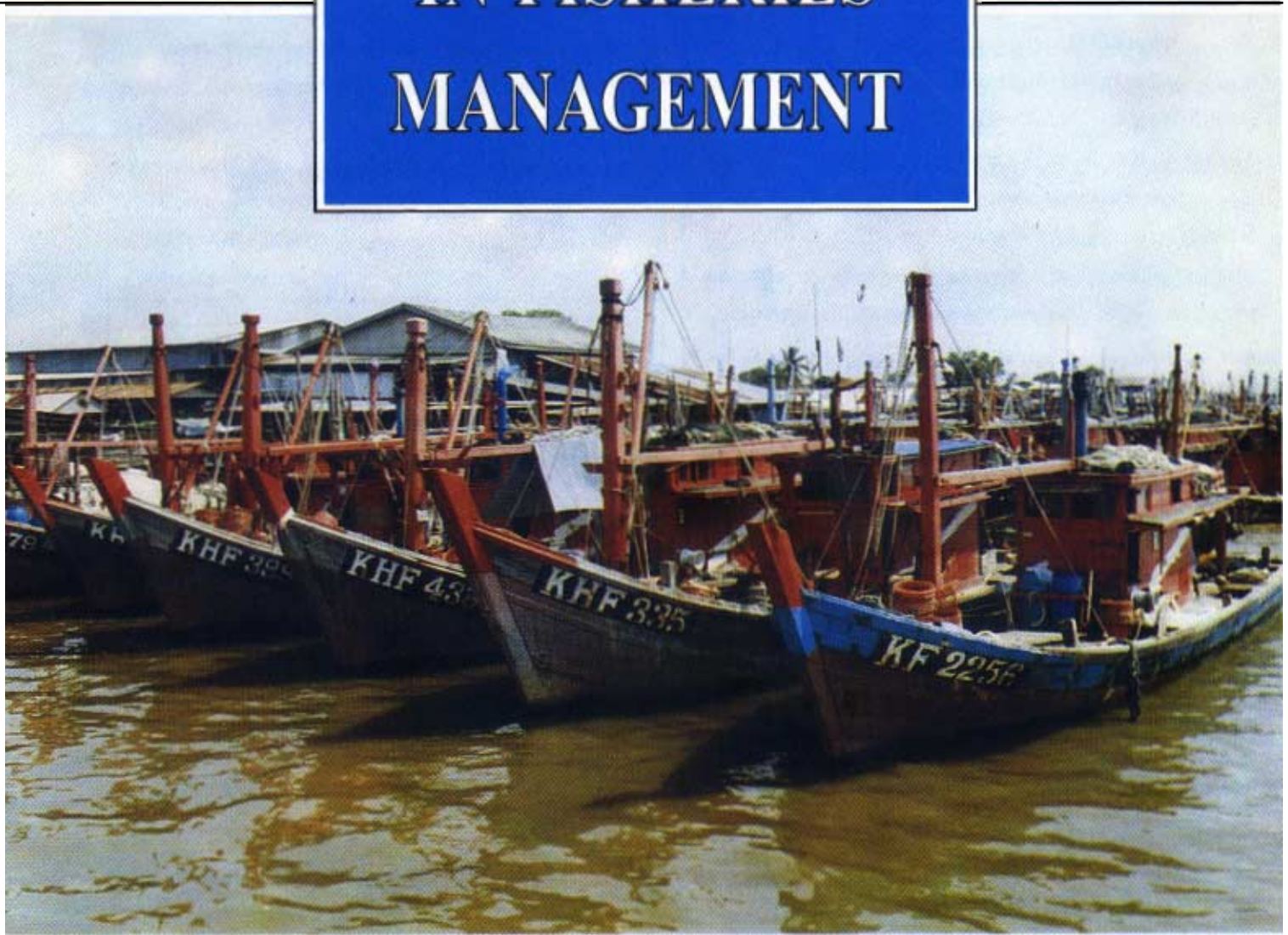


**EMERGING  
TRENDS  
AND PROSPECTS  
IN FISHERIES  
MANAGEMENT**



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# EMERGING TRENDS AND PROSPECTS IN FISHERIES MANAGEMENT

*During its current phase, BOBP assists member-countries in the Bay of Bengal (Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, Thailand) with fisheries management. Dr. Kee-Chai CHONG, Programme Co-ordinator and Senior Fisheries Management Advisor of BOBP discusses emerging trends and patterns in fisheries management in the following pages.*

For the last three to four decades, fisheries managers have been seeking solutions to problems that plague fisheries and fisherfolk communities. Fisheries management is one of the many solutions tried out, but the top-down regulatory measures carried out by the government, have given rise to socio-politico-economic problems as well. So far, government intervention has invariably focussed on short-term increases in output, neglecting long-term environment concerns. As we continue our search for solutions, options outside of fisheries also need to be looked at. New approaches to fisheries management are called for. A few, initiated quietly in the last few years, have begun to bear fruit,

The importance of fisheries and marine resource management is now well appreciated not only by the government but by industry too. Such 'management culture' is slowly taking root. More heartening is the fact that world leaders are no longer making grand statements about the "abundance" or "wealth" of fisheries resources in their seas and oceans. Such tall claims attract unnecessary investment and cause over-capitalization, putting remaining stocks under even greater fishing pressure.

As the next millennium approaches, fisheries policy-makers, administrators, planners and managers must continue to look beyond existing methods and approaches to the management of dwindling natural resources, especially in an increasingly stressed and degraded environment. One of these approaches is to re-examine the professional perceptions and attitudes of policy-makers and fisheries planners. Why is it that each time fisheries planners make projections on fish consumption or demand in their national development plans, their projections are invariably higher and higher?

It is true that output must be increased to feed a growing population, but per capita consumption level must be capped at

a certain limit. The world per capita consumption is about 15 kg/capita/year 8 kg/capita/year for developing countries and 25kg/capita/year for developed countries. In Japan, the per capita fish consumption is already well beyond 65 kg/capita year. Yet, Japanese planners project higher and higher per capita increment in consumption. Malaysia, Singapore, Taiwan and Hong Kong also project increases to their already respectable level of 40-55 kg/capita/year, while Philippines, Indonesia, Sri Lanka and Thailand have to make do with 18, 19, 22 and 25 kg/capita/year respectively. By 2010, Malaysia projects a per capita consumption of 60 kg/year, up from its present level of 45 kg/capita/year! The per capita consumption for India and Bangladesh is even lower at less than 10 kg/year. They naturally want to increase their per capita consumption level (see box).

## *Profile of Fish Consumption*

Country	Fish Consumption kg/capita/year
Arab Countries	5
Bangladesh	7
Hongkong	55
India	9
Indonesia	19
Japan	65
Malaysia	45
Maldives	126
Philippines	18
Singapore	40
Sri Lanka	22
Taiwan	45
Thailand	25
U.S.A.	18
World	15
Developed Countries	25
Developing Countries	8

*This article is adapted from a presentation at two recent regional workshops. The first, "Smart Partnerships in the Sustainability of the Fishing Industry" was held in Penang, Malaysia from 26 to 28 November / 1997, organised jointly by the Institute on Governance, Canada, Department of Fisheries, Malaysia; Maritime Institute of Malaysia; and BOBP. The second, "Conservation and Sustainable Management of Coral Reefs", was held in Chennai, India from 15 to 18 December 1997 and organized jointly by the MSSwaminathan Research Foundation and BOBP.*

The need for a cap on per capita consumption is obvious, simple and compelling. Food (fish or any other item of diet) eaten in excess is not fully utilised by the body or wasted because it is in excess of body requirements. It does not contribute nutritionally to human health and well-being. Some nutritionists claim that 11 kg/capita/year is adequate. Thus, for countries such as India and Bangladesh where per capita consumption is still below 11 kg/capita, the need to bring it up to 11 kg is justified. The pertinent sustainability question is “Must production and income keep on rising?”

This approach to fisheries planning puts unnecessary pressure on officials and others concerned with fisheries production. Officials overseeing production have to introduce and/or develop all kinds of fishing technologies to expand production, in particular more and more advanced fish finding technology. Is it any wonder that our fish stocks are always under tremendous strain?

First, fisheries planners and policy-makers should review this ‘materialistic’ projection approach to planning. They should work together with nutrition specialists to determine the recommended daily allowance or minimum dietary need for fish. Consumers should curb excessive indulgence and show restraint – in the interest of their own health, and in the interest of resource sustainability.

Second, many governments of developing countries are stingy with budgets for fisheries management, especially while implementing them at the fisherman level, where it is most needed. On the other hand, once-adequate budgets are now being cut. Alternative sources and means of financing fisheries management are therefore needed,

Thirdly, the way fisheries management has been carried out so far in many developing countries is not conducive to fisherfolk participation, imposed and driven as it were by the government in a top-down fashion. Recognizing that fisheries management has not worked out as planned by the government, many governments today are now willing to try out different experiments to manage their fisheries. They are now considering more consultative and participatory mechanisms, and adopting a more multi-sectoral approach than before to planning, development and management. This is a definite improvement over past practices where management intervention in fisheries was

usually an afterthought. It took the form of resolving conflicts between different groups of fishermen over fisheries stocks in overlapping fishing grounds, over accidental or purposely-inflicted gear damage.

The FAO/UN Bay of Bengal Programme (BOBP) would like to accelerate the ‘managed fisheries’ process along a new path to sustainable use of this much sought after food source. As the emerging trends and patterns described for each BOBP country show in the following pages, a management shift is clearly under way.

## **BOBP's Fisheries Management Orientation**

BOBP is today 18 years old, It is presently in its third phase, which began in 1995 and goes on till the end of this century. Based on member governments’ needs, the first phase was concerned with increasing productivity and production of the fisheries sector. The second phase dealt with the human factor, paying particular attention to the welfare of the fishing community – improved standards of living and quality of life. The third phase shifted focus from technology-based expanded production and community development extension activities to integrated resource management for sustainable production. The people, in particular the fisherfolk community, must be made aware that they cannot continue to take from Nature without at the same time giving back to Nature the means to sustain renewable resources. Management intervention is therefore the driving force of the present phase.

When BOBP started in 1979, there were only a few million fishermen in the region. Today, there are more than seven million, with a total fishing community population of at least million. These fisherfolk, especially the small-scale, limited-resource fisherfolk, suffer from a low standard of living. Many of their villages lack basic amenities. Their low literacy further inhibits them from obtaining the necessary information and assistance to better their lives.

Increasing population pressures in this region, especially among those living in abject poverty, have further exacerbated these problems. The goal of the BOBP's third phase, to catalyse innovative participatory approaches and solutions to small-scale fisheries management, is a timely response to this need. Fisheries

management must not be viewed as an imposition from the government but as an act of both individual and collective responsibility. Viewed in this way, fisheries management is an attitude, not a burden or an imposition. Such awareness must be aroused.

In fisheries management, the BOBP's orientation is to work together with member countries within their existing systems of administration and management, to question the theory and practice of proposed management measures and tools. If found 'do-able', management implementation is to be taken to its logical end, reining it step-by-step as lessons are learned. For example, fishermen are continuously enjoined to return gravid females to the waters. Fishermen however are reluctant to do so because they are unsure that the next fisherman will not take and keep them. The community-spawning cages of Thailand referred to later in this paper, offer a solution. In other words, fisheries management must be adapted to local circumstances and the preparedness of the community to innovate. It has to meet the concerns and needs of the people we work with.

## Stakeholder Approach to Management

BOBP's vision of management is to resolve two conflicting demands to increase the availability of fish to meet the needs of an increasing population and of surging exports; and to conserve the fast-dwindling fish resources of member countries. To realize this vision, BOBP assists countries to identify policies, actions and solutions that take a long-term perspective and promote resource 'sustainability, and also ensure livelihood security for fisherfolk. Thus, the Programme meets both demands. This vision is reflected in BOBP's Programme goals:

- + Sustainable exploitation of fisheries resources through increased management awareness; planning and development of management solutions in collaboration with stakeholder groups such as fisherfolk, government, NGO officials.
- + Equitable access (social and gender) to aquatic resources for food and livelihood security,

- + Promotion of integrated coastal area management to ensure sustainable use of coastal resources for future generations.

The third phase builds on the achievements and lessons of the earlier phases – which prepared fisherfolk communities for the responsibility of participatory management expected and required by the third phase. Early activities during the third phase have found a fisherfolk population that is more aware of fisheries problems and has ideas to help solve them. Building up the ecological knowledge and foundation of the fisherfolk has helped them to think of solution options themselves.

BOBP assists member countries in introducing innovative approaches to institutionalize the participation of fisherfolk and other stakeholders to develop and implement workable measures to improve fisheries management. In sum, the third phase will help turn local concerns into action. The components of this third phase are:

- + Building awareness and public opinion among fisheries stakeholders on fisheries management needs, benefits, options.
- + Building the capacities of local fishing communities and national fisheries and fisheries-related agencies to plan and carry out integrated coastal resources management.
- + Human resources planning and development.
- + Providing technical assistance and meeting other identified needs of member countries for implementation.

## BOBP achieves this by:

- + Working together with countries within their existing system to identify coastal resources problems (e.g. situation analysis and stakeholder consultation and analysis).
- + Getting all stakeholders identified to the discussion table, developing lasting "smart partnerships" in management.
- + Making the fisherfolk's voice matter in fisheries management under the principle of "resource users as resource managers".

<sup>2</sup> BOBP plans to convene an international Consultation on Evolving a Self-Financing Scheme for Fisheries Management in early 1999. A prospectus is being finalized.

- ❖ Integrating the roles of women and youth in fisheries management.
- ❖ Acting as a catalytic and facilitating agent to help stakeholders come up with informed and comprehensive solution options to problems.
- ❖ Providing innovative ways to generate the financial means to implement self-financing management solutions.<sup>2</sup>

## Programme Strategy

The third phase of BOBP centres on the following general strategic principles and activities:

- ❖ Creating awareness to instill in resource users a pride and sense of ownership in the ideas and concepts of management, capitalising on local and indigenous knowledge.
- ❖ Reduction of excess or surplus fishing capacity to a level that can sustain fisheries resources, including development of alternative income-generating activities for fisherfolk to reduce their dependence on the sea and attract them out of fisheries.
- ❖ Re-examination of fishing technologies to determine whether those in use deplete living resources and impair the resource habitat and identify alternative technologies.

- ❖ Promotion of action-oriented projects that produce measurable positive effects and impact.
- ❖ Implementation of Programme activities that reflect the opinions of the public involved in fisheries and coastal communities.
- ❖ Assumption of greater responsibility and leadership by BOBP's national counterparts in project implementation in the spirit of national execution.
- ❖ Encouraging governments to allocate human and financial resources for fisheries management.<sup>2</sup>
- ❖ Coordination of national and regional information systems and exchanges.
- ❖ Integration of the environmental impacts of fishing practices and *vice-versa* into fisheries management decisions.
- ❖ Coordination and consultation in fisheries management decisions among national agencies with jurisdiction in the coastal zone.
- ❖ Promotion of a regional forum or mechanism to reduce fishing conflicts between member countries and minimize arrests of fisherfolk caught fishing illegally in the national waters of BOBP member and non-member countries.

*Protecting mangroves (such as this one in pitchavaram, Tamil Nadu) as nursery grounds for fish, is essential to further the aims of fisheries resource management*



## ... Emerging Trends and Patterns

New management, development and production trends and patterns are now gradually emerging from activities and experiments of the past few years. Some of these are undoubtedly already well under way. Here are some examples from past and present BOBP activities and the work of other institutions and projects that illustrate these emerging trends and patterns,

After years of relentless government-driven production of goods and services to meet *materialistic* consumption needs, there is today a realization that such excessive production-consumption-orientation is unsustainable. The integrity and ecological functions and needs of the environment were not adequately taken into account and internalized in the *materialistic* production-consumption process. Experts believe that per capita consumption level must conform to nutrition and health maintenance needs and not to *materialistic* consumption patterns that are far from equitable. Governments have now realised the folly of such a production-dominated development programme.

As the older generation of retiring fisheries managers is slowly being replaced by a cadre of young fisheries managers, many fisheries departments are now more open to suggestions on sustainable management of resources, switching from the punitive strict enforcement of fisheries management to softer non-punitive methods of management. In its place, fishing communities are encouraged and enjoined through their community level governance structures to work out management systems which are more community-driven,

Fisherfolk and other stakeholders are slowly coming around to accept that management is not an imposition by the government but an individual and collective responsibility of all stakeholders: producers and consumers alike. Awareness-building has brought about this change in attitude: management is an integral part of sustainable exploitation and not an unnecessary imposed burden. Equally revealing is the phenomenon that beneficiaries of government development assistance and other technical or management programmes are no longer viewed as target clients less knowing and less knowledgeable than government but as equal partners in development,

The traditional supervisor-subordinate (boss-worker) or trainer-trainee divide is giving way to a collegial system of partners. Strategic alliances and partnerships are being forged between and among all stakeholders in the primary sector and beyond. The classical sectoral approach to planning and management is also rapidly giving way to a more multi-sectoral approach. Intra-governmental, not to mention inter-governmental coordination is also steadily improving.

There is today an emerging trend towards a more integrated approach to fisheries management after years of awareness-building on the need for such an approach. Government no longer assumes the centre stage, returning to the people their right of self-determination, self-reliance and self-worth, thus encouraging them to decide for themselves how and what they want to do with government development assistance.

Another emerging trend in management governance of fisheries is that fisheries and fishery-related government bureaucracies are getting less and less rigid in their administrative machinery. In fact, more and more government fisheries agencies are looking for 'loopholes' within their existing frequently archaic fisheries/fisheries management acts, statutes, laws and regulations to see if they can delegate and decentralize fisheries management authority, responsibility and functions to the direct resource users. BOBP member countries such as Thailand, Malaysia and Indonesia and to an extent Sri Lanka, Maldives, Bangladesh and India are steadily evolving more and more consultative and participatory approaches to management. In some of these countries, community-based systems have led to positive trends in resource conservation and protection, reflected in improved catch rates and income distribution.

In many cases, it has been found that indirect methods of controlling fishing effort tend to work better than direct methods of curtailing fishing effort, because the fishing communities accept such cutback in effort more readily. Direct methods usually imply outright curtailment of fishing. So long as they can continue to fish, fishermen will not object to any reasonable management measure.

The most encouraging trend that has emerged to date – hold it tight – is the

phenomenon of community *bonding* among different members of the community of stakeholders in coastal areas. Community bonding has re-surfaced – it was dormant during the phase of *materialistic* modernisation. Rapid economic and social changes had destroyed or weakened some of the traditional systems of community-based resource management, especially open-access common pool resources. Nowhere was this setback more keenly felt than in the Maldives, Sri Lanka, India and Indonesia. Building and spreading awareness on the stakeholder approach to fisheries management has enabled different stakeholder groups to come together and work for the common ecological good. This has bonded the community of stakeholders together. They have realised that working independently instead of together had led them nowhere, but only led to resource over-exploitation and environmental degradation, not to mention suspicion, tension and antagonism within the community.

BOBP and member-country activities have demonstrated that simple awareness-building with the community fosters the co-operative spirit among community members through the process of community bonding. Most fundamentally, awareness fosters ‘ownership’ of the problems. In other words, the problems are now the community’s own problems and not someone else’s, to be tackled or solved by others and not

themselves. This identification of the problems as their own, has led to a ‘coming together’ of members of the stakeholder community. The growth of community bonding comes from improved community understanding and community relationships.

A good indicator of the community spirit is not only in the turnout during public hearings but also the sense of community solidarity in good or bad times, the joint commitment to common welfare. This sense and spirit of communityness is brought about through community bonding. Bonding provides each and every member of the community the opportunity to question different aspects of the management process which are do-able or not do-able. It gives them the experience to participate in the decision-making and management process: let each and every voice count.

In the end, management boils down to building awareness and participation. The emerging trends described for each country in the pages that follow, demonstrate that fishing communities are capable of assuming more and more responsibility to solve their own problems, given the confidence and the opportunity. Fisheries managers have only to elicit their involvement and participation.

*Community-based fisheries management (CBFM) in progress. A 61-monthly meeting of fisherfolk in Ban Sam Chong Tai, a village in Phang-Nga Bay, Thailand. A volunteer bay warden/sea ranger models the uniform provided by the local chamber of commerce and the trawl owners’ association.*



# National Activities in Management, Emerging Trends and Early Impact



Past Government effort focused on inland fisheries and to an extent on large-scale commercial marine fisheries. BOBP is now assisting the Government to facilitate and enable improved management of the estuarine set bagnet (ESBN) and push net (PN) fisheries in selected coastal areas of Bangladesh, through awareness-building, strengthening the institutional capacity of the agencies concerned and provision of technical assistance.

In earlier years, coastal small-scale fisheries was by and large left to its own devices. Indiscriminate fishing technology or gear were introduced or employed to the detriment of coastal fisheries stock, leading to rapidly declining stock and more and more destructive gear technology. Because of their fine mesh these ESBN and PN fisheries invariably captured the juveniles of as many as 185 species (90 pelagic finfish, 62 demersal finfish, 15 penaeid shrimp, 3 non-penaeid shrimp, 9 freshwater prawn, 3 crab, 3 mollusc).

As poverty is widespread and endemic in coastal areas, efforts to attract fisherfolk out of overcrowded fisheries must be based on new income-generating opportunities. Both GOs and NGOs are working with BOBP to address this basic requirement. As an example, the Programme has arranged for selected women

fisherfolk to be trained in the production of boneless hilsa (*Hilsa ilisha*) for export (Each year about 25-40% of the hilsa run is lost because there are not enough large boats to bring in the catch from the choppy seas, also because the market cannot absorb the glut). The feasibility of different management options, such as gear substitution, outright ban of these two destructive gear, closed season or closed area is being looked into. This work is being contracted out to a grassroots NGO which is active among fisherfolk communities.

The fishing communities themselves are acutely aware of the problems and of their own plight. When they attempt to go further off-shore to fish, they are pushed back by fishermen already there. Opportunities for gainful employment on land are few and far between. With management awareness high, these fisherfolk are ready to experiment with any management scheme that can ease their plight, including adding value. They are prepared to add value to (a) fishing boats by using them for transport (b) to their own labour, by working on farms or pulling rickshaws or taking up other occupations during their spare time (c) to fish landed, by producing boneless hilsa (d) to coastal waters, by taking up sea farming.

*Estuarine set bagnet community in Patuakhali, Bangladesh. A BOBP pilot activity is assisting management of this fishery (Hundreds of fishermen earn their livelihood through set bagnets, but they are a resource-damaging gear.*



More effort at mobilizing and organizing such fishermen for fishery management is essential. In a BOBP pilot activity at Kumira in Chittagong, Bangladesh, effort is under way to set up a community learning and earning centre at the local temple. It will enable the community to come together, discuss the question of the rapidly declining fishery and evolve participatory measures to tackle the problem.

Experiences gained so far point to the need for a more integrated and holistic approach to community development. All relevant government agencies concerned with the rural coastal economy should come together and work out solutions in co-operation with the stakeholder community. Public works investments to mitigate coastal erosion, plus polders and other artificial barriers to minimize the impact of storm surges, are being constructed on coastal belts. Besides providing much-needed employment to the coastal unemployed, these structures also serve as artificial reefs to recolonize depleted coastal fishing grounds. Agriculture

has in the past benefited from investments in public works such as road construction and drainage, irrigation and flood control. Bangladesh recently witnessed a remarkable event: Parliamentarians from all coastal areas met in Dhaka with senior officials from fisheries and other departments to discuss food and livelihood security for the coastal peoples of Bangladesh. Awareness was established at the highest level of leadership about the problems of coastal peoples and their inter-connected nature. The door has been opened for a new era of development where many departments and many disciplines will be involved in the quest for solutions.

In a fisheries situation as complex as the one in the coastal waters of Bangladesh, visionary leadership is needed to work out a "smart partnership" in management and poverty alleviation. Stakeholder groups should hold regular community meetings which fish traders and money lenders must also join. Their own future too lies in sustainability of the resource base and welfare of the fishing communities.



The Union Government collaborates with BOBP to address integrated coastal fisheries management in two states (Tamil Nadu and Orissa) and integrated coastal aquaculture management in two other states (Andhra Pradesh and West Bengal). In Tamil Nadu, as elsewhere in India, fisheries management is undertaken in response to conflicts among different fishermen groups. This is not fisheries management in the strict sense of the word because the effort is limited to defusing community tension. Fisheries officials bring in the police to restore law and order, thus effectively treating a fisheries management problem as a law and order problem. Conflicts among fisherfolk are rampant along the 1000 km coastline of Tamil Nadu where there is literally a village per km of coastline, with anywhere from 350 to over 1000 active fishermen. Once conflicts are resolved, efforts can then be undertaken to introduce a fisheries management process which in the long-run will reduce conflicts. This is presently being undertaken by the Kottar Diocese Roman Catholic Church Coastal Peace and Development Committee.

Stakeholder identification and consultation and stakeholder perception analysis were carried out systematically, and on an extensive scale. Preferred communication channels to reach them were also studied. A manual on stakeholder consultation and analysis is being prepared for widespread application. Preliminary results of the stakeholder analysis showed that fishermen would like to go further off-shore to fish using different gear such as troll, gill net and longline which hitherto have not been tried out in off-shore waters. As a result, some limited training on commercial exploratory fishing, emphasizing design and methods, was carried out in the two states.

To further understand the dilemma of continuing open conflicts among different groups of small-scale fishermen such as *kattumaram*, *vallam* and boat fishermen, as also between these groups and commercial large-scale fishermen, a new innovation is being tried out. A Geographical Information System (GIS) framework is being used to map out and visualize existing spatial patterns of fishing and geographical overlap in the fishing

grounds among different types of fishermen deploying different fishing gears. These will strengthen the hands of Tamil Nadu fisheries managers in explaining the process of management and steps to operationalize them.

It is heartening to note that government fisheries officials as well as fisherfolk themselves are coming around to accept that Indian waters are no longer abundant with fish. Yet, existing subsidy schemes for motorization and gear have still to be phased out. The government must rethink its subsidy schemes that increase fishing effort and intensity,

As for coastal aquaculture, guidelines for sustainable coastal shrimp aquaculture are being prepared with scientific, technical and stakeholder inputs. These guidelines emphasize water quality management, responsible use of feed, demand feeding and feed formulation with a cap on protein content, group or cluster farming. For example, the protein content of shrimp feeds today exceeds the required level for optimum growth as it is the industry's present practice to keep increasing the protein content of feeds sold. The feed industry is being made aware of its

responsibility to formulate feed with an upper limit on protein content.

The use of common effluent treatment ponds and common water reservoirs is being explored to minimize pollution and disease outbreak from haphazard discharge of pond effluent. In keeping with the decision of the Supreme Court, efforts are also being mounted to turn a potentially self-polluting industry without management to a self-cleaning industry with responsible husbandry and management. For example, water will be managed as a scarce or limited input, not just as a medium to produce fish. Its value, reflecting its importance and scarcity, will be included in the cost of production of shrimp. It will no longer be regarded as a free unlimited resource. Suggestions have been made to plant mangrove seedlings along water drainage and water supply canals to help in "settling sediments and cleaning" the water discharged through mangrove roots percolation. Denuded coastal areas are being replanted, and surrogate soils brought in to replace polluted and over-used pond bottom soils, as well as other types of rehabilitation activities.

*capture of shrimp fry in West Bengal, a mass activity that threatens the shrimp resource.*



The Government of Indonesia is interested in evolving model fishing villages to undertake community-based fisheries management. The specific aims at present are to facilitate and enable improved management of grouper mariculture, anchovy liftnet fishery (with lights) and small-scale fisheries in the Tapian Nauli Bay area of North Sumatra Province, with BOBP support. The Government is intensifying public outreach programmes to spread awareness on the benefits of management, strengthen the local institutional capacity of concerned agencies and provide technical assistance. Long used to open access fishing, the fisherfolk in the Province appear to resist efforts at managing their fisheries. They are not as receptive to new ideas or innovations in management as their counterparts in other countries. They are not confident about the proposed management measures in their area, given that enforcement is still weak. This perception may not be as unfounded as the Government and others think. Indonesian fisheries managers are trying to change the fisherfolk's ingrained perceptions and attitudes by demonstrating to them that fisheries management works, and leads to improved catch rates, better prices, higher incomes,

Demand for fish from neighbouring countries is fast growing and prices are attractive. So far, small-scale fishermen are not able to take advantage of these positive market trends. It is only the large-scale commercial fishermen who have benefited from these market developments.

It appears that more emphasis is being given to increasing outputs and productivity relative to managing the resources.

In North Sumatra, fish aggregating devices (FADs) are still widely used, in spite of effort to discourage its rampant use. The Provincial Fisheries Service of North Sumatra has recently completed a survey and study on the values, perceptions and attitudes of fisherfolk towards ownership of fisheries resources and its exploitation, fishing technology, management and sustainable use. The results and findings are being analysed to provide guidelines for future fisheries extension activities and management plans in changing fisherfolk behaviour and attitudes towards responsible fishing.

Although small-scale fisherfolk from the Sorkam and Sibolga sub-districts and municipalities are aware of the Code of Conduct for Responsible Fisheries, including the principles of precaution in fishing, they confessed to being helpless to observe any management because the larger commercial fishing boats as well as those from neighbouring countries encroached into their coastal waters. Although fishing zones exist, these are neither observed nor enforced. It is interesting to note that while the trawl has been banned in Indonesian waters in the western seaboard, the trawl continues to be employed by neighbouring countries, to the detriment of Indonesian fisheries. The trawl ban however, has not been strictly observed or enforced in recent years.

Benefits earned by small-scale fishermen from grouper cage culture were short-lived, as more and more fishermen crowded out available coastal waters in front of their villages, leading to serious outbreak of diseases from pollution.

*Improved resource management in Indonesia will help small-scale fisherfolk.*





As a pilot exercise in developing and testing methodologies and approaches, the Malaysian Government focuses on a marine protected area-cum-marine park that has been established in a chain of four uninhabited islands – Pulau Payar, Pulau Segantang, Pulau Lembu and Pulau Kaca near Langkawi island off the coast of Kedah and Perlis. The DOFM/BOBP project enables and facilitates sustainable integrated coastal zone management. The management intervention is paying off, as fisheries in the adjacent waters are recovering. For example, before the establishment of the marine protected area and park, anchovy fishing (pelagic species) was limited to 3-4 months each year. Today, anchovy fishing is possible round the year. The park is also drawing growing numbers of visitors and generating valuable employment opportunities for local area fisherfolk as tour guides, recreational boat operators and underwater tour divers. In 1996 alone, there was a total of 90,307 visitors. This number is projected to grow. The fishing population is declining because fishermen are moving out of fisheries and into factories, resorts, hotels, light manufacturing and construction industry.

Although by nature and tradition, Malaysian fishing communities are rule-bound and thus law-abiding, recent strict enforcement of fisheries management regulations has further strengthened both the government and the community's resolve

to ensure that marine protected areas-cum-marine parks work. In Malaysia, fisheries management rules and regulations have been consistently upheld and strictly enforced for both domestic and foreign fishing boats. Boats which violate these laws are compounded and fined. Repeated offences invite more drastic punishment: the boats (local and foreign) are confiscated and sunk. The latter become attractive artificial reefs. Management has worked in the country because the Government is committed to it and has annually allocated the necessary budget to implement and enforce its fisheries regulations and conservation measures.

Malaysian fisheries managers are thus upbeat and feel encouraged, as many other fishing communities in the country are asking the government to declare and establish marine protected areas or parks in their waters. These fisherfolk want to belong to something that works.

In Malaysia, the sectoral approach to planning has given way to a more multi-sectoral approach. As a result there is today an emerging trend towards a more integrated approach to fisheries management after years of training on the need for such an approach. Today, Malaysia has at least 2-3 generations of fisheries administrators and managers who have been exposed to Integrated Coastal Area Management (ICAM) work.

*Visitors to Pulau Payar Marine Park, Malaysia, a marine resource sanctuary meant to protect the coral reef wealth of the area.*





Reefs are central to the people of the Maldives, where 99% of the country comprise the aquatic environment and 1% is terrestrial. Each year, Maldives attracts over 300,000 tourists, about 20% more than the national population. More resorts and other new tourism activities are being planned on the different islands and atolls. Multi-reef resource use pressures and environmental degradation are already apparent in this archipelagic island nation.

The Government is trying to enable the development of a model for participatory community-based, integrated reef resources

nature of the island population, fisherfolk compliance with management measures is not problematic in the Maldives. A small Fisheries Advisory Committee, set up after the Marine Research Section (MRS)/Ministry of Fisheries and Agriculture! BOBP Workshop on Integrated Reef Resources Management, coordinates the implementation of the IRRM workshop recommendations and reports to the Fisheries Advisory Board which provides policy guidelines and directs IRRM work in the country.

The Ministry of Fisheries and Agriculture, in particular the



*Even little children in the Maldives know how important the reef resource is – thanks to events such as colour drawing competitions organised for them.*

management (IRRM). A pilot exercise focuses on Vaavu, Meemu, Faafu and Dhaalu atolls through awareness-building and consultation, strengthening the institutional capacity of concerned agencies and technical assistance. The Maldivian fishing community is very receptive to innovative management ideas as they fully understand the benefits from resource sustainability. An atoll community learning center is being set up to be the nucleus of public meetings to work out management intervention. A unique feature of the Maldives IRRM model is the active involvement of school children in its work. As awareness and community bonding are high, due in part to the

Marine Research Section, has in collaboration with BOBP brought many Maldivian Government and NGO agencies together to map out a localized precautionary approach to reef management as well as a code of conduct for responsible fisheries in the country.

There is an emerging consensus among most stakeholders on problems and solutions. In the past, there appeared to be a divergent perception of problems and solutions between the Island/Atoll Chiefs on the one hand and the community of stakeholders on the other.



The Sri Lankan Government is very anxious to conserve critical aquatic habitats such as coral reefs, lagoons, mangroves, seagrass beds, and coastal, estuarine and riverine systems, and ensure that resources utilization from such habitats is sustainable. In this context, the Government with the help of BOBP has embarked on improved management of the ornamental fish sector of Sri Lanka. The tools are awareness-building, strengthening the institutional capacity of concerned agencies and technical assistance. Ornamental fish identification guides, manuals and posters have been produced to assist customs officials to control and regulate the export of such fish, and educate divers about the ornamental fish that are endangered, or whose export is banned. Trade exhibitions and workshops on ornamental fish are regularly organised to educate the public about the value of this sub-sector to the national economy and the need for sustainable development. Schemes for divers such as diver safety, health and life insurance as well as pension



schemes are being drawn up to protect the interests and welfare of the community. Today, ornamental fish divers recognize that their sources and means of livelihood are directly linked to the ecosystem health of the remaining reefs and the fish population.

To further strengthen and operationalize the system of management of the country's fisheries industry, the Government of Sri Lanka recently constituted a cabinet Task Force on Conservation and Management of Critical Aquatic Habitats (COMCAH) to map out future actions for the sustainable management of the ornamental fish industry. The ordinance to ban and restrict the export of certain species of ornamental fish will shortly be gazetted. Effort is also under way to educate the diver community regarding the professional ethics on the use of scuba equipment for catching fish.



Phang-Nga Bay is a microcosm of Thai fisheries. The Thai Government is keen on developing community-based management approaches by setting up marine protected areas, deploying village-based artificial reefs, and better enforcement through greater public awareness and community participation. All these and more are being tried out in Phang-Nga Bay. Regular bi-monthly public hearings are steadily bonding the different communities and bringing them together to solve their problems in their own way (See BOBN, Vol. II No. 9, March 1998 for details). For example, community spawning cages have been installed in strategic locations. Fisherfolk place gravid female crabs in these cages and let them spawn, then sell the spent crabs. Revenue from the sale of these crabs is used for community welfare.

Community relationships and goodwill are now so strong that trawlers and push nets are kept out of the Bay. Trawl owners through their association and local chamber of commerce are financing the construction and installation of artificial reefs at the entrance of the Bay to ensure that their master fishermen or fishing boat captains do not encroach into Bay waters. Coastal members of parliament from provinces around the Bay have also lent their support to the installation of artificial reefs. A combination of extension activities, close monitoring, control and surveillance (MCS) by both DOF patrol boats and traditional small-scale fishermen has had its effect on push net operators. Many of them have now given up this gear and substituted it with other gear such as gill net. The Department of Fisheries is presently demonstrating and handing out gill nets to these fisherfolk. Volunteer fisheries wardens drawn from small-scale fishing communities have been inducted by the Governors of the Provinces around the Bay and supplied with uniforms

financed by the trawler owners association and the local chamber of commerce.

Fisheries abundance is steadily increasing as these and other efforts are stepped up by fisherfolk themselves. The fish catch of Bay waters has steadily increased from 34.66 kg/hour in 1986 to 136.77 kg/hour in 1995 based on the data supplied by the Andaman Sea Fisheries Development Centre. Earlier, the CPUE data recorded a declining trend from 160 kg/hour in 1969 to

38 kg/hour in 1988. Much of this recovery can be attributed to the closure of Phang-Nga Bay and Krabi waters from 15 April to 15 June each year observed by the fishing communities since 1982. Stock enhancement activities are also regularly organized. The fisherfolk themselves, rather than official VIPs, ceremoniously release fish fingerlings and shrimp post-larvae. Protect-the-fish attitudes are thus being energetically promoted among the fisherfolk. A community-driven system of management of Bay fisheries has taken root.



*These two women from the fisherfolk community in Phang-Nga Bay are busy preparing barbecued chicken to supplement family income.*

## Why is BOBP Unique?

How is BOBP unique? While other organizations are pursuing new interests in the light of new trends in environmental management and resource sustainability, BOBP remains committed to its founding role in food production and poverty alleviation. Not only is it the only regional co-operative effort in the Bay of Bengal that facilitates coordination among countries on common small-scale fisheries issues and problems; but foremost for BOBP is its larger role in continuing to highlight the strategic importance of food production for the region's poor, whose livelihood relies heavily on the region's coastal and marine resources. While BOBP has continuously learned from and applied the latest trends and findings in fisheries, environmental and marine resources sciences, as well as policy analysis, to its Programme and activities, it has steadfastly maintained its role and obligations to coastal fishing communities, drawing attention to their continuing economic plight.

Effective cost-cutting strategies and measures are also built into BOBP's objectives and management strategy. For instance, the Programme emphasizes the application of solutions founded on a broad base of knowledge from a cross-section of stakeholders. Tapping the experiences and expertise of all stakeholders and disciplines makes possible solutions that are holistic and efficient in design. Further, the acceptance of plans and solutions for implementation is achieved through consultation and consensus. When consensus-building proves difficult, a negotiation tack is taken to work out a settlement which all stakeholders are comfortable with and buy into. The settlement may not be entirely satisfactory to each and every stakeholder

group but is something they can live with. Such solutions are not only more meaningful but are also enduring.

Besides, by encouraging participatory co-management, the government can transfer the costs incurred in fisheries enforcement to the fishing communities themselves. The money saved is used to help protect and rehabilitate the resource habitat and other community welfare schemes instead of playing a 'cat and mouse' game, with little or no increase in the real output of goods and services.

Small but imaginative funding is used for implementing the third phase, largely as seed money to initiate projects that will become self-financing over the long-term. The governments of member countries and donor agencies are co-funding individual projects that directly reach the stakeholder beneficiaries, the small-scale fisherfolk. In fact, BOBP third phase projects have strong support for implementation from the fishing communities that were involved from the beginning in the problem-solving process. This ensures that the likelihood of success is high. More encouraging is the acceptance of national execution with catalytic support from BOBP. To the credit of member governments, many activities are now self-starting and nationally executed.

The government of each member country is prioritizing projects in coastal fisheries management for implementation with:

- + Advisory inputs from BOBP.
- + BOBP assistance in developing greater local capacity and
- + Effective utilization of local capacity.

BOBP has advanced incrementally through successive programme generations, incorporating achievements and lessons learned into solid building blocks for its current phase. To continue implementation work during its third phase, the importance of co-funding by the governments of member countries and donor agencies, to make national execution possible, cannot be over-emphasized. This partnership has steadily borne fruit in member countries. It is envisaged that donors will continue to support the work of BOBP.

## Prospects for Management

After years of working with government policy-makers and fisheries managers, convincing them that fisheries abundance is declining and the sea is not inexhaustible, government policy-makers, especially politicians, are beginning to accept that the sea is not abundant with fish and is in fact rapidly being depleted through irresponsible fishing behaviour.

At a time when the per capita availability of arable land and clean water for expanded food production is declining, economic planners must rethink their approach to planning and projection: per capita consumption of food has to be capped at a level adequate for repairing and maintaining healthy life. Any consumption in excess beyond which the body can absorb and assimilate is wasted. **Per capita production and income do not need to keep rising.**

No resource management can be completely participatory; government assistance in an enabling and facilitating role in community actions is still needed. The purpose of resource management is to create an environment where the resource users with the help of the government adopt production practices which sustain the resources. Having said that we should

recognize that governments should begin to withdraw from their role as managers of the country's resources to a system of resource management by the people themselves with the governments acting in a non-intrusive advising capacity.

Lastly, BOBP attaches great importance to information packaging and dissemination. It publishes a quarterly newsletter, *Bay of Bengal News*; it brings out working papers, technical reports, manuals and guides. It has organized video films and audio-visual materials on fisheries and its management. It has communicated with fisherfolk communities through comic books, instruction books in local languages, radio programmes, art competitions, village theatre and street plays. It maintains a well-equipped library to support research and provides a reference service for those who seek fisheries information about the BOB region and beyond. Information about BOBP strategies and activities can also be accessed through the Internet (<http://www.fao.org/waicent/faoinfo/fishery/bobp/website-homepage.htm>). Fishing communities in many BOBP member countries are now more and more receptive to new ideas, a big attitudinal change compared to the recent past. To the credit of information availability and accessibility, fishing communities today live in a more aware society so that positive change can be brought about with less resistance. The trends emerging so far provide ample optimism that an improved and more sustainable management of the BOB resources is under way and steadily gaining momentum. This momentum must be kept in motion and in high gear.

After years of management awareness-building and implementation of management measures and regulations, positive impact are now emerging and becoming more evident ... the result and outgrowth of at least a couple of decades of work. If present activities in the BOBP member countries are kept up and do not slacken, these emerging trends will develop into sustainable patterns of wise use of a much sought after resource.

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### Cover Photo:

*An example of fisheries management at work in Malaysia. Fishing boats at a fisheries harbour in Kedah state are colour-coded to show which state they belong to. White stripes and "alphabet codes" on the sides of the cabin of each boat indicate the permitted fishing zone for that boat.*

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Bay of Bengal Programme (BOBP) is 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 Agricultural Organization of the United Nations).

Edited and Published by MC. CHONG for BOBP- 91, St. Mary's Road, Abhiramapuram, Chennai 600 018, India.  
Tel 91-44-4936294; 91-44-4936188; 91-44-4936096, Fax: 044-4936102, Telex: 41-21138 BOBP E-mail bobpkcc@md2.vsnl.net.in