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World Fisheries Conference 1984



June-July 1984 will witness a landmark event : the first World Fisheries Conference in Rome, which 152 FAO member-nations are expected to attend. In the exclusive interview that follows, J. E. Carroz, Secretary General of the Conference, discusses its significance with Marie-Christine Comte of the FAO Information Division.



Q: Mr. Carroz, how did the idea for the FAO World Conference on Fisheries Management and Development come about?

A: The idea of the Conference arose in 1979 when the Director-General of FAO launched a comprehensive programme to assist developing countries in the management and development of their fisheries under the new regime of the sea. The programme anticipated the formal adoption of the United Nations Convention on the Law of the Sea in December 1982. The Convention gives coastal States national jurisdiction over the living resources in the waters extending 200 miles offshore, the so-called exclusive economic zones. Over 95 per cent of the present world catch of sea fish is taken within these zones.

The suggestion that a World Fisheries Conference would be both timely and useful was further discussed by the FAO governing bodies. In the course of these discussions, it was agreed that we should go beyond the original idea of examining the scientific and technical aspects of the new situation and that we should look at the role of fisheries in national economies with a view to increasing the contribution of fisheries to food production, to achieving national self-reliance in food and even to attaining overall world food security. This means of course that we will consider inland fisheries and aquaculture, as well as marine fisheries. Adding production from inland waters and aquaculture, the total world catch of fish is presently about 75 million tons per year. When you compare this figure with the 140 million tons of meat produced each year, it gives you some impression

of the importance of the contribution of fish to food supplies.

Q: What are the objectives of the Conference?

A: Given the general aims just outlined, FAO member countries have set three main objectives: first, the better use of fish resources from the social, economic and nutritional points of view; second, greater self-reliance of developing countries in marketing and developing their fisheries and lastly the encouragement of international cooperation, not only between developed and developing countries but also among developing countries themselves.

Q: At which level will countries attend the Conference?

A: It is primarily for the countries themselves to decide at which level they want to be represented. But we have made some suggestions. As you know, the Conference will be held in two parts. At the first phase of the Conference, constituted by an extended session of our Committee on Fisheries in October this year, countries should ideally be represented by their senior administrators in fisheries, accompanied by advisors since the discussions will be mostly at the technical level.

In contrast, at the policy phase of the Conference in June 1984, it is hoped that countries will be represented at a very high level, preferably the ministers responsible for fisheries. Moreover, since the Conference will look at the question of development and management of fisheries in the context of general economic development plans, it

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A Letter from the Publisher

POST-HARVEST TECHNOLOGY

In the second session of the Committee for Development and Management of Fisheries in the Bay of Bengal or BOBC (report on pages b-7), considerable interest was shown in the subject of post-harvest technology including marketing. In identifying additional areas for donor support to BOBC's support programme, this subject received the highest rating.

It was therefore natural that the Committee strongly endorsed the scope of a regional post-harvest technology project being considered for funding by 'the UK's Overseas Development Authority (ODA) as a welcome supplement to the other projects in the Bay of Bengal region being funded by SIDA and UNDP.

In the early phase of the SIDA-funded project for development of small-scale fisheries, fish utilization was one of the subjects being tackled, but was dropped after a couple of unsuccessful activities. Reasons for the failures included inadequate homework and wrong site selection for the activities. The main reason for discontinuing fish utilization work, however, was that small-scale fisherfolk might benefit more from production-related activities. This conclusion was based on the assessment that among the really small operators along the coasts, post-harvest losses are sporadic and not significant. Remedial measures are therefore difficult. Examples : The cost of facilities to accommodate gluts will exceed the benefits derived. And if a product can be improved by more hygienic processing, the small producer is not likely to benefit in the foreseeable future. If there is any price increase, the trader is likely to reap the benefits and the fisherman will most likely end up as a loser with higher handling and processing costs. These examples seem to be typical though there are of course exceptions.

The main problems of post-harvest technology occur in the "medium-scale fisheries" between the traditional and the industrial sectors, where

small trawlers, purse seiners, gill netters, etc. operate with inadequate facilities for handling and preservation of produce. The perennial problems of utilizing by-catch from the trawl fishery and the handling of bulk catches of small pelagics from purse seines are the most striking examples here.

Equal in importance to problem-solving is the search for new opportunities; this is valid for all the sectors : small, medium and large. In the BOBC meeting, reference was made to the need for product development and marketing to enable better utilization of hitherto unmarketed and non-conventional deep-water species.

Another challenge is the identification and development of products for specific markets. Sharkfins, bechede-mer and Maldivian fish are known examples. Less known is the case of dried jew fish exported to Hong Kong from Cox's Bazar in Bangladesh where the fish is caught by longline from small traditional craft. There should be, many more such opportunities in the region for matching products with markets. One of these may be in aquaculture. In some of the countries, conditions for aquaculture are ideal but markets for the produce are absent. Promotional activities to link producers with potential buyers would be welcome.

A subject that does not necessarily come under post-harvest technology but is often closely related to it is feed for aquaculture. It is one of the crucial factors for expansion of aquafarming, and needs urgent attention.

There is obviously plenty to do in the field of post-harvest technology, and we hope that the proposed ODA project materialises soon. It will make a useful contribution to better use of the existing fishery resources. LARS O. ENGVALL



BAY OF BENGAL NEWS is a quarterly publication of the Bay of Bengal Programme (BOBP).

The BOBP is a regional fisheries programme executed by the Food and Agriculture Organisation of the United Nations (FAO) and funded by the Swedish International Development Authority (SIDA) and the United Nations Development Programme (UNDP). It covers countries bordering the Bay of Bengal.

The BOBP's main aims are to develop, demonstrate and promote appropriate technologies and methodologies to improve the conditions of small-scale fisherfolk, and to assess and monitor fishery resources.

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WORLD FISHERIES CONFERENCE 1984

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would be valuable if other ministries were represented, for example the ministry of planning, the ministry of trade and the ministry of foreign affairs.

I must emphasize that this is the very first World Conference on Fisheries Management and Development, and it really will be worldwide because invitations have been sent to all the 152 FAO member nations. In addition, steps have been taken to invite countries that are not members of FAO, for example the Soviet Union. This is important because the Soviet Union catches nearly 10 million tons of fish a year out of the world catch of 75 million tons.

Q: *What will be the relevance of the Conference for the Bay of Bengal countries?*

A: Fisheries are quite important to the Bay of Bengal coastal countries, which have been catching over 6 million tons of fish annually in recent years. That represents approximately 8 per cent of the world fish production. However, one should note that there are about 900 million people in the area, approximately 20 per cent of the world population. Consumption varies considerably from one country to the other: 40 kg per person in Malaysia, 25 kg in Thailand, which is fairly high considering that the world average is 12-13 kg. But on the other hand, consumption in India is only 3 kg; this is a question of tradition and culture, but also a problem of supplies and distribution.

Another characteristic of the region is that fisheries are mostly small-scale giving employment to millions of artisanal fishermen. The main exception is Thailand. Actually, Thailand is an interesting case, because it has developed extensive

offshore fisheries and is one of the very few developing countries that has been disadvantaged by the new regime. Some of its traditional fishing grounds are now under the jurisdiction of other countries with which it must negotiate access.

Q: *Will access agreements be among the issues at the Conference?*

A: Yes, because you cannot discuss the implementation of the new regime of the oceans without discussing the problems of conditions of access to fishery resources in exclusive economic zones. One of the basic principles of the new regime is that the coastal State has to assess the size of its fish resources and determine the allowable catch; then, it must determine how much of that catch it can harvest itself. In the event that the coastal State is not in a position or does not want to exploit all these resources, then subject to the terms and conditions it may lay down, it is requested to grant access by other countries to the surplus resources. This usually involves the negotiation and conclusion of bilateral agreements or joint venture arrangements. As you will appreciate, this is an important issue with political as well as economic implications.

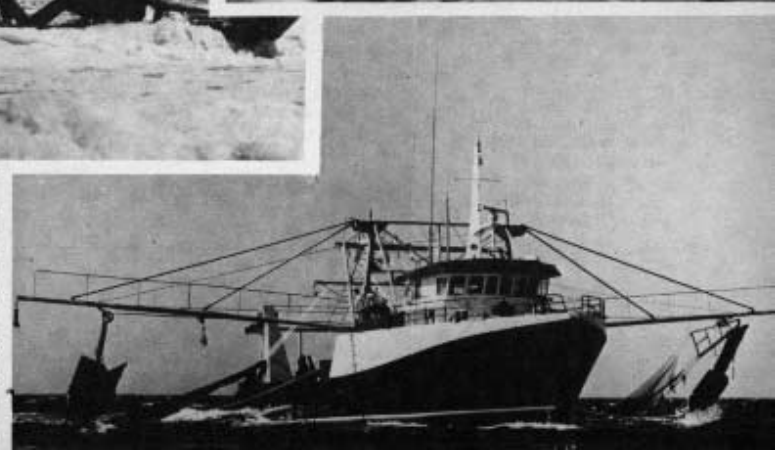
Q: *Another issue at the Conference is inland fisheries and aquaculture. Why is that?*

A: All the recent FAO regional conferences attached great importance to the inclusion of inland fisheries and aquaculture among the

subjects to be discussed at the World Fisheries Conference. Not only are there some 30 land-locked countries in the world; but inland fisheries are very important to many coastal states as well, especially in the Bay of Bengal where the proportion of fish catches from lakes and rivers is high in regard to the total fish production. In the case of Bangladesh, it is nearly 90 per cent, in India 40 per cent, in Burma about one third. One cannot nowadays consider the potential role of fisheries without including inland waters and aquaculture.

Q: *What is expected to come out of the Conference?*

A: Two specific results that are anticipated are agreement upon a strategy — meaning a series of principles and guidelines — for the management and development of fisheries at various levels, national, sub-regional, regional and world-wide, and associated concrete action programmes. Four such action programmes have already been suggested: One on technical assistance in fisheries, one on training, one on investment in fisheries and another on trade in fish and fish products. There might be others of course. In fact, Norway



has suggested a special programme to promote the increased use of fish in helping alleviate undernutrition. The strategy and the action programmes will be formulated in the period between the two phases of the Conference, taking into account the technical discussions in October this year and in close consultation with governments, donor agencies and financial institutions.

Q: *Could you give us more details about the Action Programme on Training?*

A: All developing countries are seeking to acquire greater self-reliance in the special skills required for fisheries management and development. What is needed is a more systematic approach to the planning and carrying out of training programmes in a wide variety of technical and other skills. Whilst the main responsibility for training must rest with national administrations, there is a continuing need for international assistance to supplement their efforts. The proposed action programme is expected to increase such assistance, particularly with regard to aquaculture, small-scale fisheries and utilization of fish.

Q: *Trade is an important question in this part of the world. What will be the main components of the Action Programme on Trade?*

A: The basic objective of this Action Programme is to help developing countries obtain a greater share of international trade in fish and fish products. The detailed proposals include assistance in market and product research, the provision of regional fish marketing information services, such as the one already established by FAQ in the Asia and Pacific region and based in Kuala Lumpur, and steps to assist in removing barriers to trade in fish and fish products. This programme should be of particular interest to countries in the Bay of Bengal, because some of them, for example India, Malaysia and Thailand, already have sizeable exports of fishery products.

Q: *Finally, Mr. Carroz, what are your personal hopes for the conference?*

A: I would hope that the Conference will help to focus attention on the present and potential role of fisheries. The food problem is one of the gravest issues facing the world today and fisheries can make a valuable contribution to solving the problem. I mentioned earlier that the total world fish catch is about 75 million tons. Our experts believe it would be possible to raise this catch to perhaps 100 million tons a year. This will require not only improved management of the fisheries, but



Mr. I.E. Carroz, Secretary General of the World Fisheries Conference.

also their better utilization. For example, it is estimated that 5 to 10 million tons are lost every year because of insect infestation or poor transport and preservation methods.

I believe that the Conference, through the exchange of experience and technical knowledge, but in particular through the proposed Strategy and Action Programmes, could be instrumental in helping to achieve these aims.

In all these aspects, FAQ has a central role to play. It has a wealth of expertise and experience, which is channelled to developing countries through national and regional field projects. It has also established a unique network of regional and sub-regional bodies to facilitate international cooperation in fisheries management and development. The Bay of Bengal Committee and its associated development programmes are striking examples. I very much hope that the World Fisheries Conference will further reinforce these efforts by FAQ, not only in the Bay of Bengal, but also in other developing regions of the world.



Bay of Bengal Committee meets in Madras

Covelong (Kovalam in Tamil) is a fishing village 40 km from Madras on the way to Mahabalipuram. It was here, at a resort appropriately named Fisherman's Cove, that the Bay of Bengal Committee (BOBC) met August 22 - 24 for its second session.

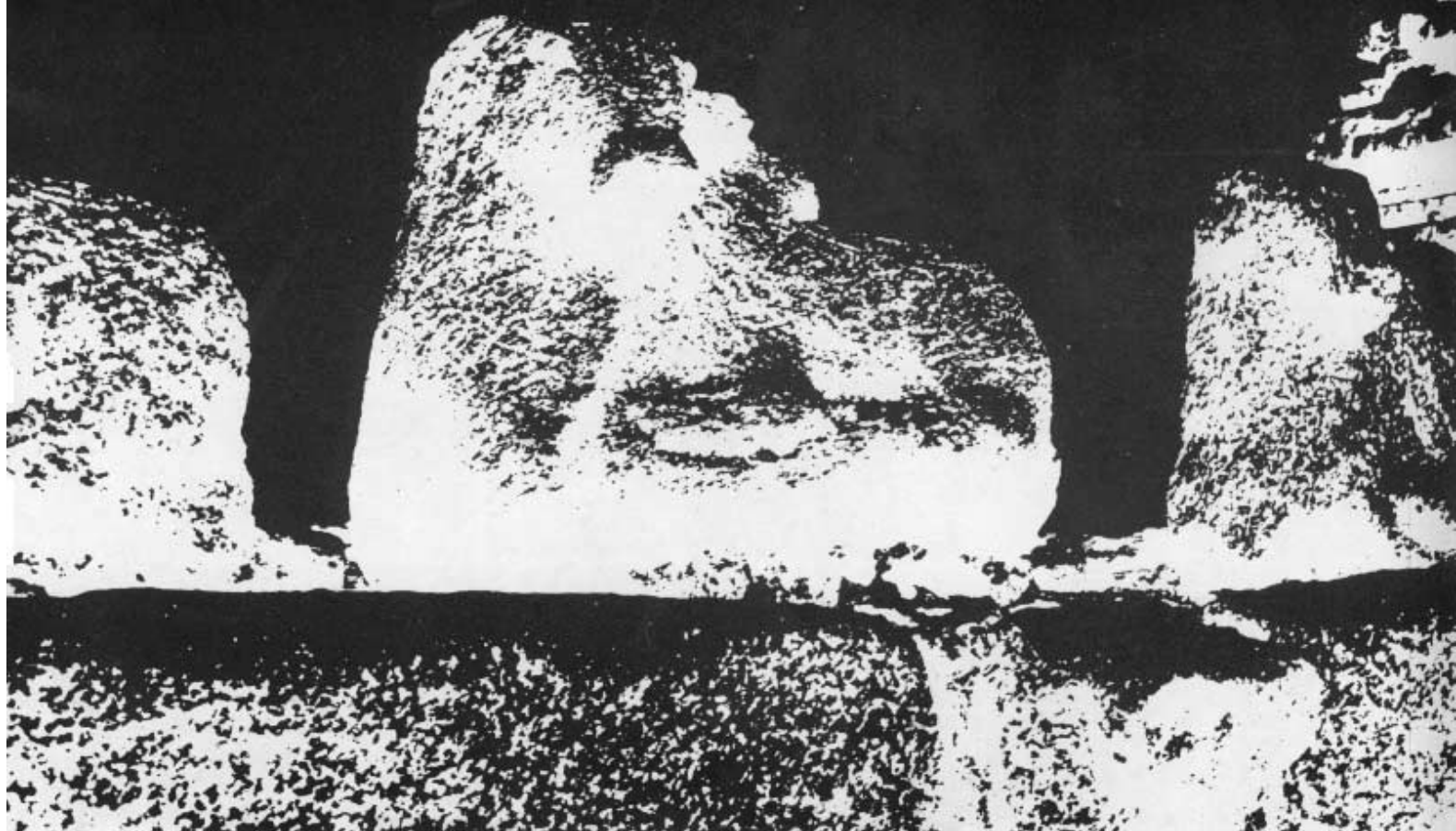
Officially known as the Committee for the Development and Management of Fisheries in the Bay of Bengal of the Indian Ocean Fishery Commission, the BOBC came into being December 1981 in Colombo. It is the supreme advisory and coordinating body for fisheries development and management in the region.

Dignity and simplicity were the hallmarks of the inaugural function.

On behalf of the host, the Government of India, the Government of Tamil Nadu made all the arrangements — which everyone agreed, were as splendid as the view of the Bay of Bengal from Fisherman's Cove. India's Agriculture Minister, Rao Birendra Singh, inaugurated the session in the presence of S R Eradha, Tamil Nadu's Minister for Fisheries. Twenty delegates attended the meeting. They included representatives from five member countries — Bangladesh, India, Malaysia, Thailand, and the Maldives — plus representatives from FAO, UNDP and the BOBP and observers from Sweden and the United Kingdom.

At the end of the inaugural session, delegates witnessed a demonstration of two BOBP beachcraft — IND 20, a fibreglass boat developed for Andhra Pradesh, and IND-23, an aluminium boat. Rao Birendra Singh, who evinced keen interest in the working of the boat, was briefed by Lars Engvall, BOBP director, and Arild Overa, fishing craft engineer.

At the first working session, India was elected chairman and Maldives vice-chairman. It was agreed that they would remain in office till the beginning of the third session. It was also suggested that the third session should be held if possible in conjunction with the 9th Advisory Committee meeting of the SIDA-sponsored small-scale fisheries project, expected to be held in January 1985.



During the Committee's discussion on the status of fishery resources in the region, it was pointed out that a better feedback from fishermen is necessary and that more use should be made of data from artisanal fisheries for stock assessment studies. It was also stated that to further improve statistics and research in fisheries, international assistance in the form of consultants would be required for data processing and retrieval systems. India supported the idea of a workshop on information flow between research scientists and industry managers.

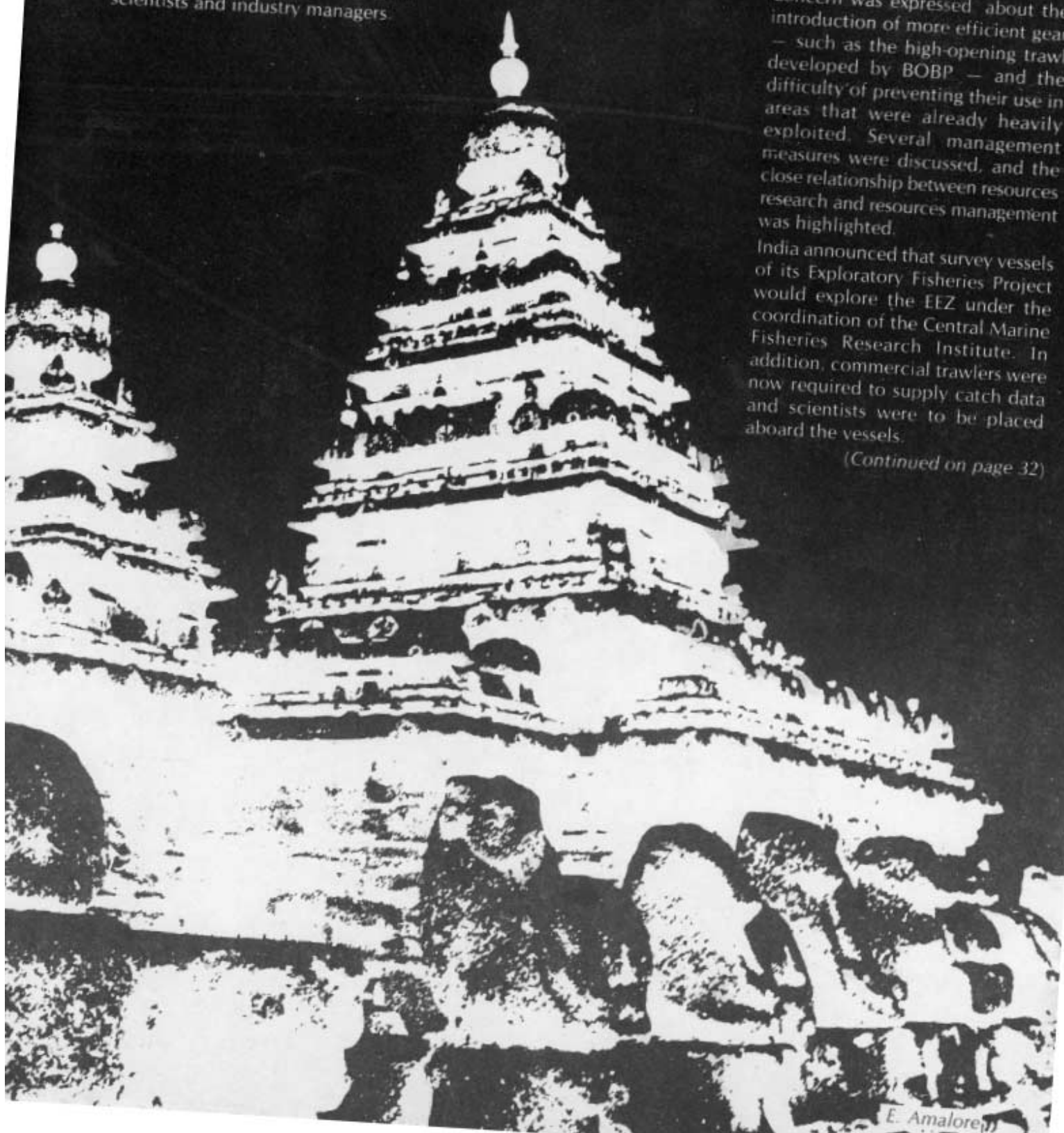
While discussing fisheries management, Malaysia described several steps taken to protect its resources. The minimum trawl codend mesh size had been increased from 25 mm to 38 mm, and trawling was not allowed within a zone of 8 km from the coast. In addition, artificial reefs, consisting of old tyres, were being deployed in certain areas; this had already increased fish stocks.

Thailand referred to attempts to limit the number of trawlers through licencing regulations and the introduction of artificial reefs (fish apartments) which protected certain areas against trawlers besides improving fish stocks.

A query was raised as to whether trawling was always the most suitable fishing method. It was suggested that more selective methods should be studied and perhaps introduced as a resource management measure. Concern was expressed about the introduction of more efficient gear — such as the high-opening trawl developed by BOBP — and the difficulty of preventing their use in areas that were already heavily exploited. Several management measures were discussed, and the close relationship between resources research and resources management was highlighted.

India announced that survey vessels of its Exploratory Fisheries Project would explore the EEZ under the coordination of the Central Marine Fisheries Research Institute. In addition, commercial trawlers were now required to supply catch data and scientists were to be placed aboard the vessels.

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SHARED FISH STOCKS OF THE BAY OF BENGAL REGION

A major concern of the recently started UNDP-funded marine resources project for the Bay of Bengal region is better understanding and exploitation of fish stocks shared between member-countries. The subject was discussed at the first meeting of the project's member-countries in Madras mid-August. Dr B. T. Antony Raja, who acted as rapporteur for the meeting, analyses here the discussion that transpired on the subject and the recommendations made.

The marine fish landings in the Bay of Bengal region are of the order of 2.2 million tonne, constituting 60% of the Indian Ocean catch. A review of current knowledge of exploited fishery resources in the region was made at the Consultation on Stock Assessment for Small-Scale Fisheries at Chittagong, organized by BOBP in 1980. Since then, the Bay of Bengal Committee (BOBC) has been established and its area of coverage has been extended to include the Laccadives, the Maldives and the Indonesian waters in the Malacca Strait and the west coast on north Sumatra. Other recent developments in the area of fishery resources also call for study.

An exercise to supplement and update the existing information on

the subject was therefore recommended at the recent meeting of technical liaison officers of participating countries of the FAO/UNDP project "Marine Fisheries Resources Management in the Bay of Bengal" held in Madras 16-20 August, 1983. The participating countries are Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand.

THE UNDP PROJECT

This inter-country project is funded by the UNDP with an outlay of US \$ 900,000 over four years starting 1983. It is executed by the FAO and is located at Colombo, Sri Lanka. Its immediate objective is to improve the practice of fisheries resources assessment among the participating countries and to stimulate and assist

in joint assessment and management activities between countries sharing stocks. The project activities are expected to lead to

- Overall assessment of the present level of exploitation of the marine fishery resources in the region with estimates of development potential by stocks and by geographical areas.
- better understanding of the socio-economic and social variables in exploitation of shared stocks.
- improved methodology for stock assessment and
- identification of exploitation techniques, management strategies and regulatory measures for selected shared stocks to

facilitate optimum exploitation of the same in the region.

SHARED STOCKS

Fishes know no national boundaries, nor recognize rules and regulations. But the men who harvest them should know about the migratory habits of fish, their behaviour, their relative abundance both in space and time, their biological characteristics, their susceptibility to different fishing techniques and their impact on local socio-economic conditions in order to devise measures for everlasting availability of the resources to all the concerned countries. Stocks which contribute to fisheries of more than one contiguous area are called shared stocks. Whether it is a national stock or a bi-national or multi-national stock, it is the

cooperative investigations are initiated at an early development stage of the fishery.

Two of the intensively exploited areas in the world are the North Atlantic and the North Pacific. Some of the well-known shared stocks of this region are the salmon, halibut, plaice, cod, hake, herring, manhaden, whiting and capelin. In order to regulate the fisheries of this area, international commissions have been set up like the International Commission for North Atlantic Fisheries (ICNAF), the International North Pacific Commission (INPFC), the International Pacific Halibut Commission (IPHC) etc. The commissions of the North Atlantic region in addition obtain scientific advice from the International Council for

"arms" have just emerged from the IOFC. They are the Indo-Pacific Tuna Programme (IPTP), and the project mentioned earlier, Marine Fishery Resources Management in the Bay of Bengal; both of them are funded by the UNDP and executed by the FAO.

TYPES OF STOCKS

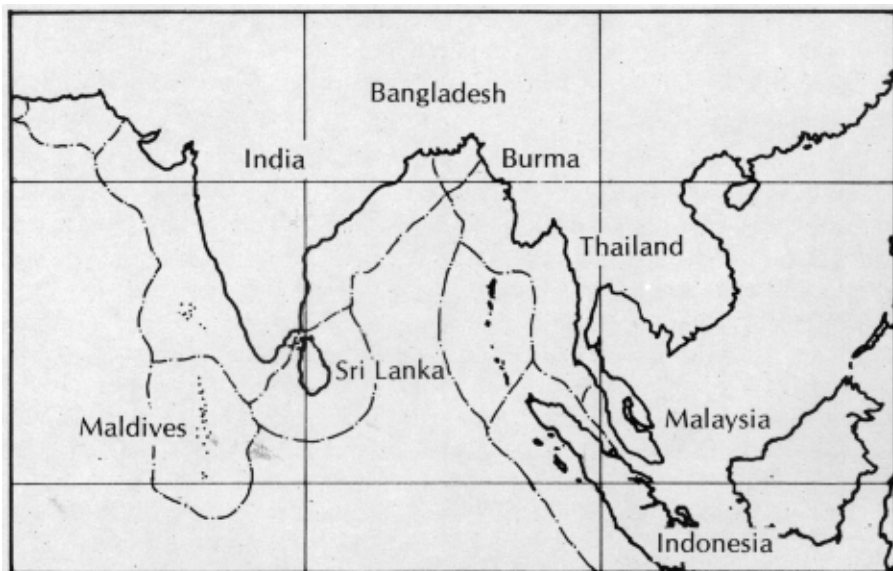
Fish stocks are of different types; at one end of the spectrum are the stocks that lie only within the Exclusive Economic Zone (EEZ) of the country and exhibit migration of localized nature within certain geographical limits. (Example: Indian oil sardine). At the other end are stocks that are caught primarily in the international waters and are not reflected in the catches of the neighbouring countries (Example:

maximum continuing sustained yield that is the aim of fisheries management. It does not matter who harvests the stock as long as it is ensured that the exploitation rate does not reduce the replacement potential of the stock or does not harm certain segments of the stock. While single jurisdiction fishery by itself is not a simple challenge to management, it is more complex in the case of bi-national or multi-national stocks where, besides national interest, different social and economic goals play a vital role. To reap the highest benefit from the shared stocks, bilateral or multi-lateral coordinated studies are necessary, whether the stocks concerned have come under heavy pressure or not. In fact the best advantage is taken when

Exploration of the Seas (ICES). Besides these organizations, specific species-oriented international commissions also exist, such as the International Whaling Commission (IWC), the Inter-American Tropical Tuna Commission (IATTC), the International Commission for the Conservation of Atlantic Tunas (ICCAT). Most of these bodies have been in existence for many years; fisheries management is one of their major responsibilities.

In the Indian Ocean region no such commission exists. The Indian Ocean Fisheries Commission (IOFC), and the Indo-Pacific Fishery Commission (IPFC) under the auspices of FAO, are in effect forums for fisheries promotion and for exchange of information. But two scientific

big-eye tuna). In between, we may have a common stock in the international waters which contributes to fisheries of two or more adjacent countries with or without chances of inter-mingling of stocks in the countries. (Example: skipjack). Early life stages of certain stocks are spent in a more or less similar ecological niche from where later life stages migrate to the EEZs of adjacent countries (e.g. prawns and Hilsa of the upper Bay of Bengal). There may be an exclusive common stock lying between EEZs of two or more countries without any evidence of an international stock to draw support from. (Example: Gulf of Mannar resources of deep sea prawns and lobsters). There may be stocks in adjacent EEZ areas with possibility



Bay of Bengal: Exclusive Economic Zones

of inter-mingling at the boundaries (Example : Mackerels and scads of Malaysia, Thailand and Indonesia in the Malacca strait). A number of independent units of stocks within and between adjacent EEZs are also possible.

IDENTIFICATION OF SHARED STOCKS

The meeting of the technical liaison officers of the project identified five geographical/fishery-oriented areas of mutual interest.

1. Western part of the project area – Maldives, India and Sri Lanka – tuna resources.
2. Palk Strait/Gulf of Mannar – India and Sri Lanka – the trawl fishery, scombroid and carangid resources and deep sea lobsters and prawns.
3. Upper Bay of Bengal – India and Bangladesh – prawn and Hilsa resources.
4. Andaman Sea – India, Indonesia and Thailand – skipjack and longtail tuna.
5. Malacca Strait – Thailand, Malaysia and Indonesia – Pelagic stocks of mackerel and scads and demersal stocks of finfishes and prawns of the lower half of the strait.

1. *Tuna resources of western part of the project area:* In the Maldivian Islands, the overwhelming majority of tuna catch is contributed by the pole and line fishery. In India, the only organized fishery is that of pole and line in the Laccadives. On the other hand, in Sri Lanka the

tuna resources are exploited by driftnet, pole and line, trolling line and longline. While fishing is year-round in the Maldives it is seasonal in the other two areas. Quite reliable estimates of total catch by major species and effort are available in the Maldives but no biological studies have however been made so far. On the other hand, information on certain important biological aspects are available from the waters around

the Laccadives. In Sri Lanka, catch data by major varieties and effort by number of craft and gear and length data are being collected.

It would appear from the existing information that it is necessary to establish a conversion factor which could be applied to the existing data on these resources in the three countries so that a comparable picture of the exploited status of the resources could be obtained. Another priority requirement would be basic biological information on length, weight and maturity and on environmental parameters – especially the temperature gradients.

Maybe the stocks of skipjack, yellowfin and other tunas are independent of each other and are not truly shared by the countries of this region. Yet, even to that conclusion, basic statistical data on catch and effort and biological information on size composition are necessary.

2. *Palk Strait and Gulf of Mannar:* In the Palk Strait, the trawl fishery as a whole depends on the stocks shared by Sri Lanka and India. The immediate concern is the exploited status of prawns and the by-catch.

The trawl fishery in Palk Strait depends on stocks shared by Sri Lanka and India.





In order to make the data comparable between the two countries, calibration experiments would be required. From the Gulf of Mannar side, large pelagics such as scorpenoids and carangids are the resources of mutual interest. The deep sea lobsters and prawns of the continental slope are also likely to be shared by the two countries in the future.

Besides the Malacca Strait, this is the best investigated pocket in the Bay of Bengal region. Yet the fund of data available does not seem to have been fully utilized. A critical comparative study of all the information and data would indicate to what extent the stock estimates obtained by various methods are reasonable and whether any rough conversion factor could be employed to make these estimates mutually comparable. This would in turn pave the way towards solving both short-term and long-term needs: it would help evolve quick and reliable methods of assessing the exploited

resources for initial development planning, it would also help evolve a long-term approach to managing the fisheries of this area.

3. *Upper Bay of Bengal*: Hilsa and prawns are considered as the two most important resources believed to be shared by India and Bangladesh. With regard to Hilsa, it is the anadromous species, *Hilsa ilisha*, that requires attention. As regards prawn resources, the situation appears to indicate a need for simultaneous study of the capture fisheries as well as the culture operations.

4. *Andaman Sea*: Small tunas are obtained as incidental catch in the purse seine fishery in Thailand, Malaysia and Indonesia. But the data are very scanty, precluding any worthwhile deductions from the present information. It is learnt that Thailand and India are scheduled to undertake exploratory work on tuna longlining in early 1984. Analysis of historical information on the efforts made by the distant water fleets of Japan, Taiwan and Korea in the area would

certainly be a rewarding exercise and should receive priority attention.

5. *Ma/acca Strait*: The demersal resources of both finfish and shrimps are of interest to Malaysia and Indonesia. After preliminary evaluation of existing data independently by the two countries, the areas of combined study would probably emerge. Thailand, Malaysia and Indonesia are all interested in the pelagic resources, particularly the fisheries of mackerels and scads. Here also, evaluation of historical data appears necessary although these fisheries have been under investigation by Thailand and Malaysia independently and jointly for some time past. In Indonesia, besides refinement in routine sampling a new set-up has to be established for research sampling. In Malaysia, an increase both in the number of sampling centres and in the frequency of sampling appears desirable. On the other hand, in Thailand, the coverage in respect of centres is found adequate but



the frequency of sampling has to be increased. An area where research sampling needs to be introduced is small-scale fisheries in the near inshore region.

OTHER FEATURES:

In general, the meeting of the technical liaison officers recommended an evaluation of all historical data relating to each of the above regions/resources — both published and unpublished, to the extent possible. Besides the joint interest of shared stocks, delegates recommended identification of activities of purely national importance. It has come to notice that there are a number of publications in the regional languages, especially in Thailand and Indonesia, relating to the fisheries of the respective areas. It would be a sad loss to science if these were to remain unutilized. There may be also information regarding the Bay of Bengal region in other languages such as Chinese, Japanese, Korean, Russian etc. It is therefore desirable that literature pertaining to the region available in languages other than English is translated so as to strengthen the information base for the region.

Good low-cost computers have now become available in the market. To facilitate standardization, quicker assessment of resources and retrieval

of data, a computerized system should be developed.

Of the exploited stocks, the two important resources which are of particular interest to all the countries, both in terms of weight and value, are the prawn and tuna/tuna-like resources, the former yielding about 180 - 190,000 tonne and the latter about 90,000 tonne.

The general picture on prawns is one of declining production in the eastern seaboard of the region, namely in Thailand, Malaysia and Indonesia, in contrast to an increasing trend on the opposite side, in India and Bangladesh. On the east coast of India, the indications are that the resources are exploited to the optimum limit in the south; there seems to be some scope for increased exploitation in the northern part, both by the large shrimp trawlers and the small mechanized boats. In Bangladesh, exploitation has reportedly reached optimum level, hence the need for careful monitoring. Indonesia has taken the bold step of banning trawling operations for prawns, thus accounting for the decline. In all the three countries — Thailand, Malaysia and Indonesia — gillnetting has become very popular with increasing returns. Wherever culture operations are increasing, it is necessary to keep a

close watch on the natural resources required for stocking, so that recruitment to the stock is not affected.

The bulk of the catch of tunas and tuna-like fishes is landed in the Maldives, Indonesia and Sri Lanka. There appears to be plenty of scope for increasing yield both from the western sector as well as the eastern sector of the region. The increase in skipjack and yellow fin tuna has been spectacular till 1981; a sharp drop is, however, expected due to market constraints. Regional cooperation and exchange of information would facilitate faster development of these resources.

One resource which could be of both national interest and bi-national interest is cephalopods (squids, cuttle fish, and octopus). The bulk of the production in the Indian Ocean is taken from the western zone, mainly by the fleet of the Democratic Republic of Yemen and Japan. In the Bay of Bengal region, the only country that produces cephalopods in sizeable volume is Thailand. The present-day production from the Indian Ocean may perhaps be only about 10% of a projected potential of 300,000 tonnes. Perhaps there are stocks of this group in the national waters as well as in the bi-national waters in this region.

Fishermen's day in the Maldives

December 10 is Fishermen's Day in the Maldives. It was celebrated with fervour by the entire nation in 1981 and 1982, and it's not just fishermen who are keenly awaiting the third Fisherman's Day this year!

It was on February 26, 1981 that the President of Maldives, Mr. Maumoon Abdul Gayoom, announced the designation of December 10 as Fishermen's Day. The "day" seeks to improve the status of fishermen in society, push efforts to improve their earnings and living standards, encourage more young people to take to fisheries.

The highlight of the first Fishermen's Day celebrations (1981) was the introduction of fisheries science into the school curriculum. This was meant to impart systematic knowledge on fisheries at an early age. Environmental ecology, fishing technology and fisheries management were part of a curriculum which UNESCO helped develop. A beginning was made in two schools in

the capital, Male, and in two grades. (From early 1983 an Irishwoman, Mrs. Katherine Cunningham, has been engaged to develop fishery science education in schools. The subject will be taught in the higher grades as well).

Also in 1981, an art competition for school children on the theme of fisheries attracted 360 entries from 20 schools and prizes were awarded. The best work was also displayed in an exhibition. Says Maldives fisheries officer Hassan Maniku: "Some of the entries were very imaginative, as only children's work can be. If funds are available we would like to get them published in book form."

Three other events marked the first Fishermen's Day: the release of a special stamp; the launching of a tree-planting scheme to help overcome timber scarcity for boat-building; and the release of *Ras Am* ("a school of fish"), a fisheries magazine. *Ras Am* is meant to promote literature on Maldivian fisheries, which is at present scanty. Copies of *Ras Am* are distributed to all the Maldivian islands, and to school libraries and government offices. It is also available for sale, at 25 rufiya per copy. (Seven rufiyas make one U.S. dollar.) *Ras Am* has now become a regular annual fisheries magazine, and the third issue will be released this year.

The major Fishermen's Day event of 1982 was the starting of two fish marketing warehouses, one in Maafushi, south Male atoll, another in Thulusdhoo island, north Male atoll. The warehouses have been a great help to fishermen, who now dispose of their salted and dried fish at a central place instead of approaching buyers scattered far and wide.

What are the highlights of Fishermen's Day 1983?

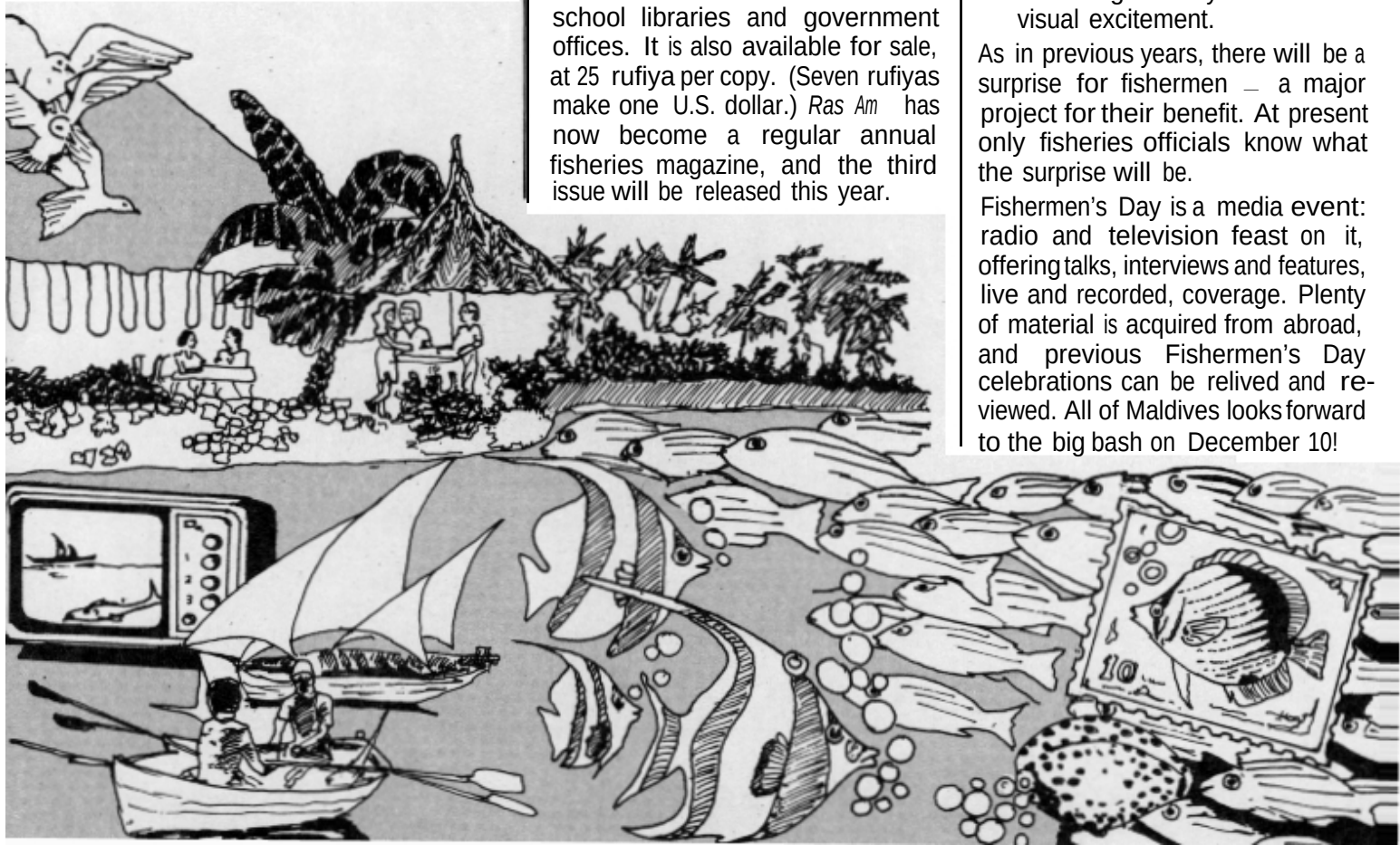
- A handicrafts competition on the theme of fisheries will be held for school children, and the entries will be displayed at an exhibition in Male. A photo exhibition on fisheries will also be held in conjunction with the handicrafts exhibition.

A meeting of officials, leading citizens, fishermen and school children will be held in a school hall in Male.

- The most dramatic event of Fishermen's Day 1983 will be a sailing contest from Male, the capital, to Feliwaru (an island which has a fish cannery) 60 km away, and back. The race is open only to non-powered craft. It will probably start December 8 and end on Fishermen's Day. The contest is obviously meant to promote sail power, besides enriching the day's drama and visual excitement.

As in previous years, there will be a surprise for fishermen — a major project for their benefit. At present only fisheries officials know what the surprise will be.

Fishermen's Day is a media event: radio and television feast on it, offering talks, interviews and features, live and recorded, coverage. Plenty of material is acquired from abroad, and previous Fishermen's Day celebrations can be relived and reviewed. All of Maldives looks forward to the big bash on December 10!



A profile of Indonesian fisheries

Indonesia is the newest member of the Bay of Bengal Committee. This article touches on some of the main features and problems of this resource-rich archipelago.

The Indonesian archipelago is located between two continents, Asia and Australia, and two oceans, the Pacific and the Indian. It consists of more than 13,000 islands of which 944 are inhabited. The main islands are Java, Sumatra, Kalimantan, Sulawesi and Irian Jaya. (Sumatra is the only island that comes under the Bay of Bengal region.) Of the total population of 130 million, about two-thirds live in Java, Madura and Bali.

Seventy per cent of Indonesia's territory is covered by water masses. With the proclamation of the EEZ in 1981, these masses accounted for an area of 5.7 million sq. km. Thanks to the large water mass, Indonesia is rich in fishery resources, both from marine and inland waters. The maximum sustainable yield of the marine resource is estimated at 2.9 million tons (within the limits of the archipelagic waters) and an

additional 1.8 million tons (from the remaining area of the EEZ). The inland open waters which cover 3.7 million hectares are estimated to have a potential of around 0.7 million tons, while aquaculture has excellent potential in an area of 340,000 hectares.

Fisheries production in 1981 was 1.87 million t (about 1.4 million t from marine fisheries and 0.5 million t from inland fisheries; of the latter, 0.3 million t and 0.2 million t were from the capture and culture fisheries respectively). Indonesia ranked tenth among the world's top fish producers in 1981. Fisheries exports amounted to US \$ 231 million.

Indonesia's marine fisheries are complex and varied, because of the diverse characteristics of the archipelago. The bulk of marine fish is produced by more than 250,000 small traditional craft. About 10 per cent of these craft are motorized;

the gear and methods used are for the most part technically unsophisticated, but very well adapted to the behaviour of the fish species.

Indonesia's small-scale fisheries are beset by shortcomings common to this sector in the region such as low level of technical and managerial knowhow; low bargaining position in marketing yields; low financial capability; resource limitations.

More than a hundred species of fish and other marine organisms contribute to fisheries production in Indonesian waters. These are grouped into four categories : crustaceans (primarily shrimp); demersals (e.g. ponyfish, groupers, and snappers); small pelagics (e.g. mackerels, scads, pomfret, sardines and anchovies); and large pelagics (e.g. tunas).

The fishing industry makes an important contribution to the national diet, accounting for nearly

Traditional fishermen in shallow waters off the coast of Java in Indonesia.



two-thirds of the total available supplies of animal protein. The industry provides employment for nearly 2 million men; an estimated total of about 6 million people, between 4 and 5 per cent of the population, depend on the fishing industry for their livelihood. In financial terms, the fishing industry accounts for 1.8 per cent of the GNP. Almost the entire national fish catch is consumed domestically, about half of the marine landings after some form of drying or salting. Small quantities are fermented, smoked, boiled in brine or canned. Fresh water species, on the other hand, are mainly marketed as fresh or live fish. Densely populated Java is the largest market for fish, absorbing not only the entire production of its own fishermen, but also the surplus of other islands.

The fisheries industry has recorded impressive growth since 1969, when the government launched the first of a series of five-year plans. The main objectives of fisheries development are to improve the incomes and living standards of small-scale fishermen and fish farmers; to increase production and productivity; to increase fish consumption, particularly among low-income populations; to increase exports and reduce imports; to exercise better control on the 'utilization and management of fishery resources.

To meet these objectives, the government focussed simultaneously on development of small-scale fisheries, on development of commercial fisheries, and on improving the government fisheries service. In small-scale fisheries, the government programme aimed at increasing production' and improving fish marketing. In commercial fisheries, the objectives were to promote exports and increase foreign exchange earnings. Since valued species such as shrimp and tuna are abundant in Indonesian waters, development of commercial fisheries were directed mainly at these species. Three policies were instituted to assist commercial fisheries development: encouraging private foreign investment, attracting domestic investment, stimulating bilateral and multilateral fisheries loan agreements e.g., with the Japanese Overseas Economic



Breeding carp being put into baskets for transfer to ponds at a fish-breeding farm. (Pictures, courtesy: Photo unit, FAO, Rome).

Cooperation Fund, the Asian Development Bank and the World Bank.

Since the Second Five-Year Plan started in 1974, the government has constructed 24 fishing ports and rehabilitated 144 fish landing centres throughout the country. 'The fishing ports encourage development of potential areas outside Java; facilitate the operation of bigger fishing boats; and improve the existing marketing, preservation and processing facilities.

To support the development of brackishwater fish culture, the government has constructed and rehabilitated 465 km of irrigation canals up to 1981. Three marine shrimp hatcheries, three fresh water shrimp hatcheries and 33 fresh water fish hatcheries have been constructed or rehabilitated to meet the demand for fish and shrimp fry.

Some important landmarks in Indonesian fisheries have been the banning of trawling in 1980, the declaration of the EEZ in March 1980, the introduction of purse-seining in the Java Sea and the Bali strait, and the explosive development of skipjack pole and line fisheries

in the Sulawesi/Maluku area. After the banning of trawlers, shrimp are being caught by bottom monofilament gillnets, trammel nets and modified tidal traps.

The administration, development, and management of fisheries are under the auspices of the Directorate General of Fisheries, Department of Agriculture. Fisheries research and development, on the one hand, and fisheries education and training, on the other, are carried out by two other autonomous agencies within the Department of Agriculture. The Directorate General of Fisheries is divided into five technical divisions which deal with planning; resource management; production; infrastructure development; and fishermen and fish farmers development. In the provinces, the Directorate General of Fisheries is assisted by the provincial fisheries services, which function administratively under the provincial governments. The provincial fisheries services in turn have branch offices in the Regencies (Kabupaten) and extension and other technical staff in lower administrative units.

EXTERNAL ASSISTANCE An Analysis for the Bay of Bengal Region

by V.L.C

What are the funding agencies active in fisheries in the Bay of Bengal region? Who are the recipients? What is the scope of the aid, what sectors does it cover and what is its role in

The eight countries of the Bay of Bengal region — Bangladesh, Burma, India, Indonesia, Maldives, Malaysia, Sri Lanka and Thailand — are developing countries which are not self-sufficient in their capacity to develop and manage their fisheries and have to depend on external assistance to supplement their resources of men, money and material in varying degrees.

External assistance is delivered through some 70 national fisheries projects and programmes. In addition there are two regional projects which exclusively cover these countries, a further five regional projects, seven inter-regional projects and a global project whose activities involve some of them in one way or another.

The purpose of this article is to analyse the parameters of these projects with a view to highlighting the role, scope and salient features of the external assistance currently rendered to the countries of the Bay of Bengal region. The analysis is based on the documentation prepared for the second session of the Bay of Bengal Committee, using available data which may not be complete in every respect, but is considered to be adequate for the purpose of drawing a broad picture of external assistance.

Of the externally funded projects and programmes, 23 are executed by the FAO while the rest are implemented by several bilateral and multilateral agencies. The two groups of projects seem to have several distinct characteristics mainly in regard to such matters as scope and content, funding levels and funding sources. The multilateral sources of external assistance in the region are the Asian Development Bank (ADB), the World Bank affiliates IBRD and IDA, the United Nations Development Programme (UNDP), the Technical Cooperation Programme (TCP) of the FAO and the International Center for Living Aquatic Resources Management (ICLARM).

The bilateral sources are Denmark, Japan, Norway, Sweden, the Netherlands, the United States of America, Canada, Australia, the United Kingdom, Abu Dhabi, the Federal Republic of Germany and France.

The interaction of sources and recipients of external assistance in respect of the national projects — without however any quantitative indications

is shown in

Table 1.

NCE IN FISHERIES

ay of Bengal Region

PIETERSZ

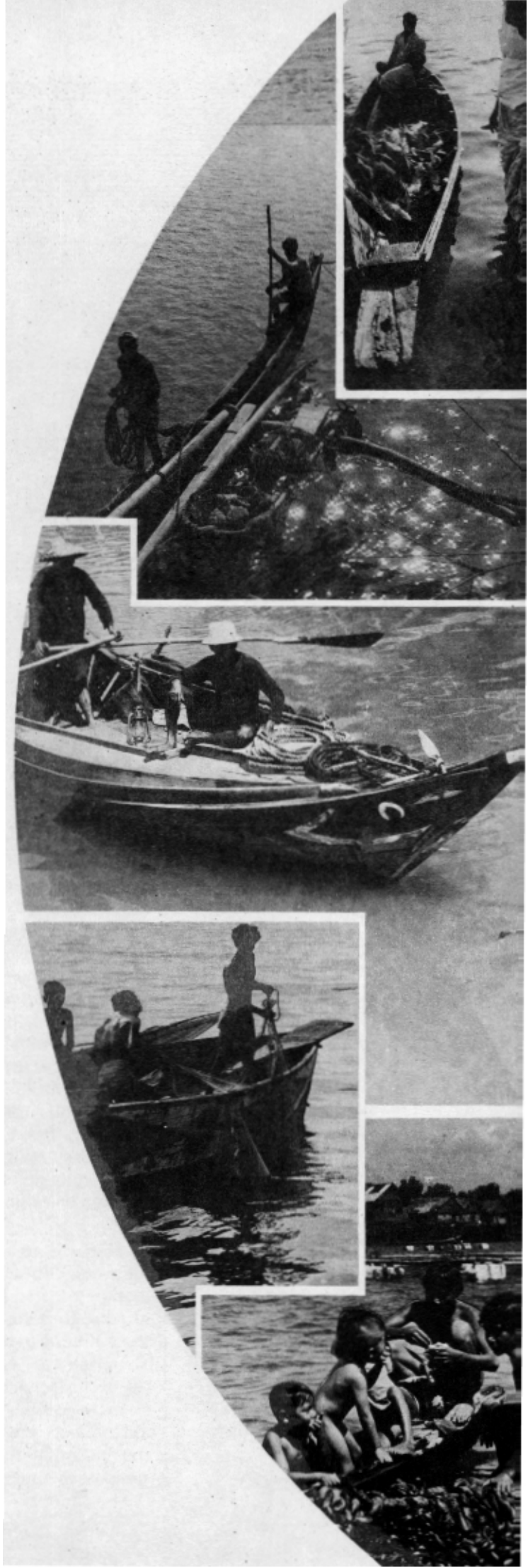
promoting development? The BOBP's Senior Development Adviser deals with these and other questions, using documentation prepared for the Bay of Bengal Committee that met recently.

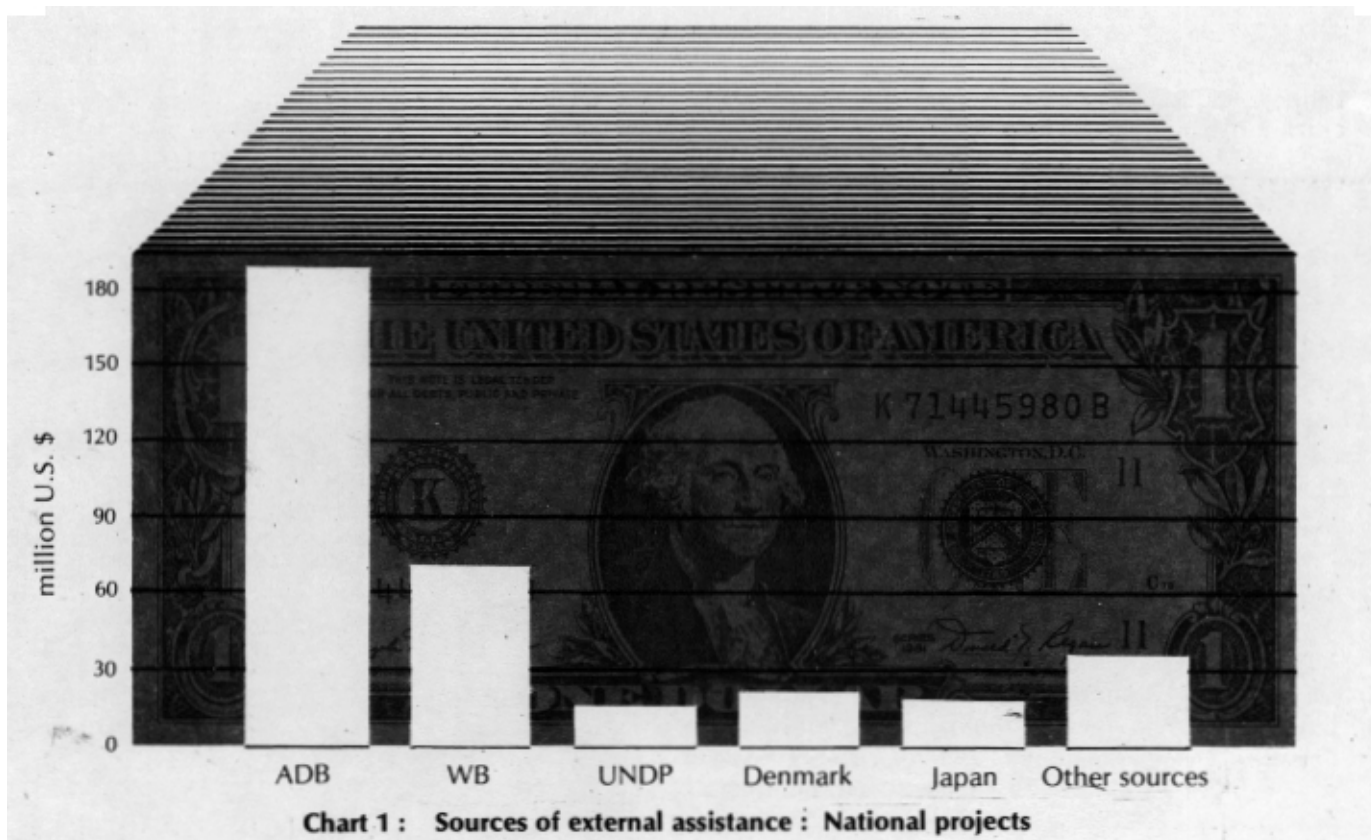
The total funding for all the current externally assisted national projects in the region is in the order of about \$ 345 m, of which the FAO-executed projects account for about \$ 19.5 m. The major source of funds for the latter is UNDP (80%) with the balance contributed by Canada (12%), Denmark (5%) and FAO (3%). The major sources of funds for the other bilateral and multilateral projects are the ADB (58%) and the World Bank (22%) with Denmark (6%), Japan (5%), and Norway (3%) heading the list of bilateral sources. Chart 1 gives a graphical indication of the quantum of external assistance from the different sources, while Chart 2 indicates the amount of external assistance received by each country.

Considering that eight countries are involved and that the majority of these countries have so far achieved only a low level of fisheries development, the level of external assistance is not very high. There are of course wide variations in the amount of external assistance received by each country. 70% of the total is absorbed by three countries – Indonesia (30%), India (25%) and Bangladesh (15%). Among the remainder the share ranges from 12% for Sri Lan'kato less than 1% for Burma. It must also be mentioned that the majority of projects have a fairly long time-frame. Except for small projects involving around \$ 100,000 or less, many projects have a duration of three years and some a duration of more than five years.

Consequently the external assistance component often constitutes only a small proportion of the countries' annual budgets. Apparently, however, the low level of external assistance to the region's fisheries is part of a world-wide trend – as stated in a recent article on fisheries aid in the journal *Marine Policy* – “without a shadow of doubt, fisheries is very low down in the league of development assistance.”

In regard to scope and content, there is a fairly clear distinction between the FAO-executed projects and the other externally funded projects. The former are almost exclusively technical assistance projects while the latter are mainly though not exclusively capital aid projects for large-scale development or investment. The activities of the former are concerned with the following subject matter areas which are shown in order of importance according to the amount of funding for each area.





- marine resource assessment and survey
- research
- extension
- coastal aquaculture
- training
- freshwater fish culture
- mariculture
- advice on policy and planning
- fish utilization

About 65% of the funds relate to the first four areas. A few examples of projects covering these areas: an acoustic survey of Burma's EEZ; a preliminary estimate of Bangladesh's fish resources and development of a statistical collection system; study of a fish disease quarantine system in Indonesia; development of extension methodology for small-scale marine fishermen and freshwater fish farmers in Indonesia; and assistance to the government in formulating an aquaculture programme and developing methodologies for the design of aquaculture projects in Malaysia.

The subject matter areas covered by the other bilateral and multilateral projects — also shown in the same order of importance — are as follows:

- fishing vessels and fisheries infrastructure
- freshwater fish culture

- coastal aquaculture
- resources assessment and survey
- research
- training
- fish utilization

Here, nearly 90% of the funds relate to the first three areas. A few examples of projects covering the latter: the improvement of three fishing harbours in Andhra Pradesh, India and provision of credit for acquisition of fishing vessels (World Bank); provision of multipurpose pole and line and longline fishing vessels, skipjack/tuna purse seiners and expansion of shore facilities in Indonesia (ADB); development of freshwater fisheries in Oxbow lakes and establishment of supporting hatchery and other facilities in Bangladesh (WB); and increase of the production of shrimp and milkfish from brackishwaters in Indonesia (ADB).

In both groups of projects it is in most cases difficult to make a clear demarcation between projects relating to industrial fisheries and those relating to small-scale fisheries. There are very few projects which are exclusively concerned with the latter. In general, most of the capital aid projects are oriented towards the industrial fisheries — though some of them include components

such as access roads to fishing villages, fishing boats for small-scale fishermen, credit to small-scale fish farmers, or harbours and shore facilities to serve small fishing boats. Coincidentally, in both groups of projects the relative funding level for fish culture is the same (32% of each group total) — a fairly high level which reflects the increasing importance of this area in the region's fisheries. Among some of the important areas which are inadequately covered or not covered at all in the national projects are fishing technology, post-harvest fish utilization, training, and internal and export marketing.

As mentioned earlier, in addition to the externally funded national projects and programmes analysed above, there are several regional and inter-regional projects and a global project, the activities of which are relevant in varying degrees to the countries of the Bay of Bengal region.

Of these projects only two — one for the development of small-scale fisheries and the other dealing with resources management — exclusively cover the Bay of Bengal region. The two together constitute the Bay of Bengal Programme, BQBP. The former is a five-year programme

which seeks to develop and demonstrate technologies in fishing craft, fishing methods and coastal aquaculture and methodologies in extension to improve the condition of small-scale fisherfolk. The 'source of its \$ 7.5 m funding' is Sweden. The latter is a 4-year programme seeking to improve capability in the region for developing and managing fishery resources. Its \$ 0.9 m funding comes from the UNDP.

The activities of these two projects constituted direct and tangible external assistance to the countries of the region. The remaining five regional projects funded by UNDP, Australia, Norway and Japan deal with aquaculture research, marketing information, fish technology research, research on tuna, and coordination of external assistance. Except for the marketing information project (INFOFISH), whose activities have a direct and regular relevance to the countries of the region, due to the common priority attached by all of them to fish exports, the activities of the others are of only occasional interest or relevance.

The 'global project and the seven inter-regional projects deal with resource assessment and survey,

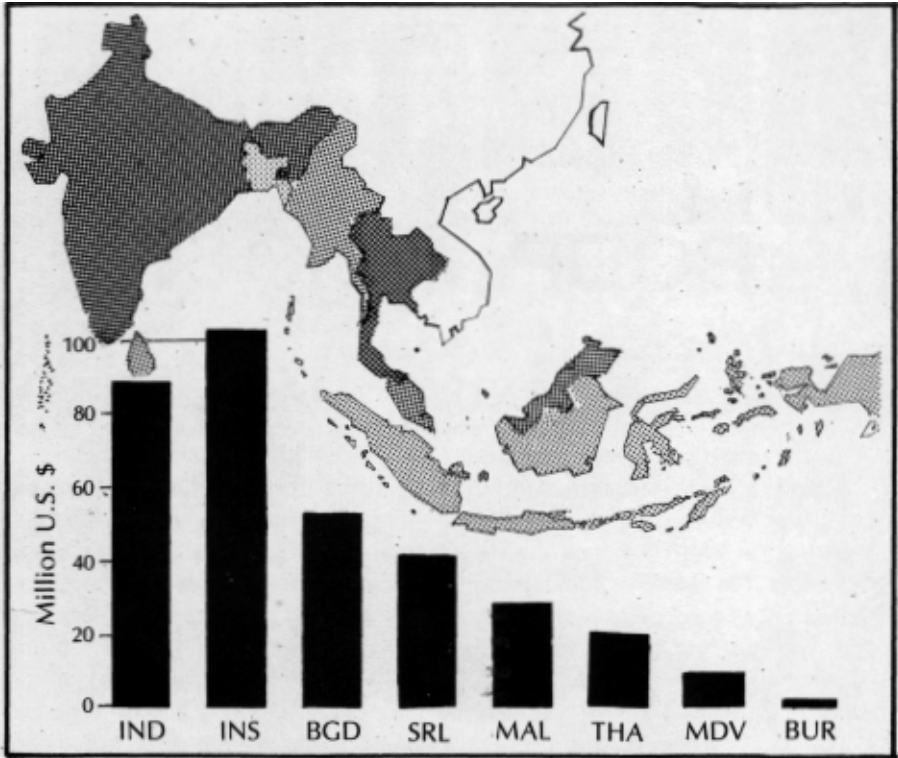


Chart 2 : Recipients of external assistance : National projects

marketing research, training in fish technology and stock assessment, aquaculture research and development, research in tuna, and fish handling. Many of these subjects are of interest to the Bay of Bengal countries and some of relate to areas inadequately covered by

the externally funded national projects. But the total level of funding – only \$ 9.4 m for all eight projects – and their extensive geographical coverage, waters down their contribution of external assistance to the region to no more than an occasional trickle.

External assistance sources and recipients – national projects

	Bangladesh	Burma	India	Indonesia	Malaysia	Maldives	Sri Lanka	Thailand
Multilateral								
Asian Development Bank	x			x	x		x	x
FAO Technical Cooperation Programme				x		x	x	x
ICLARM								x
United Nations Development Programme	x	x	x	x	x		x	x
World Bank	x		x			x		
Bilateral								
Abu Dhabi							x	
Australia					x			
Canada				x	x		x	x
Denmark	x	x	x	x				
F.R.G.					x			
France					x			
Japan	x		x		x		x	x
Netherlands			x				x	
Norway			x				x	
Sweden							x	
United Kingdom			x		x			
U.S.A.				x			x	

glimpses into BOBP projects

Sri Lanka

Banks back the fibreglass Oru

A small pilot scheme has been launched in Sri Lanka under which six outrigger canoes (Oru) of FRP construction will be introduced in Negombo. The BOBP will subsidize 50 per cent of the cost; the beneficiaries will put up about 10%; the balance will be covered by a credit from the People's Bank or the Bank of Ceylon. Each bank will support three boats. If the scheme is successful, the Ministry of Fisheries plans to include this type of craft in its regular subsidy programme.

The first prototype of the fibreglass Oru, designed by ONIWI Combine for BOBP, was launched in December 1981. It has since engaged in commercial fishing and the positive results have inspired the credit

scheme. Minor technical deficiencies in construction discovered during the trials have been corrected. The main hull is new, but other components such as outrigger, rig and sail are of traditional design and construction. It was observed during trials that a better outrigger would improve the sailing performance. A second Oru launched last year was therefore fitted with an outrigger of fibreglass. The sail performance did improve; it seems that the FRP outrigger, despite high investment cost, might be more economic in the long run than the traditional log Oru.

Experiments were also conducted with a new type of sailcloth superior in quality to the one now commonly

used. The result was interesting; the material is too efficient! Fishermen say the cloth is too 'tight' — dangerous in strong winds since the sail cannot be reefed. (Sails used now have a loose texture and let strong winds through — they are sprayed with water when the winds are light).

The Oru is Sri Lanka's most common indigenous craft: in fact it is a favourite visual symbol of the island. There are about 7,600 of them, used all over the country, except the northernmost districts. They come in different sizes and are used for a variety of fishing methods. They are made from dug-out logs. The larger Orus use sail for propulsion, the small ones use oars. Despite the fairly rapid introduction of more **modern** into the Sri Lanka fisheries the Oru is likely to hold its own for a long time. It can be easily driven because of its extremely high length/displacement ratio — an advantage in today's context.

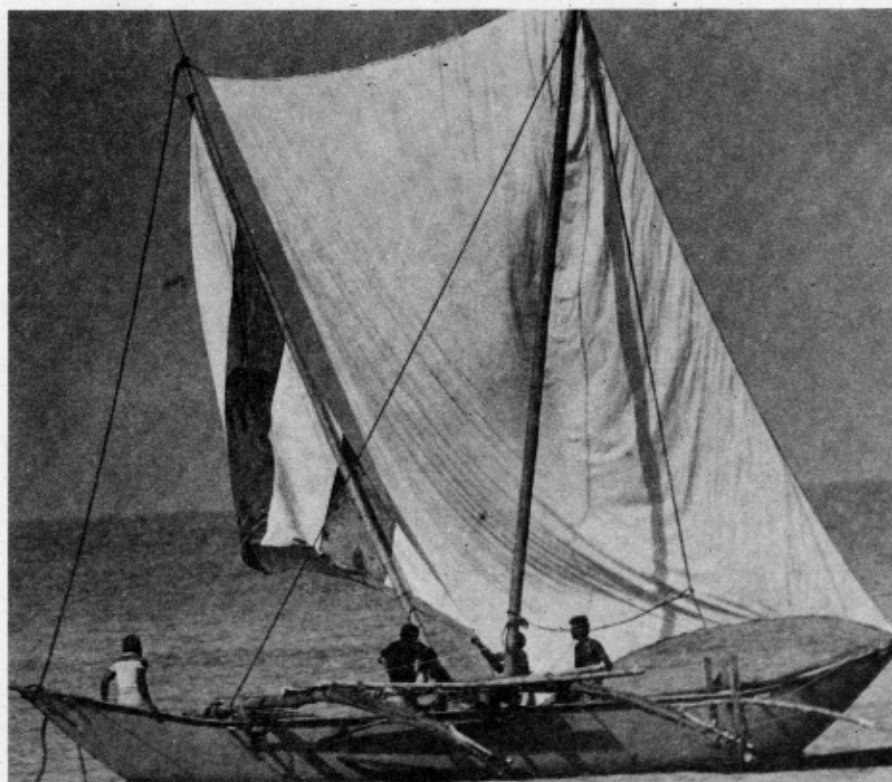
The most serious problem facing the Oru is the non-availability of wooden logs. The dug-out construction is a tremendous waste of timber and the Government has prohibited the use of larger logs of good wood for Oru construction. It is therefore natural to look for alternative material. Fibreglass was selected by BOBP since it is already common as a boatbuilding material in Sri Lanka. Also possible is the use of wood by the strip-planking method; a third possibility might be aluminium which is very light and requires no maintenance.

The shape of the traditional Oru is dictated entirely by the main log from which it is made. If other materials are used the shape can easily be modified to improve the seagoing performance and ensure greater fishing capacity and crew comfort.

For the first six craft now being issued under the credit scheme, a subsidy of 50% has been provided. Since motorized boats attract as much as 35% subsidy, it was thought that a non-motorized craft, which does not waste fossil fuel, should get even more.

Prospects of further developing Oru of different sizes for different fisheries are good; some of them are already on BOBP's drawing boards. **L.O.E.**

One of the six fibreglass Orus introduced by the BOBP and being tested in Negombo, Sri Lanka, under a pilot project.



Thailand:

Cage culture in Phang Nga

An earlier issue of *Bay of Bengal News* (December 1982) reported a breakthrough in fin-fish cage culture achieved in Thailand's Phang Nga province through the coastal aquaculture pilot project executed by the Thailand Department of Fisheries in collaboration with BOBP.

That report written during October 1982 recounted the manner in which the cage culture of seabass and grouper had taken off in Phang Nga with two successful demonstration cages out of 30 set up in the villages of Ko Pan Yi and Sam Chong 'begetting' no less than 397 cages in eight villages within a short time-span.

The number of cages continued to grow steadily during the last three months of 1982, rising to 542 at the end of October and to 629 during November until at the end of December, it had risen to 943 cages owned by 256 families in 13 of the 16 villages in the province. In this process, Ko Pan Yi village which had spearheaded the expansion was outstripped by Kok Krai — the latter, which was not one of the villages covered by the pilot project, having 284 cages to Ko Pan Yi's 271.

While this remarkable development dramatized the catalytic effect of the aquaculture project, it also brought two limiting factors into sharp focus: seed and feed.

The rapidity with which the number of cages grew caught every one by surprise and the brackishwater fisheries stations at Satul and Phang Nga were unable to cope with the sudden demand for seabass fry. Thus, by the end of December, the villagers could stock only 629 of the 943 cages using seabass fry from the stations as well as grouper fry collected from the wild. The setback was however temporary. The stations supplied the deficit by May 1983 and have worked out spawning programmes to meet future demand. The problem is not entirely solved, however. The Phuket station does

not have nursery space for the fry — it is now trying to train the villagers to nurse the fry in their cages up to fingerling size:

The problem of feed is proving to be more difficult. The establishment of the cages has imposed a severe strain on the previously plentiful yield of trash fish from Phang Nga bay. The villagers complain of scarcity particularly during neap tides. They are now thinking of

grouper, and 'farm-gate' prices range from .Baht 60-70/kg for the former to Baht 70-80/kg for the latter. The villagers have also learned to manage their cages so as to enable batches of cages to be harvested in rotation on a weekly basis. In mid-June 1983, I was present at one such harvest at Kok Krai — 1200 kg of grouper were harvested from cages belonging to nine families and sold on the spot to a fish trader for Baht 84,000.

The cage culture demonstration by the Satul unit of the aquaculture pilot project, which started at the end of 1981 at the village of Ban Bakan Koei has so far not met with the same success as in Phang Nga. There, 60 demonstration cages were



Cage-cleaning operations are on at Ban Bakan Koei village in Satul province

obtaining regular supplies of trash fish from other areas through the fish traders who buy the cage harvest; they are also thinking of establishing small holding-rooms for short-term storage of trash fish on ice in the villages.

These limiting factors have served to stabilize the number of cages in Phang Nga province at the level reached in December 1982. It is expected that future expansion will be organized more cautiously, keeping pace with the supplies of feed and seed.

Has the increase in number of cages depressed the price of cage-cultured fish? No, there is apparently a heavy unsatisfied demand for seabass and

provided to be operated and managed by two demonstration groups comprising the 60 families in the village. The expectation was that each family would thereafter set up an additional cage out of its own resources. However, only 17 additional cages have come up and there are some drop-outs among the farmers. This approach of forcing the pace seems to have been a mistake and the lesson has been learnt that demonstrations using small select groups of villagers have a greater chance of success.

This is the modus operandi being tried in another location in Satul province, and five sites in the Krabi and Trang provinces adjacent to

Phang Nga and Satul respectively, in the third phase of the aquaculture pilot project which commenced in October 1982.

These demonstrations involving 10-15 cages at each site show good progress except in one of the Krabi sites and in the additional Satul site.

At the former, the environment was found to be unsuitable and a site change was effected. At the latter the problems are due to human

factors and an intensive extension effort has been mounted by the Satul unit.

Meanwhile, even though the cage culture demonstrations in Trang and Krabi provinces started only in early 1983 and are only halfway through, over 100 cages in Krabi province and nearly 150 cages in Trang province have already been set up by villagers out of their own resources.

The coastal aquaculture pilot project

is under the direction of Pairojana Lipikorn, Director of the Thailand Fisheries Department's brackishwater division. Project activities in Phang Nga/Krabi and Satul/Trang respectively are implemented by two teams of Thai fisheries officers, one headed by Anuwat Ratanachote, Chief of the Phuket Brackishwater Fisheries Station and the other by Manu Potoros, Chief of the Satul Brackishwater Fisheries Station. — **V.L.C.P.**

Bangladesh

New intermediate technology for net-making

One of the very first activities considered by the BOBP was hand-braiding of nets at the village level. Early experiments in Sri Lanka in 1979 showed that the liberalization of import of net-making machines and the increasing cost of labour made the hand-braiding of nets a doubtful proposition.

In India and Bangladesh, the making of nets by hand is very common. But it was difficult to envisage how this practice could be improved under prevailing conditions. Even-tual conclusion : an intermediate technology should be developed to combine the advantages of local low-cost production and higher efficiency. No such technology was readily available. After a world-wide search for ideas, BOBP quite by accident came across a manually operated machine that seemed to fulfill the requirements. It is manufactured by a Bombay engineering firm and is based on an old Japanese design.

Webbing of different materials and mesh sizes can be produced on the machine, but it is primarily geared for small to medium mesh webbing of thin twine. The main limitation is its width — it can accommodate 100 meshes.

Two machines were acquired last year and set up in Chittagong, Bangladesh, in cooperation with the CARITAS-supported Kalidaha Fishing Project. A knot-stretching device and bobbin-winding machines are the major accessories supplied with the machines. It took about eight months to overcome various installation problems before establishing satisfactory quality and regular commercial production.

Four machine operators and two bobbin winders working in two shifts were employed during the commercial production test; all of them were women. The average speed in knots per hour during the trials in 1982 improved steadily at the following rate : August - 192; Sept - 235; October - 269

The knot rate attained by the operators can be considered commercially viable but can be further improved with experience. The top output claimed by the manufacturers for a skilled operator is in the order of 500 knots/hour.

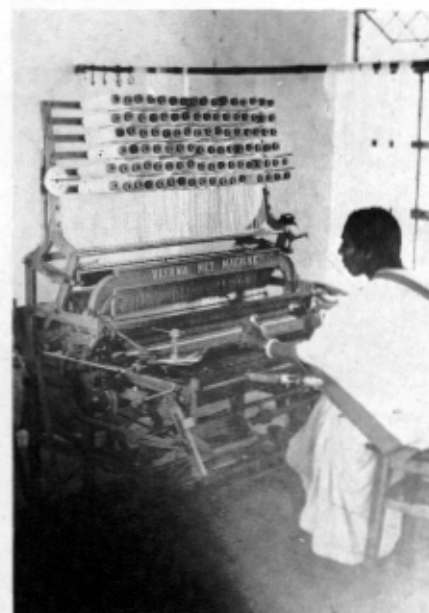
The net-making trials to date have led to the conclusion that the hand-operated machines can produce a high-quality product and that the operation is commercially viable. In fact, a preliminary comparative study of braiding by hand, by manually operated machine and by automatic machine reveals that the intermediate technology is the most economic for 4-inch mesh webbing using 6 ply twine of 210 denier. Hand-braiding is the costliest method and the automatic machine falls in between. The hand-operated machine therefore 'seems to be an attractive alternative for a large portion of the net requirements of Bangladesh. Other advantages of the machines are that they employ more people, don't require electricity, and can be installed in relatively simple premises — the ideal solution for a cottage-level industry.

But the picture is not entirely bright. Since manual operations are involved all through the fabrication process — braiding, boiling of webbing, stretching, lacing pieces together, men.ding — strict supervision is

required. The machines are simple but sensitive and need continuous monitoring and adjustment. To produce nets of good quality on a commercial basis, good management is required. Further, the production is fairly high and sufficient twine needs to be stocked for full capacity utilization; this will require capital. And the sales are of a magnitude that calls for organised marketing.

All these factors unfortunately exclude most village-level situations. Small entrepreneurs or cooperatives may not be able to manage the net-making units: one would have to look for larger entrepreneurs. The original objective of encouraging a net-making cottage industry might not therefore be attained. However, the machines do have many attractive features, and a second phase of trials in cooperation with an importer or trader of nets and twine is being considered.

The Bombay-made manually operated net-making machine introduced by BOBP being used in Chittagong.



ABSTRACTS OF BOBP PUBLICATIONS



Published here are abstracts of BOBP papers out in recent months. Earlier papers were abstracted in the issues of January 1981 and December 1982.

BOBP/REP/16: *Report of the Seventh Meeting' of the Advisory Committee, January 17-21, March 1983.*

The report records the deliberations and the conclusions of the 7th meeting of BOBP's Advisory Committee. The meeting was hosted by the Government of India and was held in New Delhi, India, January 17-21, 1983. The report includes a summary of the progress made by the BOBP in 1982 and also presents a summary of the "Impact Review" of the project conducted in November 1982.

BOBP/WP/19: *Coastal Village Development in Four Fishing Communities of Adirampattinam, Tamil Nadu, India by F W Blase, December 1982.*

This paper describes four fishing communities of Adirampattinam, a town about 350 km from Madras, and analyses their social structure. It also describes the strategy adopted by the BOBP to improve the lot of these communities and the experimental work in this direction — which was carried out during 1980-81 in cooperation with the Fisheries Department of Tamil Nadu and non-government agencies.

BOBP/WP/20: *Further Trials of Mechanized Trawling for Food Fish in Tamil Nadu by C Pajot, J Crockett,*

S Pandurangan and P V Ramamoorthy, December 1982.

The document describes the scope and findings of experiments conducted with high-opening bottom trawls in Palk Bay and the Gulf of Mannar, and off the Coromandel Coast, from July 1980 to May 1981. It is a sequel to an earlier paper (BOBP/WP/10) which described 'experiments conducted during March-July 1980. Carried out jointly by BOBP and the Directorate of Fisheries, Tamil Nadu, the experiments confirmed that high-opening bottom trawls are better tools than the conventional shrimp trawls for production of food fish. The paper says that while re-deployment of the prawn trawling fleet into a food fish fishery is possible at least to some extent, it must be carried out with caution and be subject to management and regulation.

BOBP/WP/21 : *Improved Deck Machinery and Layout for Small Coastal Trawlers. By C Pajot, Crockett, S Pandurangan and P V Ramamoorthy, June 1983.*

This paper discusses innovations to improve the deck machinery and layout of small coastal trawlers in Tuticorin and Nagapattinam. They are also applicable to trawlers elsewhere in the region. The innovations were meant to make the handling of gear safer, easier and more comfortable for the crew. They were carried out during the BOBP's experiments with high-opening bottom trawls described in BOBP/WP/20. A gantry, net-drums with a three-drum winch, and a titable drum

winch are three of the major innovations described with diagrams and pictures.

BOBP/WP/22: *The Impact of Management Training on the Performance of Marketing Officers in State Fisheries Corporations. By U Tietze, June 1983.*

This paper evaluates two training courses on fish marketing conducted by the BOBP in Tamil Nadu (December 1979) and Andhra Pradesh, November 1980. Its main conclusion, that the courses had only a limited impact on the subsequent performance of the participants, is based on detailed interviews conducted with the participants. The paper is notable for the methodology used for course evaluation, the detailed findings, and the recommendations for the conduct of future courses.

BOBP/INF/1.: *Women and Rural Development in the Bay of Bengal Region. Information Sources. February 1982.*

A list of agencies concerned with women and development and of publications — monographs, reports, books, — on the subject. It was prepared by BOBP as part of its work in planning activities for the development of coastal fishing families.

BOBP/INF/2 : *Fish Aggregating Devices: Information Sources. February 1982.*

A compilation of sources of literature on fish aggregating devices. A list of institutions engaged in work on FADs is also appended.

BOBP/INF/3: *Marine Small-Scale Fisheries of India. A General Description. March 1983.*

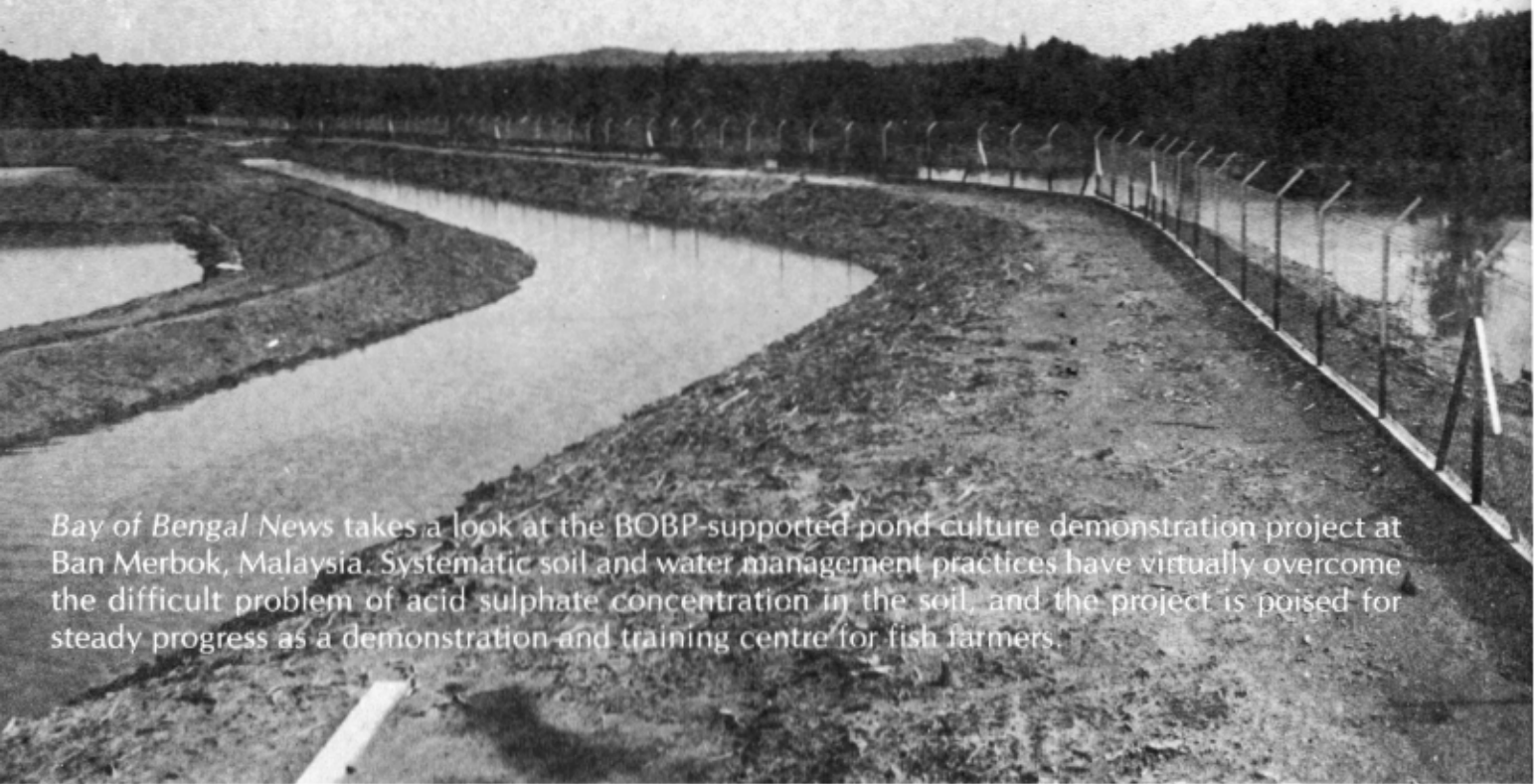
This paper is a concise presentation of factual data on the main features of marine small-scale fisheries of India. It could serve as an introduction to the subject or as a background document for discussions on the planning and programming of development assistance. This revises and updates a paper originally prepared in 1976.

BOBP/INF/4: *Marine Small-Scale Fisheries of Andhra Pradesh : A General Description. June 1983.*

A brief factual document on the small-scale marine fisheries of Andhra Pradesh.

The Ban Merbok story : Pond culture of shrimp and seabass

Text and photographs by S. R. Madhu



Bay of Bengal News takes a look at the BOBP-supported pond culture demonstration project at Ban Merbok, Malaysia. Systematic soil and water management practices have virtually overcome the difficult problem of acid sulphate concentration in the soil, and the project is poised for steady progress as a demonstration and training centre for fish farmers.

From atop the main sluice gate, the project complex looks like a pretty picture postcard. A dozen ponds cast a silvery glare in the noon day sun. Dense mangrove looms all round, a curtain of green casting thick shadows on the pond edges. We are in Ban Merbok, Kedah, Malaysia, at what is known as the Brackishwater Aquaculture Demonstration and Training Centre. At this centre — a Malaysian project supported by BOBP — shrimp and seabass are being cultured under controlled conditions in a difficult environment. Fishermen and fish farmers of the area come here to learn, VIP visitors drop by to take a look. So the project is at once an aquaculture laboratory, a training centre and a development show-piece.

To reach Ban Merbok from Penang, one rides successively along land, sea and forest; first a drive past

busy Penang streets, then a ferry ride across the Middle Bank, followed by a journey through rubber plantations. A chain link fence and a sign board announce the Ban Merbok project, which adjoins extensive mangrove swamp along the Merbok estuary.

V Palanisamy, Ban Merbok project team leader, and Kahar Rasul, a master fish farmer consultant from Indonesia, give this reporter a walking tour of the 22-hectare project. There are a dozen rearing ponds, each half a hectare in area, into which shrimp and seabass are introduced young, then nursed and fattened with loving care, so that they may be sold for profit. Ten of these ponds have been “stocked”, a few have yielded more than one “harvest.” There are six nursery ponds as well. Other physical facilities include the main sluice and pond supply gates and canals. At high tide, water from

the Sungai Gelam estuary can be let into the complex through the main sluice, then into the rearing ponds through the pond sluices.

“Looking after all these ponds must be quite a job,” this reporter says. “Yes”, agrees Kahar Rasul heartily. “We are short of men. To ready the ponds for culture, we had to concentrate on one pond at a time.”

At Ban Merbok (as with any aquaculture project) there is more to question and to understand than to see. The questions and answers below reflect the gist of talks with project specialists supplemented with published information.

Q: *When did this project begin? What have been its main landmarks so far?*

A: In two experts who surveyed Ban Merbok and other areas suggested a brackishwater aquaculture project here to utilize investments already



made to reclaim mangrove swamps. The project site was finalized in January 1980, but pre-project preparation began June 1979 (activities such as design data collection, site surveys, design of pond modules, soil sampling and water quality analysis, seed surveys for fish and shrimp...)

Construction of the pond complex began late 1980 and was completed late 1981. The first stocking was done in July 1982. So far 10 rearing ponds have been stocked, six with shrimp and four with seabass. The first harvest was in March - April 1983. Several fish farmers have been trained so far in brackishwater pond culture techniques, and a programme is being prepared for training 400 fish farmers.

Q : *What is the main problem the project has faced?*

A: The problem can be summarized in two words: acid sulphate. The

Above : Seabass fry is monitored regularly to record growth and detect abnormalities. Below: Ban Merbok has a population of about 15,000. This is a typical fisherman's home.





Above left: Consultant Kahar Rasul briefs visiting fish farmers. The project will serve as a demonstration centre for brackishwater farming for all of Malaysia. Right: A refracto-salinometer is used to check soil salinity.

soil and water in the Merbok area have a high iron and acid sulphate content and a low p^h . This can harm shrimp and fish growth. However a rigorous package of soil management practices was adopted to raise p^h value. These practices included:

- Pond dyke trenching and washing: A canal is dug into each pond dyke, and water pumped into it to dilute acid.
- Digging of V-shaped furrows on the canal dyke and “liming” them to help neutralize acid-laden water.
- Extensive ploughing of soil followed by drying under the

sun to facilitate oxidation of the acid sulphate soil.

- Repeated tidal washing of ponds, followed by draining.
- Liming: Lime is sprayed on the ponds when dry, to neutralize acid sulphate.

These operations were carried out for several months after pond construction and the p^h value constantly monitored. It gradually stabilized itself at an acceptable level of 6.5, rising from about 3.5, and the ponds became fit for culture.

.Q: Is the sulphate problem unique to Ban Merbok? Wasn't this problem

realized before when this site was recommended?

A: Quite a few aquaculture projects, including another one in Malaysia, face the problem. Perhaps its magnitude at Ban Merbok was underestimated. But then, from the economic standpoint, all this reclaimed land was available for use and other factors were favourable.

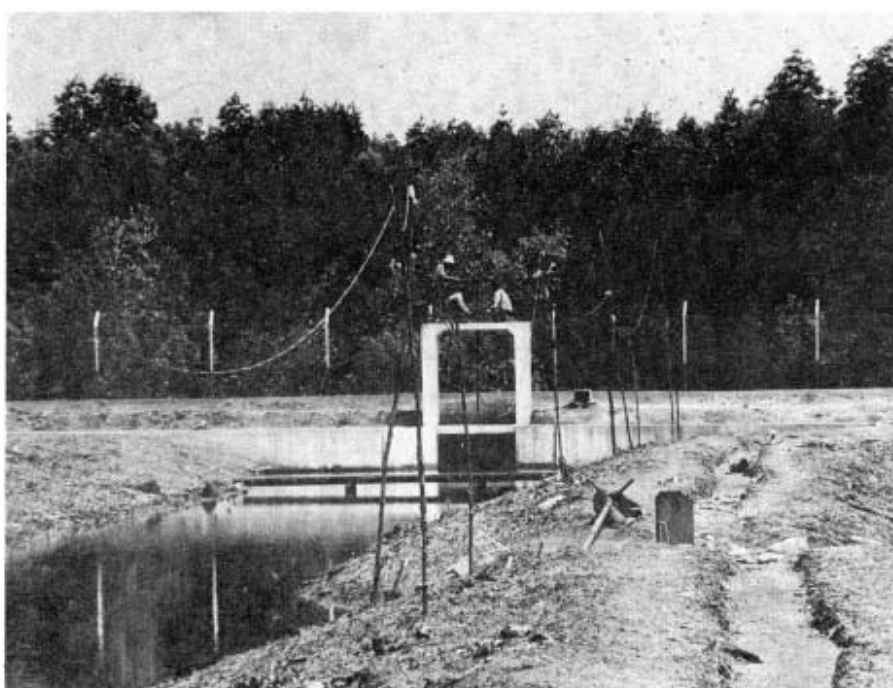
Q: Once the p^h factor was corrected, were the ponds ready to take in the shrimp and seabass fry, or were further precautions needed? Where was the fry obtained?

A: Before stocking, some basic operations were necessary. The ponds had to be freed of pests and predators. This was done by screening the tidal water, so that these elements didn't enter, and also by applying pesticide (such as tea seed cake) on the pond soil. Fertilization of the soil was also essential – the application of organic manure such as cowdung, and the planting of mangrove along the dyke-canal. And leaf shelters were installed in the ponds, so that the shrimp or seabass fry could find a cool refuge when it got too hot.

Fry for stocking the ponds was obtained from the Fisheries Research Institute, Glugor, Penang, and also from private hatcheries. The fry was usually brought in plastic bags and immersed in the ponds after ensuring that the temperature level in the bag was the same as in the ponds.

A mixture of rice bran (4.0%) and trash fish was prepared in pellet

The main sluice gate of the 22-hectare project complex at Ban Merbok.



form to serve as feed for the fry. The feed served amounted to 10% of the body weight of the fry.

Q: *What are the culture practices necessary at Ban Merbok for the healthy growth of shrimp and seabass fry?*

A: Judicious water management is perhaps the prime requisite. Polluted pond water has to be discarded; frequent draining and re-filling of ponds may be called for to keep up the oxygen level. At times the oxygen level in the pond may drop sharply early in the morning. Aeration is then resorted to: pumping in of water, or agitation of water by an outboard engine. At Ban Merbok, the consultant frequently makes early morning visits to the ponds to check on the oxygen level in the pond.

The depth of the pond has to be carefully regulated. If the pond is very deep, the deepest part may be deficient in both light and oxygen. On the other hand, if the pond is too shallow, overheating and oxygen depletion may result.

Q: *What are the daily chores of the project staff?*

A: An essential chore is monitoring the "physico-chemical parameters" of the pond soil and water: temperature, salinity, pH and oxygen. A thermometer, a salinometer, a

tester and an oxygen meter are some of the instruments used. Remedial action should be taken in the event of an alarm rise or drop in any of these parameters. The water management chores have already been mentioned.

A regular supply must be ensured of both natural and artificial feed. And the response of the shrimp and seabass fry to all this attention has to be checked: they have to be sampled periodically to test growth, to notice symptoms of disease, to keep track of mortality.

Q: *What results have been obtained from culture at Ban Merbok? Good harvest? Fast growth?*

A: Of the 12 rearing ponds, 10 have been under culture. Four were stocked with seabass (*Lates calcarifer*), the remainder with shrimp. One pond has been earmarked for training in acid sulphate management, one pond has been under repair because of damage to the sluice gate.

The results have been a mixed bag. In one of the ponds, *Lates calcarifer* of average weight 0.56 g stocked early July grew in 150 days to an average weight of 145 kg. However, of the 7,000 fry, only 9% survived; the heavy mortality rate was the result of poor water quality and lack of appropriate feed. The total weight of harvested fish was 96 kg.

Another pond was stocked with *Penaeus monodon*, of average weight less than 1g. A 120-day culture cycle produced 80 kg of shrimp of average weight 27 g. The recovery rate was again very low, 15%, partly because of the acid sulphate problem, partly because of escape of shrimp through screens.

Says M. Karim, BOBP's aquaculturist: "At this stage of the project, a big harvest is too much to hope for as the emphasis has been on overcoming the acid sulphate problem and getting the culture operations going. But better results will be imperative at later stages."

Q: *What has the impact been of the Ban Merbok project?*

A: The techniques developed by the project to overcome the acid sulphate problem should be regarded as a useful contribution to the development of brackishwater pond culture. These practices are being disseminated to small-scale fish

farmers and the eventual impact will be seen when they are adopted on a wide scale.

The many visitors to the project, including the Director General of Fisheries, Tengku Ubaidillah, and the Head of Extension and Training in the Fisheries Division, Mr. Tan Cheng Kiat, have been impressed by the results so far. The government's strong financial commitment (close to a million Malaysian dollars have been spent so far on the project's physical facilities and on equipment) also indicates its perception of the value of the project.



Ploughing of bottom soil (below) and "liming" (above) are two essential pre-culture operations carried out systematically at Ban Merbok to reduce the concentration of acid sulphate in the soil.



Tree fishing in Tamil Nadu

Some weeks ago, an Indian Express photographer asked us to explain a peculiar phenomenon — kattumaram fishermen at the Marina Beach carrying a whole tree out to sea. We explained the use of trees as FADs (fish aggregating devices), then decided to investigate current trends in this ancient practice. At our request P. V. Ramamoorthy and S. Pandurangan toured some fishing villages near Madras and told us about what they saw and heard.

"Tree FADs" — tree trunks or branches dropped into the deep, so that they attract and aggregate fish for capture by appropriate nets — are widely known in Tamil Nadu. But their practice today is limited and scattered, because tree trunks are an intrusive presence in the muddy seabed and obstruct other fishing methods such as gillnets and shore seines. In fact tree FADs are banned by custom in a few villages. There are two types of tree-FAD practices. In the first, an entire tree trunk moored at sea attracts and aggregates fish. Fishing around the tree is done with longlines. This practice is known locally as *mulam*

fishing. Under the second practice, a line of polypropylene rope is strung with palm leaves and moored in the sea where it lies for several months. A scoop net (known as *madavalai* or *kambivalai*) is used periodically to catch aggregating fish. Both these practices can be witnessed occasionally in Ondikuppam village near Royapuram, north of Madras, and Oorukkuppam village near Thiruvannamiyur, south of Madras. Most of the 1,000 fishermen around Thiruvannamiyur use conventional fishing methods such as gillnets, shore seines and trawls. But 58-year-old Mr. Namadev, an occasional FAD fisherman, tells us that

madavalais have been in vogue in the area a long time. He himself belongs to the fourth generation of *madavalai* fishermen. *Mullam* fishing or tree fishing however, began only in 1942.

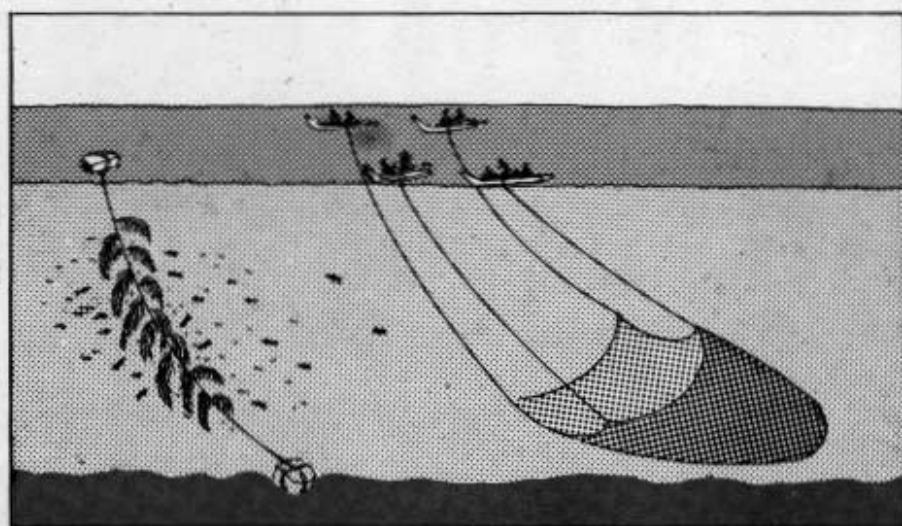
Describing the *madavalai* system (see illustration), Mr. Namadev says that at the beginning of the January - September fishing season, the owners *madavalais* moor out at sea a number of fish lures or *kambis*. Each *kambi* consists of a long coir rope buoyed at the upper end with a float of light wood. A 25-kg stone is used for mooring. The first 10 fathoms from the bottom (each fathom equals three feet) are kept

Kattumaram fishermen carry a tree branch out to sea at the Marina in Madras.



free. Above this height, 40 to 50 coconut branches are strung to each line at intervals of one or two feet. The *madavalai* is a scoop net of cotton tapering to a cod end, and is operated by fishermen from four *kattumarams*. It is cast some two weeks after the *kambis* are moored, when the leaves start decaying and algal growth begins. Sardine, small pomfret, caranx and mackerels are the species usually caught. The value of the catch varies widely, between Rs. 200 and Rs. 2,000 per day. A couple of months ago, a *madavalai* unit recorded an income of Rs. 4,000 in a single day, thanks to a heavy catch of small-sized black pomfret. Income from the sale of fish is usually shared between the *madavalai* owner, the *kattumaram* owners and the 20 crew.

Costs? A single *kambi* unit — line, sinkers, floats, leaves — plus labour costs about Rs. 200, five *kambis* would cost Rs. 1,000. The *kambis* are removed from the sea during the monsoon (October - December) and brought ashore, ready to be *A fish lure or kambi being prepared by stringing coconut leaves to a coir rope.*



A fish lure or kambi (left) is moored at sea, and the aggregating fish are caught by a madavalai or scoop net operated from four kattumarams.

laid again next February. A cotton *madavalai* costs Rs. 2,000 - Rs. 2,500.

The tree FAD is of recent origin. Mr. Namadev says that around 1942, a plane "ditched" in the sea near Thiruvannamiyur. The wreckage attracted fish, giving fishermen the idea of submerging a tree to lure fishes. The *modus operandi* is as follows

A tamarind tree or a "Flame of the forest" (*Vadhanarayana maram*) is uprooted, the trunk is tapered to a fine edge. Two *kattumarams* carry it to the fishing ground, where it is moored in the sea between hard and soft ground. Stones weighing 30 to 40 kg are needed for mooring. No float marks the place: the fishermen maintain shore bearings. The tree is allowed to decay and disintegrate; a few weeks after it has been submerged, fishermen use hooks and lines to capture aggregating fish.

A tree costs Rs. 200 to Rs. 250; laying costs inclusive of labour amount to another Rs. 1,000.

Some fishermen combine the two FAD systems described above. One or more *kambis* are laid near a submerged tree, and a *madavalai* operated around the *kambi* to catch fish that have moved from the tree to the *kambi*. Thus the *madavalai* operator, who cannot fish around a tree, yet takes advantage of the tree's aggregating properties.

Where is tree fishing carried out in Tamil Nadu? It is scattered all along the Coromandel coast, from north of Nagapattinam right up to the Andhra border. In some shallow

areas of Palk Strait, fish aggregating near the trunks are stunned by dynamite flung by canoe fishermen. A diver then collects dead fish that have heaped up near the bottom. The use of dynamite is officially banned.

Historical research into tree-fishing yields several tidbits of information:

- In 1916, a licensing system for tree fishing was introduced in Ramnad district. Purpose: To encourage the chank divers of Ramnad, who had given up their unremunerative occupation, to return and supplement their chank income through tree fishing.

- In the Palk Bay area, fishing with trees was permitted without curbs till 1943-44, when a fee of annas two was levied for each licence.

- In April 1946, a government order empowered the Asst. Director of Fisheries, Pearl and Chank, Tuticorin, to issue licences for tree fishing, levying a fee of Rs. 2 per tree up to a maximum of five trees, and Rs. 5 for every additional tree; Re 1 for every bush placed in the sea up to a maximum of five bushes, and Rs. 2 for every additional bush. How many trees and bushes were consequently uprooted, and how much fish caught, is not known.

'Tree fishing continues to interest adventurous fishermen even today, though the advantages of aggregation are perhaps somewhat offset by the possibility, of theft (of other fishermen using your tree), of damage to your tree or *kambi* (by trawlers), of conflict with other fishermen.



(iv) *Pre-school and primary school education.* Temporary school buildings have been organized. Teachers and learning materials are being provided from state government funds and non-government organizations.

(v) *Vocational training and employment* for society, members.. A few women received short-term training as non-formal, education teachers, as pre-school teachers, as agents for schemes run by the National Savings Organization and as sales personnel in Corporation fish shops. The cooperative societies provide loans to members for training expenses.

Some cooperatives have applied for loans and subsidies (organized by the Block Development Office) to run motorized transport for women fish traders to nearby village markets. They will also begin implementing two schemes provided by the State Fisheries Department for fishermen — the lean 'fishing season loan insurance and the accident loan

insurance. Though these schemes are directed' at members of male cooperative societies, they will ensure 'that fishermen's wives are made nominees of the 'accident insurance — it has been a common practice so far to name male members such as brothers and sons as nominees, depriving women of any form of security in the event of accidents to husbands.

Though the fisherwomen and the link workers themselves helped identify the schemes mentioned above, some of the schemes — such as savings and education for women — did not evoke much response. Women do not see the direct benefits of savings or education. They want their immediate needs — higher incomes, cheap credits — to be met. In other words, institutional credit at a low rate of interest, as also vocational training and employment facilities for young women, get priority.

As for employment, the jobs available are limited. Further, the majority

of women do not have a basic education. Realizing this, more and more women are now sending their children, even daughters, to school. Result: a demand for better pre-school and primary school facilities among fisherwomen.

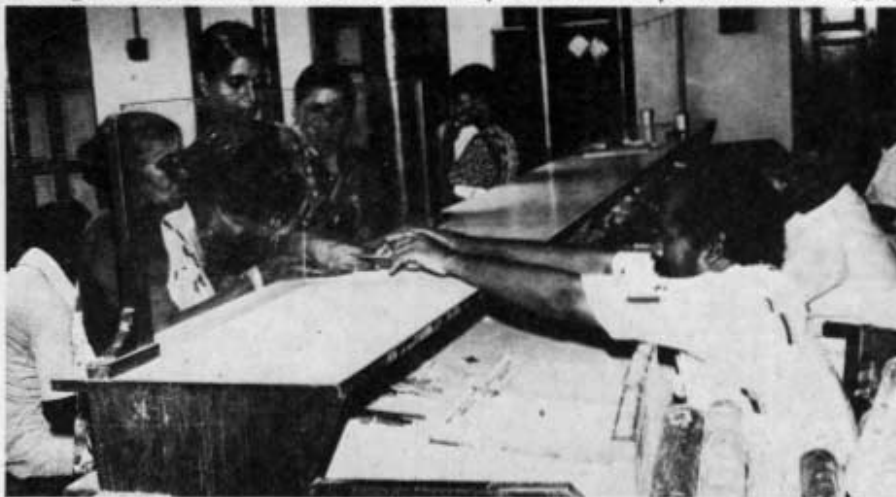
The link workers play a key role in arranging for institutional credit, in identifying and selecting women for vocational training, in applying for educational facilities and in promoting savings habits. It's a long while before a fisherwoman who asks for a loan gets it; or between the time a school is planned and gets opened. It calls for a lot of homework, paper-work and legwork — reminders to officials, to beneficiaries and to others. The link workers, advised and assisted by the Fisherwomen's Extension Service, took the initiative for most of this work, and made possible the remarkable success achieved till now. Officials from the government, from banks and cooperative societies — as also politicians, the public and fishermen — have realized that fisherwomen need not confine themselves to fish handling at home, that they need not wait for men to take all the decisions, that they do not have to be silent, submissive and helpless. Recently the Tamil Nadu Cooperative Union agreed to fund a one-week training course for women directors of cooperative societies. It was conducted by the Natesan Cooperative Training College in Madras. The link workers described their experiences and problems as directors in initiating activities through cooperative societies.

Many of the fisherwomen showed that they had learnt to 'stand up and state their opinions without hesitation. Yet the majority of them considered "the sessions conducted by female resource persons as the most useful, since they felt more free to take part in the discussions there and to clarify doubts.

Fisherwomen as a target group, and link workers, extension officers, and coordinators as people working to improve the living conditions of this target group, still have a long way to go. There are problems to be overcome, hurdles to be crossed. But a note of optimism is manifest and it is encouraging for one and all.



Cooperative societies of Tamil Nadu fisherwomen, set up with the help of the Fisherwomen's Extension Service and the BOBP, promote savings among fisherwomen, stimulate bank deposits and help secure bank loans.



Bay of Bengal Committee Meets in Madras

(continued from page 7)

Discussing tuna resources, delegates agreed on the existence of three main types; tuna-like fishes in inshore waters, surface-dwelling tunas in offshore waters, and larger deep-swimming tuna caught by longlines in oceanic waters. It was possible that the latter resource had by now recovered from heavy exploitation by Japanese vessels in the past. The Committee felt that further expansion of tuna fisheries in the Bay of Bengal should be considered in the light of the rapid development of such fisheries elsewhere in the Indian Ocean.

BOBI and BOBC

Sweden said that the request for an extension of Swedish support to the project for Development of Small-Scale Fisheries in the Bay of Bengal for another three years (1984-1986) was in the process of being approved by the authorities. The first step had already been taken; final and formal approval was expected in November.

It had become Swedish policy to implement projects directly as far as possible and to utilize organisations like FAO only when competent Swedish institutions and resource persons were lacking. Sweden might therefore wish to implement some activities on a bilateral basis during the extension phase (1984-1986).

Sweden confirmed that support to the project would not be extended after 1986 in its present form. Further regional support outside the bilateral country programmes could then only be considered for newly identified activities which require a regional implementation structure. Such support could only be considered if it was backed and endorsed by a regional body such as the BOBC, which was a positive step toward greater regional cooperation. Sweden's view was backed by the United Kingdom.

The Committee considered that since the implementation structure for regional activities built up over the years within the SIDA-supported



At the August 22 meeting of the Bay of Bengal Committee in Covelong, Minister Rao Birendra Singh (centre) and BOBC delegates watch a demonstration of beachlanding craft from the shore.

small-scale fisheries project may disappear after 1986, the development of an alternative structure should be regarded as a matter of the highest priority. The forthcoming 15th session of the FAO Committee on Fisheries in October 1983 might provide a suitable opportunity for discussion of this matter. Thailand referred in this context to the problem facing the South China Sea Committee where a similar implementation structure was now coming to an end without an alternative yet in sight.

The Committee resolved that it would henceforth function as the advisory body to the UNDP-funded project, "Marine Fishery Resources Management in the Bay of Bengal." Tripartite reviews of this project would have to be held concurrently in future with meetings of the BOBC. The Project Manager presented a brief progress report of work undertaken during the first six months, including a meeting of the project's technical liaison officers.

The Committee was informed by the observer from the United Kingdom that a regional project for assistance in post-harvest technology to reduce post-harvest losses and increase the value added of products was being considered by the ODA. The project would tackle all aspects of handling, processing and marketing of fish

and fishery products, and would work in parallel with projects under the BOBP umbrella. The UK considered it advantageous for the ODA project to work together with the well-established SIDA-sponsored project. The Committee endorsed the scope of the project and expressed its gratitude to the UK for her interest in supporting the work of the Committee.

The Committee agreed on the importance of improved post-harvest technology, and of assistance in product development of deep-water fish and/or crustacea. Additional inputs were needed for survey of marine resources, post-harvest fish technology, and for marketing, particularly of unfamiliar, unutilized and under-utilized species.

India considered that three other areas also deserved special attention larger programmes for the supply of beachlanding craft, aquaculture development with special emphasis on coastal aquaculture, and the promotion of traditional fishermen's self-help organizations and services.

The Committee felt that it might have to consider membership by landlocked countries if the terms of reference of the BOBC were amended to include inland fisheries. The subject might be discussed at the 15th session of COFI (the Committee on Fisheries) in October.