by using boats less than 10 gross tons (or length of boat less than 12 meters) and use fishing gear as follows: Gill nets and encircling gill nets groups, Stationary nets groups, Small push nets and other moving gear groups, Small trawl groups and Hook groups.

**Fishing Right:** Thailand Department of Fisheries defined the Fishing Right System as a kind of a property right, by which fishermen will have exclusive rights to use the sea areas and resources, which have been specified in each fishing right. In this system, a Territorial Use Right in Fishery will be granted to a fishermens' group based on a legal framework (law) established by the government. With the Fishing Right System, fishermen themselves may create their own fisheries management systems, which should result in the conservation of fishery resources as well as an improvement to their income and living conditions.

#### Data Analysis

The collected data were analyzed by the SPSS PC+ (Statistical Package for the Social Sciences). The analysis is composed of two parts using Descriptive Statistics and Inferential Statistics. Mean, standard deviation and minimum/maximum scores were obtained for Descriptive Statistics. The Inferential Statistics which were used for the study on relationships of the attitude of respondents toward the Fishing Right System with the perception of information were computed using Pearson's Product Moment Correlation Coefficient (r). One percent level of probability has been used for accepting or rejecting the observed 'r' value.

#### 4. Results

# 4.1 Socio-economic Conditions of Fishery Households

Data and information were collected from a sample of 300 fishery households in Laemsingha District, of which 124, 26, 66 and 84 samples were collected from Paknam Laemsingha, Bang Srakao, Bang Krachai and Koh Prued Sub-districts, respectively. The outcome of the study is as follows.

# 1) Sex and age

The head of the households was the target for interview and in the case that the household head is not available, the housewife was interviewed on behalf of her husband. In some cases, the head is female because she is single, widowed, divorced or separated. From the total interview samples it was found that 85.7 per cent were male and the remaining 14.3 per cent were female.

Regarding the age of small-scale fishermen in the study area, it was determined that the majority (76.7%) were in the age range 26-55 years, of which 30.3 per cent of the total were in the range of 36-45 years. And 25.7 and 20.7 per cent of the total were in the age range of 26-35 and 46-55 years, respectively. The eldest fisherman in the study area was 81 years old, whereas the youngest was 16. It is a fact that the small-scale fishery is a livelihood mainstay for the people who live along the coastal areas. The small-scale fishermen have very low job opportunities owing to their lack of education and experience. Thus, they have to rely on the fishery sector for their survival.

#### 2) Education

Thai fishermen are similar to other farmers of the country in that they have less opportunity for formal education due to the low income of their families. Although, they have much experience in fishing since they have been trained by their relatives and ancestors. But they lack sufficient knowledge for breaking the vicious circle. Therefore, the government has to provide informal education for the small-scale fishermen and formal education for their children.

The study showed that 73.7 per cent of the total had finished primary school (4 years) and 20.7 per cent had passed to the second level of primary school (6 years). The remainder never attended school or graduated higher than primary school.

# 3) Martial status

In general, Thai people after they marry, they hardly ever divorce because by their belief that it will bring social shame. Thus, it was found that 85.7 per cent of the total number of fishermen are married and live together with their families. Only 9.7 and 4.7 per cent of them were single, divorced or their spouses had passed away.

#### 4) Social activity participation

Owing to the long history of Thailand as a monarchy, Thai people are good followers but hesitate to participate as a leader of any social activities. Therefore, it is very hard to find a good leader in any fishing community, the fishermen prefer to be followers.

The study has confirmed the above beliefs, only 0.7 per cent of the total fishermen were head of the village, 1.7 per cent were members of a volunteer group and 5.7 per cent were members of a village, or sub-district committee. 92 per cent of small-scale fishermen did not participate in any activity groups, they are only willing to be followers.

# 4.2 Fishery Activities

Fishery is comprised of capture and aquaculture. The small-scale fishermen may engage in capture fishery, or aquaculture or capture cum aquaculture. In practice,

the fishermen prefer capture to aquaculture because they could earn money on every fishing trip, whereas, they have to wait for a period of time to earn money from aquaculture. 67.0 per cent of the fishermen in the study area engaged solely in capture fishery and 21.3 per cent engaged in capture fishery and aquaculture. Only 11.7 per cent of them engaged in aquaculture alone.

In future, the percentage engaged in aquaculture may increase owing to the development of coastal aquaculture, i.e., fish cage culture, shellfish culture, etc. This may also be influenced by the depletion of coastal fisheries resources.

# 1) Fishing boats

The small-scale fishermen in Thailand engage in fishing, some without boats or with non-powered boats, some with out-board powered boats or small in-board powered boats (less than 10 GT). At an early stage of marine fishery development in Thailand, most of the small-scale fisheries used non-powered boats and changed to out-board powered boats later on.

70 per cent of the small-scale fishermen in Laemsingha District used out-board powered boats, whereas, 21.3 and 5.3 per cent used in-board powered boats and non-powered boats, respectively. There were only 3.3 of them engaged in fishing without boats.

# 2) Fishing gear

The small-scale fishermen mainly use small scale and low catch efficiency gear. The fishing gear mainly employed can be divided into two categories, i.e., stationary gear and mobile gear. In practice, the fishermen may used one type of gear or more than one type of gear. However, there is a fishing gear that fishermen use as the major gear and use others as minor gear. The major gear contributes the main portion of fishermens' income.

The study revealed that 86 per cent of capture fishermen in study area used single gear group and the remaining 14 per cent used combined gear groups.

# 3) Fishing ground

Owing to the types of boat and fishing gear employed by the small-scale fishermen, the main fishing grounds are limited to the shallow waters, i.e., in the river, river mouth or coastal areas.

The fishermen in Laemsingha fish mainly in the river (47%) and inshore areas (35%). Only 8 and 7 per cent fished in the river mouth and offshore. Thus, it may concluded that the small-scale fishermen close to their communities.

# 4) Experiences in fishery

On the study of experiences, the results showed that the majority of fishermen in Laemsingha District had experience in fishery. Only 4 per cent of them did not have experience in capture fishery, but 2 per cent who are engaged in aquaculture did not have experience in aquaculture. Because aquaculture is only newly accepted by the fishermen in this area, there were very few fishermen who had engaged in aquaculture in the past.

Most of the fishermen had 1-10 years experiences in capture fisheries and aquaculture. Some fishermen had experience of less than 1 year because they were newcomers. 55 years was the longest experience for capture fishery, whereas, 50 years was the longest for aquaculture.

# 5) *Income from fishery*

The income of small-scale fishermen varies from season to season. The monsoon season provides low income to fishermen because their fishing days are limited.

The sources of income of fishermen in Laemsingha District were mainly from fishery. The majority of small-scale fishermen in the study area (65.2 %) had income solely from fishery. The remaining 22.4 and 12.4 per cent had income from fishery as a major and minor source of income, respectively. It may be concluded that 65.2 per cent of the fishermen were full-time fishermen; 22.4 per cent were major part-time fishermen and 12.4 per cent were minor part-time fishermen.

# 4.3 Perception of fisheries information

For the development of small-scale fishery as well as for the fishing rights system, the planners have to know how, and from whom, the fishermen obtain fishery information. This will be a guideline for planners to establish an appropriate fisheries information transfer plan.

The study showed a significant figure, 76.0 per cent of the fishermen, never received any fisheries information from fishery officers. It was also found that 97.3, 92.0, 88.0 and 76.0 per cent of total fishermen never received any fisheries information from the teacher in the village, government officers (excluding fishery officers), village committee members and village heads, respectively. The main sources of information for fishermen were television (76.7%), neighbors (73.3%) and family members (48.3%).

Regarding the frequency of fisheries information reception, the fishermen who received fisheries information from the mentioned sources received it only once or twice a year. Very few fishermen received information weekly or monthly. They also received information from television only once in 2-3 months. However, the fishermen

received information from their neighbors weekly and from family members almost daily.

Results from the study on the perception of the fishing rights system showed that 85 per cent of the fishermen had no knowledge on this issue. The remaining 15 per cent had never heard of the fishing rights system through fishery officers who are the first hand information source for them and other sources of information except other government officers, neighbors or relatives. This confirmed that the fishermen still lack understanding on the fishing rights system.

# 4.4 Attitudes of Small-Scale Fishermen Towards the Fishing Rights System

As the main objective of the study, the attitudes of small-scale fishermen in Laemsingha District on the fishing rights system were obtained. The outcome of the study is as follows:

# 1) Solving conflict problem

As mentioned earlier, owing to the coastal fisheries resources depletion problem the fishermen have to compete with each other in fishing and this leads to conflict between them. By assumption, the fishing rights system will solve the conflict problem. The study found that 79 per cent of the fishermen agreed that the system will ease the conflict problems between themselves and commercial fisheries, 50 per cent were agreed strongly. Only 11 and 10 per cent of them were undecided or disagreed.

# 2) Fishing cost reduction

Theoretically, the fishing rights system is a mechanism to enrich the coastal fisheries resources. The fishermen need not spend more time in fishing leading to a reduction of fuel cost. In addition, the fishermen can catch more fish with the same type of fishing gear, thus the fishing cost per unit of fish will be decreased.

The study showed that the fishermen believe that the fishing right system will lead to fishing cost reduction and their catches will be increased. However, there were 21 per cent of the total fishermen were not assured that the fishing rights system can reduce their fishing costs. 24 per cent of them were not assured that the fishing rights system can increase their catches. Around 30 and 20 per cent of them did not believe that the system can reduce fishing costs and increase their catches.

# 3) Responsibilities of fishermen

In the fishing rights system, the small-scale fishermen have not only the fishing rights but also they have responsibilities in managing the fisheries resources in their territory. Thus, the fishermen have to accept these responsibilities otherwise the system can not develop.

82 per cent of the fishermen in the study agreed to take responsibilities for conserving and managing the coastal fisheries resources. However, 79.7 per cent of them agreed that the government should continue law enforcement because at present there is no law that authorizes the enforcement power to fishermen.

In practice, the small-scale fishermen have an awareness on conserving the fisheries resources more than commercial fisheries. The income of small-scale fishermen is strictly dependent upon the coastal fisheries resources in the fishing grounds that they have fished for many decades. They can not fish in the fishing grounds far away from home owing to the limitation of their fishing boats and fishing grounds that they employ. In contrast, the commercial fishermen can go to any fishing ground where fisheries resources are available. Thus, they pay very little attention to conserving the resources.

# 4) Laws and regulations for the fishing rights system

The opinions of fishermen on the relevant laws and regulations for the fishing rights system were obtained in the study. The majority of them agreed (39%) and strongly agreed (37%) that the government should urgently issue laws and regulations that are required for fishing rights system implementation. Almost all of the fishermen were not certain that the present fishery law is applicable for the system.

For capture fishery, 65.8, 54.9 and 53.1 per cent of the total fishermen required regulations for fishery management measures on areas and seasonal closures, gear restrictions and limit of the number of fishing gear and size of boat, respectively.

For coastal aquaculture, the majority of the fishermen need not have any regulations. However, there were 47.7, 34.6 and 29.7 per cent of the total who wanted to have regulations for culture areas, culture methods and species cultured, respectively.

# 5) Fishermen group formation and participation

As the government has to grant the fishing rights to a group of fishermen not to individual fisherman, the fishermen must join together to form group, cooperatives or any other society and register as a juridical body.

From the study, it was found that most of the fishermen accepted establishing a fishermens' group. However, there were different opinions on selecting the fishermen to be members of the group that would be the juridical body to obtain the fishing rights from the government. Only 27 and 20 per cent of fishermen strongly disagreed and only disagreed on members who will be selected by government officers. Whereas 26.3 and 17 of them agreed or strongly agreed on members who will be selected by government officers.

For the participation in the activities of the group for the development of the fishing rights system, 74 per cent of fishermen had an intention to participate, whereas, 20 and 6 per cent of them were not decided or would not participate, respectively. However, only 3.1 per cent of them had intention to participate as a member of the managing committee. The remainder preferred to be members of the group only, they don't want to be concerned with management of the group.

The study also found that the activities that the member had an intention to participate in were group formation (34.5%), comments on fishery management programme (34.2%), financial support (50.0%), labor force (34.3%) and follow-up of the fishery management programme (35.3%). For attendance of the meetings, only 30.4 per cent of them had the intention of attending every meeting.

4.5 Relationship of the Perception of Information with the Attitude of Small-scale Fishermen toward Fishing Right System and its Components

Pearson's Product Moment Correlation Coefficient (r ) values among the independent variable- Perception of Information and the dependent variable - the attitude and its components are presented in the Table below. The 'r' values from the Table clearly indicate that the independent variable was significantly related to the attitude of the respondents.

Table - Relationship of the Perception of Information with the Attitude of Small-scale Fishermen toward the Fishing Right System and its Components

Attitude and its components	Independent variables: Perception of Information Correlation coefficient 'r'		
Attitude	0.3225**		
- Cognitive	0.3343**		
- Affective	0.2012**		
- Behavioral	0.1458*		
* Significant level	= 0.01		
** Significant level	= 0.001		

The Perception of Information were positively correlated with the attitude towards the Fishing Right System at a highly significant level. The Perception of Information was positively correlated with the Attitude components - Cognitive and Affective at a highly significant level while Behavior was positively correlated at a significant level only. This indicates that a positive attitude towards the Fishing Right System increases with an increase of the Perception of Information of small-scale fishermen.

#### 5. Conclusions

The fishermen in Laemsingha District are faced with the same problems as other small-scale fishermen in the country. The most severe problems are coastal fisheries resources depletion and the conflicts between small-scale fishermen and commercial fishermen. Thus, the Department of Fisheries has a plan to introduce the fishing rights for the coastal fishery management programme in order to solve those problems. From the study, it was revealed that in the general view the fishermen agreed to develop this system in their coastal areas. However, for development of this system in the study area the DOF should consider the followings.

- 5.1 The present laws and regulations are not applicable for the development of the fishing rights system. The fishermen ask the DOF and agencies concerned to issue relevant laws and regulations. However, the fishermen should have an opportunity to participate in the law and regulation issuing process.
- 5.2 At present, the fishermen have a limited knowledge on the system. Therefore, DOF must use all of the available methods to educate the fishermen on the concepts of the fishing rights system. In addition, the government officers who are concerned with the system should have a common understanding of the concepts of this system in order to give the right direction of development the system.
- 5.3 The fishermen need some assistance from the government in terms of education and financial support of fishermen group activities. The fishermen still lack knowledge and experience in group activities, particularly activities under juridical body conditions.
- 5.4 Under the fishing rights system, the fishermen take full responsibility for the management of their fisheries resources and the DOF will act as their advisors. But the fishermen in the study area still need law enforcement practiced by the DOF because at the initial stage the fishermen have no capability of enforcement. Therefore, the DOF should continue to provide more patrol boats for law enforcement practice in the coastal areas when the fishing rights system is introduced in order to assure the fishermen that the commercial bodies can not enter into their coastal areas.

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# PERCEPTIONS, VALUES AND ATTITUDES OF FISHERFOLK AND OTHER COASTAL STAKEHOLDERS TOWARDS OWNERSHIP OF FISHERIES RESOURCES AND ITS EXPLOITATION, MANAGEMENT AND SUSTAINABILITY

by

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#### **ABSTRACT**

This paper describes and discusses the values, perceptions and attitudes of fisherfolk and other coastal stakeholders towards ownership of fisheries resources and its exploitation, management and sustainability. It reports on the significant changes and shifts in these values, perceptions and attitudes from the old to the new generation of fisherfolk. Such changes and shifts in values, perceptions, attitudes and mode have been brought about through the spread of awareness and enlightenment of environmental consciousness.

#### 1. Introduction and Background

Of the 200 fisheries monitored by the UN FAO Fisheries Department, a third has been overfished or depleted, mostly in the developed countries. A good case in point is the fisheries off the United States of America. In spite of the Magnuson Fishery Conservation and Management Act of 1976 which provides for the establishment and financing of regional fisheries management councils to oversee its implementation, American fish stocks have slowly been overfished and depleted. According to Moseley (1996), 34 % of U.S. fish stocks are utilised to the maximum safe limit and 23 % are overutilised. With 300,000 fulltime fishermen, manning a fleet of 100,000 boats, fishing contributes more than US\$25 billion a year to the U.S. economy.

This alarming situation is not entirely different in the developing countries where there are generally no restrictions on the number of fishermen and/or boats entering the fisheries. Many of the new entries are generally non-bona-fide fishermen with access to capital who wish to capitalize on the growing insatiable national and global demand for fish. There is already today a widening supply-demand shortfall of at least 30 million tons of fish a year. According to Garcia (1996), fish consumption in Asia is growing faster than in any other part of the world and will account for more than half the demand in 2010.

It is therefore quite clear from the size of the American industry alone, and elsewhere where fisheries support the economic fabric of the national economy, the different prevailing perceptions, mood and attitudes of the government and industry towards present and future exploitation and management of the fisheries. There is now clearly a real and urgent need not only for new regulations curbing or restricting its primary activity but also to rigorously implement and enforce them.

Long used to a system of fishing and mode of production where drastic curbs were relatively unheard of or even unknown, the new requirements to protect and manage fisheries and other coastal resources would not be readily nor easily accepted with open arms by the industry. There was and still is growing resistance towards protection and management of the resources and their habitats. But protection and management do not mean no fishing. The latter is slowly being understood and appreciated by growing number of people in the industry and government. Past and ongoing effort at creating, building, increasing and spreading greater awareness on the need for, benefits and approaches and methods of fisheries management is paying off.

#### 2. Adequacy of "Knowledge" to Manage the Fisheries

There is today general consensus among all the countries, developed and developing that overfishing is a serious problem and should be avoided but not enough or very little is done to prevent it. Many reasons can be cited for it; suffice to say that we have long passed the time where we need to show that overfishing is taking place or even get "bogged" down discussing the nature of the problem. The level of awareness on the need for fisheries management is already high, even among fisherfolk. Recent field surveys revealed that such awareness has not been capitalised upon to bring about badly needed changes in producer and consumer behaviour in responsible fishing (production) and consumption due to a lack of understanding and appreciation on the need for, benefits and methods and approaches of practical and enforceable fisheries management ideas, measures and grassroot activities/actions.

In spite of certain inherent limitations and weaknesses, our present state of knowledge, statistical databases and models derived from scientific theory, research, experiences and lessons learned from past management of fisheries, as well as indigenous knowledge passed down from one generation to the next, is adequate to manage the fisheries. In other words, the precautionary approach to fisheries management can be adopted without delay and prejudice. Both government-driven top-down and traditional community-based bottom-up fisheries management activities can be imaginatively combined to bring lasting positive impact of management effort not only on the fishing communities but also the resources and habitats.

Further, fisheries management intervention is also adequately provided for and covered by existing government policies and legislations in many countries, including necessary budgetary allocation. The latter perhaps may not be as much as needed to enforce it. At the same time, many of these countries also acknowledge that fisheries management is not easy to implement and enforce, not the least being the meagre budget and humanpower. This is also partly because its implementation and enforcement mean different things to different people.

#### 3. Purpose and Objective of Study

The basic purpose of this study is to describe and discuss the prevailing values, perceptions, attitudes and mood of fisherfolk and other coastal stakeholders towards ownership of fisheries resources and its exploitation, management and sustainability. It is now very clear that the present system of fishing and mode of production are highly unsustainable. Such information can be imaginatively used to assist in the formulation of appropriate government policies and assistance programmes, including the provision of incentives and/or disincentives as the case may be to bring about desirable behavioural changes among fisherfolk and other coastal stakeholders.

Further, the information uncovered from the study is also invaluable in the planning and design of appropriate awareness-building and public education or campaign materials to correct wrong impressions, misconceptions, erroneous or misguided values, perceptions and attitudes of the fisherfolk and coastal stakeholders towards ownership of fisheries resources and its exploitation, management and sustainability, and/or build on and further strengthen those which are positive.

#### 4. Ownership

There is a definite difference in perception between the old and new generations of fisherfolk towards ownership of the fisheries resources they have come to rely on for their daily sustenance and food/livelihood security. While the older generation fisherfolk still has a relatively under- or undeveloped sense of entitlement and ownership of the fisheries resources they have exploited for years, the younger ones are increasingly asserting their entitlement and ownership rights to the fisheries, sometimes bordering on militant tendency to entitlement and ownership claims to the fisheries. This is especially the case when the fishing grounds or fishing areas are in front or close to their settlements or fishing villages.

Open conflicts and clashes at sea or sometimes on shore between and among the different groups of fisherfolk are symptomatic and direct indications of their assertion of entitlement and ownership rights to the fishing grounds and fisheries resources. Different groups of fisherfolk now are increasingly defending their fishing areas and openly keeping others out of the fishing grounds they have fished for years or generations. In fact, the young generation fisherfolk is more vocal and articulate in their views and know their basic rights. They are not keeping silent nor do they want to suffer in silence anymore.

This sense of entitlement and ownership rights to the fisheries has also come about and facilitated or even accelerated by and through government effort at fisheries zoning the sea for different categories of fisherfolk: smallscale artisanal fisherfolk and largescale commercial or industrial scale operators. For example, in Malaysia, the Government under the Fishing Licensing Policy of 1981 has demarcated four different zones:

- (a) Zone A up to 5 nautical miles from the shore which is solely earmarked for smallscale owner-operated fisherfolk
- (b) Zone B from 5-12 nautical miles for owner-operated motorised boats (such as trawlers and purse-seiners) of less than 40 gross tons (gt)
- (c) Zone C from 12-30 nautical miles reserved mainly for motorised vesssels such as trawlers and purse-seiners of more than 40 gt which should be wholly-owned and operated by Malaysian fishers, and lastly,
- (d) Zone D from 30 nautical miles onwards which is opened to foreign fishing through joint-ventures or charter operating deep sea vessels of 70 gt and above.

Of course, the fisheries zoning system or the allocation of fishing areas by types of fisheries and scale of operations came about as a consequence of growing conflicts and clashes between and among the different categories and groups of fisherfolk encroaching on each others' traditional or historical fishing areas. All the same, the sense of entitlement and pseudo-ownership claims to the fishing areas was brought about by such government effort at managing conflicts.

#### 5. Approaches and Methods of Fisheries Management

As can be seen from the above, fisheries management intervention is more at managing conflicts rather than initiating management from the very beginning before problems surface. Fisheries conflicts and clashes among fisherfolk and other stakeholders arise from growing intense competition for fisheries and other coastal resources which are growing scarce with time due to overfishing from growing fishing pressures, rather than proactive management. Such management intervention seems to be the general pattern of management effort in many countries, responding to conflicts and crisis.

Even though it is relatively easy to articulate and clarify what fisheries management is, and the need for and costs and benefits of fisheries management, there is still a lack of consensus on the approach and method/technique to be employed. Experiences with **input** and **output controls** in managing fisheries have so far given mixed results. So far, the lack of more success and positive impact of fisheries management can be traced to the piecemeal approach employed. As a

result, the costs of management and/or the lack of it have been high relative to its benefits and impact. The impact, if any has not been genuinely felt.

While awareness and appreciation on the need for and benefits of fisheries management is now relatively high among fisherfolk and government personnel, and still growing and spreading, there is still a lack of awareness and understanding on the approaches and methods and techniques of fisheries management *per se*. Besides, the perceptions and attitudes of fisherfolk towards fisheries management with all its imposed restrictions, driven as it were from the top and centre must also change from the present negative impressions of the government curbing their freedom, to be more positive and receptive. Similarly, government attitudes towards the poor in general and its attitudes towards the fishing communities which have so far been bypassed must also changed, from one of "the government knows what best for them to one which consults them on matters which directly affect them as well as involving them in arriving at decisions affecting them.

Management intervention and enforcement can be both **punitive** or "hard" and/or **non-punitive** or "soft". The approaches and methods adopted determine the costs and benefits as well as its impact. So far, the hard or punitive approach has been used more extensively, if not exclusively. This is a classic example of the perception and attitudinal problem being discussed here. It is time to employ the **persuasion approach** which is the soft or non-punitive approach. The latter approach is not only more cost-effective, it stands a better chance of working because the fisherfolk and stakeholders are brought into the management process from the very beginning. Because they are brought into the management process from the beginning, they will stay involved from their sense of belonging and pride of ownership of their contribution.

Such involvement and 'staying power' ensure the sustainability of the fisheries management effort and therefore its probability of success. It is also now increasingly acknowledged that the staying power and attention span of many fisheries projects and personnel, including some government policy-makers and planners are short. This is especially true in the case of fisheries management initiatives. These initiatives are seldom carried through to a logical conclusion, let alone in ensuring that the management initiative or reform is **institutionalised**.

The frequent changes in fisheries management and development thrusts and directions, competing and conflicting or incompatible objectives, inconsistencies and contradictions have taken their toll. Because of the short-term nature of such initiatives or intervention, lasting impact is sacrificed. Their impact and benefits, if any are discernible only during the duration and life of the projects, if at all.

Government, non-government and fishing community's interests in and willingness to introduce or re-introduce participatory community-based fisheries or coastal resources management (CBFM/CBCRM) is growing and steadily spreading in many countries. However, such interests must be carefully thought through and

not hastily implemented. The governments must be very clear on the implications of community-based fisheries or coastal resources management. The first immediate implication is whether the governments are prepared and ready to decentralise and share such management responsibility and authority with the fishing community and coastal stakeholders. A few countries have experimented with CBFM/CBCRM and had negative experiences. This is because such co-management has not been experimented or tried in recent times.

There is also little or no clear understanding on the definition of the coummunity in CBFM/CBCRM. Who is the community? As is well known, the fishing and coastal communities are not a homogeneous group; there are the owners of fishing boats who may never set out to sea to fish or are land-based and those who go out fishing; there are also the fishing boat captains, the crew or fishing labour, including the motor boat mechanic or engineer, and the cook. Among them, there are smallscale, largescale, traditional or artisanal and commercial fisherfolk and other coastal resource users, including bystander stakeholders. The community in effect comprises each and every stakeholder in the entire marketing chain/channel, from the fisherfolk who are the primary producers to the final consumers and in between there are market intermediaries such as the middlepersons, money lenders, input suppliers, seafood processing and cold storage operators, the final consumers or customers of fish, etc.

So far, very little is known about the value system, perceptions and attitudes of these different stakeholders towards fisheries, its ownership, exploitation and management. What does each stakeholder respond to? How can each and everyone of them be made to be more caring and protective of natural resources which have provided them with the means and source of their sustenance and raw materials for industrialization and economic wellbeing?

For example, the customers of fish through their purchasing power and disposable income can exercise their consumer rights to bring about and induce responsible producer and consumer behaviour, by voting with their purchases. The prices the consumers are willing to pay or not willing to pay or buy products from unmanaged fisheries can influence fishing behaviour. By not willing to buy gravid females or juvenile fish, they are sending strong market signals to the middlepersons and fisherfolk that there is no longer a market for such unsustainable production of fish. The middlepersons, on their part will stop buying such products to be sold because the consumers are no longer willing to pay for them.

Before, CBFM/CBCRM is introduced, it is important to study the perceptions, values and attitudes of the fisherfolk and other coastal stakeholders towards the ownership of the fisheries and coastal resources and their exploitation, management and sustainability. It is only through uncovering their values, perceptions and attitudes that a working system of CBFM/CBCRM can be implemented with a working probability of success. Consultation and fisherfolk

involvement and participation are necessary in managing a resource such as fisheries because of the open access free entry common property nature of the resources.

#### 6. Attitude Formation and Change

Values, perceptions and attitudes can be shaped, inculcated and moulded. An excellent illustration is the disposal of household waste or garbage. One generation ago, such waste or garbage is just thrown or dumped into a waste receptable to be carted away by the municipal garbage collectors. Today, households are increasingly sorting out their garbage according to those which can be recycled and those which cannot be re-used such as organic and perishables that will have to be dispose off properly because they will decompose and become putrid. Garbage today is increasingly being sorted out and disposed off accordingly. In the past, garbage is garbage. Such was the attitude on waste disposal of the old generation and it has taken a long time for the present positive attitude to evolve to the present state of heightened awareness, consciousness and enlightenment.

#### 7. Concluding Remarks

Fisheries support large populations in developing countries, especially the poor in the rural areas. The perceptions and attitudes of the government towards the poor have been one of paternalistic tendency, best summed up as "government knows what is best for its people".

Recent intervention in the fisheries sector in the form of the introduction and transfer of technological advances and modernisation to improve the standards of living of the fishing communities and other coastal stakeholders has grossly undermined and weakened local pseudo-institutional and community ties. The traditional and customary ties among members of the community and among communities have broke down. In its place, community indifference and apathy have developed. It is time to rebuild and strengthen the sense of the importance of community and communal ties.

To accomplish this, significant change and shift in the value system, perceptions and attitudes of the fisherfolk and other coastal stakeholders towards resource management arising from the spread of environmental awareness are required.

Lastly, concrete effort must also be mounted to help the fisherfolk and their communities to develop more fully their sense of entitlement and/or ownership of the resources they have relied on for generations for their food and livelihood security. Preliminary limited survey results show that the fisherfolk and their communities still have a relatively under- or in some cases undeveloped sense of entitlement and ownership of the fisheries resources they have exploited for generations. This is in sharp contrast to their land-based counterparts who, very

early on initiated appropriation and entitlement to the land and forests they occupied and exploited.

The Bay of Bengal Programme (BOBP) for Integrated Coastal Fisheries Management has spearheaded a regional survey and comparative study on the values, perceptions and attitudes of fisherfolk and other coastal stakeholders towards ownership of fisheries resources and its exploitation, management and sustainability in its seven member countries.

### EFFECTIVE INVESTMENT IN COMMUNITY-BASED INFRASTRUCTURES AS A PREREQUISITE FOR COASTAL FISHERIES MANAGEMENT

by

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#### 1. Introduction

#### 1.1 Importance of Fisheries in the Indonesia Economy

Fisheries plays an increasingly important role in the national economy of Indonesia. Although its share is relatively small to the gross domestic product (about 3%), the sector's socio-economic and nutritional contribution is very prominent. Fisheries provides employment for over 4.3 million fishermen/fish farmers especially in the coastal and rural areas with other substantial additional in handling, processing and marketing activities which is in total represented some 5% of Indonesia's total productive labour force. The sector also supplies about 60% of the total animal protein consumed by the population with a per capita consumption of about 18 kg in 1994. The fisheries sector is as well one of the major foreign exchange earners of the country generating about US\$ 1.8 billion in 1994.

The growth of the sector over the last decade has been steady. The total fish production increased from 2.4 million tons (1985) to 4.0 million tons (1994) with an average annual growth rate of 5.9%. Table 1 shows fisheries production in 1985 and 1994.

Marine capture fisheries contributed 77% to total fish production, followed by aquaculture (16%) and inland open waters (8%) in 1994.

Table 1. Indonesia: Fisheries Production 1985 and 1994

Unit: ,000 Tons

Sub-sector	1985	1994
Marine capture Fisheries	1,821	3,080
Inland Open Waters	269	336
Aquaculture	305	597
Total	2,395	4,013

The sector will continue to feature prominently in the economy of Indonesia as the country is one of the largest archipelagos in the world with vast fishery resource both for capture and culture activities. Its role will be growingly expanded if policies and programmes on sustainable development and management of fisheries are consistently implemented.

#### 1.2 The Purpose of the Paper

The purpose of the Paper is to highlight the importance of and the need for effective investment in community-based infrastructure as a prerequisite for coastal fisheries management on the basis of the Indonesian experiences and situation.

#### 2. The Smallscale Fisheries Development

#### 2.1 The Role and Structure of Smallscale Fisheries

The Indonesian fisheries is dominated by smallscale operations. This operations contribute about 80% to the national fish production. Its importance is even more as it has strong socio-economic and political implications involving over 4.3 million fishermen/fish farmers and fish processors in addition to their families. Table 2 shows number of fishermen/fish farmers in 1994.

Table 2. Indonesia: Number of Fishermen/Fish Farmers in 1994

Unit: Number

Sub-sector	Total	(% of Total)
Marine Capture Fisheries	1,850,200	42%
Inland Open Waters	465,540	11%
Aquaculture	2,064,120	47%
Total	4,379,860	100%

Activities of the aquaculture sector in particular are also mainly smallscale operations where only to a lesser degree the unit sizes are more than 2 ha.

In the marine sector, there were over 390,000 fishing vessels and a large variety of fishing gears in 1994. The fishing vessels are mainly made of wood and small in size. Of these, about 62% are dugouts and non-powered boats, 22% powered with outboard engine and the remaining 16% equipped with inboard engines. The majority of fishing vessels with inboard engine are also small, of which 89% are below 10 GT, 7% of 10-30 GT and 4% above 30 GT. Table 3 shows fishing fleet structure in 1994.

Table 3. Indonesia: Fishing Fleet Structure in 1994

Type/Size	of Boat		No of Units	(% of Total)
<u>Total</u>			396,185	100%
Non-Motor	ized		245,486	<u>62%</u>
Dug-out car	noes		126,800	32%
Plank Boats			118,686	30%
	mall		72,694	
	ledium		36,189	•
- Li	arge		9,803	
Motorized			150,699	38%
Outboard M	lotor		87,749	22%
Inboard Mo	otor:		62,950	16%
less than	5	GT	45,331	
	5-10	GT	9,604	
	10-20	GT	3,376	
	20-30	GT	1,688	
	30-50	GT	1,869	
	50-100	GT	567	
	100-200	GT	340	
more than	200	GT	175	

#### 2.2 The objective of and Policy on Smallscale Fisheries

The Objective of smallscale fisheries development is to improve incomes of fishermen and fish farmers including their families. To this end, during the on-going Sixth Five-Year Development Plan (1994-1998), policies related to smallscale fisheries will concentrate efforts primarily on:

- (i) increasing productivity of coastal fisheries;
- (ii) encouraging the utilization of under-exploited resources;
- (iii) rational management of resources, especially in highly pressure coastal areas;
- (iv) strengthening capacity building of fishermen/fish farmers;
- (v) development of effective fisheries infrastructure; and
- (vi) enhancing institutional capacities of fishermen/fish farmers

These efforts will be supported by improving access to fisheries technology, credit support, private sector participation (i.e. development of nucleus estate and smallholder/NES scheme), promotion of agribusiness development, continued administrative reforms and cross-sectoral joint programmes (such as transmigration programme).

#### 2.3 Trends in Community-based Coastal Resource Management

A part from the increasing contribution that the fisheries sector has made to the economy of Indonesia, over-fishing situation has been reported in a number of marine waters such as the north coast of Java, the east coast of Sumatera and the Bali Strait. In addition, degradation of coastal habitats has contributed to the depletion of the fishery resources. Moreover, the increasing number of new entrants into the fisheries, the continuing influx of fishermen fishing in major fishing grounds and the open access nature of the fisheries have resulted in further deterioration of the coastal environment.

To halt further degradation of the fishery resources and sustain livelihoods of fishermen/fish farmers, the Government attempts to promote coastal fisheries management with the active participation of the coastal community. An effective community-based coastal resource management programme would result in coastal resource regeneration and rehabilitation, reduction in stock depletion, reduced fish spoilage, improved product quality, establishment of alternative source of livelihoods and increased incomes.

#### 3. The Importance of and the Needs for Effective Infrastructure

#### 3.1 Importance of Effective Infrastructure

Effective infrastructure is one of the major requirements for proper fisheries development and management. Such infrastructure may include infrastructure support for: (i) capture fisheries (fishing port, fish landing place, jetty), (ii) aquaculture (aquaculture jetty, collection center), (iii) hand-ling and processing (drying space, storages), and (iv) marketing facilities (transport).

Fisheries infrastructure are expected to:

- (i) facilitate improvement of value-added process of fishery products;
- (ii) ease marketing of fish and fishery products;
- (iii) improve producing and living conditions of fishing communities;
- (iv) enhance the cohesion of fishermen/fish farmers and the local population;
- (v) grow the collective behaviour of fishermen/fish farmers and develop self-help initiatives.

Development of infrastructure should be in such a way that for:

- (i) Those coastal waters with development potential would support further utilization of the resources whereas the facilities would provide adequate services for loading/unloading, mooring, etc.;
- (ii) those coastal waters with high fishing pressure would provide less incentive for fishermen to increase catch, instead better support for handling, processing and marketing would be provided so that fish spoilage would be reduced and fish quality would be improved. Improving value added of fishery products would increase prices of fish sold.

To effectively implement (ii), other factors should compliment such as control over licensing and regulation of fishing gears, as further discussed in Chapter IV.

#### 3.2 The Needs for Effective Infrastructure

Community-based infrastructure should fully recognize specific locality of the fishing community using the infrastructure. The conflict however is that government tends to provide infrastructure support to fishing community that can be expected to generate revenues for local government. In such a situation, although small fishing community has considerable contribution to socio-economic and nutritional goals, they might not be provided with reasonable infrastructure.

In the case of Indonesia, two situation are presented:

(i) <u>isolated /remote and scattered small fishing communities</u> of say, about less than 30 families.

A lot of this type of small fishing communities are found in Sumatera for instance (i.e. Bangka island). The community needs simple jetty, possibly made of wood, to cost about Indonesian Rupiah (Rp.) 15-30 million or even less, on-shore protection shed, drying space, storages within the fishing village.

Similarly in aquaculture activities (seaweed culture) in West Nusa Tenggara for instance, very simple wooden jetty and landing beach have been satisfactorily functioned supported by open space for drying.

As far as the financing, operation and maintenance (O/M) is concerned, there are two alternatives:

- (a) construction and O/M by the fishing community themselves;
- (b) construction by government and O/M by the fishing community.

Fishery officer might be only responsible for catch records. Catch mainly to supply local community and the nearby areas.

(ii) <u>coastal fishing village</u> may have more than 100-200 families.

This is typical fishing community in Java. The community needs fish landing place: possibly of concrete wharf/jetty, access channel, idle berth, processing area, market/auction hall, small ice plant, fresh water supply, power supply, and fish boxes.

Construction and O/M of the facilities by government (local/district authority) in cooperation with fishermen cooperatives. In return, fishermen pay government a fixed percentage out of their total/gross sales.

#### 3.3 Issues

There are a number of issues associated with the development of effective investment in community-based infrastructure in relation to coastal fisheries management:

(i) the key to success is the collective behaviour or self-help initiatives amongst the fishing community. In this relation, the issue of fishermen's organization is very critical;

- (ii) the government's commitment to give greater role to fishermen to have wider control over the coastal resources also remains an important issue in which it requires socialization process right from the top management down to the field administrative level;
- (iii) identification and design of appropriate infrastructure taking fully into account the specific locality and needs of fishing community.

#### 4. Other Factors Affecting Proper Coastal Fisheries Management

A part from the primary importance of effective infrastructure, there are a number of factors that need to be taken into consideration for proper coastal fisheries management. These include:

- (i) limit entry or control over licensing to avoid over-capitalization;
- (ii) reduce fishing efforts in highly pressure waters and promote alternative source of livelihoods;
- (iii) enforcement of regulatory measures;
- (iv) resource enhancement (i.e. promote artificial reef); and
- (v) improve social infrastructure (health care, education/public awareness of common property principle and sustainable utilization of fishery resources).

#### 5. Conclusion and Suggestions

#### 5.1 Conclusion

From the above discussion and experiences, it can be concluded that effective investment in community-based infrastructure is a prerequisite for coastal fisheries management whereas the collective initiatives of the fishing community in the operation and management of such facilities are very critical to the achievement of sustainable development and management goals. To effectively attain the goals, other factors such as control over licensing, reduce fishing efforts and promote alternative source of livelihoods in highly pressure coastal areas should be complimented each other.

#### 5.2 Suggestions

It is suggested that socialization process of the community-based approach to coastal resource management needs to be initiated, from central government down to local administrative level, particularly the self-help and collective initiatives that fishing community should play in utilizing fisheries infrastructure.

Table 1: Number of Marine Fishery Boats by Size, 1994

Units

Boats Size	Number
< 10 GT	49,463.00
10-30 GT	3,399.00
> 30 GT	1,345.00
Total	54,207.00

Table 2: Development of Fisheries Production, 1990-1994

Unit(tons)

Item	Valume Production				
	1990	1991	1992	1993	1994
Marine Capture Fisheries	2,370,107.00	2,537,612.00	2,692.068.00	2,886,289.00	3,080,168.00
Brakhis Water Culture	287,073.00	323,156.00	337,431.00	355,284.00	346,214.00
Others	505,289.00	488,833.00	513,833.00	553,749.00	587,499.00
Total Production	3,162,469.00	3,349,601.00	3,543,332.00	3,795,322.00	4,013,881.00

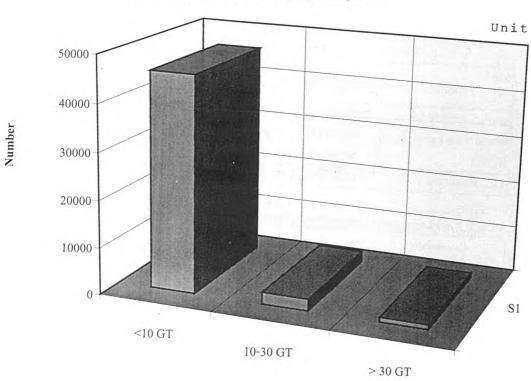
Table 3: Main Commodities Fisheries Export Development, 1990-1994

Commodities	Value				
	1990	1991	1992	1993	1994
Value (1,000 US\$)	941,421.00	1,139,312.00	1,126,229.00	1,374,452.00	1,479,116.00
Shrimp	690,230.00	769,982.00	764,850.00	876,703.00	1,009,738.00
Tuna, Skipjack, Small Tunas	124,748.00	184,426.00	145,968.00	213,819.00	182,200.00
Others Fish	115,771.00	174,371.00	205,239.00	269,029.00	266,151.00
Crabs	10,672.00	10,533.00	10,172.00	14,901.00	21,027.00

Table 4: Main Commodities Fisheries Export Development, 1990-1994

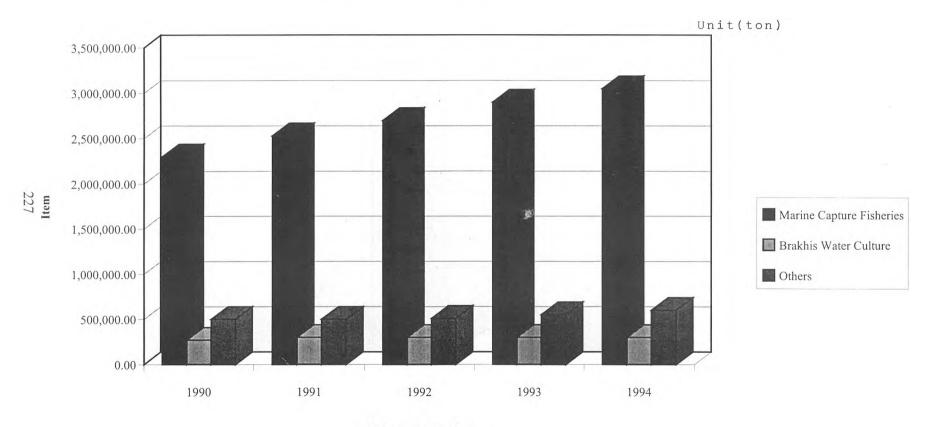
Commodities	Volume					
	1990	1991	1992	1993	1994	
Value (1,000 US\$)	279,767.00	357,962.00	362,100.00	459,507.00	454,350.00	
Shrimp	94,037.00	95,626.00	100,455.00	98,569.00	99,523.00	
Tuna, Skipjack, Small Tunas	72,756.00	103,368.00	73,439.00	92,764.00	79,729.00	
Others Fish	107,851.00	153,061.00	183,513.00	262,093.00	268,214.00	
Crabs	5,123.00	5,907.00	4,693.00	6,081.00	6,884.00	

### Number of Marine Fishery Boats by Size, 1994



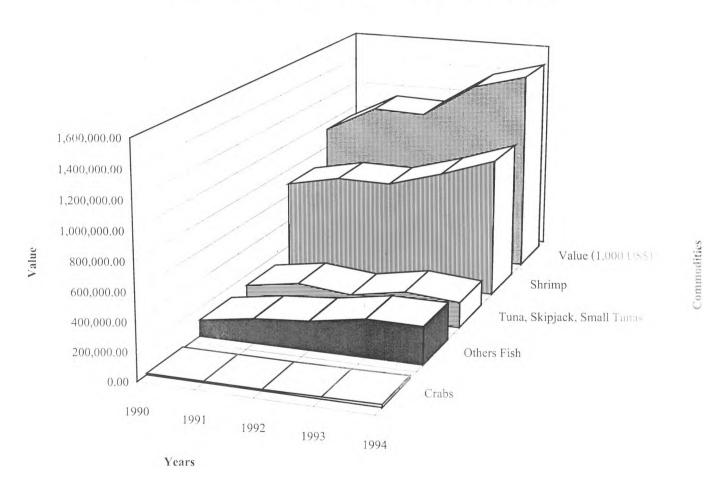
**Boat Size** 

#### **Development of Fisheries Production, 1990-1994**



**Volume Production** 

#### Main Commodities Fisheries Export Development, 1990-1994



#### Main Commodities Fisheries Export Development, 1990-1994

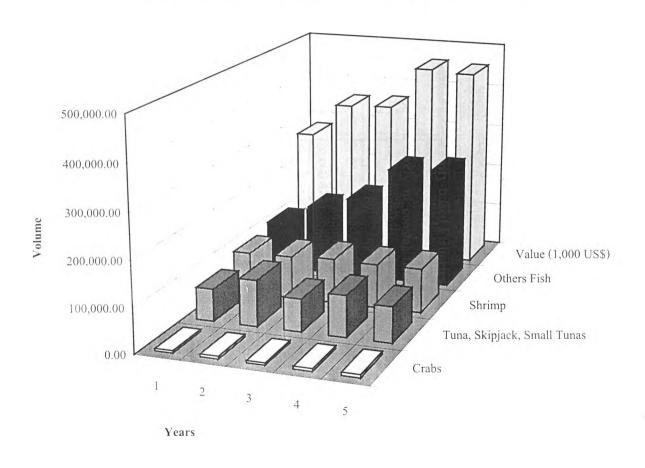


Table 5

Area Potential Development For Shell Fish and Sea Weeds in Indonesia

No.	Provincien	Area Pot	ential (Ha)
		Shell Fish	Sea Weeds
1	Aceh	0.00	250.00
2	North Coast of Sumatera	400.00	150.00
3	west Coast of Sumatera	0.00	500.00
4	Riau	1,300.00	1,500.00
5	Jambi	250.00	0.00
6	South Coast of Sumatera	0.00	1,000.00
7	Bengkulu	0.00	100.00
8	Lampung	5,500.00	300.00
9	Jakarta	2,000.00	100.00
10	West Coast of Java	6,000.00	500.00
11	Central of Java	3,500.00	500.00
12	Yogyakarta	0.00	0.00
13	East Coast of Java	10,000.00	300.00
14	Bali	125.00	1,500.00
15	NTB	8,230.00	6,000.00
16	NTT	20.00	6,000.00
17	East Timor	0.00	0.00
18	East Coast of Kalimantan	0.00	1,000.00
19	Central Coast of Sulawesi	0.00	500.00
20	South Coast of Sulawesi	1,000.00	500.00
21	South East of Sulawesi	0.00	1,000.00
22	Maluku	0.00	3,000.00
23	Irian Java	0.00	500.00

## AREA POTENTIAL AND PRODUCTION FOR SEA WEEDS IN INDONESIA, 1994

No.	Location	Area Potential	Potential	Production 1994	Level
		Ha.	Sea Weeds	(Ton)	Exploitation
			(Ton/Year)		%
1	Aceh	250	4,700	0	0.00%
2	North Coast of Sumatera	150	2,800	0	0.00%
3	West Coast of Sumatera	500	2,800	34	1.21%
4	Riau	1,500	28,100	0	0.00%
5	Jambi	0	0	0	0.00%
6	South coast of Sumatera	1,000	18,800	0	0.00%
7	Bengkulu	100	1,900	41	2.16%
8	Lampung	300	5,600	11	0.20%
9	Jakarta	100	1,900	0	0.00%
10	West Java	500	9,400	249	2.65%
11	Central Java	500	9,400	0	0.00%
12	Yogyakarta	0	0	166	0.00%
13	East Java	300	5,600	59	1.05%
14	Bali	1,500	253,100	92,827	36.68%
15	NTB	6,000	28,100	1,147	4.08%
16	NTT	6,000	112,500	2,009	1.79%
17	East Timor	0	112,500	0	0.00%
18	West Coast of Kalimantan	0	0	0	0.00%
19	Central of Kalimantan	0	0	0	0.00%
20	South Coast of Kalimantan	500	9,400	0	0.00%
21	East of Kalimantan	1,000	18,800	0	0.00%
22	North of Sulawesi	0	0	11	0.00%
23	Central of Sulawesi	500	9,400	135	1.44%
24	South of Sulawesi	500	9,400	6,752	71.83%
25	South East of Sulawesi	1,000	19,000	4,909	25.84%
26	Maluku	3,000	56,300	1,963	3.49%
27	Irian Jauya	500	9,400	125	1.33%

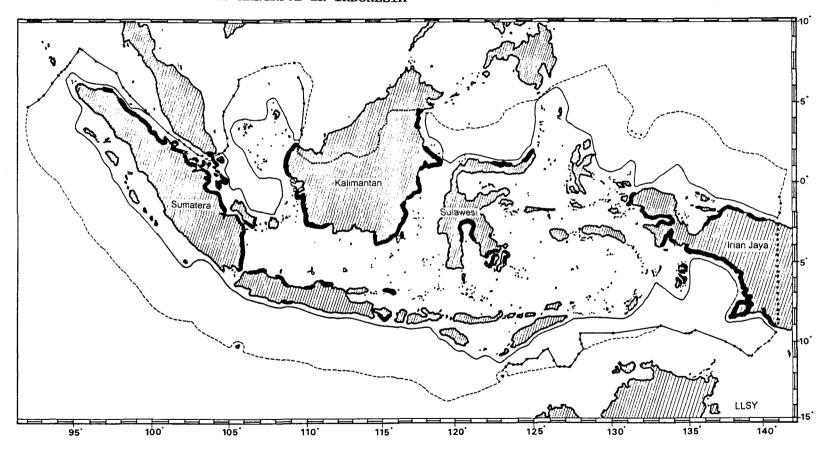
#### AREA POTENTIAL AND PRODUCTION FOR CAGE CULTURE IN INDONESIA, 1994

No.	Location	Area Potential	Production 1994
		На.	(Ton)
1	Aceh	1,344	10
2	North Coast of Sumatera	12,420	582
3	West Coast of Sumatera	1.657	308
4	Riau	6.592	99
5	Jambi	17.267	451
6	South coast of Sumatera	7	234
7	Bengkulu	51	45
8	Lampung	0	0
9	Jakarta	0	0
10	West Java	19.461	25348
11	Central Java	19,010	1508
12	Yogyakarta	2.276	. 71
13	East Java	1.739	111
14	Bali	360	6
15	NTB	0	10
16	NTT	0	0
17	East Timor	0	48
18	West Coast of Kalimantan	4.412	152
19	Central of Kalimantan	0	0
20	South Coast of Kalimantan	7.703	348
21	East of Kalimantan	6.324	2254
22	North of Sulawesi	84	1237
23	Central of Sulawesi	800	17
24	South of Sulawesi	0	0
25	South East of Sulawesi	0	0
26	Maluku	0	. 0
27	Irian Jauya	39,100	208

#### PRODUCTION FOR PEARL CULTURE IN INDONESIA, 1994

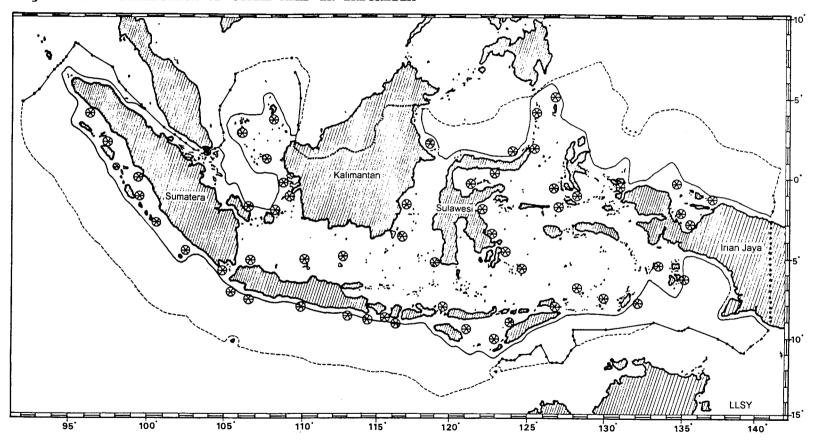
No.	Location	Production 1994
		(Ton)
1	NTB	18.60
	West Lombok	2.70
	Central Lombok	0.00
	East Lombok	3.20
	Sumbawa	6.80
	Bima	5.90
2	Maluku	774.64
	Nort Maluku	0.77
	Central Maluku	0.39
	South East Maluku	773.48

Figure 1. DISTRIBUTION OF MANGROVE IN INDONESIA



234

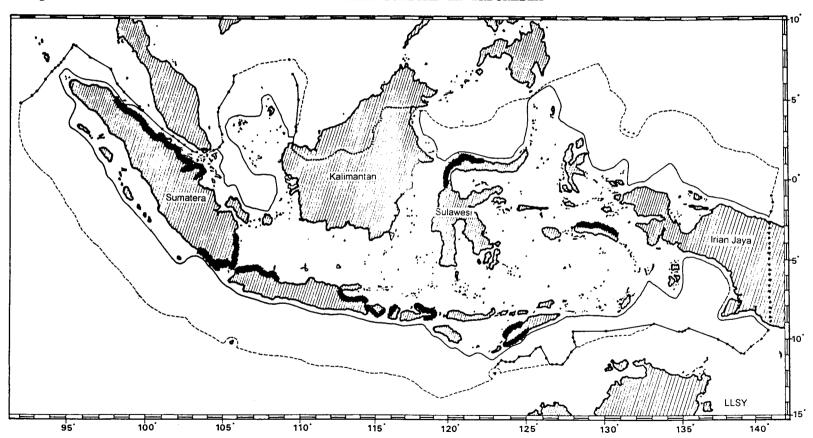
Figure 2. DISTRIBUTION OF CORAL REEF IN INDONESIA



Teluk Batang / Kalimantan ///////irian Jaya/ 105 100 140 115 95. 110 120

Figure 3. DISTRIBUTION FISHING PORT IN INDONESIA

Fig. 4. AREA POTENTIAL DEVELOPMENT FOR MARI CULTURE IN INDONESIA



## EFFECTIVE INVESTMENT IN COMMUNITY-BASED INFRASTRUCTURES AS A PREREQUISITE FOR COASTAL FISHERIES MANAGEMENT

by

#### Haji Mohamed Bin Ismail Fisheries Development Authority Malaysia Malaysia

#### 1. Preamble

Infrastructures beyond any shadow of doubt are important inputs towards achieving development objectives in any setting. This include the management of the Coastal Fisheries and as such investments on infrastructure in the area are indeed and truly a prerequisite in order to develop the related target group. Unless enough infrastructures are being built coastal fisheries may be neglected and may not meet the desire as well as the required result.

#### 2. The Roles of Fisheries Development Authority Malaysia (FDAM)

Realising the importance of infrastructures in helping especially the coastal fishermen, the Government of Malaysia established the FDAM in 1971 with two main objectives:-

- to uplift the socio-economic status of the fishermen, and
- to develop the fisheries sector.

In the Malaysian context, the fact clearly shows that the coastal or the artisanal fishermen constitute the majority of the fishermen community. It is therefore necessary that major portion of FDAM activities being allocated to this group.

#### 3. Infrastructure for Coastal Fishery

In Malaysia, the Government, through its development agencies the FDAM and the Department of Fisheries - is spending a substantial amount of funds investing on infrastructures. This includes landing piers, sorting, grading, weighting, packaging, cold storage facilities, auction halls transport bays, marketing places and processing plants (see Appendix I on infrastructure investment for small scale fishermen).

The importance of the above mentioned infrastructures and the allocation of funds which in a way may improve fish handling, marketing techniques in order to avoid post harvest losses and provide capital will thus improve the living standard of the small scale fishermen. On top of that through the fishery complexes contralise landing can be implemented.

To render the effectiveness in their requirement is to build the said infrastructure in strategic location, that is within reach of the community concerned. This is to ensure that the infrastructure or the facilities given will be fully utilised and proper upkeep of the amenities provided.

Apart from that, the Government, through FDAM is also helping out in the marketing of fish from small scale fishermen by setting up direct sales outlets to consumers. Through this approach consumers can purchased fish direct from the fishermen or through the Area Fishermen Association (AFA) which numbered 70 in the country (see Appendix II on number of AFAs in the country).

Beside that wholesale and retail purchases can also be made through fisheries complexes. There are 23 in the country (see Appendix III for the quantity of landing complexes). 15 of this complexes to be handed to AFA very soon.

Another important infrastructure built for the fishermen are the artificial reefs. The construction of this artificial reefs will later lead to sea ranching and marinazation. To date it is proven that this reefs have risen up the income of small scale fishermen.

#### 4. AFA Roles

It has been mentioned earlier on that the infrastructures are being built on the strategic sites or area. This is to say that, these infrastructures are being built in an area where the fishermen community gathered. And normally, in such area, the AFA will play an active role for the betterment of the community. In other words, to be effective and fruitful enough the infrastructure must be community based in nature. This is simply because the community are the one who will be utilising the amenities given. Only through this community based approach, infrastructure investments will be effective and at the same time will help managed the coastal fisheries.

In Malaysia we have a good example of this community based infrastructure effectiveness i.e. as manifested in AFA Tg.Dawai,Kedah, North Malaysia.

Prior to 1990. This AFA seems to lying idle due to the absence of fisheries infrastructure within its vicinity However, from 1990 onwards i.e. after basic infrastructures such as fishery complex, diesel plants etc. are being built, this AFA experienced a turning point in its roles and activities. For the first time in

1990 and 1991 the AFA managed to pay dividends to its members i.e. RM2.63/share in 1990 and RM2.43/share in 1991.

This achievement due to firstly better management of the infrastructure since the AFA get full support from its members. Secondly, the infrastructures are built on a community based basis.

#### 5. Conclusion

From the above discussion it is therefore proven that effective investment in community based infrastructures is indeed a prerequisite for coastal fishery management. Beside that full support from the community concerned is another ingredient of paramount important. It is therefore clear that infrastructures and human resource must be blend together for better result. This has been insisted by Dr. Manual Collantes as follows.

"view development in its proper perspective, that is, men at its core".

#### Investment on Infrastructure and Aquaculture Projects from The Year 1991-1996 by the Fisheries Development Authority of Malaysia (in Malaysian Ringgit)

No.	Name of Projects	Amount (Malaysia Ringgit)
1.	Jetties	20,751,370
2.	Mooring/Slipway	12,488,889
3.	Complexes	31,938,529
4.	Coldrooms	2,254,855
5.	Processing Plants	2,503,940
6.	Ice Plants	63,800
7.	Offices (AFA)	568,643
8.	Living Quarters	2,771,819
9.	Aquaculture Projects	35,526,169
	Total	108,868,014

Rate of Exchange 1 US Dollar equivalent to 2.50 (Malaysian Ringgit)

List of Area Fishermen Association (AFA)/State Fishermen Association (SFA)/National Fishermen Association (NFA)/Fishermen Multipurpose Co-operative (SKN)

No.	Name of AFA
1.	K.Perlis
2.	South Perlis
3.	Pulau Langkawi
4.	Kuala Kedah
5.	Yan
6.	Tanjong Dawai
7.	Seberang Perai
8.	Ujong Batu
9.	S.Penang
10.	Teluk Bahang
11.	Kerian
12.	Matang
13.	Sungai Tinggi
14.	North Manjung
15.	South Manjung
16.	Pangkor Island
17.	Hilir Perak
18.	Sungai Besar
19.	Kuala Selangor
20.	Port Klang
21.	Kuala Langat
22.	Sepang
23.	Port Dickson
24.	W.Malacca
25.	S.Malacca
26.	Muar
27.	Batu Pahat
28.	Pontian
29.	South Johore
30.	Pengerang
31.	Sedili
32.	Mersing
33.	Endau
34. 35.	Rompin
35. 36.	Nenasi Pekan
36. 37.	Kuantan
38.	Kuantan Kemaman
50.	Kemaman

- 39. Kujal
- 40. Kemasik
- 41. Paka
- 42. Dungun
- 43. Marang
- 44. South K.Trg.
- 45. North K.Trg.
- 46. Setiu
- 47. Besut
- 48. Semerak
- 49. Bachok
- 50. Kota Bharu
- 51. Tumpat
- 52. Miri
- 53. Bintulu
- 54. Mukah/Oya
- 55. Bruit
- 56. Belawai
- 57. Kabong
- 58. Beladin
- 59. Sebuyau
- 60. Buntal
- 61. Sematan/Lundu
- 62. Layar Rimbas
- 63. Satang Biru
- 64. Asajaya/Semera
- 65. Sri Muara
- 66. Penawan
- 67. Kuala Penyu
- 68. Kota Belud
- 69. Sandakan
- 70. Semporna

#### List of State Fishermen Association

- 1. Perlis
- 2. Kedah
- 3. Pulau Pinang
- 4. Perak
- 5. Selangor
- 6. Melaka
- 7. Johor
- 8. Pahang
- 9. Terengganu
- 10. Kelantan
- 11. Sarawak

#### List of Fishermen Multipurpose Cooperatives

- 1. Kuala Jerlun
- 2. Kuala Kedah (30 Tan)
- 3. Kuala Kedah (50 Tan)
- 4. Kuala Kangkong
- 5. Kuala Triang
- 6. Tanjung Dawai
- 7. Kuala Sala
- 8. Bahagian Tanjung
- 9. Pamtao Timor (PP)
- 10. Batu Maung
- 11. Kuala Muda
- 12. Sungai Udang
- 13. Teluk Bahang
- 14. Persatuan Koperasi P.Pinang
- 15. Kuala Sepetang
- 16. Kuala Sangga
- 17. Bagan Baru
- 18. Bagan Lama
- 19. Pulau Pangkor
- 20. Hilir Perak
- 21. Herr Ming
- 22. Heng Hua
- 23. Pengkalan Tiram
- 24. Batu Pahat
- 25. Pontian
- 26. Sedili Besar
- 27. Mersing U/Endau
- 28. Gabungan SKN Johor
- 29. Tanjung Lumpur
- 30. Kuala Kemaman
- 31. Seberang Takir
- 32. Batu Rakit
- 33. Mengabang Telipot
- 34. Per. SKN P. Timor

Appendix III

Quantity of Fish Landing at the Fisheries

Development Authority Board Complexes From 1992-1994

No.	Complex	Capacity of	Quantity Landing		
		Annual Landing	1992	1993	1994
		(mt)	(mt)	(mt)	(mt)
1.	Geting	10,000	1,084	1,168	590.78
2.	Kuala Besut	15,000	14,352	17,449	10,219.83
3.	Pulau Kambing	8,000	3,723	4,941	4,707.64
4.	Chendering	52,000	8,650	9,182	7,744.18
5.	Mersing	8,000	2,171	1,690	2,251.09
6.	Kuala Sedili	15,000	3,234	3,579	3,723.08
7.	Batu Maung	15,000	2,534	3,450	3,782.76
8.	Kuala Kedah	10,000	3,587	3,483	4,270.39
9.	K. Kemaman	10,000	444	717	272.55
10.	Bintawa	10,000	1,692	1,607	4,236.52
11.	Belawai	7,000	189	489	69.61
12.	Endau	5,000	919	1,136	767.16
13.	Nenasi	4,000	291	348	437.47
14.	Mukah	7,000	530	551	591.56
15.	Kuala Pahang	5,000	131	699	744.28
16.	Kuantan	13,000	13,790	20,991	21,605.17
17.	Marang	5,000	469	747	1,116.89
18.	Bintulu	5,000	47	186	158.90
19.	Miri	5,000	67	205	476.13
20.	Lumut	7,000	16,798	21,447	17,834.72
21.	Kuala Besar	7,000	-	50	953.49
22.	Kuala Rompin	5,000	-	-	477.26
23.	Dungun	5,000	-	-	-
	Net Total	233,000	74,702	94,115	87,031.46

# PROVISION OF LOCALLY-BASED FISHERY INFRASTRUCTURE: THE PHILIPPINE EXPERIENCE

by

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#### **ABSTRACT**

The paper discusses experiences of the government through the Philippine Fisheries Development Authority (PFDA) in the provision and operation of locally-based municipal fish ports and ice plants to support the fishing industry. Of the 190 fish ports constructed and/or improved by the PFDA, only 4 are presently managed by PFDA and the rest have been turned over for management by the local governments concerned. In addition, the PFDA is administering a total of 25 operational ice plants, of which 11 are leased to the private sector. At present, only 50-60% of the facilities are being used by fishermen, while the rest are not used at all. Reasons for the under-or nonutilization of the facilities were discussed in the paper. The PFDA finds it difficult of financially sustain the operations of the projects, especially the small ones, due to the low level of fees being charged. Financial viability of ice plant operation is affected by the old age of the plants and the very limited market for ice. Relative to the objectives of the workshop, the following recommendations are proposed: (a) Only fishing communities capable of catching at least on (1) ton of fish daily should be provided with fishery support facilities. (b) The facilities should be managed and maintained by fishermen's cooperative. (c) The construction of "horizontal work", such as stairlanding and site development, should be shouldered by the government as a subsidy to the fishermen's cooperatives. The construction of plants and buildings should be shouldered by the cooperative.

# 1. Background

If I correctly understood the Prospectus, the workshop would like to discuss the following theses:

- 1.1 Development of local level control over coastal fisheries requires basic infrastructures.
- 1.2 The minimum/basic infrastructures required are:
  - small pier

- marketing place
- storage
- processing plant
- meeting hall
- 1.3 These facilities should be situated within fishing communities, within a well-defined narrow locality to enhance the cohesion of fishermen's and local peoples' activities.
- 1.4 User groups have to effectively use and maintain these facilities. (It was not clear though whether the fishermen will own the facilities or not.)

The topics above will guide the flow of discussions in this paper. This paper will discuss the experiences of the government through the Philippine Fisheries Development Authority in the provision and operation of post-harvest facilities and plants to support the fishing industry.

# 2. Types of Physical Infrastructure Provided to Fishery Industry

The infrastructure support being provided by government to the fishery industry can be classified into three: fish ports, ice plants and cold storages, processing plants.

# **Fish Ports**

The fish ports are further classified into regional fish ports and municipal fish ports.

# (a) Regional Fish Ports

These structures are intended for the service needs of commercial fishing vessels. They are constructed in major fish landing areas or population centers where there are big volumes of fish unloadings, mostly coming from commercial fishing vessels. Consequently, the facilities provided are designed for the use of the commercial fishing vessels although an area is also reserved for use of the smaller municipal fishing vessels. The facilities provided within the regional fish ports include landing quays or piers, market or trading halls, slipways, carpentry and foundry shops and related facilities.

# (b) Municipal Fish Ports

The municipal fish ports are smaller in design and magnitude compared to the regional fish ports. These facilities are constructed in municipalities with a

considerable volume of fish unloadings coming from municipal fishing vessels and a few medium-sized commercial fishing vessels.

# Ice Plants and Cold Storages

These plants will produce and supply the ice needed by the fishermen to preserve the quality of their catches. The cold storages are intended for the storage of ice and fish catches for a limited period of time.

# **Processing Plants**

The processing facilities provided at present by the government are limited to freezing only. Thus the facilities provided are blast or contact freezers and cold storages. Most products brought to these plants are high-valued species and those intended for exports.

These plants are located within the regional fish ports.

At the moment, the PFDA is studying the construction of small-scale fish processing to assist municipal fishermen to process their own products and thus add value to their products and increase their incomes.

Of the above stated structures and facilities, only the municipal fish ports and ice plants are locally-based or situated at rural fishing communities. For the purposes of this workshop, the succeeding discussions will center only on these two facilities.

# 3. Description of Facilities Provided

# Municipal Fish Port

Within the fish port, there are two main facilities: the trading hall and the fish landing structure. What is the minimum magnitude of these facilities?

# (a) Fish Trading Hall

For a trading hall, we have set that the minimum dimension should be 6 m. by 5 m., or an area of 30 sq. m.

This facility can accommodate about one (1) ton of fishery products per trading day. In order to maximize utilization of this minimum basic structure, the fishing community should have a total daily production (or better yet, unloading) of 1 ton of fish and fishery products. If the unloading is lower than this, it is suggested that no trading hall be constructed.

The structure of the trading hall consists of four (4) wooden posts with concrete footings, concrete-paved floor area and galvanized-iron roofing on wooden trusses.

# (b) This Labeling

As a support to the above trading hall, what would be the magnitude (or length) of the landing facility?

At present levels of catch, about 50-100 bancas should call at the port in order to accumulate a total unloading of 1 ton per trading period.

Assuming a 4-hour trading period and only 1 turnover, and a service time of 15 minutes per banca, about 3 berths would be needed. And with an average banca length of 5 meters, the total length of the landing area would be 15 meters.

So, based on the discussions above, the minimum fish port facilities that will be provided to the fishing community will be composed of a 30-sq. m. fish market hall and a 15 m. stairlanding. We classified this as a Type C fish port.

For areas with slightly bigger volume of fish unloadings, a Type B fish port will be provided, the facilities of which will consist of a 60 - sq. m. market hall and a 30 m. stairlanding.

And for areas with very big volume of fish unloadings, beyond 10 tons of fish daily, a Type A fish port will provided. The structures will of course be bigger in magnitude, which will now be subjected to a more detailed study. An option for this type of fish port is the provision of an ice plant and cold storage facility and/or a processing plant. Also, an administration office will be provided.

In summary, the type of fish ports and the minimum volume of fish unloadings required for the establishment of these port are as follows:

	Facil	Min. Volume	
Туре	Market Hall	Stairlanding	of Unloading
A	30 sq. m.	15 m.	1 - 3 MT
В	60 sq. m.	30 m.	3 - 10 MT
C	( For furthe	> 10 MT	
C	(For further	er study)	> 10 M

# Ice Plants

Majority of the ice plants have a capacity of 10 tons per day. Block ice is the common type of ice produced.

The cold storages usually have operating temperatures of -5 °C.

# 4. Number and Distribution of Fishery Infrastructure

# **Municipal Fish Ports**

During the early years of 1980s, a total of about 180 municipal fish ports were constructed thru the joint efforts of our office (PFDA) and the Department of Public Works and Highways (DPWH), using the selection criteria mentioned before.

For all the completed Type C ports, the responsibility of operating them were turned over to the local government concerned. For some of the Type B and Type A ports, the PFDA opted to manage them solely by ourselves or jointly with the local government.

From 1990 to 1995, with funding from the ADB assisted Fishery Sector Program, the PFDA on its own was able to construct and improve eleven (11) fish ports.

# **Ice Plants and Cold Storages**

At present, the PFDA is administering a total of 25 operational ice plants. Of this number, 14 are directly managed/operated by the PFDA, and 11 are leased to the private sector as part of the privatization thrust of the government.

It must be noted that only three (3) of these plants are newly acquired, no more than three years old. The rest are more than 10 years old, although some them were rehabilitated/repaired some years back. These latter plants were merely transferred to our office for administration from another government agency.

# 5. Experiences of The PFDA in The Operation of Fishery Infrastructure

# **Utilization of Facilities**

# (a) Municipal Fish Ports

Based on the surveys of sample projects operated by the local government, only 60% of the fish ports are being used by fishermen. The rest of the 40% are not used.

Reasons for the non-utilization of the fish ports are as follows:

(i) Bad condition of structures. About 40% of the fish ports are in need of repairs/improvement.

- (ii) Shallow approach to the port. The bancas can not directly dock at the landing structures, or it can be done only at certain times of the day when the tide is high.
- (iii) Proximity to another major fish landing area. The fishermen prefer to land their catch at the nearby bigger fish landing area due to the presence of greater number of fish traders or fish buyers.
- (iv) Other reasons. There are fish ports which are in good condition but are not being used by fishermen for landing purposes. One reason for the non-utilization of these ports is the fact that they are not the traditional landing or trading area in the municipality. In other areas, the reason is the minimal volume of catch, thus the fishermen usually land his catch near his residence and sell his catch right there.

Then there are cases where the ports are in sad state of condition but fishermen still use them for lack of alternate place to land and trade their catches. Some of these ports with significant volume of fish unloadings have been recommended for improvement by the PFDA.

The PFDA operated some Type A and Type B fish ports, either by itself or jointly with the concerned local governments. Because of the bigger fish unloadings in these project sites, utilization of the port facilities is significant. Eventually, all these projects will be turned over to the local governments.

# (b) Ice Plants

Of the ice plants administered by PFDA, about half (52%) are actually operating, and the other half are not operating.

The major problems faced by the PFDA in the management of these ice plants can be summarized as follows:

- (i) Limited market. The plants were intended to serve principally the needs of the fishermen. Sale to non-fishermen is rare or nil. This is in conformity with the government's policy not to compete with the private sector.
- (ii) Old age of plants. Thus, the plants' operating efficiencies are already low and production costs become expensive.
- (iii) Competition from private ice plants. Since the private ice plants are relatively new and have bigger capacities, they can sell their ice at lower price.
- (iv) The lack of spare parts in the local market. Because of old age, these plants really need regular repair and maintenance works. Breakdown

of machineries happen and n takes time to bring them back to operation

Because of the conditions of the plants, it was also difficult to find interested lessees for these plant.

# Benefits to the Fishermez

# (a) Municipal Fish Proces

For those projects utilized by the fishermen, they received the collowing benefits:

# (i) Faster/Easier unloading of catch

It is now more convenient to the fishermen to land their catches. Before, they have to leave their bancas some place, carry their catch for some distance before they could deliver their catch to the broker or trader/buyer. Now, they can already land their catch directly on the stairlanding which is very near the market hall.

# (ii) Centralized landing and trading activities

The traders/buyers are now concentrated in one place. Thus, it is more convenient to the fishermen to sell their catches. The fishermen also have the option to select their traders/buyers.

# (b) Ice Plants and Cold Storage

The benefit, of course, is the immediate access to the facility. The fishermen do not have to go some place else to buy their ice.

# Sustainability of the Projects

It is difficult to financially sustain the operations of the projects, especially the small ones.

The fishermen fell that they must not be required to pay higher fees since the project is operated by the government. They believe that the government should subsidize the operation and maintenance of the facilities.

On the part of management, they fell that any increase in the fees may bring about increase in the retail price of the fish by the traders.

Thus, the fees have continued at it present low.

There is similar difficulty in ice plant operations. For one, our plants are already old. Then we have very limited market - only the fishermen, while the private ice plants can sell even to residential and commercial establishment, like restaurants and eateries.

# 6. Lessons Learned

# Mere presence of infrastructure does not ensure (further) development of the area

The PFDA learned that the provision of structures and facilities in an area is not an assurance that the fishing industry will prosper. Other factors, such as those related to the market, should be given more importance or priority.

# The project site should be properly selected.

The important factors in selecting sites for fish ports should be: a. it should be the traditional fish landing/trading area, and b. there is significant volume of fish unloadings.

The other criteria are:

- (a) adequate depth of water
- (b) protection from strong waves and currents
- (c) accessibility (from main highways)
- (d) availability of water and power supplies

For the construction of ice plants, the main criteria are:

- (a) significant volume fish unloadings, specifically the volume of fish surplus for transport outside the community,
- (b) availability of reliable and adequate water and power supplies,
- (c) presence of other ice plants in the area and current ice price (to avoid competition), and
- (d) value/price of fish species unloaded (high-valued species preferred).

# Small projects can not be sustained by the government for a long time.

Experience taught us that running a small project is not a viable undertaking for the government. It can not be sustained financially for a long time.

The government has its constraints in the operations of facilities. First, it has to follow some auditing regulations. For example, one regulation requires that the head of the facility should not handle the money matters of the facility, for control purposes. Thus, even if the business is not good, the plant has to maintain a separate cashier.

Secondly, the salaries of the personnel follow the same rate as those in the central office, including all the regular allowances and bonuses, if any.

Thirdly, some personnel occupy permanent positions. Thus, during slowdown in operations when market is not good, these personnel continue to receive their full salaries even when they were not fully employed.

# 7. Recommendation

Relative to the objectives of this workshop, I propose the following recommendation:

# **Minimum Size of Fishing Community**

In putting up fishery-support facilities, a certain size must be required of the fishing community that will be served by the facilities.

For the basic fish port facilities (Type C), it is recommended that the fishermen in the community be able to unload a minimum daily volume of one (1) ton of fish.

Experience has taught us that the municipal fishermen, with their small bancas, do not have much need for a landing facility. They can land their catch anywhere along the shore area.

And if the aggregate catch of these fishermen will not reach one (1) ton, then the market hall and the landing facility will be very much underutilized - which means waste of valuable funds.

# Organization of Fishermen into Cooperatives

If facilities will be established in a fishing community, there must be a group or entity to run, manage and maintain the facilities.

Definitely, the facilities to be put up is small or limited in magnitude. It is better that the facility be managed and maintained by the user themselves - the fishermen. Since it their own livelihood which is at stake, they would try their best for the success of the project.

The facility has also better chances of success under a local cooperative because the salary rates will be commensurate to the volume of business and tenure will be based on actual need. Also, the cooperative has a captive market - the members of the cooperative themselves.

# Government Subsidy in terms of Infrastructure Support

Construction of the fish ports require big investment which is beyond the financial capability of the fishermen's cooperatives.

To cut down on cost for the cooperatives, it is recommended that the "horizontal works", like the stairlanding, shore protection, reclamation and site **development, be shouldered** by the government as a form of subsidy to the fishery cooperatives.

The construction of the market hall can already be shouldered by the cooperative. They can recover the cost through the imposition of fees and charges to the users of the hall.

# AN EFFECTIVE INVESTMENT IN COASTAL FISHERY MANAGEMENT: THAILAND'S EXPERIENCE

by

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# 1. Background

Thailand has a coastline of 2,625 km and an area of 420,280 km within the 200-mile zone. Coastal fishing is therefore one of the country's most important occupations. According to the 1995 marine fisheries census, there were 2,548 fishing villages which included 214 commercial fishing villages and 2,334 coastal small-scale fishing villages. The latter accounted for about 92 per cent of all marine fishing villages.

Most of Thai coastal small-scale fishermen live at subsistence level. They have been currently in crisis due to the near-depletion of fish stocks and a lack of the basic infrastructure.

# 1.1 Marine Resources Depletion

Depletion resulted from

- modernized fishing technology and exploitative fishing gear, particularly by commercial fishing boats/vessels
- industrial development and the uncontrollable demand for raw materials to feed processing industry, which have stimulated fishermen to greater efforts
- exploitation and depletion of coastal habitats, particularly mangrove forests, for aquaculture

# 1.2 Lack of Fishing Infrastructure

The basic infrastructure is inadequate for many coastal fishing communities. A scattering, or living in isolation, of fishing villages along the coastlines makes it difficult to manage marine fisheries through the existing system of commercial fish landing and marketing which provides fishing facilities such as piers, landing places, and water/power systems to the fishing communities. The lack of adequate basic structures which are crucial to coastal fisheries has increased an unnecessarily financial and marketing pressure on small-scale fishermen.

increased an unnecessarily financial and marketing pressure on small-scale fishermen.

To resolve coastal small-scale fishery problems, the National Economic and Social Development Board (NESDB) agreed that a series of marine fishery development projects were implemented by the Department of Fisheries. This included the Southern Fishing Villages in Rural Poverty Areas Project (1983-86), the Small-Scale Marine Fishery Development Project (1985-86) under the Fifth National Development Plan, and the Coastal Small-Scale Fishery Development Project Phase I and II under the Sixth and the Seventh National Development Plans (1987-96).

Despite all governmental efforts, the problem of coastal small-scale fishing livelihoods remains. The coastal small-scale fishermen are still severely affected by depleting fish stocks and even changing phenomena in some villages. At the current rate of population increase, and with a stable or increasing level of demand for fish, their fishing problems are further aggravated. In trying to deal with such a difficult situation, the Department of Fisheries has continued to implement the Coastal Small-Scale Fishery Development Project, with a greater emphasis on institutional arrangements and local participation in the management process.

# 2. Strategies for dealing with the small-scale fishery problems

# 2.1 Fishing Facility Construction

If the small-scale fishing livelihood is going to be gotten better, several conditions must be improved. This includes coastal rehabilitation, conservation and effective exploitation of fishery resources, and provision of basic fishing infrastructure. Living in remote areas out of reach, some small-scale fishing villages are in need of basic structures for their fishing operation, such as community landings, fishing-gear repair shops and stores, capstans, and freshwater tanks. These fishing facilities need to be developed or constructed by the government as part of nationwide socio-economic development programs.

# 2.2 Coastal Rehabilitation

The coastal zone is an area of high population density, especially in small-scale fishing communities. Some of the key problems which emerge are competition for the resources, over-exploitation, the use of non-selective fishing gear, and coastal habitat destruction. The rapid depletion of coastal resources and habitats directly affects many thousands of small-scale fishermen and their families which primarily live in poverty. Many of them have to seek different alternatives which press more adverse effects on fishery resources and coastal ecology. An increasing number of villagers begins to use modern fishing gear and goes fishing further offshore to get more catch, accelerating unnecessary

investments and conflicts with commercial operators. Such problems can be resolved by restoring coastal resources and habitats through effective implementation of mangrove rehabilitation, artificial reef construction, and live species stocking.

# 2.3 Demonstration and Promotion of Non-Destructive Fishing Gear

Many coastal small-scale fishermen discard their old fishing gear before they consider recycle the worn nets or the broken tools. There is apparently no intention of maintaining or repairing the fishing gear which is due mainly to the lack of the technical know-how to attempt such maintain and/or repair job. Involving the coastal small-scale fishermen in non-destructive fishing gear demonstration and promotion activities will enable them to familiar with different types of gear, to understand the impacts of certain kinds of gear on fish stocks and habitats, to learn how to apply the tools that suit particular fishing grounds, and to be apprenticed to gear repairers. In this respect the fishing gear demonstration and promotion activities will contribute towards the coastal small-scale fishermen's lower costs of fishing operation, and towards coastal resource conservation.

# 2.4 Development of Alternative Sources of Income and/or Livelihoods

# Coastal Aquaculture

Aquaculture potential of Thailand's coastal areas has been well-accepted as an alternative source of income. The pond and cage culture systems along the country's coastlines reveal how valuable and productive aquaculture can be which more than compensates for losing the exclusive fishing zones. Expansion of coastal aquaculture is also due to other combinations which make the development goes faster: depleted fish stocks that reduces capture; over-fishing; high fuel costs; and the deterioration of the aquatic environment. The technologies for effective production and processing, as well as suitable sites, are also available. Further expansion of the coastal culture

development is therefore physically and technically feasible. Well-planned activities and effective production of cultured marine fisheries will contribute towards better livelihood of coastal communities while decrease fishing pressure on natural stocks.

# Post-Harvest Production

Fisheries, both capture and aquaculture, is a major source of animal protein for the population, particularly low-income residents in remote rural villages. Although coastal people, in general, prefer to consume fresh fish and to preserve or convert fish to various fish products, there is still a need to improve facilities and infrastructure, as well as human resources capability for fish handling, processing, distribution, and marketing. More efforts should be made to

provide training to the coastal small-scale fishery communities for making the full use of fish catches for direct human consumption.

# 3. Some Perspectives From Implementing Agency

The DOF's coastal small-scale fishery development project is aimed at promoting the small-scale fishing livelihood. The project was initiated in the Fifth National Development Plan and has been implemented ever since. A variety of project activities can be grouped into five components.

# 3.1 Basic infrastructure component

This component provides fishing infrastructure necessary for small-scale fishery development to selected coastal villages. Frequent and appropriate uses of such infrastructure by the villagers thus indicate success in achieving the objective of this component. The implementing result, however, has revealed that most of these structures have not been fully utilized.

<u>Fish landing piers and breakwaters</u> are not fully used to capacity - only around 80 per cent of the structures are being used. The failure lies behind a few reasons:

- The structures have not been built according to strict specifications, and thus cannot be used;
- Some coastal fishermen prefer to park their fishing boats right behind their back door and unload fish in their house before deliver to a fish market.

Fishing gear repair shops, fish processing houses, freshwater tanks, and other facilities are not fully utilized due to the following problems:

- Poor design and construction that do not make possible for the structure's practical usefulness;
- Unfavorable construction sites-several public properties made available for construction are remote from community centers, and thus are not suitable location;
- Underdeveloped raw material supply, storage and marketing systems fishermen are not prepared for the development of fish processing and marketing.

# 3.2 Coastal rehabilitation component

A significant number of large artificial reef complexes are successfully placed in several coastal fishing grounds. According to fishermen, increasing fish stocks and biodiversity resources have been observed in and around such grounds.

However, the problem still remains. Some reef complexes have been destroyed by commercial trawlers. There is a lot of debris everywhere which obstruct small-scale fishing operation.

# 3.3 Fishing gear demonstration component and Supplying (Fishermen groups)

It is hard to implement the fishing gear demonstration activities which require the fishermen's co-operation and changing their attitude towards new livelihoods. Continuity in the activities and expansion of demonstrating modules into new kinds of fishing gear will prove a success. However, so far as the project is concerned, only continuity has been observed. To overcome some of the obstacles the following is needed:

<u>Local market conditions</u> - a monopolized nature of the local markets will contribute significantly to the success of this component;

Attitude towards new livelihoods and a village culture - it is observed that where the fishing villagers are Muslims they tend to resist any changes in livelihoods and ways of living. An understanding of such limitation will help the official in dealing with the problem.

# 4. Fish product development (or fish processing) component (Housewife groups)

A number of factors contribute to the success of this component. This includes a change in consumption and marketing behavior, and some adjustment to the changing environments. Whether the fishing villagers have applied the knowledge to their everyday lives and whether this has led them to change their livelihood are thus the measures of success. Experience shows that participants of this component only use the knowledge in their everyday lives.

# 5. Aquaculture component (Aquaculture fishermen groups)

This component would be a new source of income and an alternative livelihood to the fishermen. To develop a sustainable coastal aquaculture livelihood, however, will require good environment. Continuity in providing sound management advice and problem solution is therefore very important.

Admittedly, there has not been much progress on the project implementation. The following factors have contributed to the success or failure of the Coastal Small-Scale Fishery Development Project.

- Natural environment factors
- Social and cultural values as perceived by fishing villagers

#### Market factors

A possible suggestion is to conduct an intensive study on each project site, particularly on the social issues.

# Some Perspectives from Beneficiaries

There is a sufficient evidence that the project has been well-accepted by the coastal small-scale fishermen and their families. Increasing number of villages are nominated for project site and activities are requested, particularly on infrastructure and artificial reefs. For success of the implementation it is important to ensure that the officials concerned have full knowledge and understanding of what is expected from the project activities and how to achieve the goals in different villages.

# **Project Constraints**

- **Project administration** diversified project activities, which include construction, demonstration and promotion and aquaculture, could be difficult to manage the project based on general administrative rules and standardized methods;
- **Project site** diversified social and cultural conditions of the selected fishing villages have been major constraints.

# **Recommended Strategies**

- **Project administration** should be improved to create flexibility through single agency administration;
- **Project site** detail studies on socio-economic conditions of the selected fishing villages should be conducted, both prior to and during, project implementation.

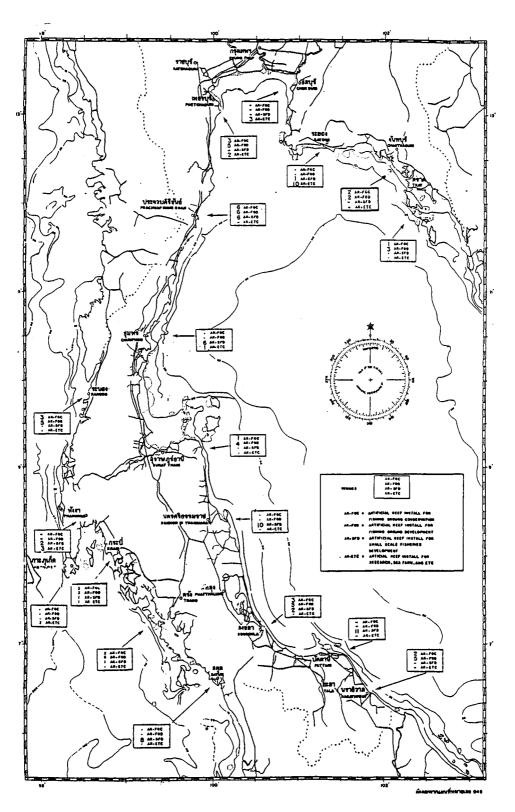
# Thai Seas Rehabilitation Project Activities

- 1. Coastal fishery resources management project (community ownership rights in the fishery/collective fishing rights/territorial use rights in some coastal settlements)
- 2. Basic infrastructure activities
  - fishing infrastructure construction or renovation

# 3. Alternative livelihood activities

- demonstration and provision of non-destructive fishing gear
- coastal aquaculture
- fish products development (fish processing and marketing)
- 4. Coastal conservation activities
  - artificial reefs construction and replacement
  - live species stocking (or releasing)
- 5. Coastal fishery development and management research activities
  - fishery research
  - research on socio-economic and cultural conditions

# Appendix



# Plan for infrastructure facilities and activities allocation under the 8<sup>th</sup> National Economic and Social Development Plan for small scale fisheries development in 22 coastal provinces

	Unit	Fiscal Year Requ					Request
Activities		1997	1998	1999	2000	2001	1997
1. Artificial Reef Installation	sites	15	15	15	15	15	38
2. Retaining Wall	sites	25	25	25	25	25	40
3. Fishing Equipment Repairing and Storage	units	5	5	5	5	5	32
4. Rain Water Tank	units	5	5	5	5	5	32
5. Demonstration of Fishing Gears and Supplying	villages	30	30	30	30	30	40
6. Fishing Piea Construction	sites	25	25	25	25	25	40
7. Fish Processing and Nutrition	units	12	12	12	12	12	12
8. Green mussel and Bloody cockle culture	villages	10	10	10	10	10	21
9. Fish culture	villages	10	10	10	10	10	19
10. Seed releasing (number)	millions	30	30	30	30	30	38
11. Infrastructure Deepening (Marine Breakwaters, Guay, Artificial beach)	sites	10	10	10	10	10	7
12. Pilot Project of Fishing (rights)	villages	3		3		3	3

# Basic Fishing Infrastructure: Level of Use, 1987-1991 and 1992-1995

Infrastructure	Infrastructure Landing Piers		Fishing Gear Repair Shops		Rain Wat	ter Tank	Fish Processing House		
Year	1987-1991	1992-1995	1982-1999	1992-1995	1987-1991	1992-1995	1987-1991	1992-1995	
Unit	42	111	7	20	4	11	5	7	
In Use (%)	88	90	58	72	73	75	59	50	
Not In Use (%)	12	10	42	28	27	25	41	50	

# **Public Hearings of Cases on Artificial Reefs**

Usefulness	Favo	rable	Nonfavorable			
Year	1987-1991	1992-1996	1987-1991	1992-1996		
Unit	30	68	30	68		
Percentage	82	93	18	7		

# **Small scale Fisheries Development Project 1987-1996**

Activity	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	Total
Total Cost	15,350,000	13,448,400	18,362,600	46,088,900	50,310,400	69,231,000	116,865,700	146,524,700	122,719,600	176,774,400	775,675,700
Land and Infrastructure Cost	2,650,000	4,201,800	4,753,400	32,000,000	33,413,000	38,103,000	90,650,000	111,050,000	89,150,000	144,150,000	550,121,200
Landing Piers		700,000	700,000	20,000,000	21,000,000	30,000,000	60,000,000	90,000,000	57,500,000	57,500,000	337,400,000
Retaining Wall				5,000,000	5,250,000	600,000	18,000,000	900,000	9,000,000	9,000,000	47,750,000
Marine Break Water									2,500,000	27,500,000	30,000,000
Fishing Gear Repair Shop Sand Stores	150,000	152,200	304,400	600,000	630,000	840,000	3,300,000	3,300,000	3,300,000	3,300,000	15,876,600
Fish Processing Houses		249,600	294,000	300,000	315,000	353,000	1,100,000	1,100,000	1,100,000	1,100,000	5,911,600
Rain Water Tanks		100,000	200,000		338,000	430,000	750,000	750,000	750,000	750,000	4068000
Artificial Reefs	2,500,000	3,000,000	3,000,000	5,600,000	5,880,000	5,880,000	7,500,000	15,000,000	15,000,000	45,000,000	108,360,000
Landing Pier Renovation Coast			110,000	500,000							610,000
Landing Device Cost			145,000								145,000
Total	2,650,000	4,201,800	4,753,400	32,000,000	33,413,000	38,103,000	90,650,000	111,050,000	89,150,000	144,150,000	550,121,200

# COMMUNITY-BASED FISHERIES MANAGEMENT SYSTEM UNDER A LIMITED ENTRY

by

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# **ABSTRACT**

In the present paper, the meanings of open access and limited entry and various ways of fisheries management systems are illustrated. Further, the meaning of community-based fisheries management system (CBFM) and its place out of various fisheries management systems is clarified. Japanese experiences reveal that the CBFM can be developed, only when fishermen conceive that fisheries resources are owned by them. Such a circumstance appears, sometimes after the government granted fishing rights to fishermen. Granting fishing rights to fishermen could be the best opportunity for fishermen to establish their own organization, although it may be a primitive one at its initial stage. Right to fish and the functions of fishermen's organization must be legally supported by national laws. Revision of national fishery law is a MUST for all Asian countries in the development of the CBFM.

#### 1. Introduction

In the majority of south-east Asian countries, marine fishery is composed of a dual structure, i.e., (i) artisanal fishery which has been in existence for many centuries and (ii) industrial fishery such as trawl, purse seine fisheries which developed after the World War II. The artisanal fishery is performed to gain income to maintain the livelihood of a fishing household, and it is normally carried out by their family members. Conversely, the industrial fishery is undertaken to pursue a profit, and because of the size of boat in use, it is undertaken with hired crew.

In Asia a serious conflict has happened between these two fisheries, as the industrial fishery tends to come into the coastal waters, which have been utilized for many centuries by the artisanal fishery. This has lead to the depletion of coastal fisheries resources. In several countries like Malaysia and Thailand, a costly national patrol boat system has been established to eliminate such a conflict. In a certain country like Indonesia, a trawl fishery has been totally banned. Yet, conservation of the coastal resources and improvement of income of artisanal fishermen are great issues to the governments in Asia.

Recognizing the above situations, a matter of small scale fishery was taken up at Kyoto Session of the Indo-Pacific Fisheries Council in 1980. However, so far adequate institutions, in both legal frameworks and fishermen's organizations, to overcome such situations have been hardly developed. As a result, little progress has been achieved with regard to the management of fisheries resources in both coastal and off-shore waters.

The reason is due to a open access regime, which has been still followed by almost all countries in Asia even though the most of resources have been fully exploited.

The present paper aims at providing some ideas with respect to the development of a coastal fisheries management system in Asian countries. During the course of his presentation, reference will be made to a paper entitled "Fundamental Difference in Fisheries Management between Japan and the Western countries", which is hereunder abbreviated as "fundamental Difference",

# 2. Historical Development of Fisheries Management

Before taking up a matter of coastal fisheries management for Asian countries, how the fisheries management system has been dealt with at a global level.

# Open Access and Limited Entry

For the use of fisheries resources by capture fishery, two regimes, i.e., Open access and limited entry are in use.

# (1) Open Access

In many countries, fisheries resources are considered to have been owned by people. Therefore, anyone is allowed, without any permission from the government, to fish regardless of whether he is fisherman or not

Such a open access regime has been followed by the most of developed countries with the exception of Japan. Such a regime was developed during a period of medieval era in England. As many developing countries were once the colonies of present developed countries, the open access regime has been followed by these countries as well.

Under the open access regime, the government establishes many fisheries regulations to let fishermen to keep the TAC system. Fishermen must comply with these regulations. However, fishermen always try to fish as much as possible by offending the regulations. Then, the government has to control fishermen to eliminate these irregularities. Naturally, the management cost becomes extremely expensive. Under such a situation, fishermen will never conceive that fisheries resources are their own.

The open access regime is not always clearly mentioned in any official document of those countries. One may feel strange that the United States did not have a national law of fishery, until the Magnuson Act was enacted in 1976. This means that a fishing in the U. S. was completely free for anyone.

# (2) Limited Entry

The use of fisheries resources for fishery is allowed to limited persons, who are normally fishermen. In Japan, the limited entry regime has been strictly followed for several centuries. It is also followed to some extent by the Republic of Korea and China (Taiwan).

Strictly speaking, the limited entry regime has been applied to some extent in some other countries other than Japan, Korea and China (Taiwan). However, in many instances these are exceptional cases for these countries. For example, Alaska has a fishing license system for salmon fishery, by which the state intends to eliminate the entry of fishermen from other states.

Under the limited entry regime, fishermen are granted right to fish with the fishing right or fishing license. Naturally, fishermen began to conceive that resources being exploited are their own, as no other person is allowed to fish in water area, where they have a right to fish. This will give a great incentives to fishermen to create their own fisheries management system.

# Classification of Fisheries Managements Systems

Various type of fisheries management systems have been developed in the world, as seen in Fig. 1.

The list of fisheries managements systems as given in Fig. 1 was originally prepared by R. B. Rettig for a FAO Expert Consultation on Fisheries Management in Rome, January 1983. The consultation lasted for ten days with the participation of experts from the developed countries. Of ten days for the consultation, discussion was focused to 1. Catch limit and 2. Indirect method. There was little discussion for 3. Restricted fishing license, 4. Monetary measures and 5. Fishing right. It may be well imagined that the type of fisheries managements followed by developed countries are mostly confined to catch limit and indirect methods, which are only ways which can be followed under the open access regime.

In the original list prepared by Rettig in 1973, there were no IQ/ITQ. IQ/ITQ was first developed in Iceland and was followed by New Zealand. Now, it is extensively applied in many developed countries. It can be adopted in a country, where the boat is large in size, the number of boats is limited and landing ports are also limited. Yet, it has many practical problems. IQ/ITQ can not be applied to Asian countries.

# Change in the Way of Fisheries Management System

By referring to the papers prepared by some world leading specialists in fisheries management, Fig. 2 was prepared to see how they changed their focus in the way of fisheries management, so as correspond to a marked increase in the world fishery production, which might result in over-fishing.

Fig. 2 indicates that in countries which follow open access regime, in the earlier time, the type of fisheries management system suggested were not strict. However, with an increase in the world catch, catch limit has received the top priority. In general, Fig. 2 reveals the following:

- (1) When Scott wrote his paper in 1961, there was no mention on catch restriction. When Christy wrote SOFA in 1967, 'catch restriction' had stayed at the fifth rank. However, when Rettig prepared his paper for FAO Consultation in 1983, 'catch restriction' had already shifted to the top rank.
- (2) In 1983 there was no IQ or ITQ. However, in 1991, IQ and ITQ was highlighted due to various difficulties arisen from TAC system alone.
- (3) In 1961, Scott had already got an idea of 'sole ownership', by which resources management could be handed over to fishermen's organizations When he came to Japan in 1994, he found that his idea has been well realized in Japan under the limited entry regime.

# 3. Community-based Fisheries Management

A term, 'community-based fisheries management' was used for the first time at FAO/Japan Expert Consultation on the Development of Community-based Coastal Fishery Management System for Asia and the Pacific, which was held in Kobe 1992. One year prior to this Consultation, Japan International Fisheries Research Society (JIFRS) sponsored an international seminar on fisheries management in collaboration with National Federation of Fisheries Cooperative Associations (ZENGYOREN). In those days it had been considered that the community-based fisheries management system (CBFM) is a kind of fisheries management system, which was created by fishermen under their own initiative.

The FAO expert consultation, which was held in Kobe, 1992, did not discuss anything on the definition of CBFM. In those days another term 'comanagement'(CM) is often used in many papers dealing with coastal fisheries management. To avoid any confusion on the meanings of these two terms, Fig. 3 was prepared by referring to the report of another FAO Expert Consultation, which was held in New Zealand, January 1995.

The above report says that from an institutional viewpoint, 'Self management' (SM) nay be considered as totally self-imposed voluntary management without any legal coverage imposed by the government. On the other hand, CM may be a management system to be practiced by fishermen (and /or fisheries organization) and government together. With these meanings, both SM and CM will fall under a category of the CBFM system.

Now it may be noted from Fig. 3 that Japanese definition of CBFM as referred above corresponds to SM. However, Japanese CBFMs may not always be SM. According to the results of the 1993 Fishery Census, some of Japanese CBFMs are more close to CM mostly with the participation of provincial government. In contrast to CBFM, most of fisheries management systems developed in countries in Europe and north America follows a catch limit system established by the government, which is called 'institutional management) as seen in Fig. 3.

In Japan, the CBFM has been extensively developed after 1949, when her national fishery law was throughly revised and fishing right and fishing license were newly granted in the utmost democratic manner by taking into account fully the ideas of fishermen concerned. Initially, the CBFM was developed for sea area right off a fishermen's cooperative association (FCA). However, nowadays some of them have expanded its sea area to the whole sea area off a certain prefecture. In 1988, the total number of such CBFMs accounted for 1339, which increased to L524 in 1995.

In fact, Japan's CBFM system was developed only after 1949, when Japan's fishery law was revised. For the detailed reasons, the readers may wish to refer to my paper entitled 'Fundamental Difference' at its section, 3.1 at page 72, 73, and 78. However, marine ranching, which developed after 1970, is thought to be another reason for the development of CBFM in Japan, as fishes released into their waters are also considered to be their own resources.

# 4. Prerequisite for the Development of CBFM

To realize CBFM there are three prerequisites to be considered.

# Granting Fishing Right to Fishermen

In Japan a fishing right is granted to a fisheries cooperative association (FCA), which is organized by fishermen only. The fishing right is valid for ten years. Upon its expiration, it is renewed without or with slight change due to change in availability of fisheries resources. The fishing right in Japan is not always an exclusive fishing right entitled to make all resources available in the sea area of the right. (For the detail, see Table 1.1, 1.2 and 2 of my paper 'Fundamental Difference''.)

A fishing license is granted, in limited number, to an individual fisherman, who engage in off-shore or distant water fisheries. Since the fishing license is issued to limited fishermen, the fishing license is also a fishing right. The fishing license is

never granted to persons other than fisherman. It is normally valid for five years, and it is renewed for another five years as long as the resources are well maintained. (For the detail, see Table 3 of my paper "Fundamental Difference".)

Thus, in Japan a fishery is allowed to only fishermen. Only under such a limited entry regime, fishermen conceive that fisheries resources being exploited by them are their own property. Then, fishermen create their own CBFM. Normally, CBFM is realized some years after the fishing right is granted to fishermen. In the meantime, to let fishermen understand the importance of CBFM, some campaigns by the government institutions or NGOs would be quite useful.

# Fishermen's Organization

For granting the fishing right, fishermen's Organization is absolutely essential, However, there are two obstacles to do so. One is that fishermen's organizations have been hardly developed, and the other is absence of any cooperative law exclusively devised for fishery.

# (1) Development of fishermen's organization

In general, fishermen's organization is not always well developed in Asian countries, and the extent of its development varies from country to country. At least, what one can say is that there have remained many fishermen, who are not member of fishermen's organization. Even when a fishermen's organization exists, it is not sure whether it is suitable in size and in nature for granting fishing right.

The minimum conditions for establishing an unit of fishermen's organization (FO) may be defined by two factors, i.e., land area of the FO and the total number of fishermen, who are supposed to be the member of the FO. A F0 should have a sufficient sea area in front of its land area, in order that it may have a reasonable size of fishing area for a fishing right. Another factor is that a FO should have at least more than 2Q0 fishermen as its members. Otherwise, it may not be able to involve in efficient economic activity.

How to let fishermen to organize into any sort of their own FO is another important issue, as the fishing tight is to be granted to a F0 only. For doing so, the best thing is to establish a legal framework, by which the fishing right will be granted to an organization established by fishermen. In this way, all fishermen will be automatically the member of a F0, as the fishing right is granted to the FO and a fisherman is not allowed to fish unless he becomes the member of the FO.

In fact, the above was the way, by which Japan's artisanal fishermen had to establish their own organization in 1901, when the first Japanese fishery law was enacted. In its earlier stage, Japan's fishermen's organization was merely a fishermen's society (FS), which was a guardian for the fishing right. Hence, the FS

had originally no function in doing any economic activity. With the progress of time and with the revision of fishery law, however, some of FSs began to involve in fish marketing and other economic activities.

In around 1930, Japan encountered a serious economic recession, which greatly affected the economy of both agriculture and fishery households. To activate the economy of fishery households, the then ministry of agriculture and forestry established a rehabilitation programme for fishermen, through which fishery infrastructure such as fishing harbor, fish marketing shelter, ice making plant, etc. were provided to many fisheries societies. With these government aids, the then fisheries societies were converted into fisheries cooperative associations in real sense.

# (2) To make Fisheries Society as Cooperative Association

In Japan, there is a fisheries cooperative law exclusively designed for fisheries. This may not be a case for many Asian countries, as a single cooperative law, which is applied to any sector of the national economy. Under such a situation, it would be a solution that a fisheries society which was established for the fishing right will be registered as a cooperative association under a cooperative law.

In this way, a same group of fishermen will have two functions One is to take care of fishing ground and resources based on the fishing right, and the other is to be involved in fish marketing, ice making, credit and saving business, etc. for the benefit of the member fishermen.

# Revision of National Fishery law

For promoting the above two tasks, there may be no question that the Present national fishery will have to be revised in order to make it a limited entry regime Without legal support, the fishing right can not valid at all

In the revised fishery law, there must be a strict fishing license system to control the industrial fishery in terms of the number, sea area for capture, the size of boat and gear and so forth. Without such a strict fishing license system for off-shore fisheries, no coastal fisheries management can be successful.

# 5. Conclusions

It is the author's dream that CBFM system in Asian countries will be developed with the following process:

- 1. Revision of National Fishery Law, which includes all ideas as discussed in 4 above.
- 2. <u>Establishment of fishermen's organization</u>, on the condition that a fishing right is granted to them.

- 3. <u>Formulation of a fisheries management plan</u> in terms of fishing right and fishing license at local level (provincial level) with a view to make harmonious use of fishing grounds and fisheries resources available in sea area right off a province. (For the detail, see 3.2 of my paper "Fundamental Difference".)
- 4. Granting fishing rights and fishing licenses based on the fisheries management plan
- 5. <u>CBFM may occur</u> some years after the fishing right was granted.

# Fig. 1 Type of Fisheries Management in Use in the World

# 1. Catch Limit

Under the open access regime, catch limit is a management system, which has been adopted by the most of developed countries.

# 1.1 TAC alone

For every fishing season, total allowable catch (TAC) is determined based on MSY. There is no restriction for new entry to fishery. Hence, TAC alone will result in increase in the number of fishing boats and over investment, which will eventually lead to the depletion of resources.

# 1.2 IQ or ITQ

Under individual quota system (IQ), parts of TAC are allocated to individual fishermen as a quota. In this way, increase in the fishing capacity of a boat or in the number of fishing boats can be prevented. Under individual transferable quota system (ITQ), the quota is allowed to sell to others.

# 2. Indirect methods

Fishing is restricted by means of:

Fishing season
Fishing area
Fishing gear, e.g., mesh size restriction
Size of fish

Indirect methods are used under both open access and limited entry regimes.

# 3. Restricted fishing license

Fishing license is issued to individual fishermen in limited number. Normally, the size of boat, fishing area and harbor to land catch are restricted.

The fishing license system is applied mainly under 'Limited entry regime'.

# 4. Monetary measure:

- i. A tax is imposed to fishermen, when a fishery has to be discouraged.
- ii. A subsidy is given to fishermen, when a fishery has to be encouraged.

The monetary measures are seldom applied.

# 5. <u>Fishing Right</u> (Territorial use right, fishery)

Fishing right is granted to fishing community, fishermen's society, , etc. under 'Limited entry regime'.

Fig. 2 Historical Change in the Way of Fisheries Management System

Year	1961	1967	1983	1991	
World Catch In Million MT	37	60	76	98	
Author	Anthony Scott	F.T. Christy	R.B. Rettig	R.B. Rettig	
Name of Meeting/ Fisheries	FAO Meeting on the Economic	1967 FAO State of Agriculture	1983 FAO Expert Consultati	JIFRS Seminar on on on	
Paper	Effect of Fisheries	(SOFA)	Fisheries Manage- ment	Management	
Venue	Ottawa	Rome	Rome	Tokyo	
	1. Closed area	1. Minimum size	1. Catch restriction	1. Catch limit	
Open	2. Closed season & Catch quota	2. Closed area	2. Indirect Control:	2. IQ or ITQ	
Access	3. Restriction of fishing	<ul><li>3. Closed season</li><li>4. Fishing gear</li></ul>	Fishing season Fishing area	3. Indirect control:	
	gear	5. Catch restriction	Fishing gear Minimum size	Fishing season Fishing area Fishing gear	
		6. Effort control	<u> </u>	Minimum size	
Limited	<ol> <li>Fishery tax</li> <li>Fishing license</li> </ol>	There was no mention, al-though mone-	Restriction of fishing fleet by license	Restriction of fishing fleet by license	
Entry	3. <u>Under Sole</u> <u>Ownership</u> , Fishermen's	tary measures and license were hinted.	2. Monetary measures.	2. Monetary measures.	
	organization or public insti- tution will be resources manager.		3. Restriction by fishing right	3.Restriction by fishing right (TURF)	

Fig. 3 An Overview of Fisheries Management

Fisheries Management
Under Limited Entry \*

(Bottom up management)\*

(Top down management)\*

SM

CM

Institutional Management

TAC alone or IQ/ITQ
with many regulations

SM:

Self management

CM:

Co-management

CBFM:

Community-based fisheries management

(Note)

Institutional management means that fisheries management is practiced based on various regulations established by the government.

(Source)

"APPENDIX 1 to WG 1 Report" to the Report of the Expert Consultation on Guidelines for Responsible Fisheries Management, Wellington, New Zealand, 23-27 January, 1995, FAO Fisheries Report No. 519.

However, for easy understanding the author added some annotations for the parts with \* marks.

# THE ROLE OF FISHERY CO-OPERATIVES IN COASTAL FISHERIES MANAGEMENT

by

# Theo Visser Information and Statistics Officer FAO/RAP

#### ABSTRACT

Community based approaches to management of coastal fisheries through fishery co-operatives may offer important opportunities. This is shown in the successes achieved in Japan and other countries. In order to play their role, fishery co-operatives need to be socially and economically successful. This inevitable means that they must have been initiated by the fishing communities themselves, the individual fishermen. They need to see the long term benefits of fishery co-operatives and feel the need to join forces. It is a natural step from development of the fisheries and fishery communities to the management of the fisheries. Governments must decentralize the authority over coastal marine areas and initiate programs to provide fishing communities with authority over adjacent resources. Involving fishery co-operatives in management may not be a quick or easy way to success, but it may well be the most effective way.

Coastal fisheries form an important part of the total fisheries production. The coastal zone is much more productive than the open sea. It's importance also lies in the structure of the coastal fisheries which is mostly notably small-scale and relatively labour intensive. This makes the coastal fisheries an integral part of the lives of most people inhabiting the coastal areas. The importance of the coastal fisheries therefore is both economic and social only adding to the need of sustainable development and appropriate management in order to secure the viability of fishing communities and the livelyhood of the people living there.

Coastal fisheries obviously are in crisis, over-exploitation and environmental degradation of the coastal marine habitats are widespread. Existing management measurements often cannot tackle the problems facing the coastal marine habitat effectively. Not coastal fisheries, but rather coastal fisheries management is in crisis. Increasingly severe depletion of coastal fish stocks and the growing conflicts among different groups of fishermen in recent years, have made the need for more effective management become more apparent. The sheer number of fishermen and boats involved make managing coastal fisheries extremely difficult. Instead of trying to impose the centralized top/bottom strategy as (quite appropriately) used in the more centralized and organized industrial fisheries, community based approaches to management, may offer important opportunities in the scattered and decentralized coastal fisheries. The principles and approaches of community based management

systems are not universally applicable, but experiences, especially in Japan, indicate that these systems can be very effective. Also management and enforcement costs associated with this community approach are less since the sense of ownership generated tends to make the fishermen more responsible and accountable for long term sustainability of the resources.

Fishery co-operatives have long been promoted as an effective way to develop fishery resources and to up lift the social and economic status of fisherfolk. As early as 1948 the FAO began to argue for co-operatives for agriculture production, recommending that they provided the best means of reducing the cost of farm production supplies, credit facilities and marketing and in general would be beneficial to improve production and the living conditions. In 1995, in the Action Programme of the World summit for social development it was once again stated to utilize and develop more fully the potential and contribution of co-operations for the attainment of social development goals, in particular the eradication of poverty, the generation of full and productive employment and the enhancement of social integration. The overall impression however was that co-operatives in the fishery sector do not work and are difficult to organize. With fishermen convinced that co-operatives were unproductive and useless, they did not want them and so they had to fail (COPAC, 1984). The situation in Asia as far as co-operatives are concerned seems to be better than in the rest of the world. More effort is going into co-operatives and more successes coming out of those efforts.

The aim of a fishery co-operative is to unite a force of small- or mediumscale fishermen, who cannot achieve any substantial results alone, in order to improve their economic and social position, principally by carrying out one or more business activities. Fishery co-operatives can be involved in a multitude of activities,

- ownership and operation of fishing vessels
- credit facilities
- marketing of fish
- cold storage
- transport
- fish processing
- supply of fishing gear and equipment
- maintenance and repair of fishing vessels and equipment
- manufacturing of fishing gear and equipment
- technical services
- insurance
- control of fishing rights
- and social and educational services

Co-operatives in Japan fulfill some or all of these activities contributing to the success and prosperity of the fishing communities. The type of fisheries and the setting influence the needs and hence the activities of any fishermen's group or cooperative. In the fishing communities the activities undertaken by the (primary) fishery co-operatives may be limited to the basic services such as provision of services in fish landing, local processing and marketing, credit disbursement and interest collection, and community services. On this level co-operatives often aim to replace middlemen. At the second and third tiers (provincial and regional levels) fishery co-operatives may expand their activities into purchase of supplies, high quality processing and regional marketing for export, credit administration control, infrastructure development, training and extension, as well as provide liaison and co-operation between the primary co-operatives at the regional or state level.

A study conducted in the early 1980s, by Maynell (COPAC, 1984), concluded that out of 11 countries co-operatives in four countries were considered successful (Indonesia, Japan, Rep. of Korea and Malaysia), 3 had both successes and failures (Bangladesh, Hong Kong and India) and two had failed (Sri Lanka and Thailand). Since then there have been developments in Malaysia and Philippines and new initiatives in other countries, like Thailand and Sri Lanka. In fact in spite of the failures co-operatives are widely recognized as having the potential to contribute significantly to develop fishery resources and to up lift the social and economic status of fisherfolk.

Most fishery co-operatives in Asia are modeled after the successful cooperatives, or fishing associations, operating in Japan. The remarkable success of cooperatives in Japan as opposed by the mixed results in most other countries is in part due to the century old common property ownership of rural fishery communities over coastal resources and the behaviour of Japanese fishermen which is characterized by collective action, reducing (social) conflicts among fishermen. It is clear that the social and cultural background in Japan is quite different from that in other South-East Asian countries. More than cultural or social background the success or failure is dependent on the core of co-operatives: the individual fishermen. Co-operatives should be built up by the fishermen themselves. A co-operative should preferably be voluntary and for sound long-term benefits that are immediately apparent to its members. Success or failure of any co-operative will in the end depend largely on the motivation and needs of its members. Successful co-operatives more often than not are spontaneously derived to strongly felt requirements within the fishing community. Other co-operatives which do not have a joining strong sentiment ultimately disintegrate or become economically inviable.

Fishery co-operatives in different countries or different provinces differ considerably in their goals and objectives. The ideal co-operative clearly does not exist. However some general constraints to the success of co-operatives are membership, leadership and lack of competent and properly dedicated management. Additional points of interest were made during a Indo-Pacific Fishery Commission Symposium on Development and Management of Small-scale Fisheries, in Kyoto, Japan in 1980.:

• Prerequisites must exist in the need of small-scale fishermen for betterment or overcoming specific or general hardships.

- Formation should be initiated by the small-scale fishermen, with guidance if necessary, based on motives generated by their own needs.
- Operation at first should be performed by hired competent management, to be transferred after about 2 years to fishermen members trained in management.
- Activities could include channeling capital from other resources to finance initial operations, and later from internal reserves to finance non-profit social services.
- Marketing activities are important, both for better bargaining position and for ensuring the most acceptable methods of loan recovery.
- Information and extension services and transfer of new technologies, as well as leadership training for management and local government communication are all important; as is some control over fishing grounds or even resources.

In general: activities can only be viable if fully integrated with marketing, credit and extension under strong and competent management and if based on motives and long-term benefits of the producers themselves.

As early as in 1969 a number of conditions for success of a co-operative were summarized at the International Seminar on Possibilities and Problems of Fisheries Development in Southeast Asia (Tiews, 1969). A lot of the failures associated with the fishery co-operatives could have been avoided if the following conditions would have been taken into consideration:

- 1. The co-operative should be built up by the fishermen themselves.
- 2. The best and most trustworthy fishermen with organizing ability should be selected as leaders.
- 3. The co-operatives should be big enough to employ and pay full-time skilled managers from the open labour market.
- 4. In order to guarantee stable prices, the co-operatives should run their own cold storage and processing plants.
- 5. The government should give financial support, at least at the initial stages.
- 6. A roof organization under government supervision should unite al local cooperatives.
- 7. Education of co-operative members as well as leaders and managers regarding co-operative principles and business practices is most important.

The role of community organizations in fishery management was recognized at the FAO/Japan Expert consultation on Development of Community-based Coastal Fishery Management Systems for Asia, in Kobe Japan in 1992. It concluded that existing community organizations, including fishermen's organizations and fishery co-operatives need to be strengthened in order to effectively implement co-operative activities in coastal fishery management. The emphasis hereby should lie on the self-management capacity of co-operatives through training of community based managers. It is noteworthy that most fishing organizations both in Asia and the Pacific are mainly involved in economic activities, in particular marketing and/or credit facilities, and (sofar) seldom take the responsibility (or have the capacity) managing fisheries. In order to increase the impact of fishery management programs, the role of fishing organizations in the management needs to be strengthened. There needs to be:

- legal support;
- social and economic viability of the co-operative;
- initiative from the fishermen; and
- linkage with the existing functions of the fishing organizations;

Obviously strong government support is indispensable. Awareness has to be developed about the purpose of fishery management. The legal and policy framework has to be improved to give the co-operatives more power and more opportunities to actually take the lead in management initiatives. The creation of fishery co-operatives is often initiated or encouraged by governments which recognize their advantages in improving fishermen's economic and social standing, as well as improving fish production and distribution. Most governments have by-laws which regulate cooperatives. Although it is necessary to have the co-operatives formalized this also tends to increases the bureaucratic red tape which is involved in the setting up and running of a co-operative. Possible policy or legal barriers have to be taken away. Furthermore, in view of the gradual hand over of management tasks to the fishing communities or co-operatives, laws need amendments to decentralize the authority over coastal marine areas. The gradual hand over of management responsibility to regional and community based organizations is widely recognized and practiced in Asia a recent example being the Philippines, indicating understanding that community based management initiatives are in fact the most effective way of managing the marine coastal environment.

Furthermore the self-management capacity of the co-operatives need strengthening with the training of (community based) managers. The gradual hand over of management responsibility to regional and community based organizations is widely recognized and practiced in Asia and this indicates that there is trust that community based management initiatives in fact are the most effective way of managing the marine coastal environment.

The leader in fishery co-operative movements in Asia undoubtedly is Japan. Originating from traditional fishing village guilds it evolved into co-operatives with the promulgation of the Fishery Law of 1901. This law provided the legal basis for granting exclusive fishing rights to the co-operatives. In order to be able to fish, fishermen needed to join the co-operatives or (co-operative associations). Co-operatives there have complete control over their allocated fishing areas (both conservation and utilization) through the administration of fishery rights. Since the co-operatives exclusively control the coastal sedentary resources they obviously are highly interested in their conservation and management. They also work on the improvement of the fishing grounds, which average 2-3 km from the shore to as far as 10 km out, including the installation (and maintenance) of artificial reef, seeding seaweed and shellfish and releasing fry. In general objectives and methods of management will vary considerably with locations because of differences of topographical, socio-economic and environmental nature. In reef fisheries (for mostly sedentary species) two sets of related management methods can be identified:

- 1. Conservation and protection of the resources, which includes:
- limitations of capture size
- restrictions on gears and fishing methods
- closed areas and seasons
- catch quota
- release of fry to enhance stocks
- controls over sport fishing and poaching
- 2. Regulation of the production methods, since the number of fishermen who are engaged in reef fisheries often are not in proportion to the stocks targeted by the fisheries, through:
- restrictions on vessels and crew
- the style and frequency of fishing

The fishing area for in-shore fishery for mobile fish species is rather extensive and since it is impossible to demarcate fishing grounds it is difficult to establish management measures. Species will simply migrate beyond the boundaries of area's controlled by individual fishery co-operatives. Therefore it will be necessary to implement a regional management body who will be responsible for the planning and implementing of regulatory measures, including patrolling and enforcement. Existing measures which are closely linked together covered by these regional management bodies in Japan are:

- 1. Establishment of disciplines in fishing grounds
- Fishing by rotation (when clear cut highly productive fishing grounds for certain species are present).
- Collective fisheries (pooling the catches of all the vessels active in the same fishing ground), this gives an incentive for optimization (reduction) of the effort and thus a reduction of the fishing pressure.

## 2. Fish price stabilization

- quota
- some sort of collective fishing, restricting the fishing effort by reducing the number of fishing hours and thereby reducing the catch or focus on improving the quality of the produce.
- 3. Resource conservation
- Catch restriction through mesh-size restrictions
- banning of certain fishing gears or methods, including closed areas and/or seasons.

#### 4. Enhancement of fish stocks

Enhancement of fish stocks can make a contribution to production from a certain area. This is especially clear for species with a limited migration pattern or no migration at all. Only certain species with a limited migration (prawns, crabs and some flatfish) are be able to contribute significantly to increased production. A very successful example is the release on a large scale of seed of the Kuruma prawn in some localities in Japan. The release of the fry needs to be accompanied by a number of restrictions on gears used, mesh width, gear position and minimum allowable catch size. All of these measures already will have positive effects on the stocks without stock enhancement.

From the Japanese experiences, as described by Hotta (in FAO 1993), it is clear that besides a social and economic successful co-operative, or similar community based organization, effective management also needs:

- Scientific data on the state of the fish stocks; and
- Close collaboration between fishermen and research institutes

The objectives of co-operative approach to coastal fisheries management can be placed at 4 levels (Renard, 1986):

- 1. It is a way to ensure that popular knowledge and experience is indeed integrated into the planning and management process.
- 2. It ensures that all needs and priorities are taken into account in the formulation of management decisions.
- 3. It gives a better guarantee for the quality of the solution identified and for its adaptation to a particular condition.
- 4. In planning and problem identification it promotes involvement in the actual implementation of decisions.

Management of coastal fisheries cannot be separated from all other aspects of coastal (environmental) management. The coastal area is an aggregate of different valuable interrelated and interdependent ecosystems. Developmental activities in one area will have impacts on other area's. The absence of clear ownership and thus the principle of common property nature of the marine coastal resources only adds to the problems associated with current attempts for effective management. Integrated Coastal Management should include all aspects of usage of the coastal environment, both marine and brackish water areas, but also land based activities.

Sustainable development implies that not only the economic, but also the social and environmental sustainability. It is clear from the foregoing that the single most important measure to be implemented to be able to effectively manage the coastal marine fisheries will be the removal of open access to the fishery. This implies both reduction of fishing effort, but also of fishing means (boats, nets etc.). In effect the number of vessels with access to the fisheries and the number of persons involved should be reduced. In a region with growing population this is bound to have serious socio-economic implications. This reduction cannot be forced upon the fishing communities, it should be a movement and initiative by the fishermen themselves if the result is to be sustainable. Obviously there are limits to the limits that can be imposed on the access to the fishery. Co-operatives can play an important role in the process of restructuring the fishery sector and through education and credit facilities create alternative employment and business opportunities in as well as outside the fishery sector. Malaysian experience shows that it is possible redeploying fishermen in their home areas by strengthening the village-based tourist development to marine parks. Other areas could be aqua/mariculture or village based fishery related industry.

To conclude with a word of caution. Management's tasks performed by a cooperative are the end product of a long development. This process takes time, even where there are successful and capable co-operatives. It took the Japanese cooperatives 50 years to reach the stage where they actually were able to manage their own resources. Given the history of Japanese co-operative movement this indicates

that involvement of co-operatives into coastal marine management is no quick way of establishing effective management. It takes time, sometimes considerable time. Co-operatives definitely have the potential to play an important role in marine coastal management, but there will be problems, there will be failures. It is important to bear potential pitfalls in mind and try to avoid them.

There is an urgent need for the development of fishery co-operatives as a tool for the improvement of the standard of living but at the same time to promote local level involvement in coastal fisheries management. In this way fishermen would have the power to manage their own resources and with that their future. In order to do this the mostly socio-economic oriented co-operatives need to be transformed and guided to a more managerial task. Here lies the challenge. The successes from several countries where coastal management already has been incorporated in co-operatives, as Japan, Korea and Philippines, gives trust that with a focused effort the co-operatives, with proper institutional back-up and training, indeed can become a powerful tool in coastal fisheries management.

The confidence with fisherfolk that they actually can organize themselves to tackle and solve their problems collectively, together with a true sense of cooperation is a must for the future role of fishery co-operatives in coastal fishery resources management. Fishery co-operatives can work if they are allowed to work. It is surprising how well they sometimes have performed as compared to other institutional frameworks for the development (or management) of the artisanal fishery. Fishing communities and the governments concerned should work together to achieve effective and sustainable development of management schemes which will benefit both fishermen and the fishery resources in years to come.

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# NATURAL PARTNERS FOR COASTAL FISHERIES MANAGEMENT: COMMUNITY-BASED FISHERIES MANAGEMENT AND INTEGRATED COASTAL MANAGEMENT

by

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#### 1. Introduction

Coastal Fisheries Management (CFM) is complex. This simple revelation is often the first source of agreement among fisheries managers and fisherfolk. One reason for the complexity is the nature of fisheries. Causes and solutions to fisheries problems often have just as much to do with the boarder impacts to a fish's ecosystem as with the direct impacts of fishing.

Ecosystem changes from human impacts on the fisheries habitat and environment, and multi-use conflicts of coastal resources (between fisherfolk and tourists, or fisherfolk and large-scale aquaculturists for example) all influence the natural mortality of fish stocks. On the other hand, fishing mortality depends on an equally complex but narrower set of issues. For example, catch limits, fishing area allocations, mesh size, gear, and the behavior of fisherfolk. Management of these issues involves a bit of natural science, social science, and people-centered programmes.

Many countries have initiated fisheries management systems that involve those in local communities most affected by the management decisions. These systems vary from country to country and within countries. Most common has been a shift to cooperative or collaborative fisheries management where government and the local communities share responsibility and effort for management. In some countries, governments have delegated the entire trust, authority, and responsibility to the local community for fisheries resource management. In Fiji, Micronesia, the South Pacific, Indonesia, and other countries having traditional systems of fisheries management, authority is delegated by local custom and traditions that either supersede or are made legally binding by government. While there exists differences between collaborative, traditional and community-based fisheries management (CBFM) systems, they have fundamental similarities, and for the purposes of clarity, will be referred to as CBFM in this paper.

An equally participatory resource management system, called Integrated Coastal Management (ICM), has emerged in the last two decades as an approach that views the ecosystem as a whole, and human societies as part of the ecosystem. ICM unifies the essential ecological, economic, and social components of each issue into

comprehensive solutions that make sense and can be implemented by a strong and diverse constituency.

Fisheries is a central issue of concern in many coastal areas, and particularly in South and South East Asia. Often, neither CBFM nor ICM alone is sufficient to address the complexities of CFM. Combining the strengths of these two approaches enables communities to develop more comprehensive solutions that can be implemented with a broad constituency of support. The paper discusses the complementary nature and interdependence of CBFM and ICM vis-à-vis fisheries issues and potential areas for integrating the two resource management approaches.

# 2. Strengths of CBFM

CBFM provides a mechanism for fisherfolk to cooperate among each other to resolve the issues that have to do with the direct impacts of their actions. This is important. Fisherfolk need to help develop the details of solutions to what they know best - the problems within the fisheries sector. However, CBFM's strength is at once its limitation in addressing the complexity of ecosystem problems that impact the fishery.

Issues such as water quality, habitat conservation, and the health of the ecosystem cannot entirely be resolved by fisherfolk alone. These issues will need the 'buy-in' or acceptance of a larger community. Rarely is CBFM structured to bring in this broader constituency needed to address these issues. While it is essential for fisherfolk to coordinate as specialists on the issues within their own sector, CBFM, if the only participatory management mechanism for the geographic area of concern, still keeps fisherfolk isolated from the larger community and the larger information base needed to develop and implement solutions.

Fisherfolk need two essential contributions from other sectors to solve ecosystem problems affecting fisheries. First, they need a broad base of information - from sociological, scientific and economic sources. This information mix leads to an improved understanding of the fisheries issues and helps make sure the right issues are identified and prioritized for management.

Secondly, fisherfolk need cooperation from other sectors to gain the unified support of the wider community necessary for implementing solutions to complex ecosystem problems. Under CBFM, the tendency or temptation will be for the fisheries government agency and fisherfolk to take on the additional tasks of addressing the environmental actions that affect fisheries. This is particularly the case with water quality improvements and coastal habitat restoration - actions historically governed by the Departments of Forestry, Agriculture, or Environment. But this increases the burden of work for the fisheries agency and the fisherfolk community. It also will not ensure that the actions of other sectors will follow suit. Unless there is a mechanism to ensure consistency among sectors using the resource,

progress made by fisherfolk and the fisheries government agency may be offset by the actions of the other sectors.

CBFM is often successful in resolving user conflicts within a single user group - the fisherfolk. For example, conflicts between small-scale fisherfolk using different gear types, or having territorial disputes. While CBFM is best able to develop management measures within a fishery - it is often difficult to resolve conflicts between multiple user groups such as between fisherfolk and tourists, and fisherfolk and local land-owners. Many of these conflicts need a bigger arena for conflict resolution, so that one group is not 'pitted' against another. In addition, a larger arena can help if conflicts within the fishery are too divisive. Particularly for small-scale and commercial user conflicts, or enforcement conflicts between the gear types used in an area.

# 3. Strengths of ICM

One of the most compelling reasons for communities and governments to put time and financial resources into ICM is the efficiency of the 'product' itself. The ICM product includes not only the group of solutions to the identified problems, but also the changes to the institutions and public that increase the chances of successful implementation.

Solutions developed under the ICM governance approach resemble an engineer's design in efficiency and common sense. They consider interactions not only between problems, and between user groups, but also between institutions that have jurisdictions over the sources of the problems in the area - and all of these are observed within the unique characteristics of the local ecosystem.

Because the design is comprehensive, wasteful ad-hoc and piecemeal efforts are eliminated. Benefits include cost savings, solid, well-thought out activities, improvements in relations between government agencies and between the agencies and communities and a greater public confidence in government.

Consensus-based solutions take time to develop under ICM. But during that time, the process builds a strong constituency in the community and within government agencies. With a strong and wide constituency, funds can be levied from outside the fisheries sector for actions that directly benefit the fisheries resource and fisherfolk community. Fisherfolk need political support for implementation of many of the ecosystem actions. This support helps generate local sources of funding which is a major step towards ensuring sustainability of management efforts and the programme.

For example, under the Bay of Bengal Programme Third Phase Project in Malaysia, the Committee developing the Special Area Management Plan (SAMP) for the Pulau Payar Marine Park is considering introducing visitor fees for the first time. This would raise funds for continuing the SAMP planning process and

implementation, not only ensuring sustainability but also greater equity between users.

When ICM participants look at an ecosystem's problems, its not from the view of one pollution problem, nor from one pollution source, but from the multiple impacts of all human activities. This unique characteristic of ICM helps to provide the distance and objectivity needed in resolving conflicts between multiple users. It also helps to resolve conflicts within a single user group such as fisheries where the issues are particularly divisive.

Multi-use conflicts between fisherfolk and tourists are common in coastal areas. Tourists may wish to have their destination pristine - but they also require amenities including resorts, swimming pools, sewage facilities and land development that all leave impacts on the environment. Even eco-tourism leaves an impact on local communities and their culture. However, tourism can be made into an advantage for the fisherfolk and coastal communities when managed under an ICM approach. The common objectives of ecosystem health can help the user groups reach consensus on activities of mutaal benefit.

#### 4. CBFM and ICM: A natural partnership for comprehensive change

Both CBFM and ICM strive to attain greater equity in resource allocation and use. And both seek to build a sense of "ownership" of the decisions and the process. They share a number of compatible strengths. Thus, in many situations, its useful to establish a partnership between the two management approaches to enable communities to comprehensively address the entire range of complex problems concerning CFM.

For example, in areas of the coast where fisheries are of importance, CBFM can be linked to a broader ICM effort that can address the entire set of issues within the ecosystem. The ICM programme can set quantitative objectives for fisheries issues - the CBFM effort can determine the details of solutions to achieve the objectives.

In fact, its often common for an ICM process to leave the development of detailed solutions to either subcommittees of the ICM process, or to separate decision-making bodies. The results are reported to the ICM programme for final discussions and consensus. Such issues requiring a more specialized input include, for example, engineering solutions for breakwaters, mitigation measures for habitat rejuvenation and fisheries management measures.

In the case of fisheries, objectives for management of issues that have to do with the fisheries resources (e.g., decline in water quality, loss of nursery grounds, decline in fish stocks, etcetera) can be established within the ICM process, where fisherfolk are represented together with other key stakeholders. For example, quantitative objectives for water quality and habitat restoration can be set to achieve

an increase in fisheries resources. Biological indicators of the health of the fishery can be monitored by the ICM effort. The monitoring information can be applied by the fisherfolk in the CBFM programme.

If fisherfolk are to participate in management - setting limits on catch and numbers of boats, zoning schemes, and seasonal closures in certain areas, etcetera - they need to have accessibility to applied science that is able to paint a comprehensive picture of the ecosystem. Fisherfolk learn from the scientific findings of the ICM process and often change their original perceptions of the issues.

CBFM often provides a firm foundation that can later evolve into a more comprehensive management effort that can help fisherfolk address those issues in fisheries that lay outside the fisheries sector. As communities begin to see the root causes of fisheries issues, CBFM programmes will need to develop some kind of approach to address the broader ecosystem issues - either by participation through representation in a separate but more integrated management programme or by initiating a broader ICM effort.

In fact, fisheries issues are often the driving force for establishment of ICM programmes. An example from the US. In the Chesapeake Bay, concerns from the oyster and crab fisherfolk of the increasingly poor water quality in the Bay began what is now a very successful ICM programme. The Chesapeake Bay Programme is over twenty years old and has been able to consistently generate millions of dollars in government and private sector funding for clean-up efforts. Water quality has improved, and the oyster and crab fisheries have recovered. Fisherfolk leadership in the Programme remains strong.

However, throughout the Programme, the fisherfolk continued to maintain their own management schemes for managing the oyster and crab fishery.

Another interesting lesson from this experience was that the fisherfolk were of disparate groups but the environmental 'crises' of water quality and habitat loss unified them and made them help to lead the wider public towards resolving the problems.

Fisherfolk participation in ICM programmes helps to build leadership in fishing communities. It gives them more confidence to take on leadership roles in the CBFM efforts, which can strengthen the CBFM programme. The presence of an ICM programme provides an incentive for specialized groups such as CBFM to organize. The sense that their knowledge and inputs will help guide decisions builds stewardship of the resources and ensures strong and active participation in the programmes.

Successful integration and partnership of CBFM and ICM can help to create a sense of unity in society, and a sense of belonging in the small-scale fisherfolk to the wider community. It can enable fisherfolk to have a wider voice in the

community on other community development issues, such as health care and education. Likewise, fisherfolk can help the broader community identify the problems and direct the solutions to the ecosystem problems or issues, educating the wider community on fisheries issues.

#### 5. Conclusion

CBFM and ICM share common objectives and have compatible strengths. Adaptive linkages between the two management approaches would help to ensure mutually beneficial programmes and a more comprehensive management of the coastal resources.

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# PERSPECTIVE OF FISHERS ORGANIZATIONS INTEGRATED TO COASTAL FISHERIES MANAGEMENT: THROUGH EXPERIENCES GAINED IN THAILAND

by

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#### ABSTRACT

The purpose of the discussion which follows is to clarify the roles of fishers organizations in coastal fisheries management. Even if there is much disagreement over the appraisal of fishers organizations, whatever the type of intermediary organizations will be expected to entail sharing-responsibility between government and fishers. A cooperative system is applicable to comanagement and community-based management regimes. Cooperative movement in Thai fisheries has not yet been mature enough to expand their activities into fisheries management. Nowadays, however, much effort has been made to create a new framework of promotion policy for fishers organizations by the Thai government. Experiences gained in Thailand will give a profound insight into a direction of fishers organization in sustainable fisheries management.

#### 1. Introduction

#### 1.1 Objectives

Decentralization of fisheries management is a key concept in new regimes, placing great emphasis on the encouragement of fishers' participation in the management. Policy makers, administrators and fishers recognize a pressing need to set up a particular type of fishers organization that functions as a management body at local level. The major purpose of this paper is to discuss the organizational structure and operation principles of the organizations.

The first part of this paper will briefly review, from a management aspect, the framework of new approaches to small-scale fisheries development. The second part will clarify the roles of intermediary organizations that entail sharing-responsibility between government and fishers. This part will also present a general view of cooperative-governance of fisheries resources. In the third part, the focal point will be on the development of fishers organizations currently existing in Thailand. There is considerable disagreement, not only in Thailand but also elsewhere in Southeast Asia, over whether or not traditional cooperative organizations could be transformed into effective management bodies. This becomes a controversial issue. This part will first

examine the substantial reasons of disagreement through experiences gained in Thailand. It will also examine a new framework of promotion policy for fishers organizations that the Thai government has just set up. The final part will conclude the perspective and direction of fishers organizations in coastal fisheries management.

### 1.2 Background

The Southeast Asian nations have rapidly expanded commercial fisheries and fisheries-based industries during the last three decades. The introduction and expansion of highly productive technologies have brought a rapid increase in production. A strong inducement to urge the development of commercial fisheries come primarily from an ever-increasing foreign demand for highly valuable species. The expansion of domestic consumption has become another important factor in the realization of a high growth rate of fisheries and fisheries-based industries. As a result, the industries have successfully increased their contribution to the national economy, providing a wide variety of employment opportunities.

However, too rapid a development of commercial fisheries has caused several contradictions. Under government-centered control over marine resources, fishers have enthusiastically increased their catch effort in fishing open-access resources. Profitable fishing business attracts newcomers and provides high employment. Local overcapitalization and overfishing are widespread throughout the country. Severe competition has occurred not only between large-scale and small-scale fishers but also local internecine problems within the small-scale fishing groups. Unequal of distribution of marine resource has become a serious social problem. Poverty alleviation cannot yet be achieved. Deteriorating coastal environments and depletion of marine resources have caused a crisis in fishing communities for their survival in economic and social terms. The Government's 'long-sighted' policy for fisheries management may often give a sense of hopelessness to poor small-scale fishers (Chong, K., 1994). Even if policy is directed towards the sustainable use of marine resources, its implementation will sometime endanger social stability and then become a political controversy.

It is obvious that narrowly focused policy for improving production of small-scale fisheries cannot solve dilemmas that fishers face. Governments, development agencies and NGOs organize many comprehensive programs which are designed to sustain economic and social stability in fishing communities. Establishment of effective management with participatory approaches is the most essential in the implementation of the programs.

# 2. Framework of Effective Management and Concept of Participatory Approaches

# 2.1 Towards Effective Management

Governments of Southeast Asian nations have so far made great efforts to structure the hierarchy of fisheries management. However, from the top-down approaches have often failed in gaining fishers' response and support. They scorn government control over their fishing activities, regarding it as bureaucratic and ineffective. They are excluded from the decision-making process of fisheries management. Restrictions on destructive fishing activities have little effect. Small-scale fishers stand in a vulnerable position relative to large-scale ones. They equip fishing boats with highly productive fishing gear and often invade restricted or preserved areas for small-scale fishers. Coastal fisheries resources, even today, are virtually open-access.

Government-centered regimes of fisheries management in Southeast Asia have found a difficulty in sustaining the stable use of coastal resources. The regimes have hardly attained equal distribution among fishers, although commercial fisheries have rapidly developed. Governments have increased their authority in fisheries management whilst local control, through traditional management and custom, has correspondingly diminished (Nielse, R. N. & Vedsmand, T. 1995). Pomeroy refers to the misleading "standard-package" approach to fisheries development, which neglects the mixed nature of small-scale fishers and their great diversity depending upon their functions (Pomeroy, R. S., 1991).»

being regarded as an adequate measure to fit in with local conditions. A fishery cannot be managed effectively without the cooperation of fishers in any process of making laws and regulations (Pomeroy, R. S. & Williams, M.J., 1994).

Decentralization of a government-centered regime is indispensable for the establishment of user-based resource management in coastal fisheries. This regime often faces a difficulty in enforcing fisheries laws and regulations due to lack of a workable administrative system, personnel and budget. The procedure of decentralization has several advantages. Firstly, fishers' indigenous knowledge of coastal fisheries resources is of great use in the enforcement of conservation measures being suited to local conditions. Secondly, their participation and cooperation in a sustainable management regime is cost-effective rather than the traditional from the top-down approach. Thirdly, local communities and people may be able to administer regulatory institutions that are superior to externally-imposed regulations (Townsend, R.E., 1995).

As many anthropological studies indicate, traditional community-based fisheries management used to have self-governing functions in using land and coastal resources within a well-defined narrow locality. Akimichi points out that the traditional marine fisheries tenure and its administration depend heavily on such distinct conditions as low population density, homogeneity of kin- or territorially-

based communities, use of primitive technologies, isolation from urban fish markets (Akimichi, T., 1995). Fishers and residents arrange a particular type of informal institution with self- and mutual-help functions enabling them to survive. Communities often have a "shared-poverty" function, too. They share same cultural backgrounds.

Jentoft theoretically describes that a traditional community-based fisheries management represents an institutional arrangement for mutual adjustment among fishers within a certain defined area (Jentoft, S. & Kristoffersen, T., 1989). This arrangement is informal. Initiatives of fisheries management belong to fishers and local residents, not to any authority of central government. Of course, traditional systems cannot always evolve into formal ones. Influenced by an infiltrating commercial economy, traditional communities have diminished the function of governing common property in their immediate vicinity. Moreover, government-centered regimes have increasingly threatened the survival of traditional community-based fisheries management. Local government control over fishing activities and coastal resources is spreading throughout the country, as Bailey and Zerner analyze 'sasi' systems in Indonesia (Bailey, C. & Zerner, C., 1991).

Regardless of whether or not a community-based fisheries management could be transformed into formal and institutional ones, traditional experiences and customs may provide a profound insight into what viable model of institution will be more suited to people's self-governance of coastal fisheries resources. There may be a wide variety of models whereby fishers participate in the decision-making process of fisheries management. Co-management and/or community-based models are the ones that transfer government-centered powers to the local level.

# 2.2 Participatory Approach and Co-management

4

It is widely acknowledged that co-management represents a particular partnership between government and local fishers (communities, and institutions): of course, there are some disagreements over the detailed concepts of co-management. The partnership shares responsibility and the authority of fisheries management between both parties (Pomeroy, R. S. & Williams, M. J., 1994; McCay, B. J., 1993). This is expected to develop an institutional framework which stimulates fishers to participate in the decision-making process of management.

A framework of co-management contains the ideal of decentralization and deofficialization. On the other hand, it sets up intermediary institutions which are legally controlled by government. This seems a contradiction. A traditional community-based fisheries management might not be applicable to the creation of a new regime without legitimacy. Government-centered regimes have found a difficulty to enforce fisheries restrictions in order to reduce the depletion of coastal fisheries resources. The co-management approach takes a middle position between government-centered and traditional community-based management. Obviously, the organization and activity of co-management is legalized by central government.

Within the scope of legitimacy, fishers will take self-governance of fishing activities. Co-management may be composed of a government-centered regime.

The question is to what extent government agencies will devolve their present duty of governing coastal fisheries. This is a very difficult one. Bureaucrats and policy makers probably hesitate to transfer their initiatives to the local level, on the grounds that fishers are incompetent as administrators of resources. Decisively, a deofficialization strategy greatly influences the whole aspect of a bureaucratic system including the local administration currently prevailing. It becomes a political controversy. Another question is what institutional framework should be designed for enabling small-scale fishers to take initiatives in fisheries management. It is generally understood that there are two substantial elements for promoting fishers' participation through any institutional framework; territorial use rights in fisheries (TURFs) and fishers' organizations (FOs). These elements are interlocked reciprocally.

The availability of TURFs is a prerequisite for community-based fisheries management, as Christy describes (Christy, F. T., 1992). It is a central element of co-management (Pomeroy. R. S. & Williams, M.J., 1994). TURFs are given to individual fishers, groups of fishers, communities and/or local governments. They may be divided into territorial use rights for capture fisheries and for aquaculture. They are regarded as exclusive access rights to coastal fisheries. The cooperative use and self-governance of resources will bring efficiency and equity to those fishers who possess the right to entry into fisheries.

In a traditional community-based fisheries management, communal organs in various forms have responsibility not only for controlling production activities of fishers but also arranging equal distribution of resources to community members. The communal organs have a 'shared-poverty' function. In case studies on the 'sasi' system in Maluku Island, community's leaders and elite have little discretionary powers that lead to their own profit making (Kissaya, E., 1993; Mantjoro, E., 1993). Their management activities have legitimacy by passing through mutual consent of all resource users in the community. In cases where a 'sasi' system works effectively, a group of committees carefully watches fishers' law-abiding activities and guides them to conserve scarce resources. Any offender is punished by the group. It acts as a management body which coordinates among the resource users concerned and avoids a conflict of interest. The group extends its function within defined territorial boundaries. It is noteworthy that sustainable use and equitable distribution of scarce resource are firmly built into traditional communities.

Government and resource users jointly establish particular types of formal organizations, as traditional fishing communities have established communal organs. Their membership may be open exclusively to those fishers who have a license and limited entry to coastal resources. Or the membership is open to any residents which defined boundaries. In either case, the management of TURFs is a key role of organizations.

FOs are communal in nature, as long as fishing communities are primary units for the management of TURFs. They may be attuned to the greater importance of communal benefit rather than individual ones. An egalitarian movement will reduce a large gap in terms of distribution of coastal resources among fishers. On the other hand, FOs show a corporate nature in organization. Under a rapid development of commercial fisheries, fishers have a strong will to advance in economic terms. Their motivation deeply affects the operational principles that FOs adopt. Fishers much prefer to maximize own individual benefit rather than to sustain economic equality among them. They are organized into a management body almost as competitors. In fact, many traditional fishing communities which have arranged an institutional framework for the sustainable use of coastal resources have gradually diminished the functions of avoiding social conflicts (Mantjoro, E. & Akimichi, T., 1995).

There will appear a wide variety of forms of FOs acting as management bodies. The basic ideal and practical components of TURFs are the major elements which affect their organization and operation. While TURFs neither concern local intimacy nor communal cohesion of fishers, the organization of FOs entail flexibility and openness. They are corporate in nature, based on competitiveness and efficiency. These organizations will be capable of managing such as individual transferable quota. On the other hand, there are many obstacles to introducing TURFs.

In Southeast Asia, coastal fisheries still provide rural people with an important means of livelihood. Some restrictions on coastal fisheries, which are conducive to the sustaining of scarce resources, will make a number of fishers and their families face a crisis of survival. Fishers have not yet grown mature enough to adapt themselves to complicated management regimes. Probably, they prefer to take a noncommittal attitude toward determination in the management of TURFs. It is obvious, of course, that they need a well-defined right to determination in the decision-making process (Townsend, R. E., 1995). Small-scale fishers adopt collective measures to manage and utilize coastal fisheries resources. FOs rely on local and social intimacy among fishers, and then develop communal procedures of decision-making processes into formal democratic ones. The cooperative ideal and procedures of resource use are becoming the most significant.

# 3. Expectations and Dilemma of Fishers Organizations in Thailand

# 3.1 Disagreement over Promotion for Cooperative Organizations

There is a pressing need to promote cooperative organizations and encourage people's participation in rural development, but this is very difficult work especially in small-scale fisheries. As Yamao describes, even today, the appraisal of rural-based cooperatives has fluctuated between a negative and positive light (Yamao, M., 1993). In fisheries fields, there have been a plenty of failures to set up self-help organizations which adopt cooperative principles and manners.

Governments in Southeast Asia have made many fresh departures in the creation of cooperative organizations in various forms during the last two decades. In Thailand, there exists at least four different types of fishers organizations: fisheries cooperatives, agriculturists groups for fisheries, fishers groups, and BAAC (Bank for Agriculture and Agricultural Cooperatives)'s clients groups. There are several substantial reasons for the coexistence of cooperatives and 'quasi-cooperatives.' Plural government agencies involved in rural development have made considerable effort to establish distinct types of fishers organizations according to their own objectives. Lack of coordination among the agencies has led to the complicated systems of fishers organizations. As a result, fishers' movement toward the improvement of cooperative activities has been divided into several sections. Promotion policy for cooperative organizations have always fluctuated between political and economic aspects, and between pessimistic and optimistic appraisal. Such changeable attitudes towards cooperative organizations are the major cause hindering the smooth development of fishers participation in whatever the type of cooperatives.

Fishers tend to regard any cooperative organizations as agencies of government's relief work. They often hesitate to deal with cooperative business activities since they have to follow complicated procedures. More decisively, the organizations do not cover all the aspects of production and distribution that fishers need. Membership of cooperative organizations are a tiny portion of all fishers in small-scale fisheries. Therefore, they can hardly act as conduits of government support to all fishers.

Naturally, promotion for fishers organizations, which is at the core of comanagement and community-based fisheries management, becomes a matter of controversy. However, many failures of traditional cooperative organizations remind policy makers and administrators that they will be little use in coastal resource management.

# 3.2 Appraisal of The Present System of Fishers Organizations in Thailand

Fisheries cooperatives (FCs), which are regulated by the Cooperative Society Act, 1. extend their membership over a district (Amphure) and conduct economic activities. In actuality, they function as occupational groups whose members share the same interests, consisting of particular types and classes of fisheries. The cooperatives do not affiliate many fishers within the district. Cooperative membership accounts for a tiny portion of the total number of fishers, estimated at less than 10% of those engaged in marine capture fisheries and aquaculture in 1994. The number of FCs has gradually increased.

Agriculturist groups for fisheries (AGFs) ,2. are distinct in nature from FCs. Membership of AGFs extend over an administrative village (Tambol). It is ideal that they should play a key role in village development programs supported by government. The number of AGFs have rapidly increased after the mid-1970s, and

surpassed that of FCs. From then onward, AGFs importantly acted as conduits of government subsidies and financing to fishers.

There are some reasons why government does not pay much attention to the rebuilding of the present system of cooperative organizations for the creation of new management regimes in coastal fisheries. First, both FCs and AGFs are designed to conduct economic activities such as provision of credit, supply of production materials, and marketing fisheries produce. It is not clear whether these two categories will be applicable to co-management and community-based management. Loosely defined, the category of cooperatives refers to an economic organ through which members would be able to grow into maturity as commercial producers. In contrast, the category of AGFs may be defined as social relief work of government (Yamao, M., 1996). In addition, BAAC's clients groups are to function with joint and several liabilities among a small number of clients.

Secondly, not much success has been achieved in the operation of business activities. Many of AGFs fell into dormancy which could have provided meaningful service. Depending heavily on the support of government, they failed to encourage people's participation on a voluntary basis. Fisheries cooperatives are not in a very critical condition, nevertheless they are not capable of the challenge of new assigned work in coastal fisheries management. Moreover, the administrative lines registering and supervising the cooperatives are separated from the implementation of fisheries policies. Without rearrangement of the administrative system, cooperatives can hardly adapt themselves to the management of coastal fisheries.

Thirdly, Thai government has still continued to investigate the enactment of the fisheries laws and regulations that do not include any framework of fishing rights (Karnjanakesorn, C. & Yen-eng, S., 1995). In a draft, the fishing right system means a decentralized system that transfers part of responsibilities for fisheries management to local levels. However, clear-cut outlines of the new regimes are not yet proclaimed. The government devotes itself to investigating fishers' attitudes toward fishing right systems and preparing for pilot projects in several provinces.

Therefore, the present system of cooperative organizations will not be integrated with new management regimes of coastal fisheries.

# 3.3 New Approaches toward Community-based Organizations

After the mid-1980, the DOF began an enthusiastic involvement in the development programs of small-scale fishing communities. While increasing the capacity of extension services, it rapidly enlarged the amount of budget earmarked for the investment of infrastructures such as small landing places, marketing places, retaining walls, meeting halls, storage and other facilities for the improvement of production and living conditions. These are located in fishing communities, termed Moo Baans and/or Tambols. As Table 1 indicates, the number of projects was more than five hundred in coastal fisheries up to 1995. In aquaculture, fishers obtain new

technology and knowledge of fish, shrimp, oyster, cockles and others with some production materials. In coastal fisheries, except for gear demonstrations, the DOF concentrated mainly on the construction of piers throughout the country, especially in Chantaburi, Trad, Surat Thani, Chumpon, Trang, and Satun. It is estimated that this work accounted for more than 70 % of the total budget for the development programs of small-scale fisheries. There were 92 piers in 1993, this then increased to 151 by 1995. The scale of a pier is not large, being in a ratio of one to 20 or 30 fishing boats. The number of projects for building retaining walls increased. A great deal of budget was invested in the establishment of artificial reefs, also.

Such active involvement in the development of small-scale fishing communities may provide great incentives for fishers to improve their production and living conditions. No analytical data indicates how effectively community-based infrastructures are used. Roughly speaking, a considerable number of piers have not yet achieved full utilization by fishers due to unsuitable location and the inappropriate design of structures. The piers privately owned by fish traders may be more convenient for fishers to have a business link with them. As long as the traders diversify their economic function on these piers, they have little motivation to move toward the new public facilities. Meanwhile, artificial reefs are very useful not only for aggregating fish but also for reducing resource damage caused by trawlers. Fishers much appreciate the installation of artificial reefs and the creation of a new fishing order in their immediate fishing grounds (Shinanuwong, K., 1993).

In the process of implementing development programs, a concerted effort has been made to establish a particular type of fishers organization since 1987. This is called "Klun Khong Tuns Pramong (group of funds for fisheries, GFF), which is distinguished in nature from FCs and AGFs. There existed 99 groups in 1993: at present, the total number of groups is more than 170. The membership of a GFF tends to extend mainly over Moo Baans which are primary units of an administrative village (Tambol). It is designed to work as an agent of the fisheries extension service and to undertake the task of managing community-based infrastructures. Those fishers joining the membership can have access to training courses organized by the extension service and gain some economic benefit. In cases where fishers do not organize themselves into a group, they set up a committee for the collective use of the infrastructures only.

Depending on the concessive support of government, GFFs perform some economic activities, especially the supply of fishing gears on credit. In a Moo Baan, Klongyai District, Trad Province, fishers are engaged mainly in small-scale trawl fisheries, gill net and trap fisheries. In 1991, 41 fishers (40% of the total number of fishing households) joined together to set up a GFF. The DOF constructed a small pier while the district administration replaced the wooden walkway along the canal by the concrete one. The GFF began with the supply of nets on credit while it was assigned to manage the pier. At the outset, the DOF subsidized a great portion of the operating funds. A share capital is one hundred Baht. Interest is charged 2 Baht per one hundred Baht for short-term credit, on a monthly basis (Yamao, M., 1995).

Table 1 Development Programs for Small-scale Fisheries (1987-1995)

	Chachoengsao	Chon Buri	Rayong	Chanthaburi	Trat	Phetchaburi	Prachuab Khiri Khan	Samut Songkhram	Samut Sakhon	Phuket	Krabi	Nakhon Si Thammarat	Surat Thani	Chumphon	Ranong	Phangnga	Songkhla	Phattalung	Trang	Satun	Naratiwat	Pattani	Total
Aquaculture 1)	0	0	0	1	0	0	О	0	1	0	5	8	2	6	1	1	11	18	8	13	9	2	86
Coastal Fisheries 2)	2	1	15	23	26	16	40	11	11	10	26	28	28	48	17	30	51	0	50	30	11	31	505
Pier	2	1	5	10	11	5	8	6	6	3	9	7	12	11	8	9	7	0	13	13	1	4	151
Retaining Wall	0	0	1	4	3	3	6	2	2	2	4	4	2	5	2	5	2	0	6	8	2	3	66
Storage	0	0	1	0	1	0	1	0	1	0	3	2	2	3	0	2	6	0	3	2	2	1	30
Processing Plants	0	0	0	1	1	1	0	0	1	0	0	1	1	0	0	0	1	0	1	0	2	2	12
Water Tank	0	0	0	0	1	0	1	0	0	0	1	0	0	2	0	1	2	0	3	3	1	0	15
Winch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Artificial Reef	0	0	6	0	1	0	11	0	0	2	1	2	0	12	7	5	5	0	7	9	0	9	77
Gear Demonstration	0	1	2	8	8	7	13	3	1	3	8	12	11	15	17	8	27	0	17	15	3	12	191
Processing 3)	0	0	3	3	7	2	3	2	0	1	2	7	5	5	1	1	12	6	9	14	7	6	96

Note

This is promotion for aquaculture of fish, shrimp, oyster, cockle, mussel and so on.
 These are mainly construction projects.
 These are for extension of technology, training, and marketing.
 (Source) DOF Phun Thi Dam Naan Kan Khlongkan Phattana Pramong Tale Chai Phan Phun Baan Phi 2530-2538

In another fishing community of the Klongyai District, a GFF supplies gill nets on credit. Fishers are engaged mainly in gill net fishing for crab, shrimp and giant queen fish. The upper limit of credit is 4,000 Baht per person. Duration of repayment is ten months. The members require two persons to stand joint and several security. As the amount of credit is not enough, they have to provide a certain portion of the money for purchasing gill nets. This GFF has not accumulated their own capital, so that the members have to wait for their turn to obtain credit. Interest payments of borrowers are the major source of profit. It would appear that the scarcity of operating funds has become an impediment to a further encouragement of fishers' participation.

Table 2 shows some indicative figures of GFFs' activities in Trang Province: no available data indicates the whole aspect of GFFs throughout the country. Compared with other provinces bordering the Gulf of Thailand, the establishment of GFFs was started at a much slower pace. For the last few years, fishers have increasingly participated in GFFs' activities. The scale of membership per group is very small, being 40 fishers on average. Such a meager scale results from the fact that GFFs are established mainly within a Moo Baan(s). The membership of GFFs do not include all fishers in their immediate vicinity, although there is a great difference in percentage of members to all fishers between GFFs. It ranges from 20 to 90 %, but many groups are at a level of 30 %. A GFF is characterized as a community-based institution. However, membership is not open to any fishers on account of a lack of operating funds. As a result, GFFs do not always represent communal interests. They follow the motivation of individual benefits among particular interest groups.

GFFs concentrate mainly on the provision of fishing gear on credit in the operation of business activities, not diversifying their function. This is not only because they are not regarded as economic organizations, but also because they have not yet accumulated their own assets. The total value of assets is 112,817 Baht per group. The funds subsidized by the DOF account for 92.5 % of the total on average. GFFs would hardly conduct any economic activities without government support. Some groups decrease the amount of supply year by year. They mediate government subsidies to members as intermediaries. Further development of business activities is very difficult work.

The figures of Table 2 prove that GFFs are of no great use for managing and maintaining community-based infrastructures, nor are they helpful to the DOF to expand new technology and ideas that are conducive to a rapid improvement of fisheries production. However, many attempts and experiences gained in the operation of GFFs are highly suggestive to the perspective and direction of fishers organizations. The next section will focus on what viable models are desirable for attaining a participatory approach in coastal fisheries management.

Table 2 Organization and Operation of Groups of Funds for Fisheries (GFFs) in Trang Province

										Unit: No., %,	Baht	
	Year of	No. of	No. of		Total	Subsidies	Shares	Savings	Profit	Supply of	Budget for	Infrastructure
	Establishment	Househol	Members	%	Assets 2)	from DOF				Materials 3)	Pier	Others 4)
Paliam District												
1	1993	138	101	73.20%	147,955	136,384			11,571	20,634	2,143,200	
2	1995	114	24	21.10%	71,630	68,630			700	68,630		
3	1995	74	28	37.80%	95,790	83,030	2,000	32,400	5,065	83,030		
Sikao District												
1	1994	112	38	33.90%	133,894	116,050	4,400	8,130	3,982	48,230		
2	1989	119	31	26.10%	92,878	92,878						500,000
3	1994	40	35	87.50%	113,092	107,231				38,391	1,098,400	
Kantan Distric	t											
1	1993	73	66	90.40%	140,223	129,831			5,213	22,200	,	
2	1993	167	37	22.20%	131,200	125,424	1,700		2,499	21,450		
3	1994	200	38	19.00%	133,894	116,050	4,400	8,130	3,982	48,230	4,114,000	
4	1994	151	32	21.20%	91,580	84,280	2,800		4,500	84,280		576,000
5	1995	63	25	39.70%	125,972	117,449		7,570	95	43,470		278,000
Khosanene Su	ub-district											
1	1995	170	20	11.80%	75,700	74,500	500		600	74,500		
(Per Group)		118	40	33.90%	112,817	104,311			3,184	46,087		

Note 1) Total of GFFs is 18 which does not include the groups with numbers of members.

(Source) Kijkaam Khong Kan Phatana Pramong Tale Chai Phang Phun Baan Yokuen Kan Jat San Leng Asai Sat Tale Khon Changwat Trang DOF, 1995

<sup>2)</sup> Figures are as of 1995.

<sup>3)</sup> Amount of supply is almost equivalent that of credits.

<sup>4)</sup> These are the budgets of the DOF.

## 4. The Creation of Fishers Organizations as Management Bodies

# 4.1 Lessons from Past and Present Experience

Three types of cooperative organizations in Thai fisheries have their own profiles, shown in Table 3. FCs would hardly evolve into a management body for coastal fisheries without any coordination with fisheries agencies. The organization and membership of some fisheries cooperatives are fitted to highly commercialized fisheries. These cooperatives always have a strong will to expand their scale of business. They are likely to expand business scale and integrate those fishers who have the same economic interests into cooperative membership beyond their immediate vicinity. Economic inducement is obviously an essential element in enhancing cooperation among members. Some cooperatives are affiliated mainly with small-scale fishers, in the same way as other types of FOs. They are local-based organizations. However, membership and operation are flexible, and distinct from AGFs and GFFs. To grow into adequate institutions involved in coastal fisheries management, FCs must be divided into new categories in the regulations. In addition, FCs have been alienated from favor in fisheries policies.

In principle, AGFs have adequate profiles and principles as community-based organizations. They are established within Tambols, consisting of several fishing communities (Moo Baans). A Tambol is a primary unit of Thai local administration with some budgetary and administrative powers, under the authority of the district and takes a key role in recent rural development projects. Standing between the district directly authorized by government and the Moo Baans managed by local residents, Tambol administration has a function of coordinating people and government. It is a formal institution in which the residents participate in the decision-making process of administration. AGFs (and whatever the type of agriculturist groups) are designed to entail social intimacy among members within the Tambol. The organizational structure of AGFs may be more attuned to the importance of sustaining a sense of political unity than that of attaining economic efficiency in business operation. Such Tambol-based organizations might have taken an initiative in co-management regimes. In actuality, a number of AGFs have fallen into dormancy sine the mid-1980s.

Generally speaking, GFFs extend their membership within a very narrow locality. The scale of membership is not large. Probably, the meager scale of membership may be better suited to the implementation of extension services, but not to the operation of any economic activities. It is regarded as primary unit of coastal management. Small-scale fishers normally cover a wider area of fishing ground beyond their immediate vicinity. As seen in a pilot project for community-based management in Tambol Khaomaikeew, Trang Province, fishers living in six Moo Baans set up an area federation a few years ago. The federation has responsibility for coordinating among Moo Baans and creating a self-governance regime in certain fishing grounds. Interlocking relationships between the Moo Baans have enabled a restriction on destructive fishing methods and gear such as trawl and push nets and

Table 3 Distinct Profiles of Three Types of Fishers Organizations in Thailand

	Laws & Regulations	Under Authority	Government Audit 1)	Area of Mem- bership	Main Activities	Nature of organization	Status	Flexibility	Conditions for participating in management
Fisheries Cooperatives (FCs)	Cooperative Society Act (in 1968)	Cooperative Promotion Department (Ministry of Agriculture & Cooperatives)	Yes	District	Supply, Credits, Deposit, Marketin	Economic orga- nization	Active		Yes Expansion of membership. Rearrangement of primary units. Creation of new categories according to members' fisheries. Coordination with DOF.
Agriculturists Groups for Fisheries (AGFs)	Revolutionary Proclamation No. 140 & No. 141 (in 1972)	Department of Fisheries (Ministry of Agriculture & Cooperatives)	Yes	Tambol (administrativ village)	Supply, Credits, Deposit, Marketin	Economic orga- nization Agents of govern- ment agencies	Not active (many are dormant)		No Some active groups may be transformed into management bodies.
Group of Funds for Fisheries (GFFs)	Notification of Depart- ment of Fisheries	Department of Fisheries (Ministry of Agriculture & Cooperatives)	No	Baan (primary unit	Supply of gears Management of Infrastructures Extension of tech- nology	Conduits of extension servie	Active		Yes Expansion of membership. Encouragement of fisher autonomy. Reduction of dependence on supports. Rebuilt organizational strucuture. Establishment of regional federations.

Notes 1) Government audit is conducted by the Department of Cooperative Auditing (Ministry of Agriculture & Cooperatives).

preserves the marine environment in their fishing grounds. It is obvious that individual GFFs will join the membership of an area federation which has a comanagement function at local level.

Meanwhile, as long as GFFs are engaged in some economic activities, a considerable proportion of fishers are excluded from their membership. They limit newcomers. A shortage of operating funds becomes an obstacle. GFFs are more economic organizations in nature than generally thought, although the scale of activities is meager. Some fishers can access government support, while others are alienated from it. Community-based organizations such as GFFs do not always have communal and majority benefits. Therefore, administrative organs of Moo Baans or Tambols may be more applicable to the establishment of co-management and community-based fisheries management having special attention to equality and people's participation.

# 4.2 Equality Democratic Control and Competition

As Table 3 indicates, there should be some preconditions for transforming the fishers organizations as they currently prevail into management bodies in coastal fisheries. It seems that FOs would be better if they specialized their function on a fisheries management aspect, not diversifying into economic fields, especially in cases where TURFs are given to communities or organizations whose membership is open to any fishers. They must avoid any rules of exclusivity within their own territory. Otherwise, the operation of FOs will cause social conflicts in fishing communities. Given the conditions where coastal fisheries still provide plenty of employment opportunities, any policy for coastal fisheries management will hardly bring a sense of hopelessness to fishers.

Cooperative organizations engaged in economic activities tend to adopt "scale of economy"-based principles in business operation under relaxation and structural adjustment of the national economy. These principles are not always acceptable by FOs with a management function in coastal fisheries. Organization and operation principles that the cooperative organizations currently prevailing adopt are more suitable to the enhancing of the market-oriented ability of members. There may be still the recommendation that FOs are to feature both economic unity and a management body. Probably, this has derived from unique experiences gained in Japanese fisheries cooperatives. In actuality, they have successfully developed an interlocking relationship between market-oriented and fisheries management functions. Such a relationship is, however, a very sophisticated arrangement based on customary fishing behavior. It will take time for Thai small-scale fishers to organize FOs in the same manner. In this sense, the promotion policy for GFFs is rational to some extent.

According to past experiences, very few cooperative organizations could avoid severe competition among members and between themselves and non-members. A particular class of members often made a monopoly of cooperative

benefits. Any system and rule of FOs must be under democratic control. In Thai rural society, local powers and elite can more easily access development benefits than others, by taking the initiatives in the decision-making process of village administrations. Without an institutional framework of democratic control in FOs, coastal fisheries resources may again be monopolized by a minority group of fishers. FOs have to develop a democratic structure of organization and operation. This must be strictly guided by central and local governments. New regimes such as comanagement and community-based fisheries management cannot tolerate arbitrary fishing behavior of minority groups. The ideal and practical procedures of cooperative organizations are built into the new regimes. Essential elements of cooperative principles are self-reliance, equality and democratic control. They become the elements of the new regimes in coastal fisheries management.

#### 5. Conclusions

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It seems that co-management and community-based management regimes reduce severe competition among small-scale fisheries which in turn reduces the depletion of coastal fisheries resources. Locally-based and formal institutional frameworks have to develop resource users' participation in the decision-making process of fisheries management. A cooperative system is applicable to these new frameworks. At the outset, the principle of organization and operation in the system will adopt the communal elements newly created which exclude a rigidly structured relationship in fishing communities. Probably, this is only a transitional stage of coastal fisheries management.

In Thailand, structural changes have occurred in fishing communities and fisheries-based industries. In developed areas, some of small-scale fishers have become mature enough to conduct highly commercialized fisheries, while residents tend to migrate to urban centers to obtain jobs outside fisheries. Fishing becomes one of the alternative employment opportunities. In the future, a locally-based management system may consist of an assembly of units of individual fishers with the possession of particular fishing rights such as an individual transferable quota. Naturally, the principle of operation and organization that a cooperative system adopts will be modified into that of particular occupational groups, diminishing the communal elements. It is attuned to the importance of economic efficiency in individual fisheries. As shown in the case of some developing countries, territorial use rights in fishing would be given to any fishers organizations that are competent to effectively use the resources and to preserve them. This is possibly one direction of a cooperative resource management through economic efficiency.

For the establishment of effective coastal fisheries management, FOs will pass through phased stages of development. Clearly, Thai small-scale fishers have to create and develop their own models of FOs. There will be a wide variety of models according to different patterns of small-scale fisheries development at local levels. Comparative case studies on the ongoing pilot projects will provide an insight into

what viable model of FOs will be more useful not only for people's participation and but also for sustainable use of coastal fisheries resources.

#### (Notes)

- 1 Department of Cooperative Promotion has the authority to register and supervise fisheries cooperatives. This department covers all types of cooperatives.
- <sup>2</sup> They are called as fishermen's groups. They are not registered according to the Cooperative Society Act. The Department of Fisheries regulates groups. There is much difference between fisheries cooperatives and groups.

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# COASTAL FISHERIES MANAGEMENT INTERRELATED TO ENVIRONMENTAL ASPECT

by

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#### **ABSTRACT**

Fisheries have played a dominant role as foreign exchange earner of Thailand's economy. Illegal practices, in particular, have caused damage in reefs, the marine habitats for living and non living organisms. Degraded coral reefs loss the diversification in species and decline a number of catch. A National Coral Reef Strategy for Thailand was developed to manage coral reefs according to their different ecological and economic values in order to maintain a balance of uses. Zonation of reefs was provided along with measures given for controlling an environmental impact. Likewise, public awareness building was suggested to satisfy a gap of implementation caused by lack of law enforcement.

#### 1. Introduction

Fisheries share a large number of agricultural products. As an important economical activity, fisheries earn high value foreign exchange to Thailand each year. In sustaining the local livelihood, small scale fishing gears and subsistence harvesting are generally found in local communities. This includes the traditional sea people and other inhabitant of small coastal communities who depend on coral reefs for subsistence with small fish, mollusks and other invertebrates. Use of reefs by these activities had brought about the decline in the abundant of reefs communities especially, shell and ornamental fish collectors and wholesale shell and ornamental fish dealers.

### 2. Damage of Corals by Fisheries

Coral reefs, a wonderful home for marine living organisms provide exotic underwater scenery. Corals keep the ecological balance by providing natural habitats, shelters, and nursery areas for stocks in which a number of species is increased. Reefs protect against strong wave and heavy storm to keep shore firmed. Coral colonies

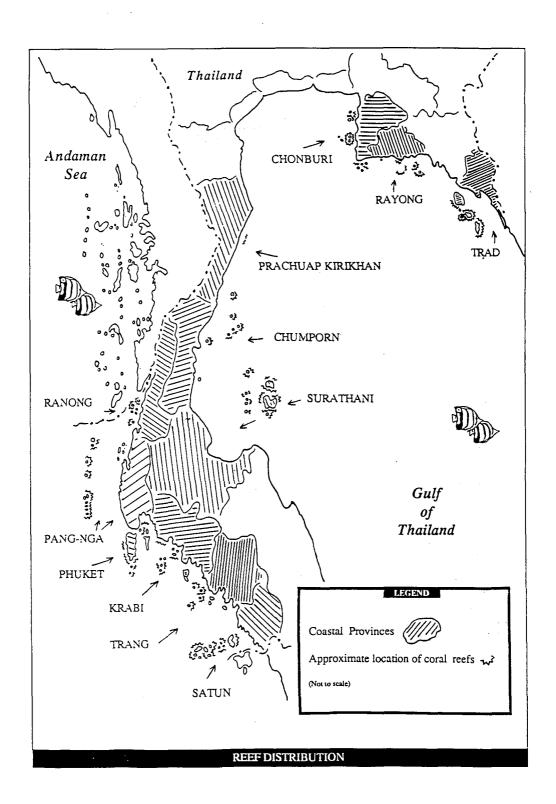
bewitchingly grow in many forms which attract tourists and general people to come to see them and the economic growth has resulted.

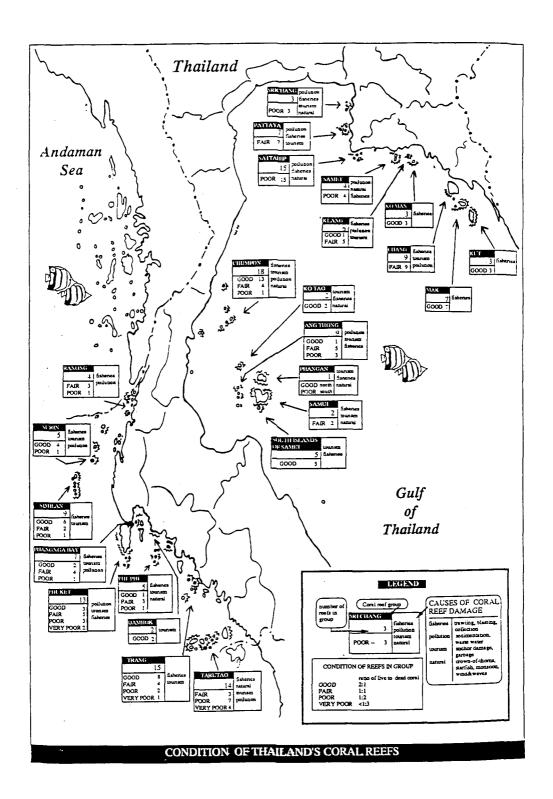
With no public awareness and no law enforcement, the destruction of coral reefs is intensified due to illegal practices. It was suggested that a more effective administration of coral-related laws and regulations shall be achieved by providing relevant government agencies with more manpower and equipment, promoting interagency cooperation, revising unclear and outdate law and regulations and adopting new ones and including local participation in coral reef management. (The Integrated Management Plan for Ban Don Bay and Phangnga Bay, Thailand, 1992.)

### 2.1 Gulf of Thailand

An increase in the demand for catch in Chumporn, reef blasting, netting/trawling, trapping and use of cyanide are consequently occurred. Coral reefs at various islands for Chumporn are quite expansive coverage with most healthy condition in the Gulf of Thailand. This condition will become worse if these activities have not yet been controlled with proper measures. Corals around Ko Luk, Ko Rat and Ko E-An of Prachuab Kirikhan are degraded. The major threat to reef is subject to small fishing gears and reef blasting. Rapid increase in a number of coastal community in Samed Archipelago National Marine Park of Rayong, mainly through encroachment, is leading to reef deterioration caused by reef blasting and trawling. In Surat Thani, approximately 50% of coral reefs are found in Angthong archipelago National Marine Park with moderately healthy condition.

Illegal practices including reef blasting, trawling, small fish trawling (Katak) and coral collecting degrade reefs both in the park and in the adjacent areas like Ko Tao, Ko Nang Yuan, Ko Samui and Ko Pa Ngan. In Chonburi, Ko Lan and Ko Sak are known as coral spots for recreation of tourists. Intensive use in reefs to satisfy the need for fisheries and tourism activities has intensified the coral destruction problem. Fishing activities include trap operating, reef blasting, netting, anchoring by fishing, use of cyanide for aquarium fish trapping and collection of corals. In Trad, most of healthy corals can be found in the National Marine Park of Chang archipelago where is remote from the shore. It was noted that reefs found in this area are of most abundant in the east coast of Thailand. Depletion of reefs is however caused by reef blasting, trawling, netting, anchoring of fishing boat, collection of shells, catch of aquarium fishes and use of cyanides





### 2.2 Andaman Sea

In the Andaman Sea, coral conditions are mostly healthy due to which are located in the national marine park. Traditional fishermen for such example at Lee Peh Island, Satun Province sustain their livelihood by small scale fishing. Since this area is abundant of nutrients valuable for marine organism, a considerable amount of catch has resulted. In keeping reefs abundant, national marine park such particularly as Phang-nga Bay, Had Nopparat Tara-Pi Pi (Krabi), Similan, Surin (Phang Nga) and Chac Mai (Trang) have played an important role in protecting against man-made impact. Use in reefs exists and illegal practices are continued and subject to coral damaging. Reef damage found in this area can be ranking in the order of reef blasting, trawling, catch of lobster, aquarium fishing, collection of corals, use of cyanides, use of small scale fishing gears such as rock netting, trapping, light netting and angling.

# 3. Impact of Fisheries on Environment

As described, reef blasting is ranked first in illegal fishing practices and is mostly found over the country. It was noted that reef blasting has caused damage in 65% of Thailand coral reefs and is the predominant cause of damage in 51% of the reefs. Reef blasting results in severe and extensive damage to coral reefs. The explosive change can uproot coral heads, indiscriminately kill adult and juvenile fish and other reef organism, and increase turbidity. Reefs that have been blasted are no longer productive for fisheries and their recreational value is greatly reduced (A National Coral Reef Strategy for Thailand Vol.1, 1991)

Trawling, the second coral damage ranking, is affecting mainly on the fishing ground. Use of fine mesh nets, small fishes and young juveniles is captured, incidentally losses fishing stocks. When dragging, trawlers destruct the fragile substrate, by the way, capture endangered species like sea turtle. Trawling is, further more, increasing a huge number of suspended solid through turbidity.

In the Andaman Sea, there is evidence that spiny lobster populations are depleted. In the Gulf of Thailand, stocks of snapper and grouper are significantly decreased in a number. Due to heavy collection, several invertebrates such particularly as cowries, cone shells and giant clams are becoming rare.

## 4. Effect on Environmental Impact Resolution

There are Ministerial Regulations and Notifications issued pursuant to the Fisheries Act. These still lack of law enforcement, hence, the problems are reported. Measures were addressed accordingly to that of previous identification including:

- Prohibition of the possession on use of explosives, toxic substances or electricity for fishing;
- Prohibition of sale of fish caught by illegal practices;

- Prohibition of the collection or export of corals;
- Prohibition of the collection of sponges;
- Prohibition of the collection of sea turtle eggs or sea turtle except by permit; and
- Prohibition of trawling and push-net operations within 3 km. from shore

Office of Environmental Policy and Planning in cooperation with concerned agencies had drafted the National Coral Reef Strategy. This paper was drawn upon a pilot study of Phuket Coastal Resource Management Project. Implementation of the project showed somewhat required its implementation to a greater extent to which the destructed reefs should be taken into account over country. The strategy had received the approval from the Government as the Cabinet Resolution issued on 3 March 1992. Such the strategy was aimed at reducing conflict use of reefs with emphasis on the need to development in harmony with conservation (A National Coral Reefs Strategy for Thailand Vol.2, 1993). As such, three zones of reefs were identified to suit each purpose as follows:

# Local Management Zone

Reefs zonated in this area is good or fair condition located in primarily rural areas. People depends on reefs include villagers for fisheries and local fishermen who have gained from reefs at subsistence level. Fishing activities include traditional reef harvesting and small scale fishing. Reefs were destructed mostly by reef blasting.

This category is objective to encourage people to participate in coral strategy by community-based reef management.

Given measures in coping with conflict use, all reef activities were allowed under general laws and regulations. Only non environmental impact fishing gears are allowed.

#### Tourism Zone

### Intensive tourism

Reefs are sited in poor to fair condition closely located to beach resorts and are intensively used by tourists.

These reefs are managed with the need to promote tourism activity. Such activity must, however, be requested for restoration of reefs, scenic beauty and enhancing the recreational use of reefs within carrying capacity.

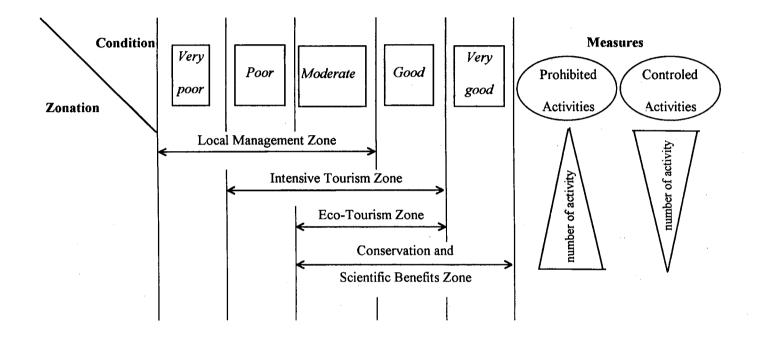


Fig. Coral Reefs Zonation Categozied According to Reef Conditions and Their Measures

All activities are allowed under general laws and regulations.

#### Ecotourism

Reefs are sited in fair to good condition with moderate. Many of these reefs are in marine national parks, but are not actively managed.

Reefs are managed based on nature-oriented tourism.

All activities are allowed under general laws and regulation. Prohibited activities are more than that of the earlier zones.

# Ecological Conservation and Scientific Benefits

Coral reefs in this zone are outstanding ecological value and known as scientific interest. These reefs are located around remote offshore islands.

Management of this category is to conserve and rehabilitate reefs as well as to promote research and monitoring program to keep marine ecological balance.

No activity is allowed in this zone except for activity related to national ecological and scientific benefits.

#### 5. Conclusion

Aware of marine habitats loss has led to an environmental protection program development. National Coral Reef Strategy is one of such the program. This requires great support from both central and local concerns to make the program implemented. It was realized that lack of public awareness and that population pressure provoke the damage in reefs, suggestions are, thus, provided as follow:

- Technical assistance in small-scale fisheries
- Improvement in post-harvest techniques
- Decreasing losses in ornamental fish collection
- Alternatives to rare shell collection and handicrafts
- Community involvement in management decision of fisheries
- Community reef reserves
- Training and skill development aimed at expanding employment opportunities for small-scale fishermen

- Build on public awareness
- Get involvement of local group in marine conservation program

In response the above ecological management guidelines, many activities have been applied, among other things, public awareness strengthening and training program, to the local. These efforts are becoming more increasingly important to which are implemented as routinely work by concerned agencies.

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# ENCOURAGING COASTAL WOMEN PARTICIPATION IN FISHERIES MANAGEMENT IN INDONESIA

by

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and

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#### ABSTRACT

Coastal inhabitants life cycle in some areas in Indonesia are still have concerned with traditional cultural heritage. Rapidly development next to coastal land for varieties utilization, could be encouraged serious threatened for the sustainability of fisheries production. Issue related fisheries resources sustainability in Indonesia actually have long been realized by part of coastal communities, where both male and female inhabitant have always respected to keep and safe the resources. The Japanese fishermen household have used to implemented an annual coastal ceremonial, locally called Nadran. In more directly touch to resources arrangement sound are represent through the traditional communities-based related fisheries management in several areas in Indonesian water includes Panglima Laot ("Sea Commander" in Aceh Province; Lubuk Larangan or Prohibited Fishing areas in North Sumatera; Lebak Lebung System in South Sumatera; Sasi in Mallucas and Macera at Tempe Lake, South Sulawesi). This paper would like to explore the coastal Women ability, condition and some constrain faced for their actively participation in fishing community development in Indonesia.

#### 1. Introduction

The role of fishing industry in the Indonesia National Economy is still relatively small. The coastal women which may involved in fisheries activities are includes fishing boat owner's wife, the motoris's wife, wife of the boat labors as well as girls labors (unmarried women). Some of them are female headed which directly contributed to the family source of income. Their varieties status in fishery economic activities are includes inland manajer or juragan darat (Susilowati, 1991). Local fish trader, fish processor and fish middlemen.

Since the last two decades, capture activities in Indonesia are tends to strongly exploited and the catch has shown decrease gradually. A number of fishing ground have been identified as highly exploited consist of the Malacca Strait, North coast of Java, East Coast of Sumatera, west coast of Kalimantan, South coast of Sulawesi (Nurzali and Yamamoto, 1977, Dwiponggo,1978; Sujastani, 1978 and recently was included Bali strait for Sardinella stock.

In fishing capture enterprise are usually preferred male rather than female worker. Approximately between 8 to 10 female worker out of 170 male worker would be absorbed in the fishing industry.

Fishing capture are mostly done by the fishermen especially for the fishing ground located from 3 mile to the offshore. In certain areas such as at Sentani Lake, Irian Jaya women are allowed capture using very simple fishing gear.

Meanwhile, fish marketing, handling and processing are dominantly done by the women. They usually work and stay close to their home. At Muncer (east Java), have well known as the center for fish processing especially for fish drying, salted, canning and fish powder production. Highly consuming catch also occurred at Muaraangke, North Jakarta (Annonimous, 1985) and at Pekalongan, Central Java (Susilowati, 1993.) The number of working days for both women and men in the processing industry and marketing at Mucar is ranged between 76/131 day for fish steaming and 90/160 days marketing.

Issue for fishery resource sustainability seems have long been realized by parts of the coastal inhabitants through locally fisheries arrangement. In more popular have known as traditional community-based management. In Indonesia several kinds of traditional community-based management have long been existed in certain areas includes Panglima Laot ("Sea Comander") in Aceh Province; Lubuk Larangan or Prohibited fishing areas in North Sumatera, Lebak-Lebung system in South Sumatera. Sasi in Mallucas and Macera at Tempe Lake, South Sulawesi. Implemented those community-based management into more formal in fisheries management concept will enabled fishing communities including the women to keep and safe the resource for future benefit.

#### 2. Gender-related in Fisheries Sector

Implementation of the National Development would be determined by both Human Resources quality and sustainability of the Natural resources.

The goal of long term National Development is formed the Indonesian with characterize by:

- 1. Harmonized relationship between man and the God.
- 2. Harmonized relationship between man and community.

# 3. Harmonized relationship between man and its environment.

To realize those, women could contributed their capability through their position within family, community and in wider Scope.

Traditionally in Indonesia, housework has been considered the domain of Women. As housewife, women was allocated more time then man to household work. For most Women the higher the community prosperity, the less their required to participated in economic activities in the community.

Seventy percent of the Indonesian was stayed in the rural areas. Which has showed more female inhabitants than male. In the rural agriculture sector actually their are equally partner both in economic activities and social life.

Up to two last decades, around two third of the rural worker both male and female were mostly absorbed in agriculture sector. But rapidly development in the urban areas have encouraged the rural worker to be involved industrial sector. In fact, the female worker are seem easier absorbed in labor market, especially those who were exist in the productive aged group (19 to 39 years.)

In the Agricultural sector, the female workers are generally earn 20% to 30% less than the male for the same work (Gardiner, 1991).

Since the past time, the existing and potential role of women in the fisheries activities both marine and coastal sector has been felt and running well. Most of the coastal people are life in poor subsistence fishing household. The survival and welfare strategies for those people are depend upon their degree of access to working capital as part of Government development program.

In most poor fishing household, the woman look for income generating work outside the home. It was forcing the men to take up several of the household work. Such as cooking and child care. This condition was particularly common for those gender-related task both in fishing and agriculture sector. In general situation among coastal inhabitants, the power women were more economically active then the have one.

So far, several programs related to enhancement the Role of women have integrated into the various sectoral programs and implemented by various government institutions within several line departments.

In Agricultural Department, there is no special program reach the rural women, except some separated parcial Project such as through P4K, P3T, Poverty alleviation Project (1990/91/92) etc.

Basically, fisheries resources exploitation have purposed to fulfill the human needs. Irrational or unequallity implementation of the resources exploitation has led to the unsustainable conditions of future benefit.

Sustainability of fisheries exploitation could be influenced by the fishing communities behavior as well as performance of the environment (Socio-cultural and political-will).

To realize of the coastal rural community welfare as a part of fishery development goal, will required balanced or harmony between human behaviour or actions, economic activities and have to supported by nice environment.

The rural villagers both among rice-field farmer, fish farmer and fishermen, have long been familiar and implemented a kind of religious meal for the "owner", either before planted or after harvest.

In the coastal areas both at North coast of Java, as well as the south part, have always implementing religious ceremony called: "Nadran" or Sedekah Laut, annually. In there ceremony, male, female adult and the kids even thought the olds have enjoyed and involved since the preparation up to the H day. The same manner have also occurred among the Tempe Lake villagers, at South Sulawesi. It was known as Macera ceremony. This traditional ceremonial implementation tends to become part of their living style, where most people involved within the activities have seriously expected for the safety of their family, the activities year-round and for the successful of their work in fishing operation. The fixtures attached describing the whole part of "Macera" ceremony.

The Indonesian fisheries production presently contributes less than 5% to the national Gross Domestic Product, while from marine fisheries contributes almost 90% of the total production, where mostly (approximately 80%) have come from small-scale fisheries.

The total fishermen engaged in marine fisheries was amounted to 1.9 million (Annonymous, 1994) which approximately 50% are operated along the coast of the densely populated area. Improvement of the small-scale fishermen welfare as the main goal of the fishery development program up to now still have to be struggled.

Some potential water in Indonesia was includes: West coast of Sumatera, South coast of Java, Eastern Indonesia and Indonesian Economic Exclusive Zone (IEEZ). To optimalize fishing operation the Government was encouraged higher boat sized and shift the fishing ground to more distance waters.

## 3. Women Role's within Fishing Household and its community

Compared to another rural's in general, the fishing households are used to be relatively poors, especially those whose under hired labor status. Traditionally in Indonesia, housework have been considered as the domain of women. both for power as well as better of household. Women from the lower social strata or the poor family, looking for work for earn additional household income, but those whose come from higher strata, tends to develop or enlarger their former economic activities (Susilowati, 1986).

Income searching work in capture fishery was characterized as uncertainty because of seasonal fish. Most of small-scale Japanese fishermen using outboard engine have one-days fishing with the average working time ranged from 22 to 24 day monthly (Susilowati, 1987). For the larger boat using inboard engine such as mini Purse-seiner, have longer fishing time, ranged from 12 to 21 day/trip.

During the weak season most men have less economic activity except repairing the net and very little work as daily labor, both in agriculture and non-agriculture. Facing those situation the women are used to spent more time working in outside their home mostly in informal sector.

Their main role as housewives has encouraged them to take over the men main function as income-searcher. Having a coffee shop, vegetable shop or as house-servant in the city is the easiest way for coastal rural women to get some more money. What the men, women, child, both male and female did regarding possible activity in the fisheries sector, was shown in appendix 1.

Women with educated level have higher opportunity for successful business both as individual home processing industry, fish middlemen and fishing manager or juragan darat. In fishing business, the manager mostly consumed parts of the working time in outside their home. Their role in household has usually delegates to the relative who stayed in the same home.

Between April-October in certain coastal areas in and outside Java, both women and man have involved in exploiting coastal resources through gathering or collectings nener bandeng (*Chanos-chanos* fry).

Women in coastal rural Java, are tends to prefer in retailing, including intervillage fresh fish retailing. At Cilacap, south coast of central Java, a talented women has been successful developed her individual small-scale business through establishment of fisher women Group or Kelompok Usaha Bersama. From fish trading into four teen different activities. Those Group with cooperative with fishermen Group have encouraged the yought (boys and girls) to be involved in coastal based activities and to get self confidence.

Marine-coastal resources exploitation technologist could determine the activities of coastal women. In cultivation and harvest of sea grass or gathering Chanos-chanos fry are the specific working areas where the coastal women are mostly and easily involved.

#### 4. Conclusions

Basically, women instinct every where are primary caregiver for their families and children. They role within the household as financial manager and motor of family members to increase the standards of household living. Within subsistence fishing household, most women (housewives) are used to laid heavy worked and tends to have less opportunity getting better wages.

So far, women in coastal areas, have played a major role in exploitation and utilization the marine-coastal resources. What ever the existed of resources exploitation technologies could determined and affected how far the coastal women could involved on it.

Attention to women's Role and their position becoming logical consequency of the National Development program. Especially which concerned with human resources program.

Access to development program mainly related to working and business opportunity would be the good choice to release them from subsistence situation. Therefore, the government in all level have to support, encouraged and offered opportunity for the coastal women to be involved in every working areas. Some social services for them have to be optimalized through the Nutritional, education, healthy and family planning program.

Appendix 1.

Economic/Productive Activity's of Fishing Household						
Gender/Age						
Activities	FA	MA	FC	MC	Time	
1. Fishing on the Sea		17111	T	10	11110	
* Cook	_	x	_	_	0,5 AM	
* Hauling	_	x	-	_	9 to 13 PM	
* Driving	_	x	_	-	3 - 13 PM	
2. Inland						
* Fish Sorted on boat	-	x	-	x	13. <sup>30</sup> - 14 PM	
* Auction	-	x	-	-	15.00- 16.00	
3. Fish Distribution						
* Local market	X	x	x	x	16.00	
* Processing	x	-	X	-	17.00	

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# The Fishermen (old & young) was Listening the Elite Speech



The Medician Women has been Praying in early warks.



The Medician women give the food to the "Owner" of the Lake.





# TOWARDS A GENDER APPROACH: PLACING WOMEN AT THE CENTER OF FISHERIES COMMUNITY DEVELOPMENT

by

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#### ABSTRACT

The paper presents the Philippine experience towards a gender approach, i.e., placing women at the center of fisheries community development. It gives the structural and historical determinants on the status of Filipino women. The government policies and programs for development and the involvement of women were highlighted particularly the Medium-Term Philippine Development Plan (MTPDP) 1993-1998, the Philippine Development Plan for Women (PDPW) and the Fishery Sector Program. The women's role in reproductive i.e., parenting and household management; productive referring to production of marketable goods and services to produce food and cash; and community service which refers to collective consumption of the community, were given emphasis in addition to the specific roles played by women in fisheries development. The needs and problems of women in their participation in fisheries activities were likewise enumerated. Some measures to address the needs and problems were recommended. It was emphasized that women's participation in development can be harnessed by institutionalizing gender-sensitivity and by providing technology and support services.

#### 1. Introduction

1

Women all over the world in one way or another, have experienced or are experiencing essentially the same societal burden, that of being relegated to the reproductive sphere of life, inequality in economic opportunities and other biases brought about by the prevalence of sex role stereotypes.

In the fisheries sector, the stereotype is, men are the role players in spite of the fact that 50-85 percent of the post-harvest activities are carried out by women. Women also support the production aspect of the sector through ancillary activities like fry gathering, gear preparation, net making or mending.

In most countries, these are not reflected much more addressed in general policies and goals of most programs and projects. This in a way is influenced by the fact that there is no disaggregated data on the men and women's share in fisheries activities.

In the past decade, significant changes on the role and status of women in the Philippines took place. No less than the presidency was occupied by a lady, ex-President Corazon Aquino. In the legislative branch of government there are lady senators and congresswomen. In the executive branch there are women heads of departments and bureaus. However, proportionately, women are still disadvantaged.

The roles played by the Filipino women in reproductive, productive, and community development will be discussed in this paper.

# 2. Structural and Historical Determinants on the Status of Filipino Women

The Philippine government in response to the International Women's Decade 1976-1985) ratified the United Nations Convention on the "Elimination of All Forms of Dicrimination Against Women" and has committed itself to the "Nairobi Forward Looking Strategies for the Advancement of Women" two of the most important documents that resulted from the decade.

The Philippine Constitution of 1987 stipulates the fundamental equality between women and men and cites the women's role in nation building (Art. II, Section 14), recognized women's maternal and economic role (Art. XIII, Section 14) and women's special health needs (Art. XIII, Section 11), declares natural born those children born of Filipino mothers before the January 17, 1973 Constitution and who elect Philippine citizenship. On July 17, 1987 Executive Order 227, the New Family Code of the Philippines was signed by the President. The New Code eliminates many of the discriminatory provision in the Spanish Colonial law based Civil Code of the Philippines.

Government structures looking after the welfare and development of women are the National Commission on the Role of Filipino Women (NCRFW), the Bureau of Young and Women Workers under the Department of Social Welfare and Development. There is also Senate Committee on Women and Family Relations which is in charge of legislation concerning women.

On November 18, 1992, Republic Act. No. 7192, known as Women in Development and Nation Building Act was approved, promoting the Integration of Women as Full and Equal Partners of Men in Development and Nation Building and for other purposes.

# 3. Government Programs for Development and the Involvement of Women

The Philippine government policies, plans and programs for development include women either as potential implementors or targeted beneficiaries.

# 3.1 Medium-Term Philippine Development Plan (MTPDP), 1993-1998.

The MTPDP enunciates gender responsive policies and programs in various sectors. For instance, sub-sectoral policies and strategies on agriculture and fishery resources recognized women ts role and participation. Specifically, it provides the following: (Silva and Dumlao, 1993).

- (a) Enhance the role and participation of women in agricultural and fisheries production and ensure that they enjoy an equitable share of benefits from development programs and objects; and
- (b) Promote partnership with non-government and people's organizations, local government units (LGU"s), and other support groups such as cooperatives, women's and youth organizations, academe and landowners at the provincial level for the speedy and effective implementation of Comprehensive Agrarian Reform (CARP).

As the national development plan already reflects WID/gender concerns in agriculture, it could be assumed that the same concerns automatically filter down to the Medium-Term Agricultural Development Plan (MTADP), 19931998. DA is the principal government agency responsible for the promotion of the country's agricultural growth and development.

However, a closer look at MTADP reveals a different picture. While the Plan recognizes the importance of empowering farmers and fisherfolks through the provision of support for the establishment and continued viability of farmer's and fisherfolks' organizations, there is no indication that the specific concerns of women in fisheries are given explicit attention.

# 3.2 The Philippine Development Plan for Women (PDPW) 1987-1998

The PDPW as approved and promulgated by Executive Order No. 348 is a companion volume of the (MTPDP). It is an initial effort aimed at integrating the concerns of women in the planning process. It aims to alter the traditional concept of women's self-worth as being subordinate to men. Such transformation requires a commitment to ones own personal growth, both intellectually and creatively. It also addresses the concerns of women for equality and development across six major spheres, individual, family, socio-cultural, economic, politial and legal.

Executive Order No. 348 directs all government departments, bureaus, offices and agencies to take appropriate action to ensure the implementation of the programs and projects outlined in the Plan.

To implement the Plan, the NCRFW in coordination with the National Economic Development Authority (NEDA) set the following measures:

- (a) Creation of WID focal points in each government line agency to review the PDPW, its projects, policies and strategies as to their impact on women's concerns.
- (b) Massive reorientation of the bureaucracy and society through the conduct of gender consciousness-raising programs and training activities NCRFW.
- (c) Provision of technical backstopping by NCRFW to all government line agencies for the effective implementation of PDPW.

In spite of all these, Filipino women in general still continue to be disadvantaged because of biases against them which have been attributed to the kind of socialization process that women and men are subjected to from childhood and carried over to adulthood.

As a result of such biases, only 36 percent of the population 15 years and over who are in the labor force are women, leaving out some 9.3 million women who are outside the labor force and who are considered economically unproductive. Latest estimates indicate that 74 percent of these women are housekeepers or those who enable other members of the family to engage in productive work outside the home whose contributions remain unrecognized (PDPW, 1987-1992).

# 3.3 The PDPW Agriculture Sector (Including Fisheries)

The basic aim of the PDPW agriculture sector is to provide an environment that shall fully integrate women in the development process. To achieve this integration, national objectives shall focus on the adoption of policies and strategies that shall allow women to participate and contribute in even terms with men in the social, economic and political processes of rural development and share fully and equitably in the gains thereof.

Specifically, the rural/agricultural sector shall concentrate on the following objectives:

- (a) To institutionalize the expanded participation of women in rural/agricultural development;
- (b) To improve and enhance the access of women to agricultural delivery systems and support services;
- (c) To enable women to view their participation in agriculture as partners of men and:

(d) To raise the level of consciousness of rural population on the important roles that women play in agriculture (PDPW 1987-1992).

# 3.4 The Fishery Sector Program (FSP)

The Government recognizing the need to reverse the problem of marine resources depletion due to over exploitation launched in 1989 a comprehensive fishery programs. The FSP embodies the policy and commitment of the Philippine Government to the management and conservation of fisheries resources on a sustainable basis. The heart of the FSP is the Coastal Resource Management Program (CRMP) which comprise regeneration of coastal resources, the rehabilitation of the coastal environment, the balancing of fishing effort with maximum sustainable yield, the control of destructive fishing activities, the alleviation of poverty among marginal fishermen particularly through the diversification of their sources of livelihood (Tan, 1995).

However, FSP did not anticipate much more explicitly indicate the role that women would play in resource management. Despite being left out in the design and implementation of FSP women still became active players in various activities. In meetings and training, attendance records showed that 30 percent are women.

# 4. The Filipino Women

Women's role maybe classified as productive, reproductive and community development and management. Reproductive roles refer to parenting and household maintenance; productive refers to production of marketable goods and services (food and cash); community development and management refers to activities that are for community's collective consumption or use.

#### 4.1 In the Household

A well known Filipino columnist and economist, Mr.Hilarion M. Henares described women as "the sweetheart to her husband and mother to her children, she is also the accountant and treasurer of household finances, the judge and jury of family quarrels, the social secretary, the nurse, the psychologist, the cook and the general handywoman." Mr. Henares continued by saying that "the more enterprising women takes the family savings and goes to business-a small store under the house, a cottage industry or even a pawnshop. She may not always succeed, but if she does chances are, she makes more money than her husband and finds so little time left for the family, that she asks her husband to quit his job and manage the business for her. That is how family fortunes are started by women. But the Filipino women will never admit this, not in a manner that might rob her husband of his prerogatives as king of the manor and lord of his creations.

It is in this light that Filipino women play her unique role as the traditional keeper of savings and investment, the entrepreneurs and founders of family fortunes and as the focal center of the home and of the Philippine Society."

In a study conducted in a coastal community, it was reported that women belonging to households that primarily engage in fishing contribute around 40 percent of their time to fishing endeavors and 30 percent each is spent on housekeeping and on other activities (Lamug et al, 1995).

# 4.2 In Fisheries Development

Women in fishing communities play important roles in fisheries development most especially in post-harvest activities and marketing, and to some extent in fish production. In urban communities, the involvement of women is mostly in marketing both as broker/wholesaler or as retailer. However these roles that women play in fisheries development are not documented. While estimates on the number of fishermen are available, the data are not gender segregated, hence, the traditional assumption that fisheries activities involve the male population. For this reason, most government policies and programs before the 80's were geared towards men. During the 80's especially with the development of the Philippine Development Plan for Women, policy makers and government planners started to integrate the concerns of women. Projects have involved women either as implementors or targeted beneficiaries.

Women's involvement in fisheries development can be one or combination of the following activities.

(a) Fish marketing or vending. Marketing is the most visible activity of women in fishing communities. In most cases, wives of small scale fishermen and fish farmers sell their husbands' catch within the community or in nearby markets. The volume that they sell is dependent upon the catch of their husbands. Whatever proceeds from the sale of fish is considered as the fishermen's earning not considering the profit gained from selling the fish direct to consumers.

Women involved in fish marketing, work almost eight hours a day for 19 days a month, 12 months a year (Villareal,1993). A case study of women in a Central Philippine town describes fish vending by women (Silva and Dumlao, 1993). "Fish vending is a full time actively of several village women hose husbands are artisinal fishermen.". These women claim that their minimal income is critical in enabling the family to survive on a day to day basis.

(b) Fish processing. In the Philippines, the role of women in fisheries operations particularly in fish processing and marketing can not be understated. A study reported that 56 percent of the women in fishing communities are involved in fish processing (de Castro cited by Silva and Dumlao, 1993).

In most coastal communities, the volume of production is small-scale, hence, the processing industry is also mostly household based.

Fish caught for the day that cannot be absorbed by the fresh fish market are processed either as salted, dried or smoked products.

In a study (Legaspi et al 1991) on the role of women in marketing and processing, which involves 1,666 fish processing workers, 50 percent were women, of these 92 percent are hired as laborers and only three percent each are doing supervisory/ managerial work, and clerical work. The study also reported that of the 113 women interviewed, 23 percent are owner operator of the plant, six percent do administrative work and 80 percent are hired workers directly involved in processing.

- (c) *Fry gathering.* In coastal areas where fry is abundant, it is a common sight for men, women and children gathering fry. Income derived from fry gathering supplements the husband's income from fishing.
- (d) Gear preparation. Wives of fishermen using multiple hook and line gears are the ones who prepare the gears by disentangling the line and putting baits on each hook. This activity takes almost as much time consumed by the fishermen during fishing. Sad to say, these activities being done by women are not considered as the women's contribution in the family income.
- (e) *Fishing.* A survey of women in a fishing village (Lagua, 1981) revealed that a substantial number are engaged in fishing activities. Of the 628 women interviewed, 487 are engaged in fish capture, and 15 in gathering shellfishes and seaweed. This discounts the traditional assumption that fishing is men's activity.
- (f) Net mending. Wives of fishermen help in the making and/or mending of fishing nets. Women usually do this activity in the afternoon after they have finished their household chores or when the children are in school or sleeping in the case of pre-schoolers.
- (g) Fishing boat owner/operator or financier. There are women who own fishing boats and hire fishermen. Some act as financier of small fishermen. The financier women if not paid in cash have the option to buy the borrower's catch at a lower price. Consequently, they act as broker or wholesaler.
- (h) Aquaculture. Women play important roles in aquaculture such as helper in the preparation of fishponds and seedlings preparation, marketing of produce and purchase of farm inputs. Women are usually the ones doing research to increase their production and to prevent the occurrence of diseases.

In the FAO project in Capiz and Pangasinan, it was reported that some women are engaged in crab fattening and mussel culture projects.

# 4.3 Community Development and Management

Women in fishing communities play important roles in projects such as community beautification, health and nutrition, social events like feast of the patron saint and other religious and/or civic affairs.

Women's active involvement in various activities in the community, not to mention their fisheries economic endeavor make them popular. This popularity sometimes land them in an elected local government position such as council woman, barangay chairman or mayor. As local government official they excel in community development projects particularly in family planning, child and youth health welfare, environment protection and management and other developmental programs.

#### 5. Needs and Problems

In most rural communities in developing world; women not only face most or all of the constraints confronting men, but also which men do not face. Some of the problems particularly those involved in post-harvest activities are the effects of the problems faced by the industry as a whole.

#### 5.1 Low Production Affects Post Harvest Activities.

Due to the depleted fishery resources and the subsequent decrease in production, less and less fish is being processed, and/or marketed hence, less job opportunities for women.

### 5.2 Inadequate Infrastructure Support to Post-harvest.

Infrastructure facilities like ice plants and cold storage transport facilities, markets, processing and storage facilities are still inadequate or inaccessible. These results to great post-harvest loss which means less economic return not only for women but to the whole industry.

### 5.3 Difficulty in the Availment of Credit.

Credit support to fisheries development projects is usually awarded to members of cooperatives. In most cases, the members of the fishermen's cooperatives are the male members of the family, usually the head of the family or the one who goes out fishing. This makes it difficult for women to avail loan for their own investment. In some cases, collateral is required to be able to avail loan, which generally can not be met by women.

# 5.4 Limited Opportunity for Decision Making Positions.

Where women are employed by big processing establishments, the positions that they occupy are usually those that require manual skill like fish filleting,

deboning, peeling of shrimp and other labor intensive activities. Very few women occupy managerial positions.

# Need to Focus on Women's Roles in the Planning and Implementation of Fisheries Development Programs.

Most fisheries development programs are directed to fishermen which by tradition are presumed to be for men. Even the credit component of program are designed for associations and cooperatives which in most cases majority of the members are men. It was only during the recent years that women have started to become members of association and cooperatives. This recent development has slowly placed women in the mainstream of development programs but in the implementation phase their involvement lost its focus.

All the above activities that women do in fisheries development are not documented in terms of extent and economic value. However, elicit data on these activities have been undertaken.

# 5.6 Limitation in Attendance to Training.

In the past most fisheries training programs have been geared towards men. Training on fish processing which is meant for women has to be scheduled to meet the women's free time. In most cases, mothers bring with them their pre-school children because no one can attend to them at home.

# 5.7 Need to Consider the Impact of Technological Developments.

The traditional role that women do particularly in what used to be labor intensive activities that need manual skill should be considered in technological innovations. Appropriate technology must therefore be developed to improve womens' participation in major fisheries development activities.

# 5.8 Need for Adequate Data and Information (Silva, et al, 1993)

The extent of women's participation in productive work is obscured by a serious lack of data, which occurs on two levels. First, fishers are lumped together with other agricultural workers in labor surveys, making it difficult to pinpoint the particular contributions of the sector. Second, studies or publications on the fishery industry do not have sex disaggregated data and often do not distinguish between male and female roles and participation.

#### 5.9 The Burden of Domestic Chores.

The burden of attending to all domestic duties is almost always assumed to be women's responsibility. In effect, women more than men are restricted in their participation in activities away from home. This makes their participation in economic activity an added burden. In fishing communities, if the wife is to engage in

economic activities, the burden of doing household is delegated to the oldest daughter, who more often than not is deprived of the right to formal education.

#### 6. Recommendation

Considering the needs and problems of women in small-scale fisheries communities, the following measures are recommended in order to enhance women's participation in comprehensive programs of fishing community development.

- 6.1 Conduct a nationwide assessment of the role of women in fisheries development. The role that women play in fisheries development, although not quantified and documented cannot be taken for granted. There is a need for empirical data to authenticate this reality and be able to justify to the planners and decision makers the need to mainstream gender concerns in fisheries development programs. The plan should explicitly indicate the concerns of women i.e. the what, who and how of the project particularly the implementors and the targeted beneficiaries.
- 6.2 Encourage women involved in fisheries activities to organize. Women involved in fisheries must be encouraged to organize or be members of associations and cooperatives. Inasmuch as credit support to government projects is usually awarded to associations and/or cooperatives, women must be encouraged to be members of organized groups. This will enable them to access credit for their livelihood projects.
- 6.3 The problem in the Philippines is not so much the absence of political will or lack of gender-sensitivity as the inadequacy of methodology or approaches to address gender issues. A lot of advocacy has been done and national laws and policies on women are already in place. However, operationalization and the required resources for implementation are still wanting. Hence, among the overriding concerns of the national machinery on women is ensuring that government departments set up the necessary structure to implement gender-responsive programs and bringing these down to the direct beneficiaries.
- 6.4 Development programs and projects in coastal communities must include gender-sensitivity for both men and women to enable them to appreciate shared parenting, joint decision making and shared resources in a family, the workplace and within the community. This hopefully would break the norm and stereotyped ideas in most societies about the roles of women as subordinate to men not only in the household but also in the workplace in the community.
- 6.5 Provide equal opportunities for men and women in the planning and implementation of skills development training programs. The training needs of women must be considered, in relation to their participation in development projects.
- 6.6 Appropriate technology must be developed to improve women's participation in fish production activities, while taking into account limitation such as lack of capital and other reproductive activities.

6.7 Women's capability to protect the environment must be tapped and strengthened through proper orientation, training and provision of appropriate logistic support.

Generally, it may be said that women's participation in development can be harnessed by institutionalizing gender-sensitivity and by providing appropriate technology and support services.

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#### WOMEN AS WORKERS IN FISHERY ACTIVITIES

by

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This paper attempts to present the situation of conflict between the reality of women's role in the fishery sector and the reporting on fisherwomen by official sources.

There are many papers reporting that women play a major role in the fishery communities, but most of them are said to be powerless and vulnerable. It is the men who hold most of the leadership positions in both the social and economic spheres. This situation is true in some other Asian countries. For Thailand, based on our observations during research work, women in fishing community are accepted in many leadership roles concerning the household economy and decision making. They can manage and make financial decision not only within their household but also in the community marketing system. We found that many successful *Pae Pla* (fish wholesalers) were women and we saw that many fish processing enterprise owners were women. Many offshore fishery activities are effectively managed by women.

#### 1. Statistics on Women

The Thailand marine fishery statistical survey of 1995 gave the total number of fishing households in the country (24 coastal provinces) as 80,701. Among those, 50,357 (62.4%) engaged exclusively in marine capture fishery; 27,357 (33.9%) engaged exclusively in aquaculture and 2,987 (3.7%) engaged in both activities. The average household size being 5.3 persons, we can estimate that the fishing population in 1995 was 427,715. The statistics of 8 of the 24 coastal provinces show that the distribution of fishery household members between male and female are 51.3% and 48.7% respectively (Table 1). This proportion conforms to that of the last 10 year survey (1985).

**Table 1.** Number of fishery household members by sex (both fishing and employee households)

Provinces	198	35	1995		
	Male	Female	Male	Female	
Trat	10,026 (51.2)	9,556 (48.8)	11,733 (52.6)	10.559 (47.4)	
Rayong	6,648 (51.8)	6,193 (48.2)	5,744 (50.9)	5,542 (49.1)	
Chon Buri	5,831 (52.4)	5,298 (47.6)	3,786 (51.3)	3,590 (48.7)	
Samut Prakarn	7,998 (51.7)	7,467 (48.3)	6,860 (49.1)	7,119 (50.9)	
Samut Sakhon	9,672 (52.4)	8,792 (47.6)	7,785 (49.9)	7,804 (50.1)	
Petch Buri	9,939 (51.6)	9,322 (48.4)	7,287 (50.4)	7,161 (49.6)	
Chumporn	10,289 (52.3)	9,371 (47.7)	12, 108 (53.0)	10,739 (47.0)	
Surat Thani	13,789 (51.9)	12,773 (48.1)	14,338 (51.3)	13,610 (48.7)	
Total 8 Provinces	74,192 (51.9)	68,772 (48.1)	69,641(51.3)	66,124(48.7)	

Source: The National Statistical Office, 1985, 1995

Regarding the statistics of the same survey which include only "fishermen" whose age is 13 years and more who were working at the sea when the survey was conducted, they revealed that only 16.2% of those who are working as fishermen are women (Table 2). This figure is almost the same as that of the last 10 year statistics.

**Table 2.** Number of fishermen in 1985 and 1995, of 8 provinces distributed by working status and gender

Provinces	1985 (1	1-60 <sup>+</sup> yrs)	1995 (13-60 <sup>+</sup> yrs)		
	Male	Female	Male	Female	
Trat	5,329(89.4)	634 (10.6)	6,148(86.2)	981(13.8)	
Rayong	3,560(89.7)	409(10.3)	2,802(89.1)	343(10.9)	
Chon Buri	3,342(86.6)	518(13.4)	1,891(84.5)	346(15.5)	
Samut Prakarn	4,085(73.2)	1,497(26.8)	2,986(77.9)	845(22.1)	
Samut Sakhon	5,188(76.5)	1,589(23.5)	3,610(83.8)	696(16.2)	
Petch Buri	5,342(81.8)	1,184(18.2)	3,511(83.0)	718(17.0)	
Chumporn	5,316(87.1)	791(12.9)	6,531(86.6)	1,013(13.4)	
Surat Thani	6,974(79.8)	1,762(20.1)	7,568(80.5)	1,837(19.5)	
Total 8 Provinces	39,136(82.4)	8,384(17.6)	35,047(83.8)	6,779(16.2)	

Source: The National Statistical Office, 1985, 1995

This is very important when we are thinking of a development project that proposes assistance to the fisherwomen. This data from the national statistical survey does not represent the real number of women involved in the fisheries sector.

#### 2. Women as workers in offshore activities

This part of the paper tries to present the activities of women that we noted during a field research in the eastern part of the gulf of Thailand. U-Tapao Mai, a village in Rayong province, is a small fishing community. Its people migrated from the military area of U-Tapao Airport. The population consists of approximately 80-100 households. Most of the villagers are fishermen or are engaged in fishery related occupations (fish wholesaling, retailing and processing). Every household is involved in crab gill net fishing. Some of them have squid traps and fish seasonally for jellyfish and have cast nets for catching planktonic shrimp. The plot of land allocated to villagers by the government is just large enough for their houses and not enough for cultivation. Fishing is the only way of earning a living of these people. Household members are employed intensively. Women are responsible not only for the home and the family, but are also actively involved in many fishing activities.

When the men come back from the sea with 2-3 gill nets full of blue swimming crabs, the women are responsible for separating the dead crabs from the live ones in order to get a good price for the catch. The live crabs are tied with elastic and kept in big plastic buckets full of sea water.

Before noon, the crab wholesalers come to the village. Most of them are women. The prices of live crabs are settled through bargaining and depend on the quantity of crabs on that day. If the price is agreeable, the buyer will bring her scale to weigh the catch and calculate its value. Crab wholesalers come to the village in pick-up tucks with a big containner with an oxygen tank in the back. Then the crabs are released into the containner. These crabs will be sold directly to the resturants in Rayong town.

Just 2-3 kilimeters from U-Tapao Mai village is Ban Pala, a big community of approximately 300 households. Half of the population are fishermen, and the other half work in the factory or on their farms. Many fishing activities are practiced: fishing and fresh fish sales, making shrimp paste, making fish sauce and selling dried fish. All activities related to fishery are carried out by women. Because of the beautiful long beach and shoreline road, the provincial governor wants to preserve this area for tourism. Keeping the beach clean is a top priority whereas fishermen need the beach for their fishing activities. At the moment that I visited the village, there were a few groups of women along the shore cleaning planktonic shrimp under temporary shelters. This cleaning activity requires 2 or 3 hours and is a very important process in shrimp-paste making. The beach is used not only for planktonic shrimp cleaning but also for storing fishing gears. When the government plans to develop the beach for tourism purpose, all the fishing activities have to move to other beaches.

A young fishermen family, consisting of father, mother and 2 small children, earns their living by fishing and selling fresh fish in the local market. The young fisherman as the household head has to go to the sea to fishing from 4 o'clock every morning and comes back around 1 o'clock in the afternoon. His wife has to take care of the children, prepare food, clean the house, wash her family's clothes and wait for her husband to come back from the sea. Their house is near the beach. When the boat of her husband comes back, she has to help him carry their fish back home, select and classify the product for selling at the afternoon market. She takes her place in the market to sell their fish which takes around 2-3 hours. Her husband meanwhile takes care of the children, cooks their evening meal, and waits for his wife to come back from the market. Every day the sharing of activities between husband and wife are repeated in this pattern, except during the monsoon season (November and December), when they have nothing to do. The young fisherman said fish is now difficult to find and he can catch only small amount each time. However, he can survive in this job because the value of the fish is higher than the past.

There are at least three fish wholesalers who are popular among fishermen in Rayong. They are women of about 50-55 years' old. They not only purchase every kind of sea produce but also give loans by providing fishing gear to the small scale fishermen. Gill net sets for swimming crabs are usually provided by the three wholesalers. One fisherman needs at least 3-4 sets of that gill net at a time. One set can last for one month. Although the fishermen who received a loan do not have to sell their product to the money lender, in practice, they usually sell their catches to the money owner to avoid the problem of carrying crabs to the market and bargaining with the fish retailers in the market.

One of the wholesalers manages her business in the way to complete the cycle as follow:

- 1. She lends money to fishermen to buy their own equipments, or some time provides them with 2-3 crab gill net sets.
- 2. She herself acts as fish wholesaler.
- 3. She purchases any of fish products from the fishermen. The price of the products differs between her money loaners and non-loaners. She will give higher price to non-loaners. The fishermen who are indebted have to pay her money back in total amount without interest whenever they have money.
- 4. She is a regular crab supplier for retailers in the center market. . She creates jobs for women in the village by organizing housewives to shell boiled crab and sell only meat which can get higher price. can earn 100-150 Bath a day (4-6 US\$) from the job.

Then we would say that women are active in the post harvest activities. Since we found:

*Women*: collect fish  $\rightarrow$  trade fish  $\rightarrow$  process fish  $\rightarrow$  sell processed products.

Women: money lended to fishermen  $\rightarrow$  purchase fish products  $\rightarrow$  sell fish products  $\rightarrow$  organize groups of women to do fish processing  $\rightarrow$  sell processed products.

*Women*: employees in selecting fish  $\rightarrow$  employees in fish processing.

*Women:* fish processing  $\rightarrow$  sell processed products.

Women: middlemen of fish products  $\rightarrow$  sell fish products to retailers in the market.

*Women:* housewife of fishermen  $\rightarrow$  fish trader

Women: and so on

# 3. Fact and Figure

From the National Statistical Office survey, it seems that women are not visible in the statistics of the fishermen survey. They were reported as consisting only of 16% of the total fishermen population, although we realize that women engaged in all the post harvest activities. So the question is, who are the fisherwomen mentioned in the National Statistics. Are the women that we found in the fishing village fishermen (fisherwomen) or are they treated only as housewife?

We learn from many studies that women play important roles in fishery. But all the studies do not represent the socio economic and cultural status of fisherwomen of the country as a whole. They were only case studies of several areas. In planning for fishery development by encouraging women to participate, there is a need to have more representative and in-depth studies on the social, cultural and economic status of women in the fishery sector. The planning needs to be based on a solid data base.

It seems that fisheries development project have not offered much to women. The projects often promote the men's activities. Even now, women are encouraged to be involved in many fishery activities that are already done by women. Then the development project that try to include women is only a fashionable project.

#### 4. Obstacles and Recommendation

The real obstacles for women in fishery development is the high degree of illiteracy among women in fishing community. This is the constraint in involving women actively in the development process.

The government should realize and plan to involve women systematically from the early stage of project planning. Let women be in responsible positions and be sure that education and training is carried out in parallel with the project implementation .



The Southeast Asian Fisheries Development Center (SEAFDEC) was established as an autonomous intergovernmental body on 28 December 1967, for the purpose of promoting fisheries development in Southeast Asia by mutual cooperation among the Member Countries of the Center.

To fulfill this purpose, the Center's activities cover training and research in marine fisheries, post-harvest technology, aquaculture and marine resources management which are respectively conducted at the four departments, namely, the Training Department in Thailand, the Marine Fisheries Research Department in Singapore, the Aquaculture Department in the Philippines, and the Marine Fishery Resources Development and Management Department in Malaysia.

The Secretariat of the Center located in Bangkok, Thailand, serves as the executive arm of the Center. It performs a variety of functions ranging from the implementation of the policies and programmes adopted by the Council, to compiling and disseminating information about the Center.

At present, the Member Countries of the Center are Brunei Darussalam, Japan, Malaysia, the Philippines, Singapore, Thailand and Vietnam. Membership of the Center is also open to other Southeast Asian countries.

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