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**For Fisheries Management**

**BAY OF BENGAL PROGRAMME**

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# BAY OF BENGAL NEWS

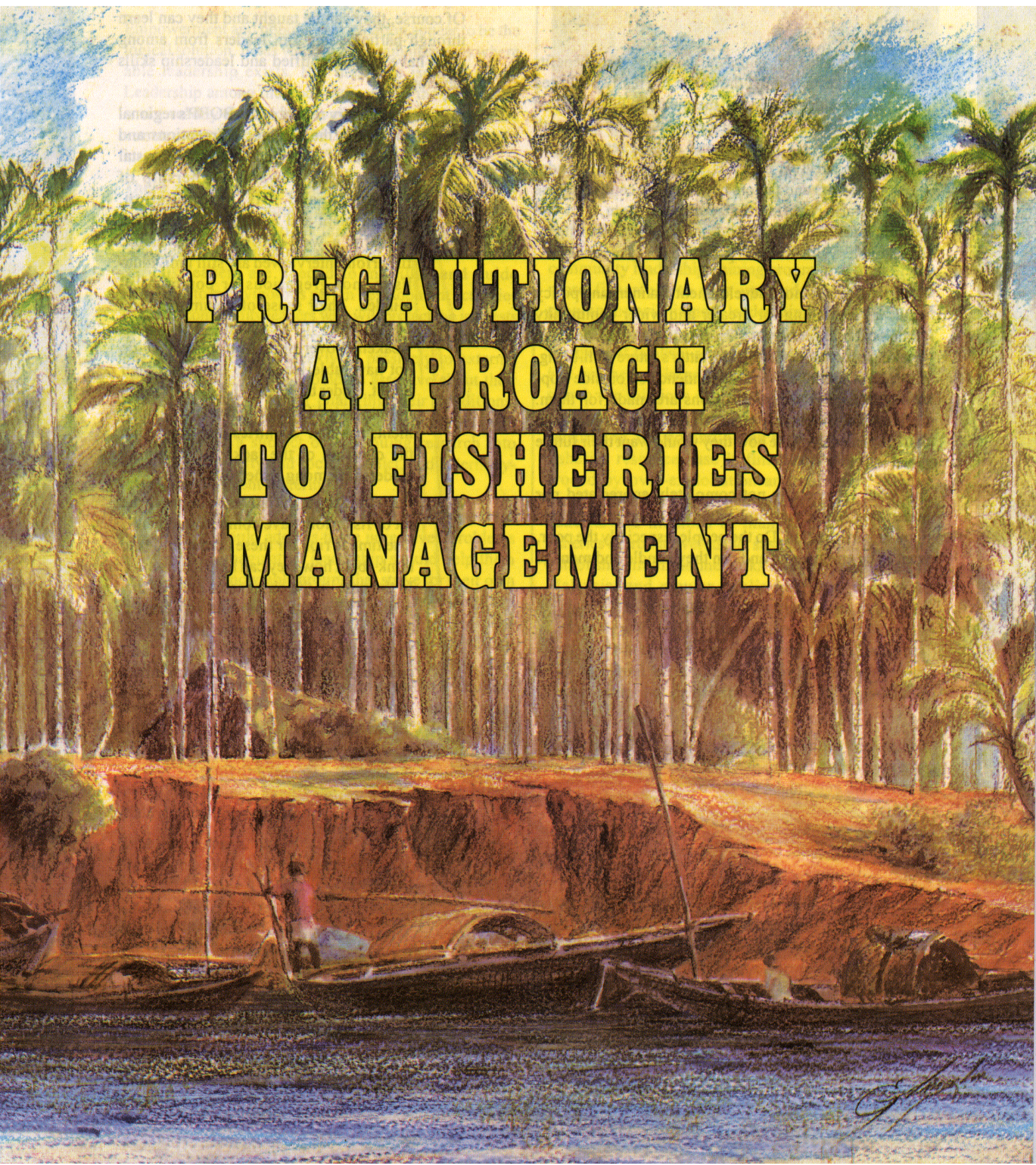
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## PRECAUTIONARY APPROACH TO FISHERIES MANAGEMENT



Fisherfolk in many developing countries are communities at the fringe of development bypassed by the mainstream economy. Governments have tried to help them and implemented various projects from time to time, but for various reasons, these efforts did not yield the expected results. They have not really benefited the fisherfolk targeted.

Even though fisherfolk supply a commodity that benefits the mainstream economy, they have not really benefited from the wealth created by their catch. With limited resources at their disposal, they eke out a hand-to-mouth existence. The very fisheries and coastal resources on which their survival depends, are increasingly under threat by sectors and factors beyond their control. These are the stark realities that confront them, and the governments and NGOs who are trying to help them. This hopeless situation has persisted for generations.

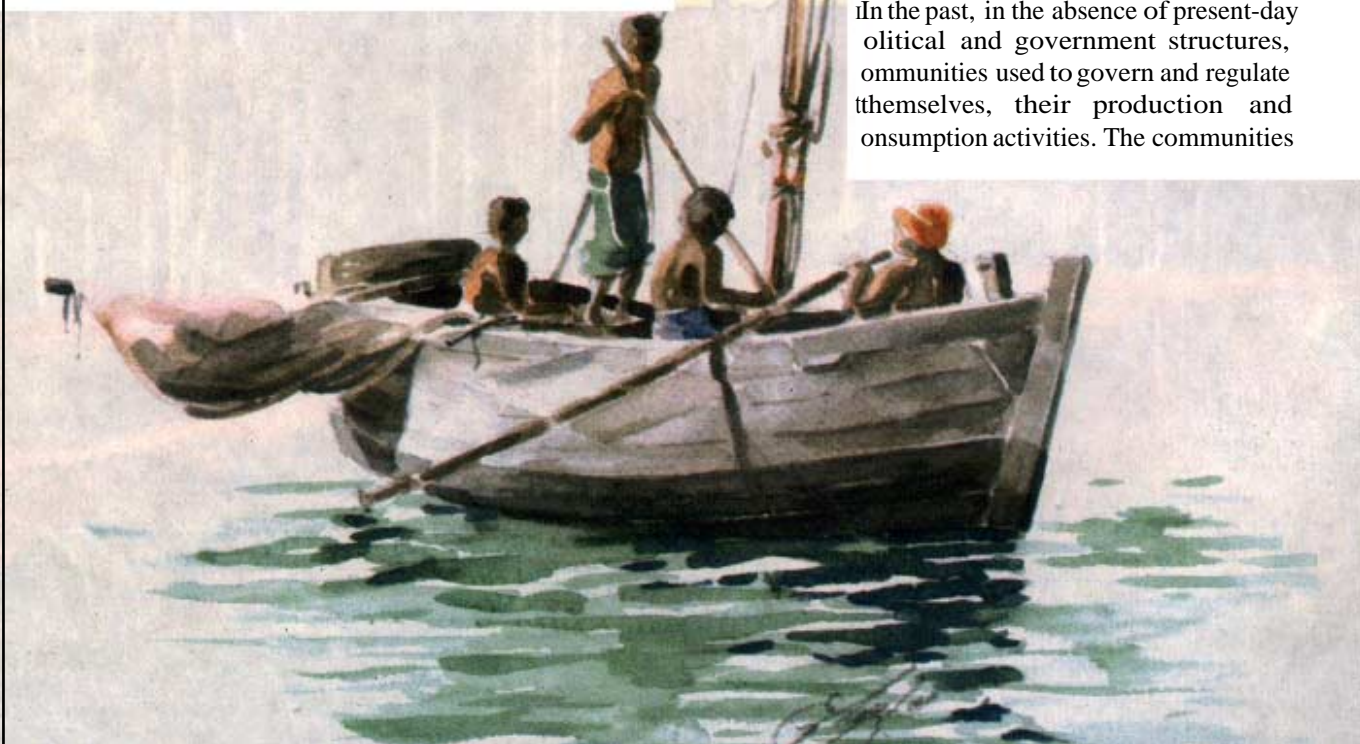
Today, more and more development planners and policy makers are calling for greater and wider community participation, especially at the grassroots level, in decision-making processes affecting the latter's future well-being, instead of the conventional dependence on outside (top-down) initiatives where decisions are made for them. Calls are thus frequently made to empower the people so that they can determine how they would want their future to be.

But what is generally not completely appreciated nor understood are the real implications of empowerment and popular participation. Do the people, especially the poor, want to be empowered and can they handle and manage

their new found empowerment? Do they have the leaders to mobilize and organize, represent and lead them? Are there leaders who can be so empowered and want to be empowered? Do they have the means, that is the skills and motivation, to be involved and participate in such processes? Of course, they can be taught and they can learn through participation. But leaders from among them have to be identified and leadership skills developed.

[Preliminary results of the BOBP's regional survey on the "Values, Perceptions and Attitudes of Fisherfolk and Other Coastal Stakeholders Towards Ownership of Fisheries and its Exploitation, Management and Sustainability" further confirm a well-known observation: fisherfolk interviewed are still individualistic, not gregarious or community-minded. Their sense of community and communal interests have steadily weakened over time. Moreover, they do not have able leaders to articulate their plight Under the BOBP-FAO/UN Project on Integrated Coastal Fisheries Management, member countries are addressing the question of the lack of community leadership among fisherfolk.

For a longtime, initiatives to improve the lot of fisherfolk have come from outside. The time is ripe for these communities to think about how they can help themselves. In the past, in the absence of present-day political and government structures, communities used to govern and regulate themselves, their production and consumption activities. The communities



were then more involved in their own welfare. There was more order in the manner in which they exploited natural resources such as fisheries for their livelihood. They had their own community's set of rules and regulations to live by. Assumption of leadership roles was clear cut, hereditary leaders or rulers dominated their lives. Today, it is the government which has assumed such responsibility, often to their detriment. Governments today have grown too big and are too caught up with a burgeoning bureaucracy to be effective at the grassroots.

Empowerment and popular participation appear to be the logical solution. It has worked in certain instances where able leadership exists. But these are isolated cases. Leadership among the poor segments of the population is not readily and widely available. Today's fisherfolk community badly needs strong, dedicated and inspirational leaders.

There are, of course, leaders who speak for their communities but invariably they have their own agendas. Still others lack critical leadership skills such as organizational, communication and managerial skills. Serious leaders are needed to mobilize and guide fisherfolk to take vigorous part in development activities – that is, community leaders who will protect the interests of the community and work towards its betterment. Instead of responding meekly or passively to external effort, the communities should be assertive about their rights and positive about changing their conditions. Without such leadership, fisherfolk communities will continue to be a subject of continuing research into deprivation, poverty and social conflict, and externally-driven development tinkering.

A shift is called for in the fisheries development paradigm. It should address these unresolved problems of fisherfolk. Imaginative leadership should help them form dynamic and viable groups that strive for their own socio-economic uplift. Group activities should tap opportunities for income generation and savings, for community enterprises, for credit to improve living standards, invest in the future and create wealth. The lessons learned from the use of micro-credit in agriculture can be applied more widely in fisheries. For example, adding value to the fish - through manual deboning of fish and direct selling-before it changes hands to the market intermediaries, can go a long way toward improving incomes. Experience from the Philippines and Malaysia are good cases in point.

Experience has shown that women can be effective organizers. Women are more passionately concerned about and involved in their family's well-being and the future of their children than the men – who believe that their work begins and ends with the fishing trip out to sea, that such a trip entitles them to rest and entertainment on land.

Examples of women caring for their family through unrelenting toil and ceaseless sacrifice are well known indeed. This spirit of diligence and sacrifice and



commitment is what makes a true leader. This spirit in women should be tapped to organize fishing communities, strengthen their bargaining power, improve their socio-economic infrastructure, and provide for a better tomorrow.

Recognizing the need for leadership training, the BOBP and its member countries are actively embarking on a community leadership training programme to motivate more fisherfolk to take up leadership roles. The programme will impart leadership skills, styles and aptitudes to aspiring leaders – not only to help combat the spirit of fatalism so prevalent in their communities and get them to improve their living standards, but to search for solutions outside fisheries and beyond the confines of their community. More importantly, while sensitizing the communities to the fact that their fisheries resource base is finite and steadily being eroded by over-exploitation and pollution, they as leaders can create, build and spread awareness on the benefits and methods of management so that the fisheries is productive, stable, sustainable and equitable. Establishment of marine parks and fish sanctuaries in Malaysia, and regular public hearings to promote responsible community participation in managing Phang-Nga Bay fisheries in Thailand, are steadily paying off in terms of significant improvement in real earnings from better quality catch and higher prices. These examples demonstrate what good leadership can do.

Leadership training can help instil more responsible social behaviour and more restrained fishing such as phasing out gear technology which impairs the fisheries ecosystem and fish stocks. These fisheries are therefore well on the way towards sustainable production, assuring more food and livelihood security for the local population.

The question, in the final analysis, for technical assistance agencies and governments is, how should one go about identifying and nurturing leadership in coastal communities, without compromising their legitimacy? We at BOBP hope to learn from our efforts and we would like to hear from readers about your views and experiences.

Kee-Chai CHONG

# BOBP IN THE FIELD

## *Bangladesh - Looking back at the past two years*

Mr. Harun-ur-Rashid writes :

The coastal fisherfolk population of Bangladesh is approximately 550,000. They live predominantly in small coastal villages with low living standards and little access to the basic necessities of life. Rapid population growth accentuates their problems. They have few sources of income other than fishing which is becoming increasingly non-remunerative.

In fact, with fish stocks in decline, lack of proper management may lead to a major catastrophe.

The pressure on fish resources has also led to serious conflicts among those who tap these resources. While the overriding problem facing the fishers is the sustainability of the resource, the implementation of management measures has been beset with problems because of lack of manpower and facilities. Management measures cannot be implemented without the active participation of fisherfolk, hence the importance of participatory fisheries management.

This is what the third phase of the BOBP seeks to do. Its main objective is to increase awareness and knowledge of the needs, benefits and practices of

fisheries management. There is a strong focus on two fisheries - the Estuarine Set Bagnet (ESPN) and the Push Net (PN) fisheries-which are considered to be the most harmful of the different fisheries in Bangladesh. A Technical Assistance Project Proposal (TAPP) was prepared, which spells out BOBP assistance to the Department of Fisheries in devising management measures for the two fisheries.

Summary of activities undertaken:

- BOBP activities started with the orientation of DOF (Marine Wing) and FRI (Fisheries Research Institute) staff to the project's objectives, plans and implementation strategy through a 4- day workshop held in Chittagong 22 - 25 May 1995. The workshop also trained 34 staff (3 I DOF and 3 FRI) on stakeholder identification, stakeholder analysis and perception and communication analysis. The staff then designed and planned field trips with different groups working at different locations - Cox's Bazar, Teknaf, Khepupara and Morelgonj for estuarine set bagnets; Cox's Bazar, Teknaf, Khepupara and Kaligonj for push nets.
- Field trips were carried out during November-December 1995 and

January 1996. The report was submitted at a workshop in February 1996. DOF/FRI staff identified problems, prioritized and analyzed them and in the context of the stakeholder studies developed activities which could address problems and pave the way for improved management. The recommendations of the staff formed the basis for an indicative workplan for 1996. This workplan was approved by the BOBP Advisory Committee at the meeting held in March 1996, in Malaysia.

During Ott-Nov 1995, the BOBP, ODA, FAO and the Government of Bangladesh organized a national workshop that brought together policy-makers, planners, administrators, fishery professionals, fisherfolk and fishery industry representatives, technical assistance agencies, NGOs and donors. They discussed the status of fisheries resources development and management in Bangladesh and future directions.

The main work for 1996 focussed on:

- i. intensive consultation with stakeholders
- ii development of communication materials and programmes
- iii studies to determine closed seasons in ESNB fisheries
- iv studies to improve the handling of wild capture *P.monodon* larvae
- v studies to identify non-fishery income sources
- vi planning pilot activity relating to ESNB closure
- vii planning and design of activities to improve *P.monodon* fry handling and reduce dependence of the aquaculture sector on wild capture larvae
- viii review workshops
- A four-day workshop-cum-training programme on Communications and Mediation Consultations was held July 14 - 17 1996, in Chittagong. Thirty Six DOF/FRI staff received training in messages that media person can use to evolve communication, and awareness materials. A one-day field trip to the fisheries of North Kumira was also included in the training programme



to enable participants to test their communication and mediation skills and learn more about the perceptions of fishers concerning fisheries resources, problems and solution options. A field trip was planned for two groups; one would study set bag net fishing in Kumira, and the other group would focus on push net fishing in Cox's Bazar. The two groups were given responsibility for holding intensive consultations with stakeholders of ESNB and PN fishers so as to identify and develop communication messages.

- A field trip was held during the second half of August 1996. 15 persons took part in the field trips. After intensive discussion with the fishers they produced brief reports on communication messages.
- These reports were discussed at a workshop on media development held 13-14 October 1996. 36 DOF/FRI staff participated in the Workshop. The workshop participants presented the findings of six weeks of field work to identify the messages that could be communicated to assist and facilitate management initiatives being planned by the project to improve the management of ESNB and PN fisheries.
- A two-day training programme on "Design and management of exploratory fishing" was held on 17 & 18 December 1996. Dr. M. Guidicelli, Gear Technologist and FAO/BOBP Consultant, conducted the training programme. 15 DOF/FRI/NGO staff participated. They were trained on methods to design and manage exploratory fishing trials.

The status of follow-up to the 1996 workshop is as follows:

- a. A request for research work to be undertaken by the FRI in order to recommend improved methods of catching, handling, sorting and transporting live *P.monodon* fry captured in the push net fishery was initiated by the National Coordinator through the Ministry of Fisheries.
- b. A series of stakeholder consultation and awareness campaigns by DOF/FRI staff to initiate management initiatives during the first quarter of 1997 has begun.



**Mr. Gerard Bernard, FAO Representative lighting the lamp during the inauguration of the government consultation on the management of the ornamental fish sector.**

### **Sri Lanka - Ornamental Fisheries Management**

Fifty two senior participants from various Government departments and agencies\* took part in a BOBP-supported Government Stakeholder Consultation on the Management of the Ornamental Fish Sector in Sri Lanka. It was held in Colombo on January 28, 1997.

The Minister for Fisheries and Aquatic Resources Development, Mr Indika Gunewardena, inaugurated the Workshop. Mr S B Bandusena, Secretary of the Ministry; Dr Anton Atapattu, Director of DFAR; Mr Gerard Bernard, FAO Representative in Sri Lanka, and Dr Kee-Chai Chong, Programme Coordinator of BOBP, also addressed participants.

How best should ornamental fish exports be monitored? This was the subject discussed at the technical session in the morning. While DFAR representatives suggested that their officers or NARA be involved, a Customs representative suggested that their agency be strengthened --- it has the competence and experience to monitor exports. Dr Chong suggested that it should be mandatory for exporters to provide detailed data on their exports. Another suggestion was that a new database produced by BOBP on reef fish should be used for identification.

Dr Rohan Pethiagoda said Sri Lanka should raise more ornamental fish in

captivity so that pressure on the natural stock is reduced. With 500 to 700 freshwater ornamental fish species in its northern region, Sri Lanka should aspire to become a new focal point for breeding and trade of ornamental fish in South Asia. Dr Pethiagoda also wanted more attention to be paid to reducing river pollution and to protecting the coastal waters.

Certain immediate actions were agreed to: Declare ornamental fish habitats as "conservation areas"; promote organization and licensing of ornamental fish collectors; work towards locale-specific and species-wise head counts of ornamental organisms through participatory data collection; encourage research initiatives, to promote the breeding and culture of marine ornamental species; strengthen enforcement capability in DFAR.

Dr S U K Ekaratne of the Department of Zoology, University of Colombo, is to undertake a study on the status of ornamental fish resources and habitats and current trends. It will last about six months. Terms of reference have been finalized.

\*Ministry of Fisheries and Aquatic Resources Development (MFARD); Department of Fisheries and Aquatic Resources (DFAR); National Aquatic Resources Agency (NARA); Department

- Continued on Page 28

# EXPERTS DISCUSS PRECAUTIONARY APPROACH TO FISHERIES MANAGEMENT

*Some 25 experts from member-countries and the FAO took part in a Regional Workshop on the Precautionary Approach to Fisheries Management in Medan, Indonesia, held 25-28 February 1997. Here's a report on what the workshop discussed and decided.*

Don't wait for evidence of overfishing to promote fisheries management. Initiate management measures right away, even in the absence of documented evidence! That in sum is what the precautionary approach to fisheries management is all about.

The Medan Workshop on the Precautionary Approach to Fisheries Management was inaugurated by the Governor of North Sumatra Province. Speakers at the inaugural session included the Governor; the FAO Representative in Indonesia; Ms Ennie Soetopo of the Directorate-General of Fisheries; and Dr Kee-Chai Chong, BOBP's Programme Coordinator. An illuminating keynote address by Dr Serge Garcia of FAO was the highlight of the inaugural session.

Sessions that followed featured country presentations on fisheries management by representatives of member countries, plus lively presentations by resource

persons. Participants discussed many aspects of artisanal, commercial and industrial fisheries in the context of the precautionary approach to fisheries management.

The discussion made it clear that management arrangements for many of the region's fisheries are inadequate. Further, several coastal fisheries had in the past operated under traditional management systems. These had suffered decline and are no longer used, but new arrangements had not been put in place. New fisheries management regimes effectively using the precautionary approach need to be formulated.

The point was made that better fisheries management is not synonymous with precautionary fisheries management. Management can be improved without following the precautionary approach.

There was some discussion on the basic question: "*Whai qualifies a*

*fisheries management strategy as precautionary?*" Participants agreed that at least some of the following characteristics should be present in a precautionary strategy:

- limited fishing access and allocation of user rights;
- production targets set lower than the maximum sustainable yield;
- formal fisheries management plans that include pre-arranged management responses to the achievement of targets or the surpassing of limits in the fishery;
- carrying out pilot projects or step-wise development rather than rapid, massive expansion;
- institution of adequate fishery research and monitoring systems, and feedback of data from these systems into the management process;

*Dr. Serge Garcia, Director, Fishery Resources Division, FAO presenting the keynote address.*





- learning from development mistakes of the past; learning from other countries.

Three working groups were formed to discuss these issues and in particular:

- operationalisation of fisheries management;
- how best to promote the precautionary approach;
- implications of the precautionary approach for small-scale fisheries

The consensus of opinion among the three groups is summed up under three heads in what follows.

### Promoting the precautionary approach

*Q: Who takes decisions on precautionary management?*

A: Government, whether Central, Regional or Provincial, is the main decision-maker.

*Q: What triggers the decision-making process?*

A: The process is generally triggered by a Parliamentary initiative which in turn may be prompted by parliamentarians, fisheries associations, NGOs, fishery consultative committees, or day-to-day interaction between administrators and the fisherfolk community.

*Q: How do you introduce PA2FM? How do you convince decision-makers*

*about the need for it? How can fishermen also be convinced?*

A: Some suggestions:

- Improve the information available and submitted to policy-makers;
- Use all opportunities of contact with management authorities to promote PA2FM. Examples: fisheries or resource crises, rehabilitation projects, development planning etc.

- Use the media to advertise and publicize issues and reach parliamentarians.

-- Promote longer-term concerns among fishery sector operators. Example: introduce fishing rights and allocations. This promotes secure access to resources. Long-term licensing is an option for industrial fisheries, and territorial user rights for artisanal fisheries. These rights could be recognized by purely legal means (e.g. statutory local reef ownership) or by a system of paying nominal user fees for the right to fish. This would instil among fishers some feeling for the value of their ownership rights and make them defend or stand up for such rights.

-- Where resources are depleted and coastal conflicts occur, community projects could seek to introduce PA2FM by

- (a) devices such as artificial reefs to keep large-scale fishing out;
- (b) organizing local enforcement
- (c) strengthening local community organizations

- (d) integrating community support toward clean water supplies, alternative job creation etc. Such projects would create a climate receptive to PA2FM. Introducing such an approach before resources are degraded would be precautionary. A cap on fishery capacity should also be established.

*Q: What kind of information is required to convince decision-makers and what would be the nature of such information?*

A: Research concerning promotion of PA2FM is insufficient at present. Such research should address not only biological topics but also economics and social sciences. It should not only assess fisheries resources, deal with risk assessment and look at management options, but should also produce relevant and timely forecasts. The information produced should be systematically supplied to decision-makers and industry.

Systematic development of management plans will help institutionalise the information process. Such management plans should preferably be organized by area or by species groups, particularly for multi-species fisheries.

In the case of shared and trans-boundary stocks, problems and solutions are similar. But the Government then has an even more important role than it has with national resources.

*Q: What are the analytical tools needed to generate the needed information?*

A: The role of fisheries models including bio- and socio-economic parameters,

## Objectives of PA2FM

Reduce risk to resources and people

- Guide decision-making when information is lacking
- Improve balance between short and **long-term**
- Maximize discounted net benefits
- Promote inter-generational equity
- Protect fisheries from other users' impacts

dealing with micro- and macro-economics, is important. The results generated by these models should be conveyed in a simple and effective way to decision-makers.

### **Institutionalizing Fisheries Management**

**Q. Could you cite some successful fisheries management initiatives in your countries?**

A: Three major areas have been identified for these initiatives:

- Banning eco-unfriendly fishing gears and methods;
- Strengthening legal frameworks to support management needs;
- Sound communication systems between government and the fishing communities.

**Q: Are there innovative easy-to-implement management methods?**

A: Difficulties in the way of management methods were identified.

- Political decisions inconsistent with technical advice;
- conflicts between large-scale and small-scale sectors;
- a lack of awareness on the need for resource management;
- non-compliance by fishers of fisheries laws and regulations;
- inadequate enforcement of laws;
- conflicting development / management objectives within Government;
- inadequate Government structures for management;
- inadequate legal instruments or frameworks to allow management;
- lack of credible information from statistical services;
- inadequate international co-operation to deal with trans-boundary problems.

**Q: Who manages fisheries? Who identifies the need for management?**

A: Government fisheries departments.

**Q. Who develops fisheries management policy?**

A: Fisheries departments with occasional external inputs.

**Q. How is the policy converted into laws, rules and regulations and by whom?**

A: Policies are given to legal drafting systems (Attorney General's Dept.) who convert departmental requirements into legal language. Laws have to be passed by government. Ministers and departments implement the regulations passed.

**Q. How are fishers and other stakeholders made aware of the needs, benefits and methods of fisheries management?**

A: Fisheries Department extension services are usually responsible for this. The approach followed is still top-down. Public awareness campaigns are launched, using media considered appropriate. It includes printed literature, comics, posters, radio, TV, video etc.

**Q. How are stakeholders involved in the process of fisheries management?**

A: Most answers reflected the top-down nature of fisheries management in the region. Stakeholder involvement is in broad terms minimal.

But there have been instances of particular groups playing a part.

Newer fisheries (less established) tend to have greater stakeholder involvement in their development and management.

**Q. Could you recommend changes in the process of institutionalization of fisheries management?**

A: The group suggested that action was needed in the following areas:

\* Public education and awareness -- a multi-media campaign to alert the entire

public (not just fishers) to the value of the marine resources and the way in which they are being misused or could be better used;

\* Cost/benefit analyses of what might happen if no action is taken, and the management system is allowed to drift;

\* The subject of traditional user rights generated heated discussion. Opinions varied. But the need was recognized to formalize traditional user rights, either by purely legal means (statutory local reef ownership) or by local token or nominal payment for rights to fish.

### **Implications of PA2FM for Small-Scale Fisheries**

A fishery can be broadly understood as small-scale if it has a reasonable number of the following characteristics:

- fishers have a good understanding of their ecosystem
- occupation is ecosystem-based
- simple technology
- low capital investment
- high skill intensity
- low occupational mobility
- multi-species/multi-gear fisheries
- highly seasonal occupation
- linked to agriculture and other coastal occupations
- dispersed habitats
- household level of activity
- owner/operators and labourers in others' boats
- near-shore fishing

**Mechanised and traditional fishing crafts crowding the Negombo lagoon, Sri Lanka.**





*Most of the coastal waters are polluted by activities like this - ship breaking in Chittagong, Bangladesh.*

- traditional fishers for several generations and recent arrivals

The technologies that small-scale fisheries have evolved over time would tend to be management-oriented because they are tuned to the local ecosystem; they are simple, with relatively low efficiency; they would be eco-friendly, because they have existed for generations without destroying the system. Thus small-scale fisheries are already in a way practising PA2FM, and should therefore be open to the idea.

***Q: Is there sufficient justification for promoting PA2FM among small-scale fisheries?***

A: Small-scale fisheries are increasingly under stress and are displaying symptoms of stock stress, even depletion. There is reason from a resource management point of view to promote PA2FM.

More importantly, PA2FM is a subset of the Code of Conduct for Responsible Fisheries (CCRF) which all countries in the region have adopted. This code requires that we concern ourselves not only with the resources but also with people who work the resource. A section of the code obliges us to protect the artisanal sector.

Given the crowded nature of coastal areas and the intensity of small-scale fisheries in the region, the only real management option seems to be to reduce fishing effort. Whose effort needs to be reduced -- small-scale, large-scale or both? Applying the principles of

equity, fairness and right to livelihood, governments should require large-scale fisheries to move further off-shore -- or even get out of fisheries and switch to non-fishery investment options.

But merely reducing effort in the large-scale fisheries adjacent to the small-scale sector would not solve all problems. There would still be a need to promote PA2FM in the small-scale sector.

Given the scattered and dispersed nature of small-scale fisheries and the difficulties of enforcing management, the only feasible option would be to involve stakeholders in small-scale fisheries directly in the decision making, monitoring, implementation and enforcement of management measures.

This would require devolution of powers. But stakeholders, including government, should clearly decide what powers should be devolved and then spell out the rights and responsibilities of stakeholders.

Coastal areas are often treated like extended garbage bins, with everything finally finding its way to the coast. Given the dependence of fishers on the coastal ecosystem, they ought to have a say in coastal zone development and management.

Integrated coastal area management (ICAM) measures need to be introduced in a precautionary way. Small-scale fisheries too could use the precautionary approach to demand a key role in ICAM for fisheries and fishers.

**Some Ideas on Follow-up Action Concerning PA2FM**

The workshop identified follow-up actions concerning PA2FM for each country. They are as follows:

**Bangladesh**

- National-level studies and research, possibly with international donor support, to make management of certain fisheries more precautionary;
- Awareness-building workshops with stakeholders, assisted by BOBP.
- Greater effort to involve the private sector, especially the many high-calibre NGOs of Bangladesh, in fishery management efforts;
- Briefings for ministers and policy-makers on the need for fisheries management, and the benefits and means of the precautionary approach.

## Originality of PA2FM

- Fishing is harmful unless proven otherwise
- It considers risks for resources and people
- Increased people's participation is needed
- It is not limited to exceptional conditions
- It becomes integral part of good practice
- Science has a central role, but
- A different science is called for
- It is compatible with UNCLOS and fills some gaps



*Kattumaram, traditional fishing crafi returning to the shore in Tamil Nadu, India.*

#### Indonesia

- Better coordination among the various Government departments involved in fisheries management, or whose activities have an impact on fisheries;
- More effort to manage fisheries on the basis of economic and social factors rather than simple production targets such as maximum sustainable yield.

#### India

- Communicate the idea of precaution in fishery management to State Governments and other Government departments;
- Further study the relationship between newly-mechanised and traditional fisheries in order to develop better means of conflict resolution through improved management;
- Introduce management arrangements in all fishery-related sectors, particularly inland fisheries, that are seriously impacted by irrigation, power generation and other schemes that divert water courses.

#### Thailand

- Make greater use of public hearings and other forms of consultation to develop and manage fisheries;

- Revise fishery regulations and laws with a view to incorporating more precautionary aspects;

- Reduce fishing effort in coastal areas by confining larger vessels to offshore zones, or through vessel buy-back schemes;

- Use inter-departmental committees to promote more responsible attitudes in other sectors that impact fisheries;

- Incorporate the precautionary approach into rehabilitation programmes for damaged fisheries.

#### Sri Lanka

- Take advantage of new enlightened attitudes and policies throughout Government to introduce the precautionary approach into general thinking;

- Make better use of new environmental laws to mitigate damage to habitats by development projects in the coastal zone;

- Introduce precautionary ideas among youth associations in order to raise awareness of responsible fisheries use among them, and influence the thinking of older generations.

#### Maldives

- Incorporate precautionary concepts into manpower training activities;

- Conduct surveys and pilot projects in support of fisheries development;

- Promote inter-sectoral cooperation;

- Improve data collection systems. Strictly enforce provisions by which fishing vessels provide catch data.

- Promote the concept of a broad stock assessment programme to look at the resources of the Indian Ocean, with emphasis on shared resources.

#### Malaysia

- Conduct seminars to explain the precautionary approach to fisheries extension staff and State Governments. BOBP assistance is requested.

- Develop marine education kits for school children;

- Discuss the idea of strengthening regional cooperation in this area by incorporating a strong precautionary thrust into a possible next phase of the Bay of Bengal Programme.

– S.R.Madhu.

# UNRESOLVED AND NEW ISSUES IN FISHERIES MANAGEMENT

By Kee-Chai CHONG and John Kurien

*In this paper, presented at the Medan workshop on precautionary management, the Director of BOBP and a leading fisheries economist-cum-social activist together examine unresolved and new issues in fisheries management.*

## Introduction and Background

In many developing countries of Asia, fisheries development has been driven by fisheries acts and ordinances either formulated by the countries themselves as in Thailand or inherited from colonial rulers (Sri Lanka). Such fisheries acts were prompted by conditions prevailing then, and by considerations of development rather than management.

In spite of 2-3 generations of intervention in fisheries, the problems of fishing communities largely remain unresolved. New issues are emerging at the same time. Whatever management measure has been put in place, results from government response to conflicts. It is not proactive management per se.

This article attempts to identify unresolved and new issues in fisheries management in developing countries of Asia.

## Development over Management

In developing Asia, we are still very much in the fisheries "development" mode. "Management" is seen as an attempt to curb production - in other words, only the regulatory dimension of management is being perceived. The active aspects of management that pertain to allocation, conservation and rejuvenation or rehabilitation of the resource and the ecosystem are perceived only peripherally.

It is also worth noting that in countries where the "active" management mode has been in vogue for nearly two decades, its adoption has been hastened by widespread socio-ecological and political pressure from small-scale fishing communities. The latter have demanded the State's intervention in regulation, allocation and conservation - almost to set right the consequences of State-sponsored development using inappropriate technology.

The list of unresolved issues in fisheries management is likely to be large because it includes issues never even taken up by the State; The new issues therefore read more like an agenda for solving the former.

So far, efforts to address fisheries issues have confined themselves to problems rather than solutions. In any discourse on fisheries, the depiction of problems takes up most of the attention. Solutions are relegated to the very end, after reader interest has waned. Further, many government - sponsored assistance programmes are of very brief duration. Commitment and follow-up are low.

To move from the development mode to the management mode does not come naturally. Many "interest groups" in society would like the development mode to continue.

In Asian countries, while there is a lot of talk about the need for management, actions continue in the old mode. To quote General Sardjono, former Director General of Fisheries in Indonesia, when the 1980 trawl ban was introduced, "We need to take two steps back to make a

big leap forward". If we backtrack a bit to study what was done in the name of development, we would be on surer ground when we leap into the management mode.

## Unresolved Issues

### Effective Enforcement of Regulation and Conservation Measures in Coastal Waters

Most countries have enacted legislation for regulating and conserving coastal fishing typically through zoning arrangements; entry regulations; closed season and closed area; mesh regulations and gear restrictions; bans on certain fishing methods; protection of certain species. Inability to enforce these legislations is the rule rather than the exception. Why are well-meaning laws not enforced? Is it lack of technique or lack of will?

In many countries, the organizational set-up and institutional structure are not conducive to management. To begin with, the organizational structure is compartmentalized. Even within this compartmentalization, there is no

***Fishing boat sunk: symptom of continuing unresolved conflicts in allocation of the fisheries among different user groups.***





fisheries management-dedicated unit. Even if one exists, it lacks staff, equipment and budget. In short, many fisheries departments are not set up for management.

#### ● Proper Allocation of Resources and Rights of Access in Coastal Waters

The coastal fishery has been largely one of open access. No catch limits have been set. We hear only about fish harvests going up, and about more boats, gears and fish finding devices etc.

Only in a few countries are customary rights acknowledged by the State. Most often, the major stakeholders who for decades have eked out a livelihood from fishing are treated at par with the small minority of outside investors for whom

the fishery is a source of quick and easy profit. Result: conflicts in **which** the majority stakeholders are marginalized. What measures can be undertaken to prevent short-term quick-buck interests from cornering most of the benefits? Till date, the question of use and user rights remain unresolved.

#### ● Effective Enforcement of Rights Over Exclusive Economic Zones

Most countries extended their EEZs in the 1970s. However, the inability to prevent encroachment and illegal access and monitor the access of licensed vessels has been a major cause for worry, and in some countries conflict. To what extent is lack of investment and technology for monitoring compliance the main problem? Or is it lack of regional and sub-regional cooperation

agreements? Will this change in the context of the UNCLOS agreement on straddling and highly migratory stocks?

#### ● Protection of Critical Habitats

Mangroves, seagrass beds and coral reefs are examples of critical habitats which have been degraded or destroyed, often in the name of "development" of one sort or another, without realizing the crucial role they play in enhancing the biological productivity of the coastal waters. To what extent is ignorance of the role played by these habitats in enhancing fishery productivity the cause for such destruction? Are factors outside the fishery primarily responsible for degradation? The perception of the public toward the sea and ocean - as a large receptacle for waste - have not helped in their protection.

#### New Issues/Initiatives

#### ● Sub-Regional and Regional Cooperation for Management

In the light of UNCLOS and the Agreement on Straddling and Highly Migratory Stocks and also the Code of Conduct for Responsible Fisheries, the issue of regional co-operation for fisheries management assumes significance. What institutions already exist? What is the scope for new ones to be formed? Even the future of FAO regional fisheries bodies has to yet be resolved.

#### ● Structuring Participatory Management into the Overall Management Realm

The need for community management at the local level has been highlighted. The



usefulness of such approaches is beyond question. What needs to be sorted out is the manner in which local, village level management institutions can be tailored into the large State-supported management framework. Are there examples in Asia where attempts to achieve this have met with reasonable success?

Also, what are the implications of participatory community-based systems of management? Is the government willing to share responsibility and authority with the fisherfolk in managing the fisheries? Are the fisherfolk themselves ready to take on such management responsibility? All these are pertinent issues and questions. Different groups of users and stakeholders have different objectives in managing the fisheries. A consensus has to be worked out on the overall objective of management.

#### ● Initiating Aquarian Reforms

When access to the resource is asymmetric - because investment capability differs - the overall regulation of effort may be insufficient as a management measure. Allocation priorities over rights to the resource must be worked out. Hence the need for an aquarian reform where the "rights to boats, fishing and first sale of fish are given exclusively and only to the persons who actually fish". Such allocation of rights particularly in countries which have large numbers of artisanal fishworkers, must be seriously contemplated to limit entry into the coastal fishery. This class of owner-workers then become key participants of local level co-management. Is this a technically feasible and politically viable solution? What are the preconditions for aquarian reform?

#### ● Proactive Measures for Resource Enhancement

Rather than wait till depletion and degradation set in to begin conservation, planned and proactive participatory measures for resource enhancement that create new fish habitats need to be considered. Artificial reefs (made from vessels deemed "illegal" following aquarian reforms!), redundant boats, mangrove replantation, sea ranching, "no-go" bio-reserves, coral reef and sea grass rehabilitation are measures that



merit considerations. Can these be organized through State initiative alone? What is the role and relevance of local-level participation in ensuring sustainable success for such initiatives?

In many coastal areas, many boats are for sale. These could be bought and retrofitted to serve as platforms for sea-farming or mariculture of mollusc such as oysters, mussels and scallops. These fishing boat-cum-platforms can be towed out to sea and left there and towed back into sheltered waters during bad weather or impending storm outbreaks.

#### ● Integrating Fisheries Management into Coastal Zone Management

The coastal waters being the "tail-end" ecosystem, resource management within it must be integrated into the management of both the aquatic and the terrestrial components of the coastal zone. What legislative support is needed for this? Should the initiative for CZM come from the fisheries sector?

#### ● Involving Women in Resource Management

The world over, women play an important role in the fisheries sector. The masculinization of fisheries was a result of the development mode, with the role of women being relegated to one of producing fishermen! This emphasis needs to be changed, and women's role as effective natural resource stewards should be profitably utilized (see editorial). The manner of bringing this about will vary from society to society.

#### ● Considering Coastal-Oriented Employment Opportunities

Since most countries in developing Asia are labour-surplus economies, options for jobs "outside" fishing are likely to be few. Besides, fisherfolk possess limited marketable skills. As part of a long-term strategy the human pressure on fisheries resources in developing Asia should be reduced. Job opportunities in coastal fishing areas should be expanded to accommodate educated youths and older men from fishing communities. To what extent does such redeployment depend on the performance of the overall economy? Is such employment creation socially acceptable?

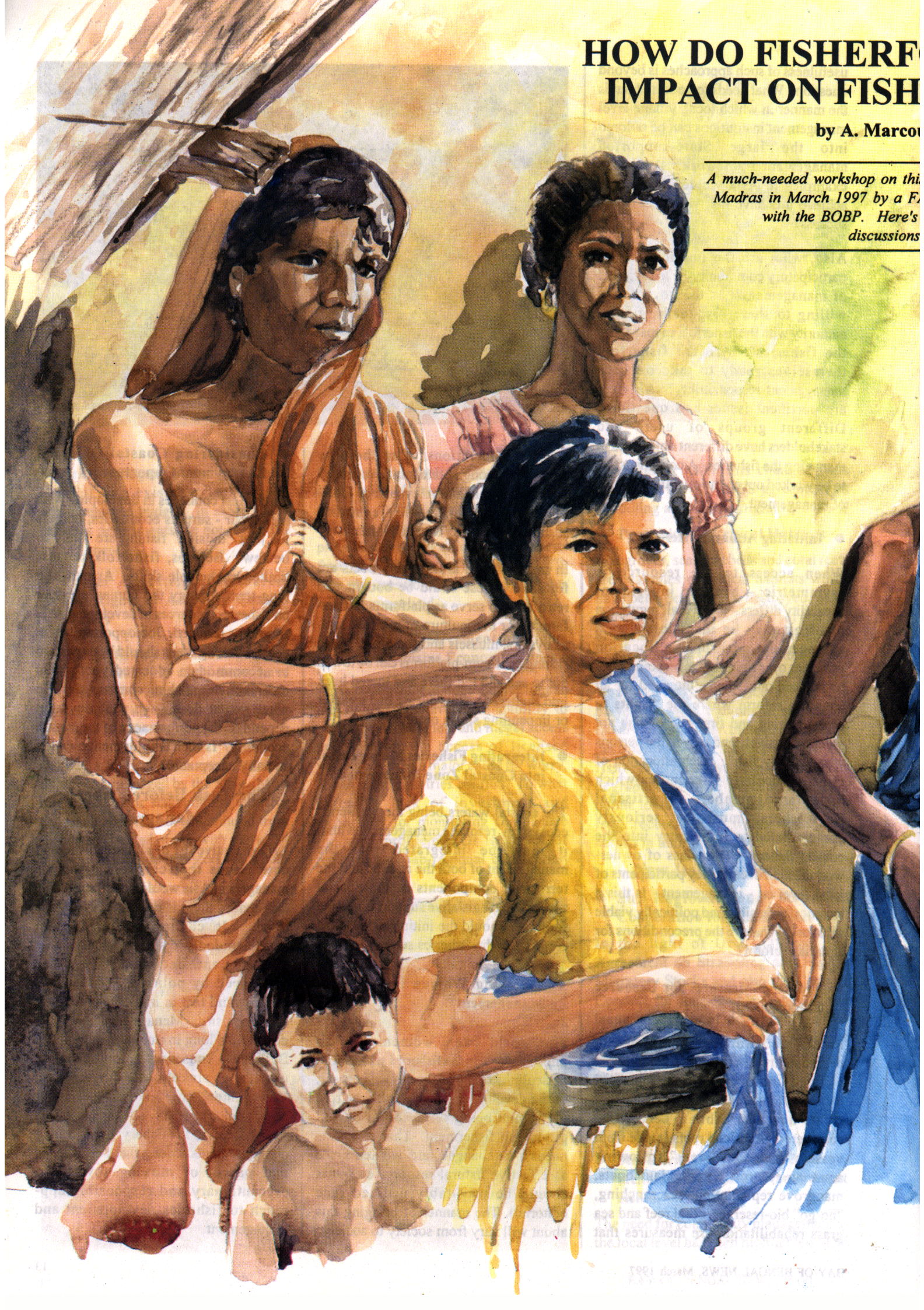
#### The Task Before Fisheries Managers

An exhaustive list of all unresolved and new issues that confront fisheries managers in Asia would be difficult. The task before them is daunting, to say the least. It cannot be undertaken singlehandedly by them. Moreover management decisions are often influenced by politics. Tenacity of purpose and tact in implementation are a prerequisite. Management decisions do not hold long in a context of conflict. Building a consensus among different user and stakeholder groups on management objectives; identifying common interests among various stakeholders in the fishery; and working out agreements among them are all part and parcel of moving towards a precautionary and responsible approach to fisheries development and management.

# HOW DO FISHERMEN IMPACT ON FISH

by A. Marcor

*A much-needed workshop on this  
Madras in March 1997 by a F  
with the BOBP. Here's  
discussions*



# OLK POPULATIONS ERY RESOURCES?

IX and U. Tietze

*little - known subject was held in  
MOUNFPA project in co-operation  
a report on the workshop's  
and decisions*



# HOW DO FISHERFOLK POPULATIONS IMPACT ON FISHERY RESOURCES?

## Background and issues

Population aspects in fisheries are often overlooked. Population growth in fishing communities is responsible for fisheries resources getting over exploited and the coastal environment being degraded.

Little attention has been paid so far to socio-demographic characteristics of fishing communities and their changes in the last few decades. Even less is known about the effects those changes have had on the exploitation of fishing resources and on the state of the coastal environment. Fishing communities rarely figure in population education programmes or benefit from related health and social welfare programmes.

This situation is addressed by the project, "Strengthening of Research and Training in Population and Development Dynamics in Rural Fishing Communities". It is funded by UNFPA and executed by FAO in co-operation with research and educational institutions in Bangladesh, India, Malaysia, the Philippines, Senegal and Tanzania. The project, is being coordinated by FAG, Rome. Its interim phase began in 1992 and its main phase in 1995.

Under the project, macro-level and micro-level studies are being carried out on population characteristics of coastal fishing communities, changes in these characteristics during the last two decades, and on the implications of these changes for the exploitation of fisheries resources and the state of the coastal environment. Views and perceptions of fisherfolk on these changes are also being examined.

The project convened a workshop in March 1997 to compare the outcomes of the project's first studies, orient on-going and future studies, and draw conclusions to incorporate the issues that emerged into future fisheries management strategies.

Madras was the ideal venue for the workshop. It hosts the BOBP, which has been concerned with artisanal fisheries development and management in South and South-East Asia for more than two decades; and the International Collective in Support of Fishworkers (ICSF) which has close links with

artisanal fishers and their associations. Further, Madras is 'located in a region with a high fisherfolk population density and a high level of exploitation of fisheries resources; it is also centrally located with respect to the project's participating countries.

## Purpose and participation

The workshop brought together 23 fisheries scientists/socio-economists and population experts from Philippines, Malaysia, Bangladesh, India and Senegal with experience in demographic and population research on fishing communities and fisheries management. Its aims:

- \* Present and discuss the findings of recent studies of population characteristics of coastal fishing communities, their relationship to fishing effort and exploitation of fisheries resources; help incorporate **research findings** into fisheries education and training.

- \* Provide advice to countries on designing and introducing special population policies and programmes for fishing communities so as to improve the standard of living of coastal fishing communities and enhance their role in sustainable exploitation of fisheries resources.

- \* Formulate recommendations for institutionalizing population research on fishing communities so that population research findings can be taken note of in fisheries planning and management.

Participants represented numerous agencies— the Department of Fisheries, Tamil Nadu; the ICSF, Madras; the Madras-based M S Swaminathan Research Foundation; the BOBP; the FAO Population Programme and the FAO Fisheries Industries Division, Rome; the Netherlands Interdisciplinary Demographic Institute; the British ODA; the South Asia Network for Small Fisherfolk Development; the Christian Workers Movement Catholic Centre; the Madras Institute of Development Studies; the Universiti Putra Malaysia; the College of Fisheries of the University of Philippines in the Visayas; the Central Institute for Fisheries Education, Bombay; the Bangladesh Academy for Rural Development; the Bureau of Statistics, Senegal.

The Department of Sociology of the University of Dar-Es-Salaam, Tanzania, presented a paper. Dr. M. Hotta of Japan, a former FAO staff member with profound experience in community-based fisheries management in Asia, was one of the resource persons.

## Programme and proceedings

The programme was divided into three main parts. The first part consisted of presentation on broad issues. Mr. A. Marcoux, Senior FAO Population Officer, discussed the FAO Population Programme and the relationship between population concerns and natural resources management. Mr. G. Groenewold, Senior Demographer of the Netherlands Interdisciplinary Demographic Institute (NIDI), spoke about the research methodology and findings of the UNFPA/FAO project.

Dr. K.C. Chong and Mr. Rathin Roy of BOBP made a joint presentation titled "Values, Perception and Attitudes of Fisherfolk and other Coastal Stakeholders Towards Ownership of Fisheries Resources and its Exploitation, Management and Sustainability: An Overview of BOBP's Role and Experiences With Regard to Fisheries Management".

Ms. Chandrika Sharma of the International Collective of Fishworkers presented a paper on "Overfishing, Artisanal Fishing Communities and Demographic Research - Nailing the Issues". Dr. M. Hatta spoke on "Principles of Community-Based Fisheries Management".

The second part of the programme consisted of presentations and case study discussions from Bangladesh, India, Malaysia, the Philippines and Senegal on population characteristics and trends in fishing communities and their relationship to resource exploitation.

In the third part of the Workshop, two working groups met to discuss and formulate recommendations. The first group focussed on institutionalization of **population** research on fishing communities. The second group put up recommendations about population issues to be considered in fisheries policy planning. The second group **also** prepared a proposal for an inter-regional technical assistance project on integration of population concerns into fisheries management.

## Findings and recommendations

Preliminary findings from the macro-level and micro-level studies being carried out by the FAO/UNFPA project at the national level revealed some interesting results which are trends quite contrary to what is commonly believed.

It was found that in most countries, sharp increases occurred in the number of coastal fisherfolk during the '70s and '80s. This intensified exploitation of fisheries resources. The number of fishers increased - both because of population growth in fishing communities and an influx into fishing from other occupational groups.

Towards the end of the '80s maximum levels of exploitation were reached in most countries. Further increases in the number of coastal fishers were much smaller; in fact stagnation and decline could be observed in the number of full-time and part-time fishers. A considerable number of fishers switched from fishing as full-time or part-time occupation to fishing as an occasional occupation, or gave up fishing altogether. Some reasons for this development: traditional entry limitations as well as alternative employment opportunities.

What accounted for over-exploitation of in-shore fisheries resources? Uncontrolled industrial fishing in areas in-shore played a more significant role than population increases in traditional fishing communities.

Regarding the attitudes and practices of coastal fishing communities to family sizes, age of marriage and other population characteristics, a significant change was found to have taken place from the last to the present generation. Young women and men prefer to live in nuclear rather than extended families. They also prefer to have fewer children and to marry at a later age.

These and other findings will have to be confirmed, however, and to be explored further with the help of the micro-level household surveys which will be carried out next in the context of the inter-regional project.

Some select recommendations of the Working Groups are summarized below. A full and verbatim copy of the recommendations may be obtained from the authors.

**Working Group I** dealt with "Institutionalization of population research 'on fishing communities'". The Group made recommendations to be considered by governments, NGOs and international organizations.

The Group urged Governments to ensure that censuses, surveys and statistical, operations provided data on fishing communities: They were also asked to maintain a data bank and set up a clearing house for research materials on fishing communities. They ought to regularly publish a report on the socio-demographic aspects of the fisheries sector, and encourage institutions that did research on fishing communities to set up networks.

The Group urged NGOs to document the socio-demographic conditions of fishing populations. It suggested that international organizations such as FAO should periodically prepare global assessments on socio-demographic aspects of the fisheries sector. They would thereby stimulate government initiatives in this area.

**Working Group II** examined how population research findings could be used in fisheries planning and management. Some of the major recommendations in brief:

- Formulate policies that pay adequate attention to the carrying capacity of fishery resources, to linkages between population trends and production and income trends, consumption patterns etc.
- Formulate policies that consider the mobility of fishers and their access to fishery resources.
- Strengthen the capability of fisheries

planners to integrate demographic and gender-related components into development and management programmes.

- Establish viable alternative employment opportunities to absorb displaced fisherfolk.

- Strengthen the collection, analysis and dissemination of information on demographic and socio-economic characteristics of fishing communities, and on the attitudes and perceptions of fisherfolk. Establish mechanisms to make use of the data.

- Assess the impact of population-related programmes on fisherwomen, their fertility, earnings, employment, work burden, health etc.

- Create awareness at all levels about population-related issues and problems in fishing communities.

- Strengthen coordination among agencies on collection, analysis and sharing of data, as well on demographic management strategies and programmes.

- Consider how community-based fisheries management can help resource conservation and stable fish prices.

- Promote and strengthen fisherfolk organizations and empower them to participate in community-based fisheries management.

### Follow-up

Participants agreed to continue co-operation and information exchange in future and to help secure funding for the inter-regional technical assistance project which has been proposed by the workshop.

*Management dilemma: how to attract fisherfolk out of overcrowded fisheries faced with limited employment opportunities?*



PHOTO FEATURE

# Community-based fisheries management in Phang Nga Bay, Thailand

*by S.R. Madhu*



*Phang Nga Bay in Thailand, about two hours away by car from Phuket, is noted not just for scenic magnificence but for a rich and diverse eco-system: 39,000 acres of mangrove forests, a few thousand acres of seagrass beds, coral reefs, beaches. Fish, shrimp, crabs and other invertebrates populate the coastal waters of the Bay's 35 villages.*

*However, falling fish catches and signs of environmental decline worry the authorities. Catches have fallen in recent years because of increased fishing effort – by trawlers on the one hand, pushnets and small-mesh gears on the other. Land-based activities – tin mining, resort development, tourism – have led to the inevitable fallout: pollution.*

*The Department of Fisheries, Thailand is trying to introduce community-based fisheries management (CBFM) in Phang-Nga Bay. It has selected the area around Ban Hin Rom, the biggest village along the Bay, as a model for developing CBFM over a period of five years from October 1995. The project is supported by BOBP.*

*CBFM activities in the Bay include awareness-building & education, and research studies; mangrove reforestation; a ban on pushnets and trawlers within a 3-km zone reserved for small-scale fisheries; construction of artificial reefs; technical assistance for mariculture.*

*Here are glimpses into Ban Hin Rom, in words and pictures.*

## Ban Hin Rom: the village of mud pots, longtail engines and grouper cages

No visitor can forget Ban Hin Rom. The physical beauty of the village – with the sea in the foreground, mangrove forest and limestone rock formations on the horizon – is characteristic of the Bay, but contrasts starkly with the rather basic living standards of village residents.

Most people live in huts that stand on stilts. A bigish water pot stands outside each home, symbolic of the chronic water scarcity that bedevils the village. This mud pot can collect and store 1.5 tons of drinking water during the rainy season – this is what a family has to depend on throughout the dry season. Drilling for water doesn't help; it is brackish water that spurts up.

Fishermen buy fresh water. They pay 30 baht for three 20-litre buckets of water every day. Since the average family's daily income is 100 baht, a good part of it goes toward drinking water.

Fishing is of course the main occupation in Ban Hin Rom. Of the 125 households in the village, about 100 are fisherfolk households. A fish landing centre is the heart of activity at Ban Hin Rom. The village has some 100 long-tail engine boats operated by small-scale fishermen. The main fishing gears used are trammel nets, crab bottom gillnets, mackerel gillnets and traps for grouper.

Suchart Sanchang, Fisheries Biologist from the Phang Nga Fisheries Station, is helping guide and monitor community-based fisheries management around Ban Hin Rom. The work keeps

him busy – installing an artificial reef at one place, helping out with mariculture in another, discussing the pushnet ban or the current drinking water scarcity in yet another. "During the past five years, about 40 artificial reefs have been constructed," says Suchart.

At Ban Hin Rom, there's a "gear repair hall" near the fish landing centre which is also used as a community hall. "We hold a meeting here every two months" says Suchart. Some 80 to 100 people attend the community meeting. Chairs are obtained from the village mosque. BOBP has provided furniture and a white board for the common hall.

The villagers discuss their problems and the progress of fisheries management. Training courses are held. Awareness meetings are conducted. Even school children of the area come to the community hall, where Suchart talks to them about the need for fisheries management.

Some valuable suggestions have been made at the meetings. One of them was to increase the population of crabs. The villagers of Ban Hin Rom would provide gravid crabs, the project would nurture them in cages, and release the eggs into the wild a few months later. Another suggestion was that boats should be charged for landing facilities (10 baht each); the money would be put to community use.

The project has encouraged the community to set up groups – there's one for mussel culture, another for

fishing gear. Members are eligible for a loan of 4000 or 5000 baht, which is returned in instalments. This money finances loans for others. Thus, a revolving fund is in operation. Group members frequently assist the staff of the local health centre in measures to collect and burn garbage.

We take a boat from Ban Hin Rom for a mariculture boat tour – we view raft culture of mussel and cage culture of grouper. There are scores of rafts and dozens of cages. The Department of Fisheries has provided fisherfolk with a floating platform for use during neap tide when the water level falls and the boat can't get back to the village. The platform also serves as a centre for rest and recreation; fishermen who set out early can rest there when the sun gets fierce, and return home later in the afternoon.

### Interviews with fisherfolk

One finds a heartening upbeat spirit among the fisherfolk community at Ban Hin Rom. The hassles of everyday life don't confound them. They like the concept of community-based management, and are doing whatever they can to make it work.

Says Moosa Lansan, 28, of the DOF: "Catches have gone down mainly because many fishermen from outside have come to Phang Nga, attracted by the mangrove resources. Some of them operate push nets. The Department's patrol boats try to catch the pushnet fishermen. But these fellows play hide-

and-seek. They don't operate push nets when the patrol boats are around. "

**Fard Sintoa**, 46, has a 10m boat with a 5.5 hp longtail engine and uses mackerel gear. Earns an average income of 100 to 150 baht per day. He has six children, five of them in primary school. "I can afford to send only one child to high school, perhaps the one who studies very well."

Recreation? "I don't fish all the time. When I am not fishing I am free," Fard says simply. His radio and TV sets offer a means of entertainment. He likes to watch sports and Thai boxing on television.

**Thorayut wong-rit**, 25, owns a 10m boat with a 22 hp engine. He engages in mussel culture, wants to engage in cage culture of grouper and seabass. He talks about the fishermen groups in the village. "It's certainly an advantage to be in the group," he says. "If I lose my fishing gear out at sea, I can get it back from the group."

**Hasina** is 24, pretty, recently wed and full of cheer. Seated on one of the huts-on-stilts in the village, she is busy smoking barbeque chicken and chatting with her sister-in-law.

Hasina hails from a fisherman's family in Songkhla. She got married last month. Her husband is a longtail boat fisherman. She likes Ban Hin Rom. "If I don't like it, I'll go away with my husband to Songkhla," she declares with a laugh.

*Hasina from Songkhla*





*Facing page: The fisherfolk community at Ban Hin Rom, the biggest village along Phang Nga Bay in Thailand. Water storage tanks in bottom pic dramatize the water scarcity in the village. Oyster culture (above left) and cage culture of mussel (above right and below) are important activities.*



# 1997 IS THE YEAR OF THE REEF

by Donna J. Nickerson<sup>1</sup>, John Baldwin<sup>2</sup> and Abdulla Naseer<sup>3</sup>

Dedicating a year to coral reefs is a chance to reflect a bit on this very important, beautiful, and unique marine resource. To fisherfolk, coral reefs are homes to fish that are waiting to be caught. To snorkelers, divers and glass-bottom boat tourists, corals are one of the most unique art galleries in the world with amazing displays of color and shape and are brilliantly designed living creatures. Included in the gallery are the many species of coral reef fish that are inseparable from their coral reef homes. These fish are an essential part of the coral reef ecosystem.

For much of the world tropical coastal population, coral reefs are synonymous with reef fish and edible marine invertebrates. Reef-related fisheries yield between 9 and 12 per cent of the world's total annual catch of 70 million metric tons (White et al. 1994). And this reflects only the recorded catch. Much of the coral reef fisheries is small-scale and much of the small-scale catch is not traded on the market. Instead, the non-market fish are 'unsung heroes' of coastal community health and welfare - important providers of protein and food security for coastal fisherfolk communities.

As a response to a realization that coral reefs across the world are under threat from a variety of impacts, a partnership

of governments, agencies and NGO's commenced working together in 1994 as the International Coral Reef Initiative (ICRI). Coral reef survival depends upon the world community acquiring knowledge and the capacity to conserve and sustainably use coral reefs and their related ecosystems. It is the objective of ICRI to promote this message globally through the establishment of regional associations and actions including developing capacity within those regions to solve local issues in a local context.

The ICRI South Asian Workshop held in the Maldives in 1995 came up with several priority regional issues that emphasized the importance of fish as part of the coral reef ecosystem. One priority action was that unsustainable extraction of living resources should be identified, quantified and halted.

A sustainable coral reef fisheries has a lot to do with the health of the corals. Each living individual coral animal or 'polyp' generates nutrients that produce algae, forming the basis of a very complex coral reef ecosystem. Spiny lobsters hide inside the holes of the reef and feed on the abundant planktonic life passing by their 'door'. Groupers and snappers feed on bigger life forms of the reef but also need the protection of the reef from their own predators.

Reefs not only provide the homes for many tropical fishes. They are used in the Maldives and Sri Lanka for building human homes. The mining of corals for homes and building materials was identified as a priority regional issue for management in the ICRI South Asian Workshop. Coral mining is also one of the five issues that the Maldives is addressing under the Integrated Reef Resources Management Programme (IRRM).

IRRM is one initiative that is implementing recommendations under global agreements such as Agenda 21, Chapter 17, which calls for development of an integrated approach to the management of coastal and marine resources with particular reference to the protection of coral reefs as an area of high biodiversity and global importance. Maldives IRRM is one of the many examples of one country's vision to better manage the important coral reef ecosystems of the world. BOBP is one of the organisations assisting the Government of Maldives with IRRM.

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*Pictures courtesy Dr. R.C. Anderson*

## Reef resources management in the Maldives

by Donna Nickerson (Coastal Zone Management Officer, FAO/RAP, Bangkok) & Maizan Hassan Maniku (Director-General of Fisheries Research and Development, Ministry of Fisheries and Agriculture, Maldives)

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*Maldives has laid a strong foundation for Integrated Reef Resources Management, (IRRM) with several positive measures in recent years. A Workshop held last year resulted in a comprehensive package of recommendations on IRRM. This article discusses these measures and recommendations.*

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Reef fish are synonymous with corals; both are synonymous with the Maldives.

Maldives is a nation of over 1,000 small coral islands spread over 90,000 square km in the Western Indian Ocean. Tourism and fisheries are two of the most important industries; both depend on the high environmental quality of reef and marine resources. While tourism is the highest foreign exchange earner, fisheries are the main source of jobs and nutrition.

Historically, fisheries in the Maldives have been based on the pelagic tuna resources and the livebait fishery. Both fisheries are connected with the reefs. But since the early 1980s, Maldives has seen the emergence of new reef fisheries: the export-oriented grouper fishery, the marine aquarium fish trade, the *beche-de-mer* fishery and the giant clam fishery. There has been severe pressure on these

fisheries because of high export demand, a small resource base, and inadequate management measures.

Responding to these pressures, the Government of Maldives has initiated an Integrated Reef Resources Management Programme (IRRM). It is a holistic approach to reef management that seeks to combine fisherfolk knowledge, scientific studies of reefs and the expertise of all Ministries in the reef areas. The approach hopes to ensure that management solutions will be comprehensive and sustainable.

The Programme builds on earlier efforts, initiated with external assistance. Such as the ODA-initiated research on tuna and reef degradation; establishment of a Coral Reef Research Unit assisted by the ICOD/Canada; the BOBP/UNDP-assisted extension programme of 1988-1994 under which a series of consul-

tations, workshops, seminars and training courses were held in Vaavu, Faafu and Meemu atolls. This extension programme produced a useful Reef Resources Management Handbook and a booklet "Our Living Reefs" for community schools in the project area.

One of the long-term goals of IRRM is to evolve development policy guidelines for all atolls by the year 2000. A short-term objective is development of a management model for the Vaavu, Meemu, Faafu and Dhaalu atolls.

The IRRM is supported by BOBP under its present phase (1994-99). Five key issues have been identified. These consider cultural, scientific and sociological aspects of management. While unique to the Maldives, they are certainly useful for other countries with fragile reef ecosystems.

The key issues are:

**Reef Fish Fishery:** Main areas of concern would be the export-oriented grouper and marine aquarium fish trade. The Government of Maldives is developing mariculture pilot projects to help offset the intensive effort and catches in the *beche-de-mer*, grouper and giant clam fisheries.

**Baitfishery** for the tuna pole and line fishery.

**Coral Mining:** Impacts from coral and sand mining; dredging as well as reclamation.

**Tourism/Fishery Interactions:** The project will study the interactions within each sector, before analysing the interactions between sectors.

**Comprehensive Management of the Resources:** Mainly concerned with the legal and institutional aspects of IRRM.

To implement IRRM, a forum was needed to produce a common understanding among participants on the vision of IRRM and its objectives. Such a forum would enable sharing of scientific and socio-economic information on the five issue areas. It would facilitate the development of draft approaches to assess these issues and apply them to IRRM.

**The IRRM workshop :** A workshop was held 16-20 March, 1996, to pursue

these objectives. Representatives from fisheries, tourism and reef-related industries, including public interest groups, and from a number of Ministries, took part in the workshop. IRRM awareness materials, including a prospectus and brochure that described the concept and vision of IRRM, were distributed to these participants. Guidelines were provided in advance to authors and resource persons for their contributions to the workshop.

Workshop participants visited IRRM project sites and a number of government agencies. During a field visit to Vaavu atoll, a meeting was held with a large number of fisherfolk; IRRM objectives and management measures were discussed. During another field trip to the four atolls, four staff of MOFA were trained to undertake stakeholder identification and analysis, and stakeholder communication and perception analysis.

All these activities ensured strong participation at the workshop and resulted in useful papers and presentations.

The workshop was organised around the five issue areas. Resource papers were presented in the morning; five working groups of about 15 experts each (comprising representatives from government agencies, NGOs, private exporters and divers) held discussions

in the afternoon and developed recommendations to implement IRRM. The international resource persons noted the strong unified understanding of objectives and knowledge of the five identified issue areas for management among the Ministry representatives.

The student sessions held in the afternoon constituted one of the unique aspects of the workshop. Working Groups of students aged 14 to 18 years developed recommendations for IRRM education in schools and what they could do to implement IRRM. These bright schoolchildren came up with points that the adults had overlooked. These were incorporated into the workshop report.

The IRRM workshop was successful in developing an implementation strategy for a more holistic approach to reef management.

The workshop's immediate output was a draft report with recommendations for each issue area; a draft collaborative management plan; and a draft IRRM implementation framework. The workshop recommendations and abstracts of papers were translated into Dhivehi for implementation in the atolls. The workshop advised that leadership for executing activities be assigned to



relevant management levels – National, Atoll and Island.

The workshop's recommendations are spelled out in the Collaborative Management Plan by issue area and by management level. Selected recommendations are mentioned here.

The recommendations include many of the activities agreed to at the South Asia Regional International Coral Reef Initiative (ICRI) Workshop held in the Maldives in 1995.

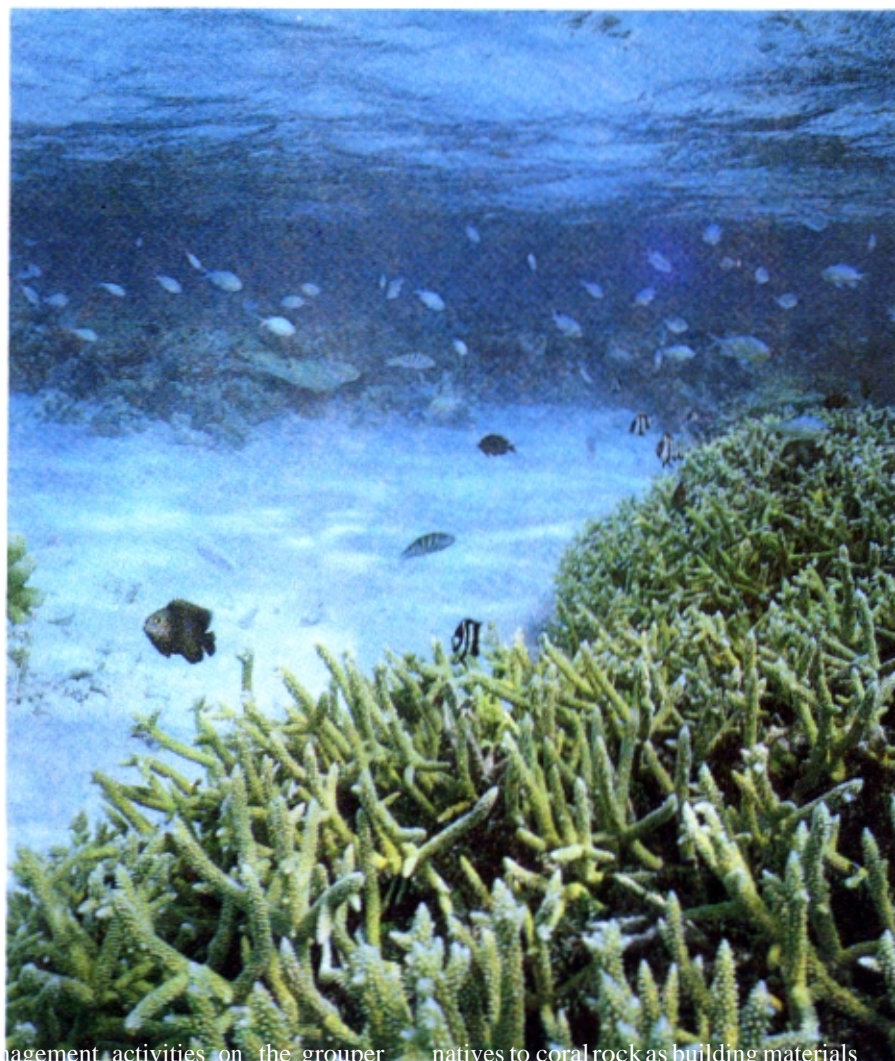
Three strategies make up the plan -- the Reef Fish Fisheries Strategy; the Coral Mining and Related Activities Strategy; the Tourism and Reef Resources Interactions Strategy.

### **Reef Fish Fisheries Strategy**

Some of the recommendations for this strategy *at the national level* are: build awareness among the fishing community and the public on reef resources management through environmental clubs, school groups, use of local, print and radio media, documentaries on national television; introduce fisheries science at the primary or middle school level; conduct debates, poster competitions and quiz contests in schools about coral reefs; ban fishing during the breeding season wherever appropriate; impose a moratorium on fisheries that are severely over-fished, allowing stocks (e.g. sea cucumber), to recover; consider banning the capture of sea birds. Take strong action to prevent destruction of bird habitats.

*At the atoll level*, some recommendations are: develop a plan for each atoll, based on community participation and co-operation; ban fishing during the breeding season where appropriate; control fisheries in each atoll by limiting the catch and fishing effort; ban the use of small meshes in gillnets; impose a moratorium on fisheries that are severely over-fished.

*At the local level*, recommendations include: work together with the Marine Research Section (MRS) to document existing local knowledge of marine resources and management systems to provide a sound foundation for IRRM; estimate potential fishery yield targets for different fisheries of each atoll. Identify potential fishery targets and help to set size limits. Monitor reef fisheries using logbooks. Concentrate initial community-based monitoring and



management activities on the grouper natives to coral rock as building materials

management activities on the grouper fishery.

*Recommendations for MRS support to the IRRM process include:*

Provide technical direction and information for radio programmes and documentaries; engage suitable fishermen on targeted islands to monitor reef fisheries using logbooks. Help organise lectures for school leaders to provide information on career opportunities for students taking subjects relevant to coral reefs. Carry out research to assess the status of livebait fish stocks and their sustainable yields. Initiate a baitfishery data collection system. Prepare fishery information packages for school teachers.

### **Coral Mining and Related Activities Strategy**

Recommendations for this strategy *at the national level* include: provide information to atolls and island communities to help set size limits on commercially important species. Establish mechanisms to make alter-

natives to coral rock as building materials socially acceptable in the country, and encourage the use of alternatives in maritime structures. Consider assigning MPHRE the approval authority for coral mining permits. Conduct training courses in Male and the atolls to make concrete blocks an alternative to coral rock for construction.

Recommendations at the atoll level include: initiate and develop a participatory reef monitoring programme involving island and atoll development committees, women's committees, NGOs and other stakeholders. Develop criteria to define boundaries for house reefs of tourist and inhabited islands and zones designated for different uses.

Some of the recommendations at the *local community level*:

participate in the design and implementation of a reef monitoring programme involving island and atoll development committees, women's committees, NGOs and other stakeholders; develop criteria to define boundaries for house



reefs of tourist and inhabited islands and zones designated for different uses.

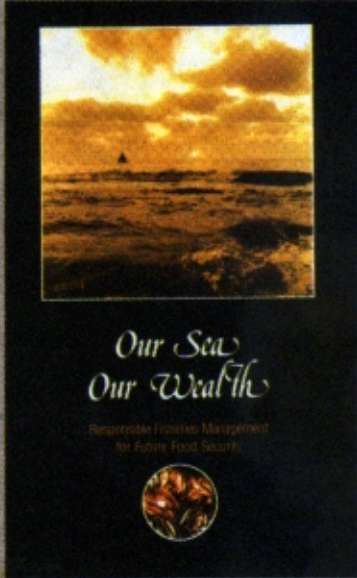
*Recommendations for MRS support to the IRRM process include:*

Provide technical direction and oversight for a participatory reef monitoring programme. Develop criteria to define boundaries for house reefs of tourist and inhabited islands and zones designed for different uses.


#### **Tourism and Reef Resources Strategy**

Recommendations for IRRM include: provide incentives for the tourism industry to support marine-related research and education programmes for both locals and visitors. Compile the results of research related to management of marine resources. Determine limits for expansion of the number of tourism islands. Develop a network of marine protected areas. Minimise impacts of dredging and develop strategies to deal with wastes. Develop a licensing system for tourism and fisheries based on personal transferable licenses.


To conclude, as the International Year of the Reef unfolds other coral nations may well take a leaf from the book of the Maldives in deciding on a comprehensive approach to manage its coral reef ecosystems.



*Our Sea  
Our Wealth*  
Responsible Fisheries Management  
for Future Food Security



CONSULTATIVE AND PARTICIPATORY  
APPROACH TO MANAGEMENT



A SIMPLIFIED MODEL OF HOW FISH STOCKS CAN BE MANAGED

**THE ABOVE  
BOBP POSTERS  
ARE AVAILABLE  
ON REQUEST AT  
PRINTING,  
PACKAGING AND  
POSTAGE  
CHARGES ONLY.**



## What Maldivian students say about reef resources

The recent IRRM workshop on the Maldives was unique in one respect: the enthusiastic participation of students. They formed their own working group and made some thoughtful recommendations on resource conservation. Here's a summary of their ideas and observations.

**Coral Mining:** Builders should be discouraged from using coral for construction activity. Alternate materials like imported sand and granite should be made available at a reasonable price by the government to all islands. Courses should be held on making cement bricks which could serve as an alternative to coral for construction activity.

**Tuna Fishery:** Tuna is a main source of protein for all Maldivians and a foreign exchange earner. Research is needed on existing tuna stocks. The maximum sustainable yield must be determined.

**Sea Birds:** Sea birds play an important role in locating fishing grounds. Many of these birds are being caught by fishermen and kept in their homes as pets. Some of these birds are now seen very rarely. The government should impose a total ban on the capture of sea birds. The destruction of bird habitats should be stopped.

**Bait Fishery:** The government should protect the fishing grounds for live bait, which are important for the pole and

line fishery. Reefs should not be damaged during bait capture. Coral mining should be banned in these areas. Fishermen should be made aware of existing problems in catching live baitfish. Overfishing should be discouraged. Excess bait should be returned to a reef, not thrown into the open sea. Specialized boats should be introduced for bait fishing.

**Garbage Removal:** The students urged firm government action against destruction of coral reefs, and suggested that a higher tax be levied on mined coral. They also castigated those who dump garbage on coral reef sites. They suggested that the government introduce facilities to collect cans and plastics throughout the Maldives, also machines to incinerate these materials. Students environment clubs could be mobilized to collect the cans and plastics. They could be paid a small sum to collect the cans and plastics.

**Awareness Programmes:** The students urged awareness programmed on coral reefs. The government should send qualified environment field officers to various islands to create awareness. They should use information media, and organize lectures.

**Fisheries Science in Schools:** The students urged several steps to

incorporate coral reefs study into the educational curriculum. They said that fisheries science should be introduced at the primary rather than the secondary school level, since many students drop off from school before the secondary stage. Teachers should carry out practical activities. At present teachers do not use the recommended activity workbooks.

**Lectures, video, slides debates, quiz, contests etc.:** The students noted that most teachers of fisheries science are expatriates. They have very little practical experience on coral reefs. This may be the reason they are so reluctant to take student out to the reefs. The students urged that Maldivians be trained to teach fisheries science in schools. Field trips to organize coral reefs must be organized once a year. Lectures for school-leavers should inform them about career opportunities relevant to coral reefs. Lectures, video and slide shows by various departments would create awareness about man's fragile environment. Radio programmes, national television documentaries, debates and quiz contests among school students, and nationwide poster competitions were also suggested. Environmental clubs from schools could design leaflets and help paint billboards which should be put up in various locations in the islands.

# BOBP IN THE FIELD

(Continued from Page 5)

of Coast Conservation; Ministry of Environment, Transport and Women's Affairs; Central Environmental Authority; Department of Customs; Export Development Board; Department of Wildlife Conservation; Department of Forest Conservation; Ministry of Public Administration; Marine Pollution Prevention Authority; Sri Lanka Board of Investment; National Zoological Garden; and local universities.

## **BOB Region: Survey of fisherfolk values, perceptions and attitudes.**

How do you change the behaviour of stakeholders in fisheries? How do you induce more caring, concerned and responsible behaviour toward the environment in general, and the fisheries resources in particular?

Past efforts at introducing fisheries management have not had the desired impact. One reason certainly is that we do not know enough about fisherfolk and other stakeholders in the fisheries - their instincts and motivations. What drives them? What do they think about the fisheries resources and then exploitation? Do they know what overfishing means? Have they heard about the concept of management?

Along with member-countries, the BOBP has launched an ambitious wide-ranging survey that will yield a wealth of data on the value systems, perceptions and attitudes of fisherfolk and other stakeholders in the coastal zone and beyond is the market chain. The survey is based on a 21 - page questionnaire with four sections. They deal with the values, perceptions and attitudes towards a) ownership of fisheries resources b) fishing c) fishing technology d) management and sustainability.



*Community participation in fisheries management: change in perception and attitudes called for.*

The survey has an imposing title: Regional Comparative Survey and Study on the Values, Perceptions and Attitudes of Fisherfolk and Coastal Stakeholders. Towards Ownership of Fisheries Resources and its Exploitation, Management and Sustainability. But it is known in brief as VPA survey. It is to cover a minimum of three or four selected villages in each country - and in the case of India, each of the four east coast states. A minimum of 30 fisherfolk respondents will be interviewed in each village, and a minimum of 100 from each country or state. Over the next several months, selected officials of fisheries departments of member-countries will talk to fisherfolk in detail, using the 21-page questionnaire.

BOBP has been working closely with member-countries in conducting training and orientation courses for officials who will conduct the survey. So far, the training has been conducted in Indonesia, Malaysia, Thailand and Sri Lanka. Survey teams in these countries are already busy interviewing fisherfolk. Similar surveys will also be conducted in the Programme's other three countries - Bangladesh, India, Maldives. A regional

workshop to share and discuss the findings of the regional survey is planned.

The survey's principal designer and investigator is Dr Kee-Chai Chong BOBP's Programme Coordinator. He is assisted by Mr Rene Verduijn, BOBP Resource Economist.

"We already have a lot of information about fisherfolk through the various stakeholder studies and analyses we have been carrying out," says Dr Chong. "So we will integrate knowledge from these studies and from the VPA survey. All this information will go a long way towards identifying the type of awareness and public educational materials we must use to induce more responsible and caring attitudes and behaviour in fisheries management. Also the best communication channels for disseminating these materials".

So the day is not far off when fisheries management measures will be based on knowledge. To be exact, a combination of traditional fisheries knowledge and guidelines from scientific studies. This will result in pragmatic ways of managing a declining fishery."

**Bay of Bengal News** is a quarterly publication of the Bay of Bengal Programme (BOBP), a regional multi-agency fisheries programme which covers seven countries around the Bay of Bengal — Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. The Programme plays a catalytic and consultative role : it develops, demonstrates and promotes new methodologies, techniques, technologies or ideas to help improve the conditions of small-scale fisherfolk communities in the member countries. The BOBP is sponsored by the governments of Denmark and Japan, by member governments in the Bay of Bengal region. The main executing agency is the FAO (Food and Agriculture Organization of the United Nations.)

