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BOBP and small-scale fisherfolk: **IT'S TIME TO ACT!**

*"Poverty and deprivation are akin to quicksand. Small-scale fisherfolk
in the Bay of Bengal region are in their vice-like grip.
Only strong hands and determined action can pull them out."*



BOBP and small-scale fisherfolk:

IT'S TIME TO ACT!

Twenty-one years ago, the BOBP started its tryst with small-scale fisherfolk in the Bay of Bengal region. Three phases later

with a record of hundreds of activities in the seven countries, many successes and a few failures as well — the tryst acquires a new meaning. Hope emerges of a stronger, more enduring partnership — with fisherfolk, with member-countries, with the international community.

The bulk of the fish harvested in the Bay of Bengal comes from the small-scale sector. The Bay's many million fisherfolk toil with little reward to catch fish that feed not only people in the region, but outside it too. They belong to the lowest, the least privileged strata of society; they generally earn far less than the national average. With hamlets scattered along the coastline and the interior reaches of the estuaries, the fisher community is the last to receive basic amenities and services such as roads, water, electricity, education, health care. Generally illiterate as a community, the fishers are ever at the mercy of exploitative middlemen.

Sandwiched between land on the one side and the deep sea on the other, the small-scale fisher has very few options. If the land is totally alien to him, the deep sea is inscrutable, unpredictable, enigmatic. The narrow territorial waters and their contiguous areas have been his home and hearth for centuries. His ancestors have for countless decades treasured the near-shore waters. Anything outside the coastal waters is still beyond his ken.

Contemporary global developments have threatened the existence of small-scale fishers. Major marine fishery resources have suffered from the combined assault of overfishing, destructive fishing practices and a burgeoning fishing fleet. The fisherman is the biggest casualty, with a cruel fall

in catches and earnings. To make matters far worse, illegal, unregulated and unreported fishing is on the rise, especially in the high seas. Sustaining the livelihood of small-scale fishers in the Bay of Bengal region has therefore become a formidable challenge.

A strong and collective response to the plight of the small-scale fisherman from all fisheries stakeholders — most importantly, from the governments of the BOBP member-countries is urgent and vital. What's needed is not just support but action. A level playing field has to be created to enable small-scale fishers to survive. Apathy and inaction at this stage may be calamitous, compelling bigger and more complex remedies at a later stage.

The BOBP has always been a valuable forum in the Bay of Bengal region for co-operation in raising common issues and challenges and meeting them head-on. There are no quick fixes to managing natural resources or sustaining the livelihood of small-scale fishers. Strong and sustained support is vital. The BOBP provides a mechanism for such support.

Over the past two decades, the BOBP has always promoted and popularised people-oriented approaches to solving the problems of fisherfolk. It was RRA during the first two phases, it was stakeholder analysis in the third phase. While development will continue to be participatory, new tools and techniques must be developed to solve increasingly complex resource management

problems. The BOBP's mechanism for regional and international co-operation is an opportunity that member-countries must seize.

Way back in 1979, the BOBP held a workshop on "social feasibility in small-scale fisheries development" in Chennai. Its report is still very valid today. The workshop concluded that "both human and economic factors need to be considered conjointly to ensure the social feasibility of a development programme". "Human factors, because most fishermen are still very poor and disadvantaged. Economic considerations, because the large majority of small-scale fishermen who still produce most of our fish represent a vast potential force."

About change in fishing communities, the workshop pointed out that "Change has occurred, new methods **have** been accepted, in fisheries as in agriculture. What is needed is more empathy with the fisherman, more effective extension work, more time for change to be understood and absorbed."

Yes, BOBP's tryst has been eventful. The tryst will continue. Thanks to member-countries — their initiatives, their foresight, their support — we will bring about change for the better. We owe it the doughty small-scale fisherman. We owe it also to fisheries, to fishery resources, to the national economies of the Bay of Bengal region.

V S Yadava

"For fishers to become effective partners in management, a better understanding of their communities' culture is essential. Reaching a better understanding of such cultures is key to fisheries management and food security in most artisanal and small-scale fisheries."

*Ichiro Nomura
Assistant Director-General, FAO Fisheries Department, Rome*

Honouring Fishermen: Celebrations in the Maldives & Thailand

The idea of a “Fishermen’s Day” or a “Fishermen’s Week” is catching on. It is seen as society’s way of thanking fishermen, recognising them and honouring them for undertaking a difficult, risky and none-too-rewarding profession that brings nutritious food to everyone’s table round the year.

The BOBP recently supported observances of ‘Fishermen’s Week’ in the Maldives and Thailand.

Maldives

Maldives, a slender string of about 1200 islands and coral atolls stretching some 800 km from north to south, has been organising Fishermen’s Day/Week from the early 1980s. The day was first designated in 1981 by the President of Maldives, Mr Maumoon Abdul Gayoom, who said that Maldives would always look to the sea for its principal sustenance. Fishermen’s Day is a media event, with plenty of programmes on radio and television – talks, features, interviews. Fishermen are the toast of the country on that day.

Glimpses into past Fishermen’s Day! Week observances in the Maldives:

- Handicrafts competitions and art competitions for schoolchildren on the theme of fisheries. Photo exhibitions on fisheries for all.
- Meetings of officials, fishermen and schoolchildren
- A sailing contest from Male to Feliwaru (60 km away) and back, open only to non-powered craft.



Mr Dhammarong Prakobboon, Thailand Director-General of Fisheries, inaugurated an exhibition on November 20 in the Phang-Nga bay on the occasion of Fishermen’s Week

- Release of a special stamp
- Tree-planting ceremonies. (More trees means’ more timber for boats)
- The setting up of fish marketing warehouses.

The most recent fishermen’s day celebrations, supported by BOBP, were held in Thaa Atoll Guraidhoo from 14 to 20 November 2000. Four Cabinet Ministers and some 135 invitees took part in the celebrations, which began with a 2-day workshop on 14 November on “disseminating information on sustainable utilization of marine fish resources”. It was organized by the Marine Research Centre.

Several other activities were also organised. A fisheries trade fair; an official “fishermen’s week” meeting;

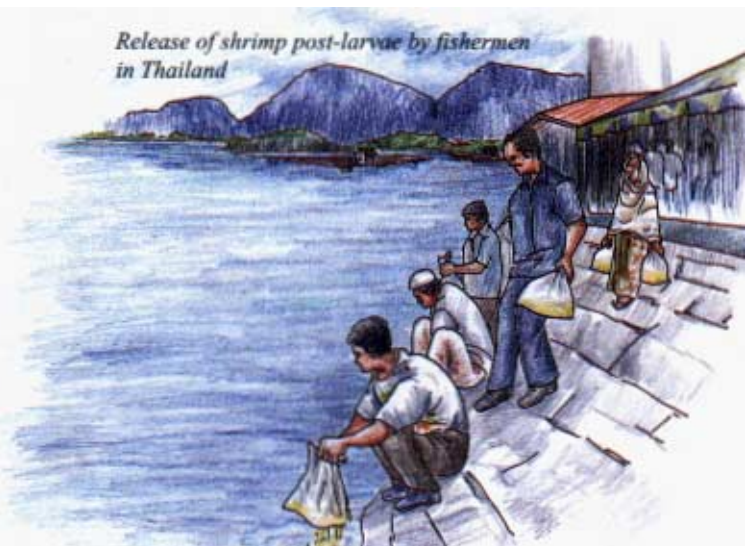
launch of a fish market in Thaa Guraidhoo; a workshop on “quality of fish – opportunities for the future”; a pole-and-line fishing competition for Thaa Atoll fishermen; a reef fishing competition for Thaa Guraidhoo women; a swimming competition; a reception hosted by the Minister of Fisheries; and entertainment programmes.

The 2-day workshop mentioned earlier was attended by 40 participants. Topics discussed included sustainable fisheries development, sustainable utilization of reef resources, the status of sea turtles in the Maldives, tuna fishery resources, safety at sea, ensuring fish quality. At the end of the first day, participants went out on a night fishing trip. Certificates were awarded the following night.

“We are proud to be fishermen,” said a traditional dhoni fisherman whose handsome catch of tuna the previous day drew many admirers. The observances of “Fishermen’s Week” in the Maldives are meant to nurture and sustain this professional pride.

Thailand

The fishermen’s week in Thailand was celebrated in Phuket, Phang Nga province, during November 20- 26, 2000. An exhibition was put up on the occasion. It featured activities implemented under the BOBP-assisted project to develop community-based approaches to the management of fisheries and aquaculture. School children presented a cultural show.





Thai fishermen proudly sport BOBP T-shirts

The exhibition was inaugurated by the Director-General, Department of Fisheries, Mr Dhammarong Prakobboon on November 20, 2000. It was attended by the Governor of Phang Nga province and other top administrators, fisherfolk, fisheries officials, teachers, volunteers and students.

In a speech, the Governor expressed pleasure that Phang Nga had been chosen as the venue for the DOF-BOBP project. A number of fishermen communities from 13 villages had taken part. He hoped that the exhibition would convey the lessons of the project to other villages as well, so that it succeeded in promoting fisheries development and management and the incomes of fisherfolk throughout the province.

Inaugurating the exhibition, the Director-General of Fisheries described the BOBP-assisted project as "exemplary". It showed how the government and fisherfolk could co-operate in conservation and sustainable

management of coastal resources. If other communities demonstrated the same spirit, Phang Nga province could become a model for sound management and wise utilisation of fishery resources.

In a "background report," Dr Anant Saraya, Director of the Marine Fisheries Division, said that the BOBP-assisted project had led to several successes such as mangrove reforestation, which would encourage many varieties of fish to breed and spawn. Crab production and cage culture had been stimulated. The deposit of spawners in spawning cages, and the release of eggs hatched in the cages to the sea was another achievement.

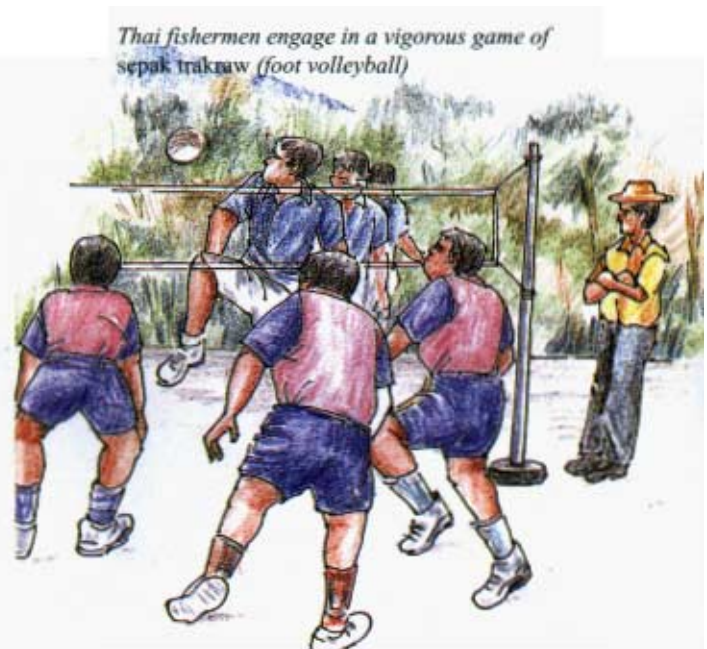
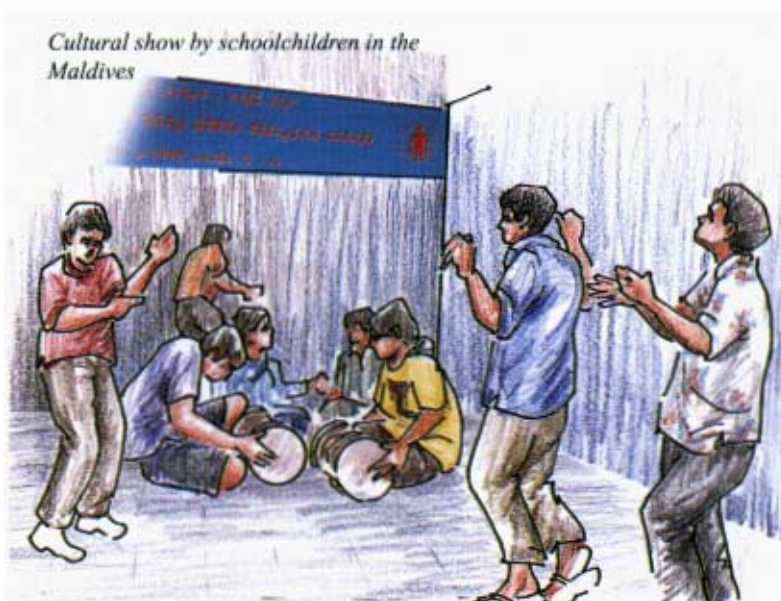
Dr Saraya said the exhibition was meant to give an idea of activities implemented by the project; demonstrate the unity of the community in managing and sustaining fishery resources; and publicize fisheries, which was a tourist attraction, and the workstyle and lifestyle of fisherfolk.



A Maldivian fisherman receives a certificate

In his speech, BOBP's IGO Coordinator Dr Y S Yadava complimented the skill and enterprise of Thai fishermen and fish farmers, and pointed out that activities carried out in Thailand during all three phases of BOBP had been successful. But the most significant long-term work was perhaps that of community-based development during the Third Phase. It had raised awareness of fisheries management, strengthened fishery resources, achieved mangrove reforestation, reduced social conflicts between pushnet and gillnet fisherfolk, and improved the participation of fisherfolk in fisheries development and management.

Dr Yadava noted that there might soon be a change in the structure of the BOBP. It would become an inter-governmental set-up and would continue to work for small-scale fisheries development and management in the region.



Useful Publications from Sri Lanka

Census of Marine Fisheries in Sri Lanka (West, South and East), by LD West and M A W Ariyadasa. Department of Fisheries and Aquatic Resources. Marine Fisheries Management Project, Colombo, Sri Lanka, 1998. Pp 97 + 21.

This census report, brought out under the auspices of the UNDP/FAO-assisted Marine Fisheries Management Project, provides comprehensive baseline data of marine fisheries in coastal districts from the west, south and east of Sri Lanka (comprising the 11 DFEO divisions of Puttalam, Chilaw, Negombo, Colombo, Kalutara, Galle, Matara, Tangalle, Kalmunai, Batticaloa, Trincomalee).

As the late DrARAtapattu, then Director of the Department, puts it, the census report “will be of substantial value to fishery administrators and social researchers in understanding Sri Lanka’s fishing industry and the characteristics of the community.”

The census was conducted mainly by department staff with the assistance of Kewagama Research of Australia. It provides the statistical results of the first stage of a “multi-stage research programme” initiated in 1991. Baseline information provided relates to participation levels, key fishery types, boat ownership and socio-demographic profiles. More detailed data will be provided by subsequent research stages.

Kewagama Research was commissioned by FAO in 1993 to undertake the first of several consultancies covering the design, conduct and analysis of Stage 1. The study involved an exhaustive frame survey of coastal districts, followed by an intensive (1 in 6) sampling of identified fishing households. In total, over 13 000 interviews were conducted by trained DFAR field staff in two stages – coastal districts of the south and the west in 1995-1996, and the eastern districts in 1996-1997.

The resulting demographic data is varied, detailed and fascinating. For example, how many fishing households does the area covered have? (More than 72 000 in the west, south and east) What is their population? (More than 344 000). What’s the percentage of fishing as a source of

household income? For how many people is fishing the sole source, for how many is it a main source? What’s the family structure in these households? What’s the household size? What’s the age and gender distribution? What’s the household composition by age group?

Some other statistics relate to where the fishermen live, the generation links in fishing (“Was your father a fisherman?”), the educational qualifications of fishers, the second job they hold (whether it is fishing-related, agriculture-related, whether it is in the government sector or in other industries), employment status during the previous 12 months.

There is valuable information about fishery groups (based on species and gear).

For example, there is a table about the number of fishers who engaged during the previous 12 months in the catch of surface fish, bottom fish, shark or skate, prawns, lobster, crabs, squid, chank, sea cucumber, ornamental fish, freshwater fish, all other species/gear types. Information about the number of fishers is also provided by gear under each fish species.

Data is provided about fishery group activity during the previous 12 months in the 11 fisheries divisions, the amount of fishing effort (less than 50 days, 50-150 days, more than 150 days), the main boat types (Pani, Oru, Vallam, Theppam, 17-23 ft. FRP, 3.5-tonner, multi-day boat), about how many fishers are skippers. There is detailed information about the fishing fleet – age, boat length, the main construction material used for the hull, the main propulsion method (outboard motor, inboard motor, sail, oar or paddles), the engine horsepower, average fishing trip duration, average crew size, the ownership status of the skipper, quantum of government subsidies, sources of finance, boat-related loans.



As Minister Mahinda Rajapakse puts it, the census “is a timely activity to identify relevant social, economic and institutional factors essential for responsible fisheries management”.

Compendium of Fisheries Legislation in Sri Lanka. Compiled by M A W Ariyadasa. Department of Fisheries and Aquatic Resources. Marine Fisheries Management Project, Colombo, Sri Lanka, 1998. pp 388 + 13.

This compendium is a compilation of all important enactments and regulations that impact on the management of the fishing industry in Sri Lanka. (It does not include the most recent enactments of 1996, copies of which can be obtained from the DFAR on request). It is designed to serve as a reference manual for field staff of the Department of Fisheries and Aquatic Resources who are authorised to enforce fisheries regulations at the local level.

The book contains the texts of the Village Communities Ordinance (Inland and Marine Regulations), the Local Boards Ordinance (Inland and Marine Regulations), Game Protection Ordinance (Inland and Marine Regulations), the Small Towns Sanitary Ordinance (Inland and Marine Regulations), the Local Government Ordinance (Inland Regulations), the Fisheries Ordinance, the Fisheries (General) Regulations (Inland and Marine), the Fisheries (Regulations of Foreign Fishing Boats) Act, the Pearl Fisheries Ordinance, the Whaling Ordinance, the Chank Fishery Act, the Coast Conservation Act, the Fisheries Pension and Social Security Benefit Scheme Act, the Maritime Zones Law.

Managing the Push Net and Set Bagnet Fisheries in Bangladesh:

Awareness Campaigns and Their Impact

The push net (PN) fishery in Bangladesh provides *Penaeus monodon* post-larvae (PL) for supply to a large number of coastal shrimp farmers. The collection of post-larvae therefore means jobs and incomes for a large number of the rural poor in Bangladesh, mainly women and children. But the PN fishery is extremely destructive to the marine resource. Reason: More than 95 per cent of the catch consists of juveniles of commercially important marine and brackishwater fin and shell fishes. These get discarded – a waste of precious biological resources.

The Department of Fisheries (DOF) wanted to improve management of this fishery, to protect fisheries resources and improve the quality of life of the thousands of people who depend on this fishery. A participatory approach to fisheries management was adopted with BOBP support, consisting of rapid appraisal methods and other consultative techniques. The project sought better awareness and knowledge of the needs, benefits and practices of fisheries management among the various stakeholders. A series of public hearings, a consultation and a road show were planned under the project.

The focus of a pilot programme of consultation with stakeholders was to reduce the mortality of target species, improve the quality and handling methods of *P. monodon* fry, and increase the earnings of fry collectors through awareness-building, training, and demonstration of by-catch handling techniques. Materials were developed to support the pilot activities. A comic book was printed in Bangla.

Preparatory activities included identification of stakeholders, stakeholder analysis and perception analysis, stakeholder communication analysis, and training-cum-workshop sessions.

Activities were initiated with a 3-day orientation-cum-training workshop conducted by BOBP on 20-22 July, 1999, in Chittagong. Detailed discussions were held about the implementation of public hearings. Two separate groups of officers and staff were assigned to work with the PN and ESNB fisheries.

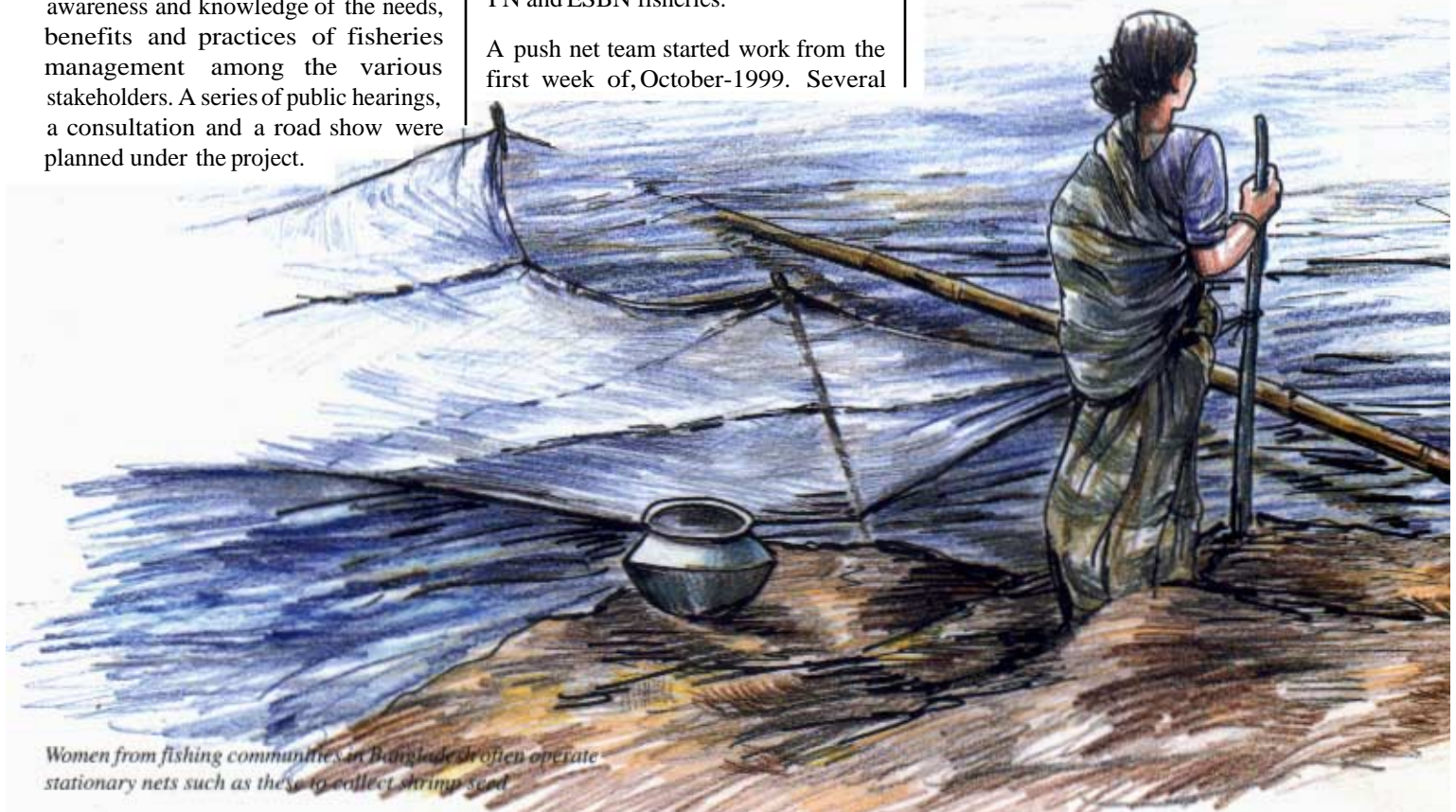
A push net team started work from the first week of October-1999. Several

fishing villages were visited. Three of these (Samity Para, Saikat Para, Kalatali village) were selected for public hearings. All three are situated along the beach; inhabitants of all three villages collect shrimp PL throughout the year. People of these villages are homeless; most of them are migrants from other districts. After detailed discussion, 50 PL collectors were selected from each village for consultation and public hearings. The selected PL collectors included women as well.

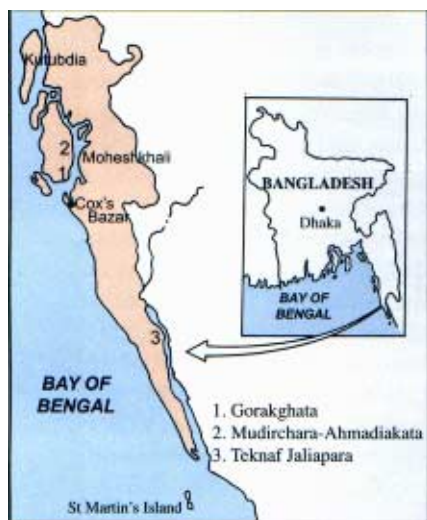
Public hearings

A total of nine public hearings, a consultation and a road show on the PN fishery were held at different dates from November 1999 to June 2000. They were organised in local clubs, with four resource persons and four field staff in charge.

Some 100 PL collectors took part in the **first hearing** where the problem of PL



Women from fishing communities in Bangladesh often operate stationary nets such as these to collect shrimp seed



Villages selected for ESNB pilot management initiatives

and by-catch mortality was discussed in detail. Efforts were made to convince participants to practise PL collections in such a way that it did minimum harm to the fishery resource. Techniques that could reduce PL and by-catch mortality were discussed. Demonstration activities toward this end included setting the net for a specific period of time, sorting of PL in the shade, quick sorting techniques, releasing by-catch to the sea, use of air pumps, PL transportation methods, etc. The first hearing was fruitful in building awareness among PL collectors.

The PL collectors agreed that their nets are destructive and harmful to the fish resource. They said they have already started releasing by-catch back to the sea, but face some problems: (a) lack of a pot or container to keep the by-catch and release it back to the sea (b) insufficient motivation and awareness among the PL collectors in general (c) absence of legislation to protect the fishery resource.

In response to the request of the FL collectors, the project bought 100 aluminium vessels and 15 air pumps through open quotation. These materials were distributed among the 100 fisherfolk.

A second set of public hearings was held after four months. The people of Samity Para and Saikat Para (who have migrated from other districts) seemed more responsive than those of Leboni Para (mainly locals) in accepting the responsible PL collection techniques suggested by BOBP and DOF.

The participants in each village were divided into four groups of 50 each. In every group, one person was given the

responsibility for monitoring the activities of all group members. Every group member expressed his opinion on how other FL collectors could be persuaded to reduce the mortality of shrimp larvae and by-catch by shortening the soaking time, quickly sorting the FL in shaded places, promptly releasing fish juveniles into the sea, using a small portable air pump, using clean sea water and ensuring proper stocking of fry in containers. Various techniques in this context were demonstrated.

Fisherfolk at this hearing seemed to have got the message that they have a responsibility to the country to save fishery resources from destruction by facilitating the survival of shrimp by-catch. They were in fact alarmed at the depletion of fishery resources. The low-priced fish that was once a part of their diet was no longer available cheap. They even suggested that people who did not release fry back into the sea should be punished.

It was decided that every participant should motivate 10 other PL collectors. A random check was made of such efforts. One participant said he had motivated 40 FL collectors. A “best worker” was selected from male participants and another “best worker” from female participants. The two were rewarded with a useful gift – an air pump. The other fisherfolk were assured that they too would be rewarded for top performance.

Some participants said that if they were helped with loans, they would not approach middlemen for an advance against the FL. (what happens is that middlemen provide loans and nets to most FL collectors. In exchange, the collectors have to surrender captured larvae to the middlemen at a price that is low and exploitative).

The final phase of **public hearings** was held during May-June 2000. It focused on alternative income-generating activities (IGA) such as poultry-rearing, running small shops, goat-keeping, fish culture, fish trade, etc. But the FL collectors lived on government land on the seashore, where there was little scope for IGA.

Observations, findings and conclusions:

- The fisherfolk’s response to the awareness-building campaign has

been very positive. But it is amply clear that the catch of shrimp fry is an easy, independent and profitable profession. It is difficult to stop it through awareness-building or motivation alone. Rehabilitation programmes and financial and logistic incentives are necessary to eliminate the profession altogether. However, the detrimental effect of FL collection can be decreased by minimizing mortality through improved techniques. Another measure would be to increase the supply of hatchery-reared shrimp – which might make fry catching unremunerative.

Despite the awareness-building effort, a few FL collectors still do not release shrimp by-catch back into the sea. Close monitoring is needed to prevent such actions; this is not possible at the moment.

- Migrant fry collectors from other districts seem willing to leave the profession if they find some other IGA. But local people see the situation differently. They earn money both from fry-catch and from other activities. A special donor-assisted project is needed to make them stop FL collection.
- What about a total ban on the FN fishery? Opinion was divided. The large number of migrants said that such a ban would relieve them from oppression by money-lenders; they would then opt for another profession. Because of the loans they have taken, they are compelled to catch fry even during the lean season, despite low catch prospects and poor incomes. But the local FL collectors did not like the idea of a total ban.
- Except in a few areas like Salimpur, all PL collectors use set bag nets rather than push nets to collect FL. Though they were told that fry collected by push nets are more robust and healthy than those collected by set bag nets, fisherfolk seem to prefer set bag nets as they catch more fry.
- The collectors were negative about the use of aerators – cost was one reason. They preferred traditional methods of aeration.

- The fisherfolk's social problems – need for better health, education and social services, and putting an end to interference by local hooligans – must be addressed.
- Exploitation by middlemen cannot be eliminated overnight. The PL collectors need help to organise themselves. If they are assisted to repay the loans provided by middlemen, they won't have to catch shrimp FL during lean seasons. This will save some shrimp PL and by-catch.
- The pilot awareness programme was limited to one thana of a district. But the FL collection goes on in 15 districts. For the programme to spread to all the districts, international assistance and co-operation is necessary.

Management Initiatives with ESNB Fisheries

Studies and surveys have revealed that the estuarine set bagnet fishery (ESBN fishery) is harmful to marine fishery resources and biodiversity. A decision was made by the DOF to try and reduce fishing effort by area and season, by persuading some ESNB fishers to serve

as volunteers. A number of workshops were organised for DOF staff who were to conduct pilot management initiatives. A team was formed to organise public hearings and related activities.

It was decided to select three villages of ESNB fisherfolk for the pilot management initiatives, conduct three hearings in each village with 50 fisherfolk and submit a detailed report to the government.

Accordingly, three model villages were selected from Cox's Bazar district: Gorakghata Jaladas Para and Mudirchara-Ahmadiakata Jalia Fara from Moheshkhali upazila, and Teknaf Jaliapara from Teknaf upazila. Fifty ESNB fishermen were selected at random from each of the three villages, most of whom were owners of fishing gear. Some leaders of the community were also selected as observers. This selection process was carried out between 4 October and 18 October, 1999.

The first public hearing was conducted in the three selected villages during 5-10 April, 2000. Day-long activities in each village included lectures, discussions, display of materials, distribution of comic books, audio-visual programmes, mobile exhibitions such as road rallies.

During this hearing, the resource persons outlined the past and present status of marine and coastal fisheries resources, the life cycle of important shrimps and fishes, and their exploitation by different gear, especially by ESNB, and the government's mode of resource management. The responsibilities of different stakeholders in participatory management of the resources were also discussed by team members. On the other hand, the fishermen (most of whom had handled ESNB since their childhood) recalled their memories of ESNB fishing, catches and incomes, and made suggestions concerning management.

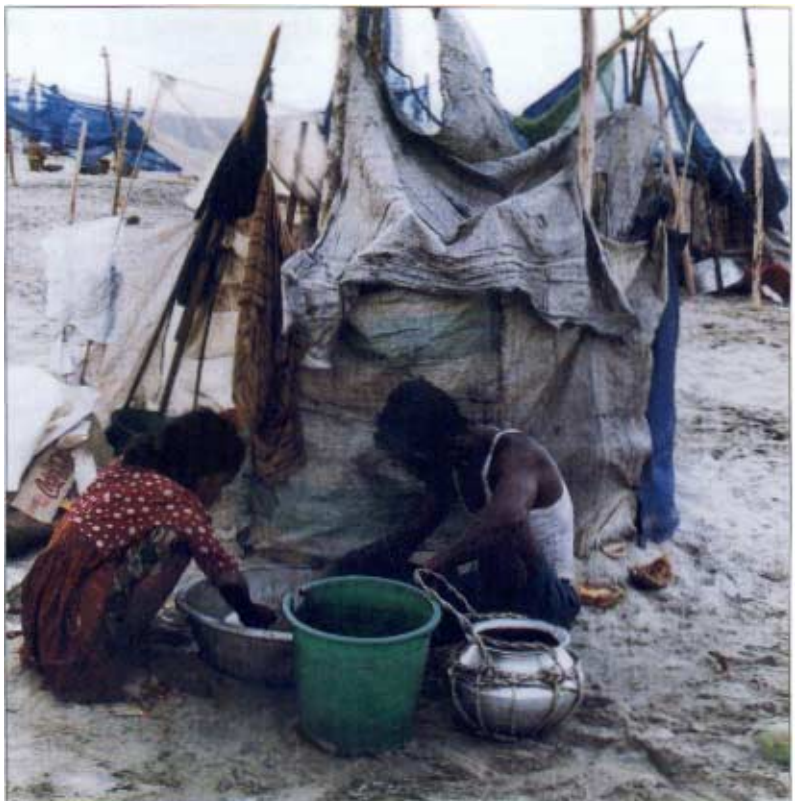
A summary of comments made by the fishermen:

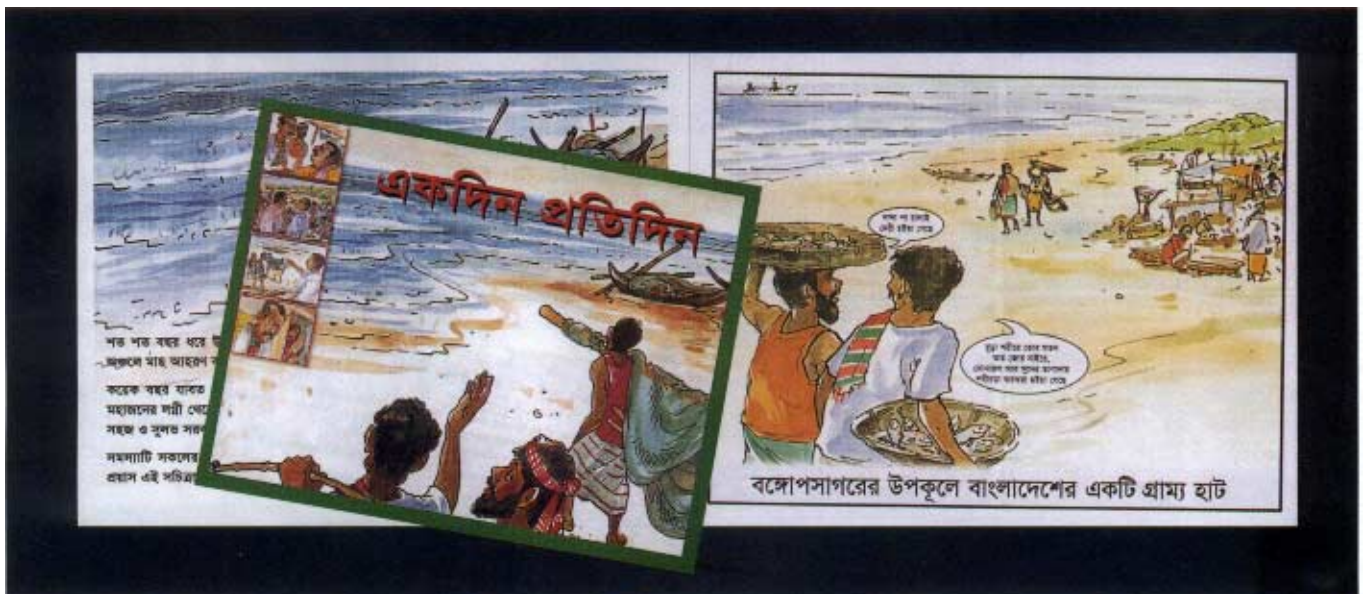
- ESNB are not as destructive as other gear such as PN, beach seines, trawls or current nets;
- Ecological imbalances are a result of siltation and deforestation;
- The ESNB fishermen mostly catch small-sized fishes (anchovies, *acetes* sp., etc) which other traditional gear cannot catch;
- The resources, catch rates and the incomes of ESNB fishermen seem to be decreasing day by day; but the number of ESNB gear is increasing day by day because of new entrants to the fishery.

A push nethung out to dry



Seed collectors sort their catch in the shade, separating shrimp and other species





This comic book in Bangla was part of the extension effort with fisherfolk on managing the ESBN and PN fisheries in Bangladesh

The second public hearing (11-16 May, 2000) featured the same villages and participants as the first. The activities were similar too. But the approach to the discussion differed.

Team members highlighted the damage to resources by ESBN fishers and others and noted that the future of the resources was in peril. The ESBN fishermen were asked how they could help arrest resource deterioration. What would happen to them if the estuaries ran out of fish? What IGAs could they take up?

A summary of reactions and comments by the ESBN fishermen:

- Most fishermen have changed their views about government. Earlier, they thought that all that government does is to make laws and implement them. They expressed appreciation of the Government's initiatives on management extension.
- However, the fishermen said that there is little they can do. They have no land and no money, nor the education and the skills or training needed for other IGAs.
- Some fishermen agreed that ESBN is destructive, but they are unable to leave it. The technology is easy, they have inherited it from previous generations. Some said they would not like their children to continue in this profession, but there was no alternative.

- Some fishermen said they are willing to switch to other IGAs if they are given the facilities needed – by Government, NGOs or some other agencies. A few fishermen pointed out possible IGAs in their localities.
- Some fishermen suggested that overfishing by ESBN should be banned for three to six months a year, depending on the abundance of eggs and post-larval shrimps and fishes.
- Dredging in rivers and estuaries and mangrove reforestation were suggested as measures to increase the resource.

The third public hearing (21-26 June, 2000) again featured the same villages and participants as before.

Team members summarised previous discussions and opinions. They said that reduction in fishing mortality by ESBN was at present a good way to overcome the depletion of fisheries resources. ESBN fishermen should therefore contribute to the process. Granted that they were poor, and that the scope for other IGAs was limited. But what was the way out? ESBN fishermen were asked to discuss the problem frankly and come out with ways by which they could take to other IGAs.

A summary of comments by the fishermen:

- Fishermen are now aware of the destruction of coastal resources caused by ESBN, and appreciate the

Government's extension initiative. It should be a continuous process in coastal districts.

- The fishermen discussed possible alternative IGAs – such as fish drying, gillnetting, longlining, tailoring, running small shops. If the Government or other agencies provided facilities (money, technologies, inputs), some of them could switch to these alternative IGAs.
- If the Government resorted to a ban on ESBN fishing during certain months, the fishermen would not be able to eke out a livelihood.

In conclusion, the team members agreed that they should encourage the ESBN fishermen to look for alternative IGAs. The latter should be informed that the Government might frame regulations to reduce ESBN effort by area and season.

The team members also noted that extension is a continuous process. The authorities should look for indicators of success – through interviews, personal contact, sample surveys and socio-economic surveys, and follow-up.

(Note: The PN and ESBN fisheries of Bangladesh are resource-damaging. Equally so are the push net and the estuarine set bag net fisheries practised in the Hoogly-Matlah estuarine reaches of the state of West Bengal in India. These also need to be phased out. BOBP's work in Bangladesh is worth replicating in West Bengal. —Editor)

Fisheries Staff Training Strengthened in Tamil Nadu, India

The Fisheries Staff Training Programme in India was first initiated in 1945 at Barrackpore (West Bengal) for inland fisheries and at Madras in 1950 for both marine and inland fisheries,

The Tamil Nadu Government started a Fisheries Staff Training Institute (FSTI) during the early 1950s with headquarters at Nagapattinam. The Institute was subsequently shifted to Chennai. The Institute is now headed by one Deputy Director of Fisheries with expert faculty in marine fisheries, inland fisheries, fisheries technology and fishing gear technology,

Each faculty is headed by an Assistant Director of Fisheries supported by the Inspectors of Fisheries/Research Assistants.

Over time, providing staff training has become a routine activity with little or no analysis of:

- emerging field requirements;
- knowledge and skill-gaps of staff;
- the kinds of courses needed;
- the timings of these operations;
- the costs involved;
- training effectiveness,

It was also observed that current systems in the state development departments can be made more efficient by adopting modern human resource management methods. With a view to induct HRD and HRM practices in government departments, a World Bank - funded programme was launched in 1996. The Department of Fisheries is one of the six line departments to benefit from the project. Its basic objectives:

- improving the quality and relevance of in-service training programmes;
- strengthening the capacity of the participating states to develop and manage agricultural human resources;
- establishing a human resources management approach to the direction and supervision of extension staff of participating departments.

The total outlay of the project is Rs. 22.2 million. The project started in 1995-1996 and is scheduled to conclude by December 2001.

The major components of the project are:

- i. Construction of a hostel building along with the additional classrooms

at the FSTI in Santhome at an estimated cost of Rs. 2.02 million,

- ii. 'Training of Trainers' programme abroad with FAO assistance.

- iii. Procurement of books and periodicals

- iv. Purchase of teaching and office equipment

- v. Purchase of furniture for classrooms and hostel

- vi. Purchase of lab and farm equipment for hands-on programmes.

- vii. Purchase of computers to keep pace with the information technology revolution and facilitate networking (both WAN and LAN).

The same project also gave a thrust to Human Resources Development through the creation of a HRD cell in the Directorate. The main task of the cell is to introduce HRM and HRD practices in line departments, which formerly were not heard of in a government department. Apart from this, the main task of the

HRD cell is to identify the skill gaps as well as the training needs and institutions with reference to the specific needs of the department. Moreover, the HRD cell has designed a specific HRM software package for implementing HRM practices in the Department of Fisheries. These packages can be dovetailed to the

needs of the any government department, provided the data input is properly created. So far as the Fisheries Department is concerned, the requisite data input for HRD and HRM practices has also been created through a specially designed format.

Under the 'training of trainers' programme, so far 37 officers have been trained abroad in mariculture, aquaculture management, fish disease diagnosis and fisheries management practices. It is also proposed to train another 13 before the end of this project. The major countries to which officers were sent for exposure are the Philippines, Thailand, Israel, China, UK, U.S.A. and the Netherlands.

Under a procurement plan, the FSTI has been equipped with a hostel facility and teaching equipment on par with any state-level apex training institution in

India to handle any training programme – either for the specific needs of fisheries sciences or for fisheries management programmes. This institute can also offer training programmes to officers of agricultural and allied departments for broadbased extension in achieving the goal of food security in the new millennium.

R Srinivasan

BOBP and fisheries staff training in Tamil Nadu

The BOBP has supported two important exercises in strengthening human resources development in the Department of Fisheries, Tamil Nadu. The idea was to build institutional capacity towards better coastal fisheries management.

The first was a 1998 study — Skill Gaps and Training Needs Assessment in the Department of Fisheries — conducted by Om Consultants, Bangalore. The aim was to identify gaps in skills in the DOF that must be filled, and the training needs that must be met, so as to develop a training plan for human resources development.

A participatory approach was adopted in carrying out the study. Workshops were organised in Cuddalore and Bangalore, field trips and interviews were carried out, questionnaire responses were studied. BOBP/MM/3 reports on the rationale, conduct and implementation of the study.

The second exercise (in 1999), also in co-operation with Om Consultants, was to strengthen the systems for monitoring and evaluation and management information systems in the DOF, Tamil Nadu, to enable the long-term goal of sustainable development and management of fisheries.

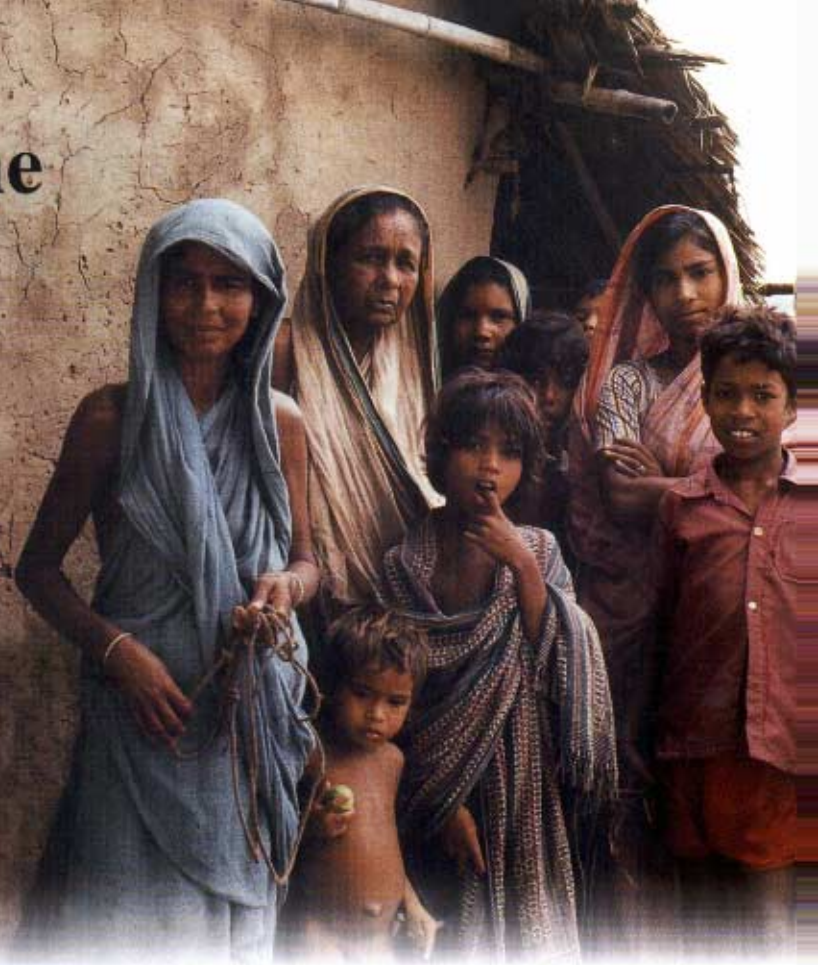
As part of the exercise, discussions were held with the DOF both at the headquarters and the field. A workshop was also organised at which DOF officials and representatives of fisheries research organisations such as CMFRI and CIBA took part, and a logframe was developed for the Department of Fisheries along with objective monitoring parameters for selected activities of the department.

BOBP/MM/4 reports on this study.

Glimpses into the BOBP's Achievements, 1979-2000

S R Madhu

The first editor of Bay of Bengal News races through 21 years of the BOBP's work to summarise the Programme's achievements and impact in its member-countries.



Sri Lankan fishermen in the high seas are excited as they listen to a radio announcement on a new fisheries policy. Bankers, fisheries extension officers and fisherfolk of Orissa, India, come together at a unique workshop to develop mechanisms for providing credit to small-scale fisherfolk. Bangladesh fishery officials investigate damage to resources by push nets. Officials and scientists are trained in tuna stock assessment in Maldives. Experts and officials work with fishermen in Phang Nga Bay, Thailand, to install artificial reefs and carry out mangrove reforestation. Experts probe the underwater bio-diversity of the Pulau Fayar Marine Park, Malaysia. Fishermen in Sumatra, Indonesia, attend a training course on small-scale entrepreneurship.

The diverse activities described above have one feature in common. They are pilot small-scale fisheries activities initiated or organised by the **FAO**-executed Bay of Bengal Programme (BOBP) at various times during the past 21 years, in close co-operation with fisherfolk and national or local governments in seven countries – Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka, Thailand.

The BOBP started in 1979 to help improve the conditions of small-scale fisherfolk in seven member-countries. The Programme's approach was catalytic

and consultative: pilot activities to introduce new innovations, technologies or methodologies. Replication on a wide scale to touch large masses of fisherfolk was envisaged as the responsibility of national or local governments and NGOs, with the BOBP sometimes providing support for such replication.

The BOBP is still around, after the birth of the second millennium, and may soon be seen in a new form – as an Inter-Government Organization (IGO). It may therefore be useful, in this issue of *Bay of Bengal News*, to race through what BOBP did in its last 21-year existence.

Can a single sentence capture the BOBP legacy? Yes, statistically. Three phases; many donors; transfer of several useful technologies that touched and helped thousands of fisherfolk; hundreds of officials and scientists enriched with new ideas and concepts; several hundred workshops, training courses, seminars and consultations; some 275 technical reports, 70 issues of the informative and pictorial quarterly *Bay of Bengal News*, 13 issues of *PHF News*, some two dozen audio-visuals and video films, a library housing a few thousand books, reports and journals plus 25000 color slides and 5 000 negative wallets; a pair of CD-ROMs encapsulating the entire print output.

Some facts about the many donors of BOBP over the years. The Programme's first phase (1979-1986) was funded by Sweden, the second (1987-1994) by Sweden and Denmark, the third (1994-1999) by Denmark and Japan. Besides, several individual projects under the BOBP umbrella attracted special funding. A project on post-harvest fisheries (1987-1998) was executed and funded by the UK. The UNDP funded a four-year project on marine fishery resource assessment (1983-1986) as well as a project on bio-economics of small-scale fisheries (1991-1993). In 1986-1987, the National Swedish Board of Fisheries funded a wide range of activities on "People's participation and small-scale fisherfolk development" which culminated in a regional seminar and a booklet. The International Maritime Organization (IMO), under its SIDA-supported Global Programme for Protection of the Marine Environment, funded a project (1988-1993) to combat pollution in fishery harbours. The Arab Gulf Programme for United Nations Development Organizations (AGFUND) supported training activities during 1990-1992. The United Nations Population Fund (UNFPA) sponsored the preparatory phase of a project "Improvement of living conditions of fisherwomen and their families."

The Swedish Centre for Coastal Development and Management of Aquatic Resources (SWEDMAR), with funds from SIDA, assessed environmental hazards to fisheries through a two-year project (1991-1992). A few FAO/TCF projects have been carried out in member-countries. Finally, member-governments of BOBP have been making financial contributions to the BOBP toward the Programme's Information Service.

The First Phase : Introduction of New Technologies

At the time of the first phase (1979-1986), small-scale fisheries development meant technologies to raise catches and incomes. During this period, the Programme initiated several innovations with small-scale fishing craft, fishing gear and aquaculture. At the same time, many studies and workshops grappled with socio-economic issues among fishing communities, particularly women. The subjects included credit, non-formal education, income-generation activities and micro-enterprises for fisherfolk.

In India, the Programme engaged the best international expertise to research, design, develop, test and recommend beachcraft that were safer, sturdier and more powerful than traditional boats. Many designs and 14 prototypes were made and tested. One of the craft, the IND-20, proved very effective in Andhra Pradesh and Orissa, improved access to new resources such as shark and large pelagics, and over the years induced enterprising fishermen of Andhra Pradesh to modify their traditional *nava*. Considerable work to improve the traditional *oru*, develop small-sized multi-day boats for offshore fisheries and introduce improvements to traditional gear (to either raise productivity or lower cost) was done in Sri Lanka. In Fang Nga Bay, Thailand, a combination of sound culture technology and active fisherfolk participation led to sensational success: the seabass cage culture introduced by the Programme spread like an epidemic, from 16 villages of one province to six provinces of southern Thailand.

Several interesting aquaculture activities were carried out in Malaysia. These included the culture of shrimp (at Ban



Fisherfolk communities in Sri Lanka (above), Bangladesh (previous page) and other member-countries have interacted closely with BOBP

Merbok), cockles and seaweed. (The pioneering work in seaweed culture, Malaysia, generated ideas that helped implement a seaweed culture project in Mandapam, Tamil Nadu, during the second phase). Pilot activities in shrimp culture were also implemented in India, Bangladesh and Sri Lanka.

During the early years of the BOBP, little information was available about resources. A regional stock assessment consultation held in Bangladesh in 1980 led to three hugely popular papers (see page 19). The UNDP-funded marine resources project (January 1983-December 1986) strengthened knowledge of fish stocks — such as the hilsa (*Ilisha tenualosa*) of Bangladesh; the tuna resources of Sri Lanka and Maldives; the scad and mackerel resources of Thailand, Malaysia and Indonesia in the Malacca Strait; and the tuna resources of Thailand and Indonesia

in the Andaman Sea. The project undertook computerisation of data processing and stock assessment in the region. It trained national biologists to develop the ability to improve sampling techniques, identify and collect data, and analyse and interpret the results. It conducted 19 training courses and workshops and brought out 15 publications.

Socio-economic issues during the First Phase

The socio-economic issues studied by BOBP during the first phase, and the resulting documentation, attracted wide interest within and outside the Bay of Bengal region. One of the early classics of BOBP literature, “Three fishing villages in Tamil Nadu: a socio-economic study with special reference to the role and status of women” (BOBP/WP/14), was a detailed statistical and analytical

Several fishing technology activities to improve fishing craft and gear were carried out in Sri Lanka during the BOBP's first and second phases



investigation. A 1981 consultation in Dhaka, Bangladesh, on "Development of activities for improvement of coastal fishing families" generated several useful ideas.

Many activities to improve the status and participation of fisherwomen in development followed. Training courses and women's self-help groups and loan schemes were initiated in India, and training for alternative income-generation activities was carried out in Bangladesh, Sri Lanka and Thailand. These activities and their reports created a women-friendly image that has stood the BOBP well.

An extension training project undertaken by BOBP for a dozen young fisheries extension officers of Orissa led to many significant activities in that state. The most noteworthy was the well-documented credit project for fisherfolk in Orissa — an inevitable case-study topic even today at seminars in any part of the world on credit for the rural poor. Another project concerned non-formal education for fisherfolk children of Orissa, and the development and publication of pictorial booklets for them.

Non-formal education for adult fisherfolk was the subject of an outstanding project in Tamil Nadu. Following a couple of workshops and many pilot exercises in fishing villages, two special illustrated booklets — the "Trainer's Manual" and the "Animator's Guide" — were developed by BOBP. These two books inspired similar manuals for rural populations in general, prepared by the Government of India with UNICEF assistance. More than 40 booklets for fisherfolk and animators were also prepared in Tamil under the project.

The Second Phase (1987-1994)

The second phase of BOBP, which began in 1987, continued the activities of the first phase, with a stronger orientation than before on fisherfolk communities. New projects included radio programmes for fisherfolk in Sri Lanka; integrated extension services in Ranong province, Thailand (culture of oyster, mussel and shrimp, along with health care, non-formal education and women's amelioration); development of fisheries extension services in Bangladesh and Maldives; a one-year bio-economic and

BOBP's Three Directors

1979-1994	Mr Lars Engvall (Sweden)
1994 2000	Dr Kee Chai Chong (Malaysia)
2000-	Dr Y S Yadava (India)

sociological study of *kattumaram* communities in Kothapatnam, Andhra Pradesh, India; training for small enterprise development in Langkat district, Indonesia; introduction of new outrigger canoes in Indonesia and Sri Lanka; oyster culture in Malaysia; development of comic books on fishery resources in India; a regional workshop on fisheries extension in Indonesia; promotion of Rapid Rural Appraisals (RRAs) as an extension tool throughout the region; a fish market for fisherwomen in Tamil Nadu, India; development support for NGOs in India. Activities on fishing technology continued. During the first two phases, as many as 48 reports and working papers were published by the BOBP on fishing craft, gear, engines and propulsion devices in member-countries.

In the area of fisheries resources, many studies on bio-socio-economics were initiated in 1991. The idea was to improve the catches and earnings of fisherfolk, and simultaneously ensure sound management through better resource knowledge and understanding, as well as the participation of fisherfolk in management. The project carried out

bio-socio-economic assessments of fish aggregating devices in the tuna fishery in the Maldives; small pelagics along the southwest coast of Sri Lanka; the estuarine set bagnet in Bangladesh; artificial reef installations in Ranong Province, Thailand; fishing for shrimp in Kuala Septang, Malaysia; and fishing for shrimp in Langkat district, Sumatra, Indonesia. Training in bio-socio-economic assessment was also done. Two offbeat publications related to resources were the lively and well-researched comic books "Our shrimp, their lives" and "Our fish, our wealth".

Several post-harvest fisheries activities were carried out in India, Bangladesh and Sri Lanka (1987-1998) through a project executed and funded by the UK under the BOBP umbrella through the ODA (Overseas Development Administration), later renamed DFID (Department for International Development). The project sought better handling, processing and marketing of fish: some specific objectives were to reduce post-harvest losses, enhance fish utilization, and add value to fish and fishery products.

Under the post-harvest fisheries project, insulated fish boxes aboard the *navas* of Andhra Pradesh were developed and demonstrated; they were meant to improve quality and fetch better prices for fish. A permanent on-shore ice box was demonstrated in Kanniyakumari; low-cost drying racks for anchovies were introduced in Kanniyakumari. A new prototype fish container for fisherwomen, more hygienic, cost-

The conduct of Rapid Rural Appraisals (RRA) was introduced throughout the region as a valuable participatory tool in rural development



Glimpses into activities of the first two phases

1. Fourteen prototypes of beachlanding craft were designed, developed and constructed for India's surf-beaten coasts. The IND-20 (shown here under sail) was the most successful. It boosted fishermen's catches and incomes in Andhra Pradesh and Orissa. In AP, fishermen modified the Nava to include features of IND-20, Indiq.

2. Women from fishing communities benefited from the many activities in Orissa, India – beachcraft development, credit for fishfolk, non-formal education for fisherfolk children. Extension methodologies, fishing technology and aquaculture were the focus of activities in Tamil Nadu, Andhra Pradesh and West Bengal.

3. The fisheries extension service in Bangladesh was strengthened through RRAs, workshops and training courses. Motorization of traditional craft, fishing gear development, shrimp culture, and stock assessment and training were among other activities.

4. In Indonesia, small-scale enterprises by men and women from the fishing community were encouraged, plank-built outrigger canoes were introduced, and stock assessment training carried out.

5. In Malaysia, the focus of work was on aquaculture and resource assessment and training. Seaweed and cockle culture were tried out during the first phase and oyster culture during the second.

6. Special radio programmes were introduced for fishfolk in Sri Lanka. They were strengthened with the help of a consultant from the UK. Activities relating to boat development for offshore fishing, improvement of traditional boats and gear, shrimp culture, women's amelioration and stock assessment were implemented.

7. An integrated extension project in Ranong province, Thailand included culture of oyster, mussel and shrimp, health care, non-formal education and women's activities.

8. Beach-hauling devices were introduced in the Maldives. Fishing technology, resource assessment, and extension services were the focus of BOBP's work in this archipelago.

9. Studies were conducted on alternative income-generation activities for women in Bangladesh and other member-countries.

All photographs in this issue

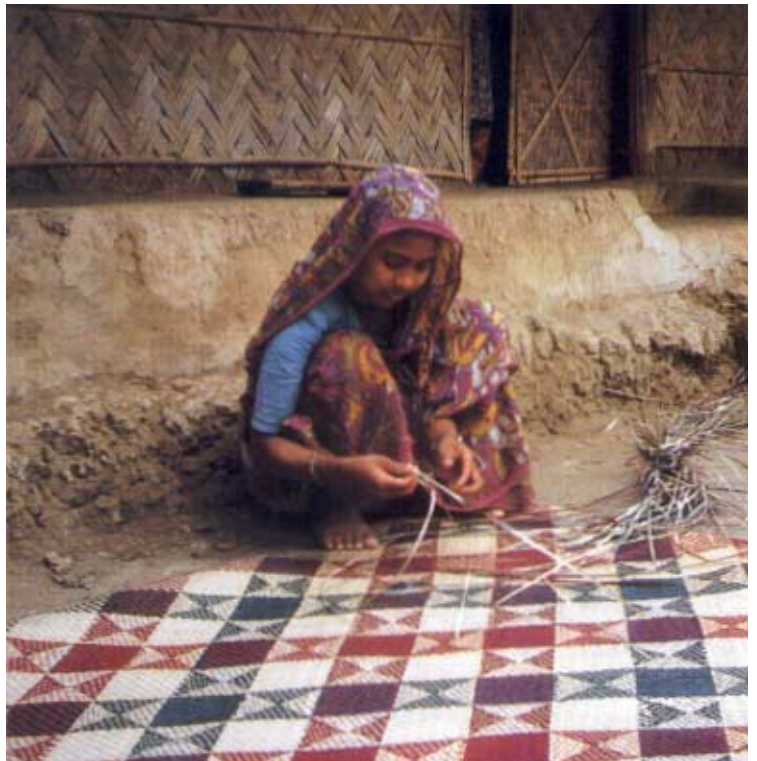




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The Third Phase of BOBP was devoted to fisheries management. In Malaysia many useful lessons emerged on management of marine parks

effective and comfortable than traditional fish baskets, was designed, tested and introduced in Tamil Nadu. Studies were carried out on discard of shrimp by-catch, on indigenous development of shrimp feed, on better utilization of shark, on village-level extraction of agar from seaweed. From 1995 (during the BOBP's Third Phase), the post-harvest project began publishing its own newsletter, *PHF News*. By the time it wound up in 1998, the post-harvest project had published 18 Information Bulletins, 13 issues of *PHF News*, several leaflets and a comprehensive manual of information and guidelines on post-harvest fisheries.

The interaction between fisheries and the environment was an important specialist subject during the Second Phase. It was carried out at BOBP by SWEDMAR, with funding support from SIDA. The outcome was "An environmental assessment of the Bay of Bengal region" (BOBP/REP/67), an exhaustively researched 260-page report.

Fisheries management and the Third Phase of BOBP

During the early 1990s, the small-scale fisheries scenario was changing. Countries began to notice disturbing trends — such as stagnating and even declining fish catches, reduction in average sizes of fish caught, and changes in the species composition of catches — all of them ominous signs of fisheries stocks under stress. Globally too there was increasing concern about overfishing and declining resources. The third phase of BOBP, which began late in 1994, reflected these concerns. The Programme's mandate was to enable and facilitate improved management of fisheries through awareness-building, strengthening the capacity of fisheries

agencies to address management, and technical assistance.

The BOBP applied the "stakeholder approach" to fisheries management. The rationale is that legislation alone cannot ensure fisheries management; even persuasion cannot. The active co-operation of various stakeholders — fishermen, fisherwomen, the public, fish vendors, retailers, processors, wholesalers and exporters, government departments, scientists, international organizations, donors — is essential. Representatives of all the stakeholder types should then come together to discuss individual and collective problems, analyse one another's viewpoints, and come up with practical solution options.

The stakeholder approach to management is participatory. It can be slow. But it is steady, sure and systematic. It not merely widens awareness, it narrows differences, reconciles conflicting viewpoints, facilitates solutions.

During its Third Phase, BOBP introduced the stakeholder approach to tackling an impressive diversity of fisheries management problems in the Bay of Bengal region.

In the Maldives, an Integrated Reef Resources Management programme was drawn up by the government, following a landmark first-of-its-kind national workshop in 1996, because of the need to protect reef resources, which are critical for the food and livelihood security of this archipelago. Follow-up action has been proceeding on many fronts.

- In Sri Lanka, numerous interests and groups were brought together to discuss ornamental fisheries in the

island, which are vital for biodiversity and export earnings. To aid the consultation process, two parallel streams of activities was organised. One was to make available the best scientific information on ornamental fishery. Another was awareness-building on the need for management. Many activities were held under both streams. These included seminars among officials, a one-day meeting with ornamental fish divers, discussions with insurance companies about insurance plans for divers, a trade fair and seminar on ornamental fisheries, preparation of identification catalogues on ornamental fish and an elaborately researched review of the "Status and Trends of Exported Ornamental Fish Resources and their Habitats in Sri Lanka".

In Bangladesh, the problems posed by two resource-endangering but employment-intensive fisheries — the push net and the estuarine set bag net — were examined by stakeholders at all levels. Coastal Members of Parliament were roped in for a full day's meeting for the first time to appraise them of a fisheries problem whose solution lay outside the fisheries sector. Public hearings organised by the government on the two fisheries practices led to useful suggestions to contain resource damage (pages 6-9). Alternative income-generating activities for the push-net collectors were discussed. BOBP's approach and methodology have been adopted by two international development agencies — the UNDP and the DFID — who have formulated projects on the basis of BOBP effort. In fact, UNDP formally invited BOBP to help the design process to make it participatory.

- In Thailand, work done by the BOBP-supported community-based fisheries management (CBFM) project was featured in a UNDP book of "success stories" on sustainable development. CBFM has come into force in 110 fishing villages of Phang-Nga Bay where overfishing and resource stress were serious problems. Examples of the impressive package of CBFM management measures: ban on trawls and push nets within 3 km of the shoreline; construction and installation of community spawning cages; culture of finfish, oysters and mussels; voluntary surrender of resource-damaging push nets by fisherfolk in return for gillnets; installation of artificial reefs to keep

out trawlers and aggregate fish around the reefs; mangrove reforestation; sea ranching; construction of a floating pontoon on the sea; setting up of a multi-purpose community learning centre; empowerment of fisherfolk to serve as voluntary rangers to monitor fisheries and ensure compliance with management effort.

In India, training provided on the stakeholder approach has helped improve the data base on fisheries and the knowledge base on participatory training and management. Officials say that BOBP-supported training has eased implementation of other fisheries projects as well, by strengthening interaction and rapport between government extensionists and the fisherfolk. It has increased the confidence of government staff in confronting the myriad problems they face in their day-to-day work.

In Kanniyakumari district, Tamil Nadu, fisherfolk identified and prioritised their infrastructure needs as part of a pilot activity. Another project used the tool of Geographic Information Systems (GIS) to produce maps of fishing intensity in Kanniyakumari district. These helped define overlaps in fishing effort by different types of fishing craft. Both activities brought different groups of fishermen together in an effort at conflict resolution.

In Andhra Pradesh, useful extension literature on shrimp culture has been published in the local language. Stakeholder consultations have led to positive ideas to overcome problems with shrimp culture — such as setting up clusters of farmers to modify the water drainage system; culture of alternative species, such as crab, and different shrimp species, such as *Penaeus indicus*; and waste treatment to reduce environmental hazards and improve management. Through another activity, a comic book produced by the Aquaculture Foundation of India with BOBP support and technical assistance provides guidelines to small-scale farmers on sustainable shrimp culture.

In West Bengal, government staff acknowledge the usefulness of PRA (participatory rural appraisal) methods introduced by BOBP, as a tool for data collection and situation analysis.

In Malaysia, a BOBP-supported project on the Pulau Payar Marine



Reef resources management was a major activity in the Maldives



Stakeholder consultation and analysis was the thrust of Third Phase work in all member-countries. Here is a meeting among stakeholders in Bangladesh



A community-based fisheries management project in Phang-Nga bay, Thailand, was very successful. Cage culture was one of the components of the project



Information generation and dissemination has been a major activity in all three phases of the BOBP. The well-equipped library in Chennai has stimulated both research and pilot activities.

Park, Kedah state, has led to valuable lessons for the region on the management of marine parks and marine protected areas. Thanks to the project, fishers around the park can now fish all the year round, instead of just for three months. Fish stocks seem to be increasing. The project implemented a Special Area Management Plan (SAMP) for the park, and tested strategies to strengthen eco-tourism and ensure resource sustainability. The project's workshops and activities have led to useful knowledge about the "carrying capacity" of the park, about integrating land and water management, about underwater biodiversity in the Pulau Payar Park, which is a treasure house of marine wealth.

In Indonesia, problems to be addressed by BOBP were inadequate management and enforcement, resource conflicts between groups of fishermen, collection of wild seed to feed the growing mariculture industry, and pollution. BOBP adopted a two-pronged strategy: it promoted CBFM concepts at the national level, and organised several stakeholder consultations and technical inputs at the local level. A well-researched study was carried out of traditional community-based fisheries management systems in six provinces. This will soon be published. Another useful outcome of BOBP effort: a major project supported by the Asian Development Bank (ADB) grew out of the community-based participatory approach promoted by the BOBP.

Says Indonesia's Director-General of Fisheries "BOBP can be a short-cut to us for learning from countries like Thailand and Sri Lanka." The Programme's work will help propel Indonesia's future thrust in fisheries management.

Information and the BOBP

The BOBP has kept up a rich tradition of documentation in the print and audio-visual media. The print output as of today includes 70 issues of the popular pictorial quarterly newsletter, *Bay of Bengal News*; some 275 technical reports, manuals and booklets; annual fisheries calendars illustrated with sketches, which are in perennial demand both for their elegance and their utility; and about a dozen telling posters on management issues. An elegant colour brochure on the BOBP brought out during the late 1980s won a national award for design and printing.

The Programme's audio-visual output includes a dozen video films, several audio-visuals and photo exhibitions. A packet of two CD-ROMs that contain the entire print output of BOBP is at an advanced stage of production. It will be replicated for wide dissemination early in 2001. This pair of CD-ROMs is eagerly awaited everywhere.

The BOBP library is an invaluable aid to research and reference. It includes fisheries literature in book, magazine and report form, including much-sought-after FAO and UN reports. The library also houses some 25 000 color slides and 5 000 negative wallets originated by the BOBP – which should constitute the

biggest pictorial collection on small-scale fisheries in the region.

A major BOBP achievement relates to training and the sharing and exchange of ideas and experiences. Even some years ago, it was estimated that BOBP's training courses, workshops, seminars, and consultations at various levels had added up to several thousand man-years of training. Over the years, most senior fisheries officials of the seven member-countries have at some time or the other enriched their knowledge, skills and contacts through the BOBP.

The BOBP represents a co-operative, multi-disciplinary and truly international endeavour. Staff and consultants of BOBP have been drawn from many countries besides the seven member-countries. These include Denmark, Japan, Sweden, Norway, Germany, Holland, Belgium, France, UK, USA, Canada and Singapore. They have been remarkably successful in studying and understanding the conditions and the culture and the problems of countries far different from their own, and in solving these problems.

The success of the BOBP is mainly that of its member-governments and of national institutions in each country. It is their knowledge, contacts and experiences that have enabled the BOBP's impressive record of achievement.

But the success of the BOBP is mainly that of its member-governments, the national institutions and the national staff in each country. It is they who implemented the Programme's activities. It is their knowledge of the national and local scene, their grassroots contacts and their past development experiences that enabled the Programme to carry out so many activities in member-countries with such an impressive record of success.

As pointed out in the June 2000 *Bay of Bengal News*, efforts are on to ensure that BOBP evolves into an IGO from 2001. An IGO will ensure the logical progress of the BOBP – an institution which means much to fisherfolk, officials and scientists of the region; to governments and NGOs; to regional exchange and co-operation; and to the success of sustainable fisheries development and management in the Bay of Bengal region.

The BOBP's Most Popular Technical Reports: A Subjective Recall

More than 275 technical reports in different series have emanated from the BOBP during the past 21 years. They enrich government libraries as well as institutional and individual book collections within and outside the region. Here's a nostalgic flashback on the "best-sellers" among BOBP publications, to use the expression of BOBP's first director Lars Engvall.

BOBP/WP/2, "Inventory of kattumarams and their fishing gear in Andhra Pradesh and Tamil Nadu" by T R Menon, was the first published paper of its kind on kattumarams. Its extensive photo documentation generated immediate and wide interest. The book quickly ran into a second edition.

BOBP/REP/5, "Report of the workshop on social feasibility in small-scale fisheries development" was a report with a difference, presenting the workshop's proceedings and conclusions in short sentences and paragraphs. Perhaps the easy-to-read style endeared it to audiences. The paper was reprinted twice to meet demand.

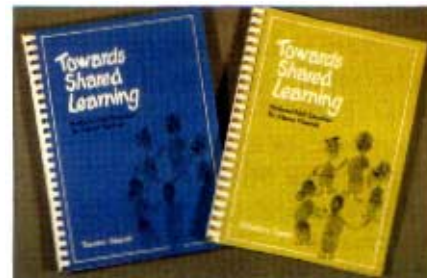
Our well-researched and documented papers on fisheries resources have been widely circulated and extensively cited in technical literature. BOBP/REP/10.1 and 10.2, about the Consultation on Stock Assessment for Small-Scale Fisheries in the Bay of Bengal, held in Dhaka, Bangladesh, in 1980, and BOBP/WP/8, "Current knowledge on shelf resources in the Bay of Bengal" were written by the late Dr. B T Antony Raja. They constituted an excellent summation of resource knowledge in the region; no wonder the response to all three, particularly BOBP/WP/8, was heavy and worldwide. Several other publications on fishery resources have been in continuing demand – for example those on hilsa, mackerel and tuna in the middle and late 1980s (BOBP/REP/36, BOBP/REP/39, BOBP/REP/40, BOBP/REP/41, BOBP/WP/31, BOBP/WP/35). BOBP/WP/58, "Shrimp fisheries in the Bay of Bengal" by M Van der Knaap, and BOBP/WP/59, "Fishery statistics in the Bay of Bengal" by T Nishida, were best-sellers

on the strength of their title alone! A paper that attracted a great deal of attention was BOBP/WP/53, "Atlas of deep-water demersal fishery resources in the Bay of Bengal" by T Nishida and K Sivasubramaniam. Also significant were two papers based on reef fish resource surveys in the Maldives – BOBP/WP/64 and BOBP/WP/80.

The BOBP was the first organization in the region to systematically record, produce and disseminate factual and analytical information on women in fisheries. No wonder all such publications generated heavy demand. Examples: BOBP/REP/4, "Report of women in small-scale fisheries of the Bay of Bengal"; BOBP/REP/24, "Fisherwomen's activities in Bangladesh: a participatory approach to development," by Patchanee Natpracha; BOBP/REP/27, "Activating fisherwomen for development through trained link workers in Tamil Nadu, India" by Edel Drewes; BOBP/WP/14, "Three fishing villages in Tamil Nadu: a socio-economic study with special reference to the role and status of women" by Edel Drewes; and BOBP/REP/21, "Income-earning activities for women from fishing communities in Sri Lanka", also by Edel Drewes.

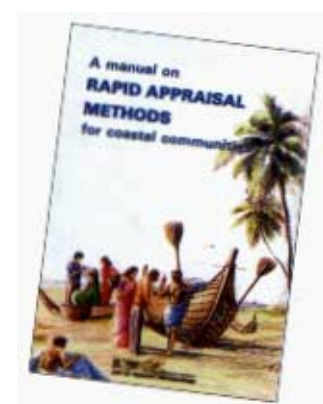
Publications on BOBP's extension work created quite an impact. Topping the list is BOBP/REP/32, "Bank credit for artisanal marine fisherfolk of Orissa, India", by U Tietze which anyone concerned with institutional rural credit anywhere in the world has heard about.

Other best-sellers were the report on non-formal education in Tamil Nadu, BOBP/REP/29 (by L S Saraswati and P Natpracha), as well as BOBP/MAG/1 and BOBP/MAG/2, a trainer's manual and an animator's guide respectively concerning non-formal education for Tamil Nadu fisherfolk, both of which were full of appealing sketches. BOBP/REP/31, "In-service training programme for marine fisheries extension officers of Orissa" by U Tietze, explained the strategy and the implementation of a unique training programme.

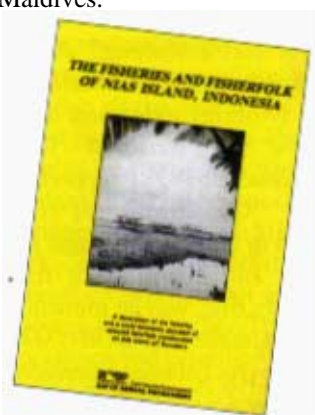


BOBP/REP/60, "Increasing fisherfolk incomes through group formation and enterprise development in Indonesia," BOBP/REP/65, "Learning by doing in Bangladesh" and BOBP/REP/68, "Fisheries extension services: learnings from a project in Ranong," all three by Rathin Roy, reported on revealing, trend-setting fisheries extension activities executed by national fisheries departments with BOBP support. BOBP/MAG/9, "Guidelines for fisheries extension in the Bay of Bengal region", by Inge Jungeling, with its self-explanatory title, was an immediate hit. Equally valuable was BOBP/MAG/15, "Guidelines for fisheries extension in the coastal provinces of Thailand."

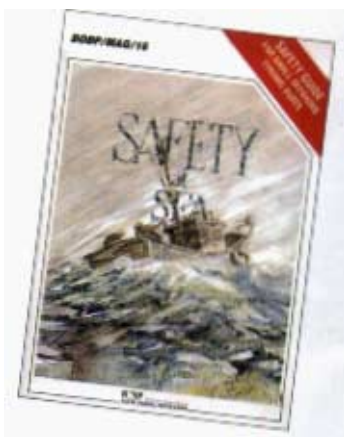
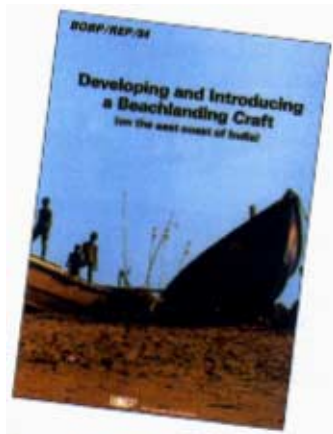
General informative analytical papers about fisherfolk have always attracted wide interest. One of the first to make a splash was "Fishermen's co-operatives in Kerala: a critique" by John Kurien. The paper's case-study annexe about the evolution of a people's movement in Marianad, Kerala, attracted wide notice. BOBP/MAG/6, "Rapid rural appraisal methods for coastal communities – a manual" by Philip Townsley, a lucid well-written guide to that ubiquitous data collection tool, RRA, is in demand even



in Africa and Latin America. BOBP/MAG/6, "Helping fisherfolk to help themselves: a study in people's participation" described a year's work carried out by BOBP—literature searches as well as pilot activities and case-studies. This book was out before "people's participation" became the buzzword it is today. BOBP/MAG/19, "Management of fisherfolk micro-enterprises" (a manual for training of trainers) by V Muthu, P S A K Padam and D Bhatnagar, contained a wealth of information. BOBP/WP/78, "The fisheries and fisherfolk of Nias Island, Indonesia," was a lively socio-economic study. BOBP/WP/76, "Status and needs of fisherfolk: Vaavu, Meemu and Faafu atolls" was an invaluable contribution to knowledge about fisherfolk of the Maldives.



Fishing technology to raise incomes and living standards was a high priority during the first phase of BOBP, and copious literature was generated, particularly through working papers on fishing craft and gear. Improvements and innovations were tried out with large-mesh driftnets in Bangladesh and Sri Lanka, with bottom longlines in Sri Lanka, with high-opening bottom trawls in Tamil Nadu, India, with set bagnets in Bangladesh, with beachcraft in India and inboard motorization in



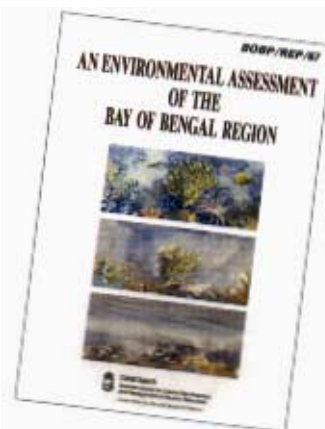
India, Bangladesh and Sri Lanka. Fishing technologist G Pajot kept up a prolific stream of papers about the findings of BOBP's experimental activities. The paper BOBP/REP/54, "Developing and introducing a beachlanding craft on the east coast of India," by V L C Pietersz, reviewed and analysed the many-faceted work on beachcraft and the learnings and lessons from it.

Two general papers on fishing craft – BOBP/WP/27, "Reducing the fuel costs of small fishing boats," and BOBP/MAG/16, "Safety at sea – safety guide for small offshore boats" – both by Oyvind Guibrandsen, made an invaluable contribution to knowledge in a vital area. The second paper generated considerable interest in Japan; private companies there asked for a few hundred copies of the publication. BOBP/WP/23, "Review of experiences with and present knowledge about fish aggregating devices," by Magnus Bergstrom, compiled and collated information about FADs of all types from all over the world. This profusely illustrated publication quickly ran into a second edition which also got "out of print" very soon.

Many significant publications related to post-harvest fisheries. Examples: BOBP/WP/68, "By-catch from Indian shrimp trawlers in the Bay of Bengal" by Ann Gordon, and BOBP/WP/85, "Processing and marketing of anchovy in the Kanniyakumari district of South India" by T W Bostock, M H Kalavathy and R Vijaynidhi. During the second half of the 1990s, the UK-funded post harvest fisheries project of BOBP brought out post-harvest overviews of Bangladesh, Sri Lanka and India's east coast. Some other publications related to cycle fish traders in Sri Lanka, rural credit in Bangladesh, fish containers for women

fish vendors of Tamil Nadu. A number of extension leaflets on post-harvest fisheries in English and local languages were found very useful by fisherfolk and NGOs.

Aquaculture also generated a rich crop of literature. During the first and second phases, 27 papers were published on the culture of shrimp, seaweed, oyster, cockle and crab in India, Bangladesh, Sri Lanka, Malaysia and Thailand. As many as 13 of them dealt with shrimp, shrimp feed or fry. BOBP/REP/28, "Small-scale aquaculture development project in South Thailand: results and impact" by E Drewes, discussed and analysed the most successful activity of the BOBP's first phase. BOBP/REP/51, "Report of the seminar on mud crab culture and trade" provided very exhaustive coverage on the biology and natural resources, seed supply, culture techniques, trade and economics of the mud crab *Scylla* sp. The report is sought after even today by prospective crab farmers and aquaculturists.

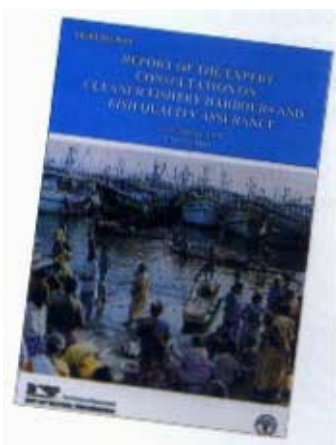


BOBP/REP/67, "An environmental assessment of the Bay of Bengal Region" by Dr Staffan Holmgren, documented the problems of environmental degradation in coastal ecosystems in the Bay of Bengal. This publication remains one of the most exhaustive and detailed summations of the environmental status of countries around the Bay of Bengal.

A factual series on the "general description" of the "marine small-scale fisheries" of some member-countries did much to enhance the BOBP's visibility in the region. BOBP/INF/8, "Marine small-scale fisheries of Bangladesh: a general description" received accolades far and wide as an invaluable source of reference and information, perhaps because of the dearth of information on

the subject till then. The seven publications in this series are incomparable as a source of basic, factual and statistical information.

Among publications of the Third Phase, one of the first was also one of the most valuable. BOBP/REP/71, "Towards sustainability: needs and concerns of aquatic resources and fisheries in the Bay of Bengal region and project ideas to facilitate their sustainable development", provided the basis for the Programme's thrust in member-countries during this phase. Another comprehensive document that covered the whole region was of course the report of the mission that studied the learnings from the Third Phase. BOBP/REP/85, "Learnings of the Third Phase of the Bay of Bengal Programme for Coastal Fisheries Management, 1994-1999" by G L Preston and Y S Yadava, contained findings and insights that should be immensely useful to officials, planners and donors.



Third Phase documentation is strong in regional studies and workshop reports. BOBP/REP/74, "National workshop on fisheries resources development and management in Bangladesh" is a 320-page tome — weightier for its information than its size. It is regarded as a must for anyone concerned with fisheries in Bangladesh. BOBP/REP/76, which discussed integrated reef resources management in the Maldives; BOBP/REP/81, based on the "Smart Partnerships" workshop in Malaysia; BOBP/REP/82, about a workshop held in Indonesia on the precautionary approach to fisheries management; and BOBP/REP/86, which reported a symposium held in Malaysia on the management of marine protected areas, were full of useful information. They

discussed ideas and findings not widely known till then. BOBP/REP/84, based on the Chennai consultation on cleaner fishery harbours, was the final report in a series of publications of facts and figures and analysis about the IMO-supported project on the subject.

Mention must be made of the newsletter *Bay of Bengal News* — which has been quite unique in the region as a professional fisheries newsletter. BOBP's technical specialists found very early that summaries of their reports in *Bay of Bengal News* were read more widely and generated more feedback than the technical reports themselves. Some of them acknowledged that the requirements of the newsletter made them rethink their writing style. Officials within and outside the region have often said the fisheries periodical they most look forward to is *Bay of Bengal News*.

This note on popular BOBP publications is random and selective — and subjective,



based on memory recall. But all BOBP publications meet high standards in content, composition and presentation. Bringing out these reports, and making them available far and wide, has been a labour of love.

SR Madhu



Management of Invasive Alien Species

The growing impact of invasive alien species on the world economy and environment needs to be addressed as a priority area by governments scientists and world bodies like the WTO

A four-day Conference on Management of Alien Species was held during 2-5 December, 2000 at the M S Swaminathan Research Foundation in Chennai, India. It was jointly organized by the M S Swaminathan Research Foundation, Chennai, CABI Bioscience, U.K., the Ministry of Agriculture, Government of India, and the Ministry of Environment and Forests, Government of India.

The scope of species invasions is global and the cost is enormous, in both ecological and economic terms. Invasive alien species are found in all taxonomic groups. They include viruses, fungi, algae, mosses, ferns, higher plants, invertebrates, fish, amphibians, reptiles, birds and mammals. They have invaded and affected native biota in virtually every ecosystem type on earth. Many hundreds of extinctions have been caused by invasive aliens, especially under island conditions, either on real islands or in ecological islands, such as aquatic

ecosystems. The ecological cost is the irretrievable loss of native species and ecosystems,

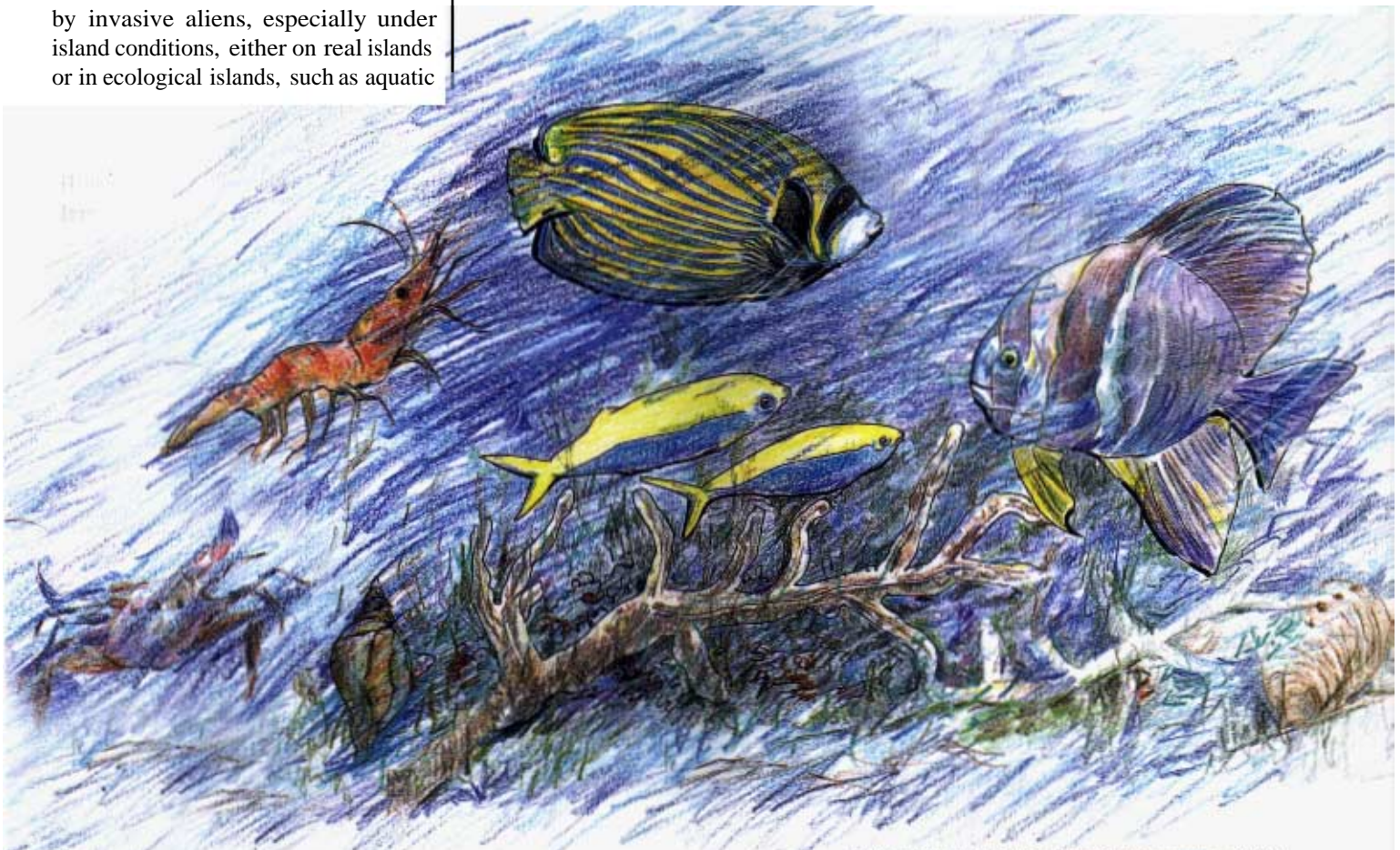
Most introductions of alien species are benign, in fact agriculture depends heavily on the introduction of new plants and animals. However, a small proportion of species which are introduced become invasive, and threaten agricultural sustainability and environmental conservation.

The Convention on Biological Diversity (1992) recognizes invasive alien species as the second greatest threat to the conservation of biological diversity, next to habitat destruction. Alien pests, diseases and weeds have long threatened agricultural production. However, with a dramatic growth in world trade as well as air sea and ground transportation over

the past decade, the introduction of new alien pests is accelerating at an unprecedented rate. The growing impact of invasive alien species on the world economy and environment needs to be addressed as a priority area by governments and their representatives to the Convention on Biological Diversity and the World Trade Organization.

New initiatives in quarantine, including regional facilities, are needed to prevent undesirable new introductions. There is a long history of successful management of agricultural invasives through eradication and biological control, and a record of innovation at the local community level in management of invasive weeds.

The Conference on Management of Invasive Alien Species brought together



a wide range of technical expertise on invasive species problems affecting forestry, agriculture and aquatic systems, as well as experts from agencies responsible for prevention and management. The findings of the Conference represent a significant advance in the synthesis and analysis of invasive alien species problems in the region. The following conclusions concerning priorities for the next stage were arrived at.

Filling Knowledge Gaps

In order to address the growing threat of invasive alien species, there is an urgent need to fill gaps in our understanding of the problem. A database of information on the nature and extent of invasive alien species problems in India needs to be assembled. Research is required to accurately measure the social, ecological and economic impacts of invasive alien species. There is a particular need to understand invasive species as they affect communities and landscapes at a local level, documenting traditional ecological knowledge and community perceptions as a basis for designing management strategies. Prevention and management require new research into new tools for risk assessment and control, as well as backstopping from an improved taxonomic capacity.

Taking Action

Urgent action to address invasive alien species is required at the local, state, national and regional levels. Across all these levels, there is an immediate need to raise awareness, particularly by providing information and demonstrating impact. Rapid implementation of new and improved quarantine standards is required to prevent new invasions and the spread of existing problems. Action should be taken to eradicate or control biological invasions which currently threaten sustainable development and environmental conservation, before their spread generates greater losses and increases future costs of control. Throughout, a participatory approach, involving all stakeholders, is required.

Recommended: ACTION PLAN

- **Awareness**

The greater the public awareness of the threats of invasive alien species

to bio-diversity and food and health security, the greater will be the success of efforts to manage them and to prevent further introductions. Awareness leads to analysis, and analysis leads to action. Voluntary codes of conduct could be observed by the travelling public and by those engaged in the import and export trade of agricultural commodities. Public awareness stimulates public action. Mass media, both printed and electronic, can play a major role in generating awareness and action.

- **Research**

There is an urgent need to fill gaps in our knowledge of invasive alien species and the problems they create. Research is required to measure the social, economic and ecological impact of invasive alien species, as well as to evaluate traditional ecological knowledge at the local level. New technologies will be required for prevention and management, including methods for risk assessment and control. There is a need for an improved taxonomic capacity.

- **Action at the Local and Provincial Levels**

Awareness-raising and training is required at the local administrative level and with NGOs, to empower communities in the detection, monitoring and management of invasive alien species affecting local land and water resources. Participatory action research projects should be initiated, engaging indigenous knowledge and involving NGOs and communities in invasive alien species management.

There is a need at the state level to build institutional capacity for

research into biological invasions and their prevention through quarantine and management. Appropriate legislation needs to be reviewed and/or formulated. A specific initiative is required on domestic quarantine and the inter-state movement of invasives.

- **Action at the National Level**

At a national level, there is need for a high degree of co-ordination and co-operation. Government should inform the general public of the threats posed by invasive alien species and establish a national database which identifies existing and potential problems, their distribution and consequences. Action to implement existing legislation should be expedited, including a review of quarantine regulations. Existing legislation should be extended, or new legislation developed, to cover areas of risk not yet addressed.

- **Action at the Regional and Global Levels**

Invasive alien species problems do not respect borders. By their very nature, they may require international co-operation to limit spread or find solutions. Regional co-operation should be strengthened for concerted action on shared invasive species problems or threats and for harmonization of national legislation.

International co-operation will enhance and accelerate a national response to invasive alien species. The Global Invasive Species Programme, a co-operative project between CABI Bioscience, IUCN and other international organizations, may be approached to assist with the development of databases, toolkits and collaborative projects and with training on quarantine, risk and impact assessment and management.

Invasive species issues relating to trade in agricultural and other products should be addressed in the context of the World Trade Organization and the Sanitary and Phyto-Sanitary agreement.

We invite readers to write!

We request feedback from readers about the articles and features in *Bay of Bengal News*. We also invite you to contribute articles on topics related to small-scale fisheries in the Bay of Bengal region. We reserve the right to edit articles as necessary

Editor

Y S Yadava

Recent BOBP Publications

BOBP/REP/87 An acoustic approach to resource mapping of Pulau Payar's coral reef: by Lee Wah Sze, George Chong and Mohd Pauzi bin Abdullah

This report discusses a new approach, the hydro-acoustic method, to map the reef substrate of four islands at the Pulau Payar marine park in Kedah state, Malaysia. The Rox Ann Hydroacoustic Signal Processing System, which is a state-of-the-art hydroacoustic remote sensing tool, was used to carry out the reef mapping exercise. Its aim: to document the diversity of coral growth forms at Pulau Payar, map and quantify coral resources, and prepare an update on the status of coral reefs at Pulau Payar.

Over the years, coral survey techniques have depended heavily on the SCUBA method which is considered risky, time-consuming and costly. Further, it is impossible to produce a broad-scale map with the SCUBA diving method. The authors believe that the "new, repeatable and non-destructive hydro-acoustic survey approach" heralds a new era in coral studies.

BOBP/REP/88 A Review of the Status and Trends of Exported Ornamental Fish Resources and their Habitats in Sri Lanka: by SU KEkaratne

The capture, breeding and export of ornamental fish (to some 25 countries) is an important industry in Sri Lanka. It generates jobs, incomes and foreign exchange. But it also triggers concern. The collection of ornamental fish for export could have a detrimental impact on the rich but fragile ecosystems of the island, such as coral reefs, that teem with marine life. During its management-oriented Third Phase, the BOBP was requested by the Government of Sri Lanka to help facilitate improved management of the ornamental fish sector.

Working with the Ministry of Fisheries and Aquatic Resources, the BOBP sought to promote consultation and negotiation among various stakeholders in ornamental fisheries. These included as many as 15 Ministries, various exporting finns, their suppliers, and the ornamental fish divers who collect and sell ornamental fish. To aid the consultation process, two parallel streams of activities were launched. One aimed at strengthening knowledge of the ornamental fishery and giving stakeholders the best available scientific information. Another stream aimed at awareness-building on the needs, benefits and methods of management.

This report strengthens both streams. It reviews the status and trends in the export trade of ornamental fish species. It contains lists of marine and freshwater species, including endangered species, and information on their population, ecology and distribution. It briefly discusses the impact of the export effort on resources.

BOBP/INF/15 BOBP Third Phase Publications (1994-2000)

This report contains brief descriptions of publications brought out by BOBP during its Third Phase, along with photographs. Fisheries officials and scientists and librarians will find this a useful reference publication.

The following four publications report on activities carried out by BOBP in Tamil Nadu during its Third Phase.

BOBP/MM/1 Basic Needs of 39 Coastal Fishing Communities in Kanniyakumari District, Tamil Nadu, India: A Survey to Investigate and Prioritise Problems Regarding Services and Infrastructure: by Rene J C Verduijn

What do coastal fishing communities of Kanniyakumari district regard as their main priority needs? This document discusses the conduct and the results of a BOBP survey of the perceptions of 39 coastal fishing communities, carried out as part of the Programme's work in applying the stakeholder approach to coastal fisheries management in Kanniyakumari district.

BOBP/MM/2 Qualitative Analysis of Fishing Intensity and Fishing Behaviour in Kanniyakumari district, Tamil Nadu, India: by Barbara Bierhuizen

This book presents the rationale, conduct and findings of a 1997 survey on the fishing intensity and fishing behaviour of three different groups of fishermen who operate kattumarams, vallams and mechanised boats from all coastal fishing villages of Kanniyakumari district. The report carries a number of maps that show the fishing areas and overlaps in fishing areas between the three groups of fishermen. The tool of Geographic Information Systems (GIS) was used to map the fishing behaviour and the fishing intensity.

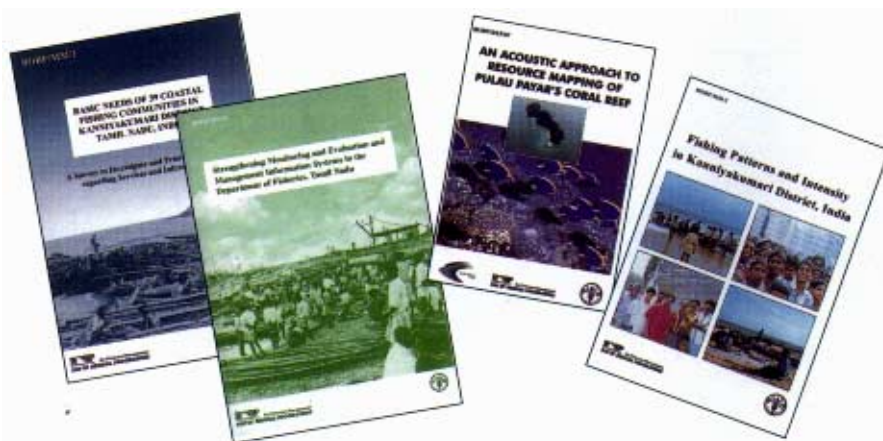
BOBP/MM/3 Skill Gaps and Training Needs Analysis of the Department of Fisheries, Tamil Nadu, for Sustainable Development and Management of Fisheries

What are the skills needed in the Department of Fisheries, Tamil Nadu, to meet the goal of sustainable fisheries development and management? What are the gaps in skills that need to be filled? What training needs have to be met? This paper discusses the rationale, the conduct and the findings of a BOBP-supported study on the subject.

BOBP/MM/4 Strengthening Monitoring and Evaluation and Management Information Systems in the Department of Fisheries, Tamil Nadu

This is the report of a study organised by BOBP for the Department of Fisheries, Tamil Nadu, and carried out by Om Consultants, Bangalore. It discusses methods to improve and streamline monitoring and evaluation and management information systems in the DOF in the context of the need to strengthen fisheries management in Tamil Nadu. A useful contribution of the report is a Logical Framework Matrix evolved for activities of the DOF at a participatory workshop, and a selection of objectively verifiable indicators.

The report proposes that an MIS cell be set up in the headquarters of the DOF.



Development of Fishing Harbours in India*

by Y S Yadava¹ and K Omprakash²

Introduction

India has a long coastline of 8 118 kms covering the east and west coasts of the peninsula as well as the Andaman & Nicobar and Lakshadweep group of islands. India's Exclusive Economic Zone (EEZ) covers an area of 2.02 million sq km. The exploitable marine fishery resources in the EEZ have been estimated at 3.9 million tonnes. There are an estimated 3 937 fishing villages all along the Indian coastline, and fish is being landed at 1 896 landing centres. The fishing fleet comprises about 54 000 mechanised fishing vessels (MFVs) and 225 862 traditional craft (including 44 578 motorised craft). Besides, there

are about 170 deep sea fishing vessels with a length of 23 meter and above.

Continuous efforts have been made to increase fish production, both for domestic consumption and exports. The total fish production from inland and marine sectors has increased from 3.84 million tonnes (mt) in 1990-1991 to 5.26 mt during 1998-1999. The provisional figures for the period 1999-2000 are 5.66 mt. Marine production has accounted for about 2.70 mt during 1998-1999. There has been a significant growth in the export of marine products – from 139 419 tonnes valued at Rs. 8 934 million³ in 1990-1991 to 302 934 tonnes valued at Rs. 46 269 million during 1998-1999.

To increase production and productivity in fisheries, the Fisheries Division of the

Department of Animal Husbandry and Dairying, Ministry of Agriculture, Government of India (GOI), has been undertaking various production-oriented schemes, input supply programmes, infrastructure development projects, etc., either directly or through the states/union territories. A number of institutions have also been established for development of fisheries in the country.

Development of Fishing Harbours and Fish Landing Centres

Landing and berthing facilities – a historical perspective

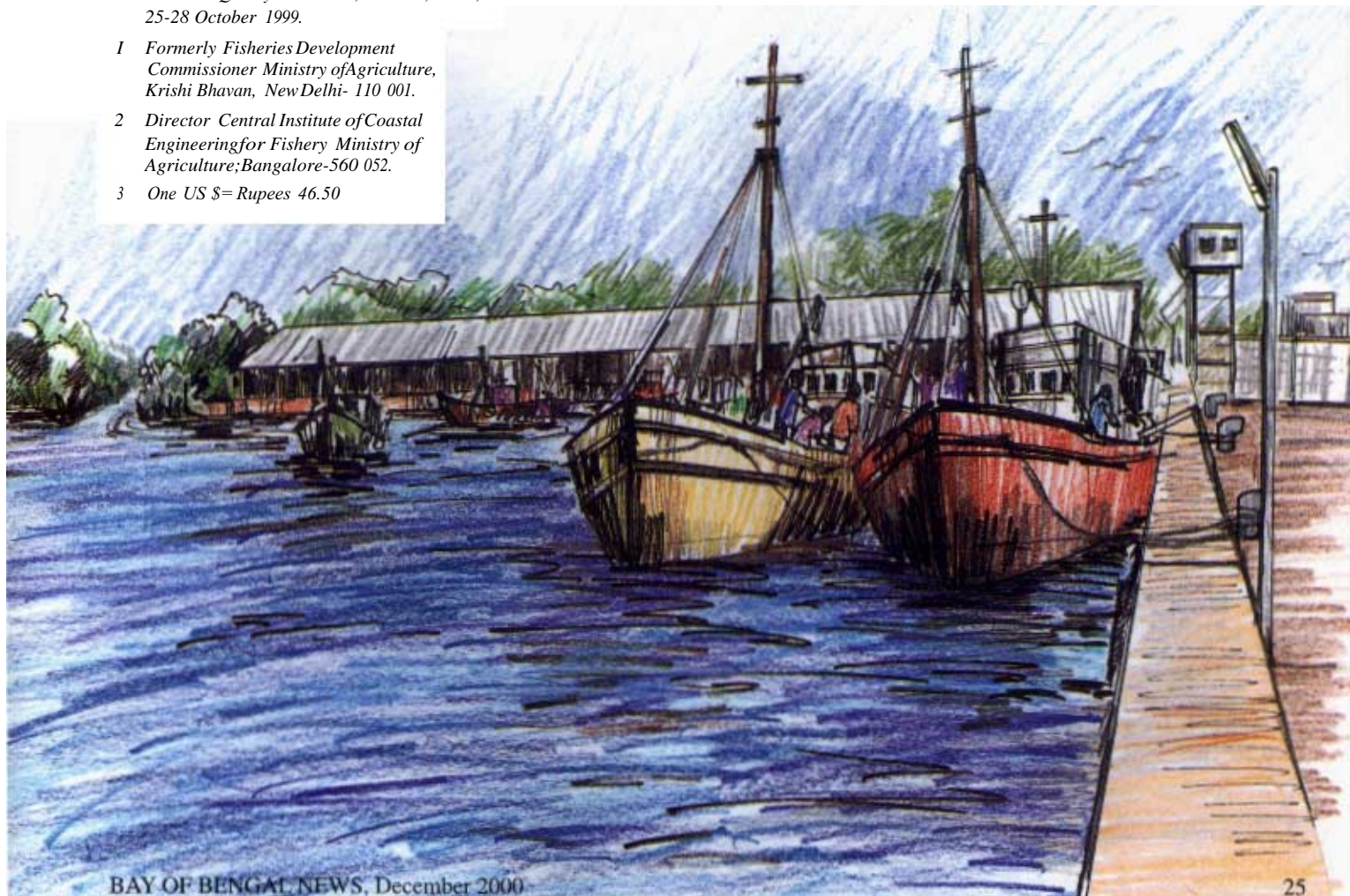
It was during the Second Five-Year Plan (1956-1961), that the GOI began to give technical and financial assistance to state governments for setting up fishing harbours, and sought assistance from the

* Excerpts from the paper presented at the BOBP/FAO-IMO Regional Expert Consultation on Cleaner Fishery Harbours and Fish Quality Assurance, Chennai, India, 25-28 October 1999.

¹ Formerly Fisheries Development Commissioner Ministry of Agriculture, Krishi Bhavan, New Delhi- 110 001.

² Director Central Institute of Coastal Engineering for Fishery Ministry of Agriculture; Bangalore-560 052.

³ One US \$ = Rupees 46.50



FAO for survey and preparation of feasibility reports. Between 1956 and 1961, FAO experts identified some 40 sites for development of fishing harbours and fish landing centres and prepared feasibility reports. During the Fourth Five-Year Plan (1969-1974), the GOI, with the assistance of FAO/UNDP, established the erstwhile Pre-Investment Survey of Fishing Harbours at Bangalore for pre-investment surveys, preparation of techno-economic feasibility reports and related work in fishing harbour construction and development.

During the Second, Third and Fourth Five-Year Plans, emphasis was laid mainly on the construction of minor fishing harbours and fish landing centres. During the Fifth Plan (1974-1979), the construction of major fishing harbours at Sassoon Dock, Cochin, Chennai, Visakhapatnam and Roychowk was sanctioned. The development of fishing harbours and landing centres continued subsequently in the Sixth, Seventh, Eighth and Ninth Five-Year Plans.

Fishing Harbours Developed under Foreign Assistance

An Integrated Fisheries Project was formulated with World Bank and GOI assistance in 1977 by the Gujarat Government to support development of marine fisheries in the state. Under this project, Veraval and Mangrol were developed as full-fledged modern fishery harbours. In Karnataka, two fishing harbour projects — Karwar under Indo-Norwegian assistance and Tadri under Indo-Danish assistance (DANIDA) — were implemented. The Karwar project was completed in 1972 and the Phase I and II of the Tadri Project were completed in July 1992 and July 1995 respectively. One fish landing centre at Bahabalpur in Balasore District of Orissa was also constructed under NORAD assistance during 1986-1987.

Government of India Schemes

The Department of Animal Husbandry and Dairying, GOI has been implementing a Central Sector Scheme (CS) and a Centrally Sponsored Scheme (CSS) since 1964 to provide infrastructure facilities for landing and berthing of MFVs, traditional and



motorised fishing craft and deep sea fishing vessels. Under the CS, the Port Trusts are provided with 100 % grant on the capital cost for the development of major fishing harbours at major ports.

Under the CSS, maritime state governments are provided with 50% grant on the capital cost for development of minor fishing harbours and fish landing centres. The construction, subsequent management and maintenance of the facilities are the responsibility of the respective state governments. The union territories are provided with a 100% grant under the scheme. However, during the Ninth Five-Year Plan, the two schemes have been combined, with the funding pattern remaining the same.

Under the CS, Government has so far sanctioned six major fishery harbours - Cochin Stage I and II in Kerala, Sassoon Dock in Maharashtra, Chennai Stage I and II in Tamil Nadu, Visakhapatnam Stage I, II and III in Andhra Pradesh,

Paradip in Orissa and Roychowk in West Bengal. All the six major fishing harbours have been completed⁴. Under the CSS, the GOI have sanctioned 48 minor fishery harbours and 171 fish landing centres. Of these, 33 minor fishery harbours and 130 fish landing centres have been completed and the remaining are under various stages of construction.

Procedures Adopted for Setting up of Fishing Harbours

Investigations and Preparation of Techno-Economic Feasibility Reports

The Central Institute of Coastal Engineering for Fishery (CICEF), Bangalore, was established in January 1968 by the Government of India in collaboration with the FAO. The primary objective: to carry out reconnaissance surveys/pre-feasibility studies to identify

⁴Some minor works are pending in respect of the fishing harbours at Sassoon Dock and Chennai Stage II.

potential sites for development of fishing harbours and follow it up with engineering and economic investigations besides preparation of techno-economic feasibility reports. The Institute has been entrusted with the task of monitoring the progress of construction of ongoing fishing harbours sanctioned under the GOI schemes and provide technical advice on the engineering and economic aspects to the state governments! union territories.

CICEF, which is the nodal institute for fishing harbour development in the country had prepared a master plan for the development of fishing harbours in the country during the period 1978-1981. A total number of 117 fishing harbour sites were identified at that time. The master plan has been subsequently reviewed and updated by identifying more sites.

Environmental Clearance

The harbour proposals are referred to the Ministry of Environment and Forests, Government of India, for environmental impact assessment. The Pollution Control Board of the concerned state and

the Ministry of Environment and Forests examine and assess the environmental impact of the project. It is also mandatory for all the project proposals to have a component on environmental protection.

Construction, Management and Maintenance of Harbour Projects

The six major fishing harbours have been constructed by the respective Port Trusts and the management and maintenance is also their responsibility. For the minor fishing harbours and fish landing centres, a Central Monitoring Committee has been constituted in each state for monitoring the progress of sanctioned projects. The Committee periodically monitors construction activities and resolves bottlenecks arising during construction. After completion of the project, the management and maintenance of fishing harbours is carried out by the respective state governments! union territories.

Post – Investment Evaluation

Post-investment evaluations of the completed fishing harbour projects are undertaken by CICEF. The evaluation is conducted to:

- assess the degree of utilisation of facilities provided at the harbour
- quantify the stream of benefits arising out of the facilities created
- draw broad conclusions regarding the ultimate impact of such facilities on the standards of living of the fishermen community and
- assess the need for future development/ expansion.

Issues in Construction, Management and Maintenance

At the end of the First Five-Year Plan, there were 863 MFVs operating along the Indian coast. Presently, there are about 54 000 MFVs and 44 578 motorised fishing crafts. The landing and berthing facilities commissioned so far can only meet the needs of a quarter of the total fishing fleet, resulting in over-crowding and a host of other accompanying problems. Therefore, there is an imperative need to develop more fishing harbours and landing centres to meet the requirements of the existing fishing fleet.

The fishing harbour projects sanctioned by the GOI have a definite completion

Brisk activity at the Royapuram fishing harbour, Chennai





Bird's eye-view of a minor fishing harbour

date. However, availability of the right type of equipment, labour and materials, selection of an experienced contractor to execute the project and the timely availability of funds are some of the constraints impeding completion of the projects within the stipulated time period. In many cases, a poor approach road, non-availability of electricity and water supply, and natural calamities like cyclones and adverse weather conditions also lead to cost/time over-runs.

Most fishing harbours are not properly maintained, due to lack of management and inadequate revenue collections. After the harbours are commissioned, the responsibility of maintenance and management is vested with the user agencies. Revenue is being collected regularly in only a few fishing harbours. In some, the revenue collected is too meagre for proper management and maintenance. Adequate funds are essential to maintain the facilities especially dredging. In the absence of

regular maintenance dredging, the basins of many harbours can be utilised only during the high tide, resulting in congestion and partial utilisation of the facilities.

The hygiene and sanitation conditions in most of the fishing harbours and fish landing centres are below the normal specifications. This is partly due to inadequacies in the design and construction of the facilities and partly due to poor maintenance. The user groups are largely responsible for the poor state of hygiene and sanitation. Accepted standards of hygiene and handling of fish demand that these facilities be maintained strictly, and that contamination of fish be kept down to a minimum.

Suggestions

The fishing harbours in India need to be modernised to meet minimum international standards necessary for fish quality assurance. Special design

approaches need to be adopted to meet the requirements of standards laid down by HACCP and ISO 9000. To help enhance the returns in the fishing industry, the following factors need immediate attention:

- Quick handling and transfer of fish catch from vessels to auction halls and then to marketing areas.
- Collection and safe disposal of solid and liquid waste from the auction hall and other land-based facilities.
- Adequate supply of fresh water free from contaminants for cleaning and handling of fish.
- Suitable design approaches for construction of modern auction halls and allied facilities for hygienic handling of fish at a faster rate.
- Economic and low-cost inputs for efficient fish handling and transportation channels in fishing harbours.
- Periodical maintenance dredging of approach channels and harbour basins for uninterrupted vessel traffic, speedy landing, handling and quick disposal of fish catch to markets.
- Collection of appropriate user charges for generating revenues required for keeping the establishment self-sustainable.
- Greater awareness on hygiene and sanitation among user groups, including the harbour authorities.
- Involvement of NGOs in awareness programmes and setting up of dedicated harbour management agencies.

⁵ For modernisation of the existing facilities, the GOI has allocated a budget in the Ninth Five Year Plan @ Rs. 4.0 million for a minor fishing harbour and Rs. 2.0 million for a fish landing centre. This would be a one-time assistance to the states/union territories.



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 fisheries communities in the member countries. The BOBP is sponsored by the governments of Denmark and Japan and by member governments in the Bay of Bengal region. The main executing agency is the FAO (Food and Agriculture Organization of the United Nations).