BAY OF BENGAL NEWS

BOBP For Fisheries Development
BAY OF BENGAL PROGRAMME
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WHERE HAS ALL THE MONEY GONE?

With this number, we celebrate **fifty** issues of the Bay of Bengal News. And about that half-century, not out, you will read elsewhere in these pages. It has been a pleasure over the last dozen years and more to publish this newsletter, and that has mainly been thanks to the very positive response from readers in the region and many other places around the world of fisheries and fisherfolk. We had, therefore, hoped that we would be able to continue this effort for many years to come. However, the prospects, beyond the next two issues, are bleak.

The Bay of Bengal Programme's (BOBP) 'mother project', 'Small-scale Fisherfollc Communities in the Bay of Bengal', jointly funded by DANIDA and SIDA, is coming to an end this year. Plans for a new major project, 'Coastal Fisheries Management in the Bay of Bengal', have been drawn up and endorsed by all the countries participating in the programme. But the anticipated funding support has not yet materialized — and time is running out.

At BOBP's 17th Advisory Committee meeting held in early April in Dhaka, the future of the Programme was discussed. Although interest was expressed by a couple of donor agencies, no firm commitments were made. Even the amount of possible support mentioned by these agencies is far below the requirements. It appears that funding sources are dwindling at a pace with fishery resources.

Fisheries management has become the prime concern of the fisheries administrations in the region, but the process of it is still in its infancy. The proposed

Have we had an effect outside the region?

During the discussions at the 17th Meeting of the Advisory Committee of the Bay of Bengal Programme (BOBP), held in Dhaka, Bangladesh, earlier this year, members were unanimous that the various activities of the Programme had had a stimulating effect on small-scale fisheries development efforts **within** the region. But, wondered several delegates to the Meeting, have they had any effect **outside** the seven countries that are part of the Programme?

The Programme is about to complete its second phase and the members of the Committee were of the view that any impact of BOBP's work **outside** the region should be documented in the terminal report for this phase. While we have heard regularly from institutions and individuals in the region about programmes, approaches and methodologies introduced by BOBP being put to sustained use, we have heard little or nothing from countries outside the project area. Yet, the BOBP's Information Service receives scores of requests every year, for printed material and information, from countries as far apart as Cuba and Pakistan, Mozambique and the Philippines. There are also regular requests for information from such developed nations as the U.S.A., Canada and Australia among others. How has all this documentation and information been used by those countries?

We at the Bay of Bengal Programme — and particularly those of us in its Information Service — would be very pleased if you, the readers who have sought such information or received it as a matter of course, would spend a few moments to consider how the material has been useful — or even, whether it has been useful — and would then write to us how BOBP's work has been put to use by you. The time and effort put into sending us your answers will be greatly appreciated. But we would appreciate even more your views themselves, for they might provide donor nations with some indication of the validity and usefulness of such regional programmes in a wider context.

THE EDITOR

management project is designed to assist the participating countries in

- increasing the awareness of the needs and benefits of fisheries management among the various stake-holders at different levels, from the fisherfolk themselves to the highest government officials;
- enhancing the capability of fisheries administrations, NOOs and fisherfolk to manage their fisheries; and
- devising strategies and practices of fisheries management and resources conservation in the context of integrated coastal area management.

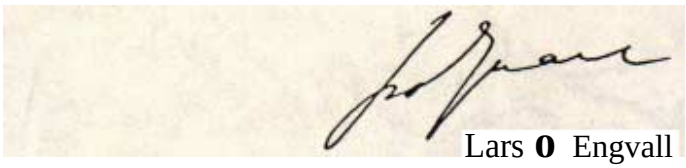
The ambitions of the proposed project could be scaled down to a certain extent. But, even so, in order to make such a regional project meaningful, a certain critical mass of multidisciplinary inputs is required. If this is not available, justice would not be done, either to the participating countries or to the donor agencies.

BOBP has, in the past, engaged itself in many activities that have not been of interest to all the countries in the region. In Fishing Technology, for instance, the work has been restricted to India, Shri Lanka and Indonesia. Extension activities have been conducted in all the countries, but some problems and solutions have often been unique to a particular country, although there have been common elements in the approaches and the learnings.

Fisheries management, on the other hand, is an issue that is very similar in all countries. With small adjustments for special national features, common awareness campaigns, training packages and strategies could be used in all the countries. Both the economic and methodological advantages of regional cooperation are obvious.

The process of fisheries management needs to be accelerated to ensure sustainable development and to prevent environmental degradation. The framework for actions has been set by the UNCED on which there is nearly global agreement.

BOBP has benefited from generous support, particularly from SIDA and DANIDA, for more than a decade. It has been greatly appreciated by the participating countries. Without any negative reflection on any agency, it is doubly ironic that, at this time when, more than ever before, countries wish to work together towards a goal not only common to them but to donor agencies as well, the fmancial support is elusive. We haven't given up yet, but there are only **about** six months left before our **second innings ends.**



Lars **0** Engvall

OUR COVER

When the first issue of the ***Bay of BeAgal News*** came out in January 1981, Champa, the cover girl of our 50th issue, must have been very like that little girl from a Bangladesh fishing village who shares the cover with her while wondering what future the Bay of Bengal has to offer her. Twelve years ago, Champa, from Nazirpur — a fishing village in Bangladesh, Patuakhali District, must also have wondered what her future would be one day. But she was more determined than the rest not to leave her future to fate. She went on to school and matriculated. And her grit brought her to the BOBP's notice.

Today, 12 years and more later, she is an active part of the Bay of Bengal Programme, coordinating BOBP's extension activities in her village, inoculating poultry, persuading mothers to give their children both healthcare as well as education, and motivating project participants to repay credit availed of.

Champa, now 19, has grown just as the ***Bay of Bengal News*** has grown. We started out as a 12-page journal printed in black and white; today, we are regularly 32 pages and as bright as Champa's smile. We may still be talking about 'Better Beachboats for India's East Coast';, 'Making Fishing Gear Better and Cheaper', 'The Continuing Quest of Small-Scale Fisheries', trying out 'High-opening Bottom Trawis' and the contents of our other publications, but we are also talking about much more nowadays and of activities throughout the region. Now we are talking of extension learnings, resource management, aquaculture techniques, and post-harvest practices ensuring value addition and social upliftment.

It is a much bigger fisheries world we are looking at today in our fiftieth issue. But our commitment is still the same — to those small-scale fisherfolk whose daughters, we hope, will grow into other Champas with a little help from us.

THE EDITOR

FIFTY ISSUES OF THE BOBP NEWSLETTER

This month's newsletter marks the publication of the fiftieth issue of the Bay of Bengal News. ***The Bay of Bengal*** *Programme (BOBP) has always had an active publication programme. In* addition ***to*** *the working papers, reports, manuals and otherfisheries related bulletins* ***put out by it, BOBP's*** *Information Service has been mailing the quarterly* BOB News *since* ***1981*** *to over 12(X) organizations and individuals scattered around the world. What transformation has this in-house journal undergone in those dozen years and more? What changing realities in the seven-country region has it reflected?*

"Modern technology has changed the face of publishing worldwide. Readers are, as a consequence, constantly looking for publications that are brighter and more colourful. This has forced us to change the 'looks' of the *Bay* ***of*** *Bengal* ***News (BOBN),"*** explains E. Amalore, who has designed this newsletter from its very first issue in 1981. But, he adds, there are still some, like our founder-editor, S.R. Madhu, who feel the old, stark black-and-white format is more elegant.

But whatever the views on the all-round facelift — which has involved a livelier lay-out, colour throughout, more graphics — the newsletter's strength is its content. So has there been a change beneath the face value?

"Not in its general philosophy, of wanting to convey to a varied readership, which comprises, in the majority, a non-technical readership, what can be done to improve the lot of the small-scale fisherfolk in the Bay of Bengal region. But its slant has shifted in accordance with the aims of the Bay of Bengal Programme (BOBP) itself," says Lars 0 Engvall, BOBP's Programme Director and Publisher of the *News.* The theme of the programme's first phase, for instance, focussed on the technical development of small-scale fisheries. "Consequently," explains Engvall, "the articles featured were more technical in nature". During the second phase, there has been a natural unfolding towards more extension approaches and that has resulted in an increasing emphasis on sociological, environmental and management topics. "The *News* now reflects what has been going on in the second and what might happen in the third phase," says Engvall.

If fisherfolk community extension work underscored the second BOBP phase, then the management of fisheries is the challenge for the third phase, intended to start early in 1994. "We are still unsure of the scale of this phase and its information component," Engvall admits, "but the dissemination of management news and constant regional updates area must in this line of work," he adds.

There is a consensus among readers that the *BOBN* "gives useful information for those who are working in the field," that BOBP should "keep it up because it is not a mere 'in-house magazine' but actually means something to all readers," and that "a newsletter like this should be in the library of all institutions dealing with fisheries, aquaculture, coastal fisherfolk and environment management, whether colleges or universities or NGOs". But there are readers who also feel the journal could do much more than merely providing "enjoyable reading".

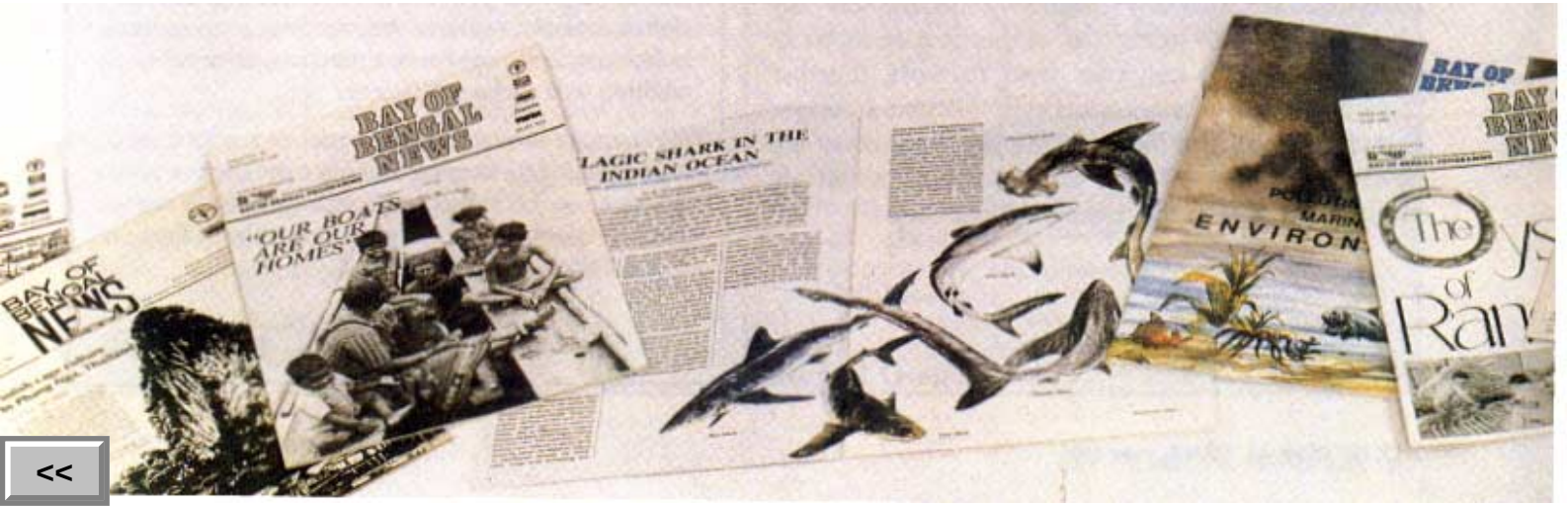
Dr. P.J. Sanjeeva Raj of the Centre for Research on New International Economic Order, Madras, says, "The basic utility of this newsletter to target beneficiaries seems to be not quite clear for the publishers as well as for the readers!

"If the newsletter has to be useful for the grassroot level fishworkers, it should be also in the regional languages of the countries/states bordering the Bay of Bengal. More emphasis should be on items useful for the fisherfolk and coastal zone management, rather than on abstract scientific papers.

"If it is an organ for enhancing participatory fishery development, articles from all fishery workers and scientists from this zone could find a place therein, of course after screening their suitability for the newsletter, keeping your basic objectives in view. Otherwise, it is just a monologue or a unilateral voice of the BOBP alone, as if no expertise is available among the participant fisherfolk or local fishery scientists. If indigenous expertise is not respected, it looks like another domination, by the Western world or their agents, on indigenous people, the basic issues at the UNCED also, which we must erase soon, for a better sense of participation."

While translation into the various languages of the Bay poses several problems, not the least being print-production-oriented ones, operating as the journal does from one location, the *News* has always encouraged translation of its articles for free use in local journals. It has also constantly sought articles from authors in the countries around the Bay on the subjects BOBP has been interested in, but the response has always been poor, linguistic problems, perhaps, having something to do with it.

The targets and aims of the *News,* however, have long been a much-debated issue at



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OUR READERS

In 1991, the *Bay of Bengal News* readership was analyzed to ascertain, amongst other things, whether readers enjoyed the magazine. All recipients, 1200 plus, were sent the questionnaire and *536* responded.

Of those who responded

- 529 answered Yes and only seven were not mterested in the publication
- Sweden, followed by Norway, India, USA, UK and Dennark had the highest questionnaire response rates: 83, 82, 71, 66, 65, 64 and 63 per cent respectively. Bangladesh had the lowest response rate: 23%. Other low response rates were from Thailand (32%) and the Maldives (33%)

A further analysis of the *News* mailing list under various broad classifications of recipients indicates that

- research and education institutions receive 51 per cent of the newsletter copies
- government organizations 20 per Cent
- international agencies 14 per cent; and
- private sector organizations and individuals 15 per cent.

BOBP. The newsletter has never been a journal aimed at fisherfolk. It has always been aimed at those who locally **Work with** small-scale fisherfolk full-time — and most of them in this region have little knowledge of fisheries science and technology The journal has, therefore, aimed at making this group especially knowledgeable about the field they are working in

Science and technology made easy says *S* Muthiah BOBP s Information Officer and the editor of the journal is therefore the premise of the newsletter'. The *News* is a technical yet hopefully readable magazine which features news and articles about the Programme's work with small scale fisherfolk and attempts to present the technical component of those activities in a simple language meant for a wider audience Nothing more' Muthiah explains.

While pointing out that a couple of the newsletter s weaknesses are the lack of case studies on craft performance of follow up articles which leaves us with more questions than answers' and of profiles' of organizations BOBP has long worked with T V Sast the De t Gene Manager of the Andhra Pradesh Fisheri:s Corporation Boat Building Yard in Kakinada nevertheless feels that the journal has contributed substantially to the functioning of the Boat Building Yard (BBY) He writes

The Boat Building Yard has been associated with the Bay of Bengal Programme for nearly a decade and a half and right from the beginning the BBY has been emulating the examples set by BOBP Be it BLC design improvements on the design modifications of the existing craft or modelling an entirely new craft like the FRP *Nava* and FRP ***kattumaram*** the guiding principle has always originated from BOBP Thanks to BOBP the BBY is a pioneering FRP umt in Andhra Pradesh

That s the reason the BBY has to keep up with the latest BOBP information I have been following the magazine almost from the first issue and appreciate its supplementary value to the information contamed in the reports and working papers BOBP brings out from time to time The working papers and reports help us proceed with precision and confidence while the *BBN* gives us a bird s eye view of things in general pomting out the thrust areas the problem areas the possible solutions etc in a nutshell The last mentioned problem management is probably the chief function that the magazine serves

Offhand I can mention half a dozen reports in the *BBN* which have helped ifl conceptualizing new ideas which have been quite fruitful

- Fishing Craft Development in India R Ravikumar Issue No 8
- How to Save Fuel O Gulbrandsen Issue No 7
- Good News from Uppada O Gulbrandsen Issue No 3
- Beach Craft Development Looking Ahead Guibrandsen Issue No 21
- Kattumararns' A Dame! Issue No 3
- 'Motorization of Andhra Pradesh Nava M Murah Mohan Rao and R Ravikumar Issue No 23
- 'A Propulsion System that Makes Small Fishing Craft More Versatile' G Pajot Issue No 47

"We get good food for thought every once in a while and can think up possibilities of introducing modified versions of craft from elsewhere featured in the ***BOBN*** like SRL-15 etc.

People like Mr Sastry right round the Bay are the readers the *Bay of Bengal News* has targeted o'ier the years If some of them have, like him benefited then these fifty issues of the newsletter would have served their purpose.

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INCREASING GIANT CLAM HARVESTS THROUGH MARICULTUR

by Hassan' Shakeel*

Giant Clams have been an important seafood in the Indo-Pacific region for many years. However, in other parts of the world, these animals have been portrayed as killers which seize divers and cause them to suffer agonizing deaths by drowning. Giant Clams are now losing this undeserved reputation, as people become more familiar with coral reefs and reef animals. Today, Giant Clams have become domestic marine animals.

The most outstanding attribute of juvenile and adult Giant Clams is their symbiosis with a dinoflagellate algae, or zooxanthellae, which lives in their bodies. The algae makes food by photosynthesis. A part of the food is used by the algae and the rest is passed on to the clam. Thus, the clam does not need food from an external source. Its own food can be made inside its body when sunlight is provided and good water quality is maintained. This characteristic of a Giant Clam is very attractive to the farmer, because it frees him from a very costly and time-consuming operation — food preparation and feeding. Other characteristics, such as the short larval period and relatively low dependence on phytoplankton after settlement, coupled with rapid growth of the clams after the first year, also make Giant Clams particularly suitable for culture.

In the Giant Clam family, Tridacnidae, there are eight species within two genera. The size of an adult Giant Clam varies according to the species. The range is from about 15 cm to more than 1 m in shell length. *Tridacna gigas,* the true Giant Clam, is the largest bivalve mollusc that exists.

Giant Clam culture described below is based on the practices at 'Reefarm', located on Fitzroy Island, Australia. A Bay of Bengal Programme (BOBP)-funded study tour gave me the opportunity to visit this farm, learn its culture techniques and make this article possible.

GIANT CLAM CULTURE

Giant Clam culture can be divided into the hatchery phase, larval phase, land nursery phase, and ocean nursery and grow-out phases.

Hatchery and larval phases

Broodstock collection and holding: The hatchery phase starts with collecting broodstock from the field and holding them in broodstock tanks. Before they are put into the tanks, the animals are scrubbed clean of external fouling and their valves are rinsed with bag-filtered seawater.

Spawning: During peak spawning season, it is easy to induce Giant Clams to spawn. Giant Clams are herma-phrodites. During spawning, the animal first releases sperm and then eggs, with a short resting period in between the two processes.

All spawning operations of ***T. gigas*** are done while keeping the clam in the broodstock tank, as it is difficult to move the huge animals (some animals weigh 300 kg or more) elsewhere. Serotonin (2 ml of 2 mm concentration), a natural neurotransmitter in Giant Clams and other bivalves, is injected into ***T. gigas,*** keeping the water in the tank static. When the clam starts to release sperm, the sperm, along with some seawater (sperm water), is collected into a plastic bag placed over the opening of the outlet of the water siphon systems of the animal. Eggs, whose release takes place a few minutes after the sperm release, are collected in the same way as sperm, but in a much larger bag. The eggs are then transferred to a plastic tub for fertiliiation.

Hatchery operations include spawning, hatching and contaminating larvae with zooxanthellae.

* Fisheries Resources Officer, Marine Research Section of the Ministry of Fisheries and Agriculture, Maldives.

To induce spawning in smaller species, the clams are taken out of the broodstock tank and placed in a shallow pre-spawning tank. When putting the broodstock into the pre-spawning tank, the hygienic measure of scrubbing the outer valve surfaces and rinsing them with filtered seawater is repeated. Once the clams have been in the tank for some time, serotonin is injected into a few of them. When a clam starts to release sperm, a part of it is collected in a beaker (to be used to induce other clams). The animal is then removed from the tank and placed in a bucket filled with filtered seawater. It completes sperm release in the bucket.

When this process is complete, the clam is taken out of the bucket, rinsed with filtered seawater to remove sperm sticking to its valve surfaces, and then placed in another tub filled with filtered seawater. It now releases eggs into this container. When egg-release is complete, the animal is taken out of the tub and the eggs in the tub are ready to be fertilized.

Fertilization and hatching: To fertilize the eus collected in the tub, sperm water from the bag or bucket is poured into the tub. To get good quality offspring, sperm from two or more clams are added to the eggs obtained trom one clam. Aeration is maintained in the tub containing the fertilized eggs.

The fertilized eggs are stocked in a hatching tank at a rate of 20-25 eggs per ml. Water in the tank is static and aerated. The eggs hatch about 12 hours after fertilization. Within 40 hours of fertilization, the trochophore larvae become veligers. The swimming veiger larvae are retrieved by siphoning the water into a large 80-88 micron sieve with high walls.

Larval rearing: Veliger larvae are stocked in a larval tank at a rate of 3 or 4 per ml. Water in tills tank is also static and aerated. Larval rearing lasts 6-10 days, depending on the temperature. Every two days the water in the tank is drained through an 80-100 micron sieve. The larvae caught on the sieve are washed and transferred into another larval tank containing a fresh supply of filtered seawater.

About 6 or 7 days after fertilization, the larvae become pediveligers. The pediveligers settle at the bottom and a foot develops in each and begins to probe about. Now the larvae them-

Giant clam broodstock tanks.

***Hatching** tanks for giant clam eggs.*

selves have completed the swimming stage and they are ready to fix to the bottom. At this stage they have to be transferred to a settlement tank by siphoning them onto a sieve.

Land nursery phase

Pediveligers retrieved from the larval tank are washed with filtered seawater and stocked in a nursery tank with 5/cm^2, of the bottom surface area. Water in this tank is not unfiltered but allowed to flow through. The juveniles become visible to the naked eye at the age of two months. This phase ends when the clams are about nine months old. From this point, the juveniles can be moved to the ocean nursery.

Contaminating the clams with zooxanthellae: Parent clams do not pass on zooxanthellae to their offspring. Normally, the zooxanthellae present in the sea enter the body of the clam larvae. However, the water in the nursery tanks may not contain this algae. Therefore, the algae must be introduced into the nursery tank. This is done by removing the mantle tissue, with the algae in it, from a clam of the same species, washing it, chopping it with the help of a food blender, then straining it through a 28-55 micron sieve, to remove larger pieces of mantle tissue debris, and pouring it into the larval tank close to its seawater inlet.

The zooxanthellae feed is given on day three, day five, day seven and day nine post-fertilization.

Larval feeding. As with the majority of bivalve mollusc larvae, Giant Clam larvae feed on plankton. When a larva has spent the small amount of yolk provided by the egg, it has to depend on an external food source At 'Reefarm' the larvae are fed microalgae ***(Chaetocems gracii.s Isochrysisgalbana*** *and* *Pay/ova* ***sauna)*** cultured on the farm.

Ocean nursery ***and grow-out phases***

Clams of 15 mm size can be taken to the intertidal ocean nursery. However, they still need to be protected from predators. For this purpose, the clams are put into plastic net cages with coral rubble as substratum for them. The cages are placed at the bottom of a plastic net enclosure to give the clams additional protection. When the clams have reached 10 cm, they are taken out of the cage and planted on the bottom of the enclosure. At about 20 cm shell length, the enclosure can be removed. Now the clams are left on their own to grow to market size.

FEASIBILITY **OF GIANT CLAM CULTURE IN THE MALDIVES**

Giant Clam culture can be very promising in a country like the Maldives. It has the potential to

Land nursery. Settled clams are left to grow until they are ready to go to the ocean nursery.

Giant clam nursery.

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T. gigas ***in a broodstock tank.***

increase clam harvest from the reefs. Hatchery-raised juvenile clams can be planted on reefs and in new habitats ***(e.g.*** seagrass beds), where natural clam larvae cannot normally survive the severe conditions even if they happen to settle there. Increased adult clam density within a locality, in turn, will enhance natural reproduction.

The Giant Clam's mode of life, as well as local environmental conditions, favour clam culture in the Maldives. The simple culture techniques of clams and the present circumstances in the country also contribute positively towards culture feasibility.

Adult Giant Clams get most of their food indirectly from photosynthesis, which means they rarely use other organisms as food. Very few reef animals feed on adult clams. Hence, as far as food is concerned, these animals are quite independent and have a very loose connection with the reef food webs. The feeding habit of Giant Clams have three implications:

- the ecological imbalance resulting from Giant Clam stocking on the reef or harvesting from it will'be minimal;
- as it is not necessary to feed the clams, culture cost will below; and
- for the same reason, culture-associated eutrophication of the waters will be excluded.

The fact that two species of Giant Clams ***(T. squamosa*** and ***T. maxima)*** inhabit Maldivian waters indicates that the local marine environment is suitable for the development and survival of clams. The existing Giant Clam culture techniques have been tested in similar environmental conditions as those in the Maldives. Giant Clam culture in the Maldives is, therefore, environmentally and technically feasible.

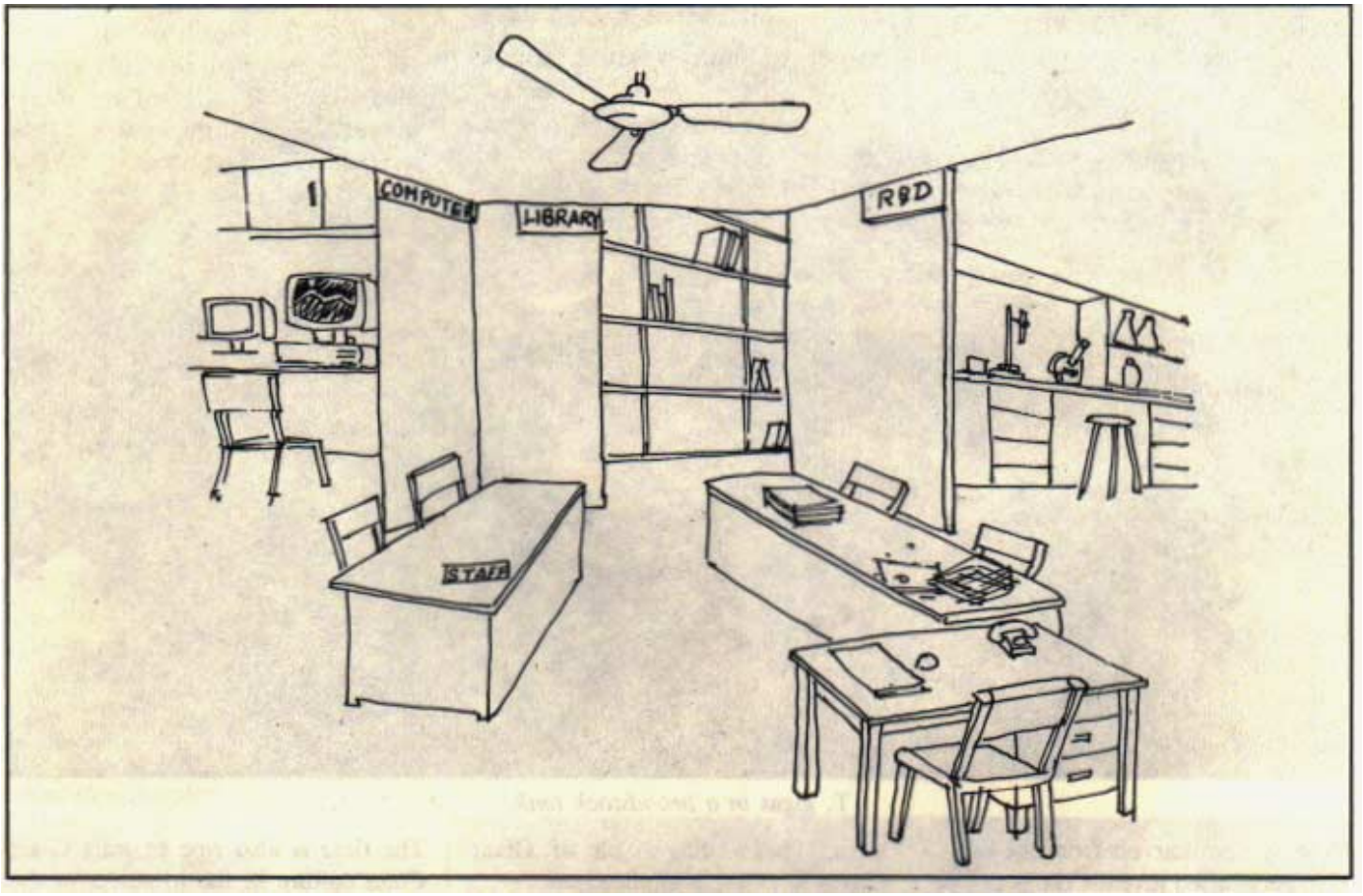
The time is also ripe to start Giant Clam culture in the Maldives as the Government is encouraging rational exploitation of its marine resources. Only Giant Clam culture can offer a future to the clam fishery in the Maldives, which is at present banned. Experts have recommended that the Maldives exploit its natural clam resources along with cultured clams. Culturing Giant Clams will also enable restocking of the atolls which have been depleted of their natural stocks.

Giant Clam culture can be started easily by aquarium fish exporters, who already have experience of handling and marketing marine animals. Today, the Marine Research Section of Ministry of the Fisheries and Agriculture is in a position to condlict experimental Giant Clam culture and transfer the experience to all interested parties in the country.

THE RESEARCH' NEEDS

For present and future development and management of marine fisheries in the Bay of Bengal region

by K. Sivasubramaniam
(Senior Fishery Biologist)



With management of the marine fisheries resource the need of the hour in the countries of the Bay of Bengal region, research into both resources as well as their management is becoming more and more vital. Unfortunately, such research in the region is hampered by

- the lack of appropriate statistics;
- the lack of coordination among institutions involved;
- the inappropriate methodology used in socioeconomic surveys;
- the lack of appropriate methods of communication with the fisherfolk;
- the uncongenial work atmosphere and constant transfers in many institutions;
- inadequate allocation of national staff;
- a preference for fundamental research rather than short-term investigations; and
- the lack of adequate library facilities.

Unless these needs of the researcher are improved, managing the resorces of the region adequately are likely to be long-delayed. This has been the experience of the Bay of Bengal Programme (BOBP), which has been continuously involved, since 1983, with research into the fishery resources of the Bay of Bengal and fisheries management in the region. But to begin at the beginning...

Past trends

The 1970s was a significant transition period in marine fisheries development not only in the Bay of Bengal, but also in general, with world fish production changing drastically from about 7 per cent increase a year to only 1 per cent. The price of fish increased faster than those of agricultural products. The human population, including fishermen, increased and marine fishery resources became subjected to more intensive exploitation. Catch rates declined in many traditional fisheries and more and more fish species became luxuries, affecting the low income consumers in the region, who depended heavily on fish for their protein intake. With prices rising even higher in the developed world,

opportunities for earning much more through export attracted entrepreneurs to the fisheries sector, particularly those willing to make capital-intensive investment in the harvesting, processing and export, on a large scale, of such products as shrimp, lobster, squid, cuttlefish, tuna etc.

Increases in prices and new entrants to the list of luxury seafoods also encouraged relatively higher investments in modern motorized and mechanized small-scale craft for trawling, purse-seining, large-mesh driftnetting, multiday offshore fishing etc. In some countries in the Bay of Bengal region, this was done as a replacement of some of the traditional systems of fishing, but in others it was **additional** to the traditional system. In still other cases, there has been significant increase in investments in large-scale trawl or purse-seine fisheries for harvesting exportable items, but with relatively poor development of the small-scale marine fisheries subsector.

As a consequence, the complexity of marine fisheries in the Bay region increased through interactive and competitive fishing between the small-scale and large-scale fisheries and within the subsectors themselves. Many of the resources were fully exploited or became overexploited. Diversification of fishing methods within the small-scale sector, targeting the same resources, changed the homogeneous traditional fisherfolk communities into heterogeneous ones with their income ranges widening at both ends.

The present status

Prior to the 1970s, when fisheries were nonproblematic, fisheries researchers mainly produced material which generally only described the fisheries. Since the 1970s, however, the research needs have increased tremendously and fisheries research units/sections have been established where none existed and universities have upgraded their courses in marine biology/ecology into departments or faculties of Fisheries Science. Some of the problems these research centres have had to tackle have been:

- Many species being exploited by a single gear and many gear exploiting the same species;
- Difficulties in determining the age of fish in tropical waters;
- The lack of good time-series data/statistics on annual changes in catch and fishing effort, applied through many interactive fisheries; and
- The complexity of the mathematical calculations that had to be handled by zoologists/biologists.

The last-listed was overcome to a certain degree by the introduction of length-frequency-based methodologies, microcomputers, software packages and training courses on the methodologies and software.

National-level decisions on management of some of the marine fisheries, taken up in practically every country in the region, have varied from mesh size regulations for traditional gear, like set bagnet, pushnet, dragnet etc, and non-traditional gear, like bottom trawls and purse-seines, to closed areas or zones for certain types and sizes of motorized craft, closed seasons for shrimp trawlers and even a complete ban on trawling, purse-seining and pushnetting. However, very few of these steps have been successfully implemented, due to

- The lack of cooperation from the fisherfolk involved,
- Lack of funds, facilities and personnel for effective enforcement and surveillance, and
- Sociopolitical reasons.

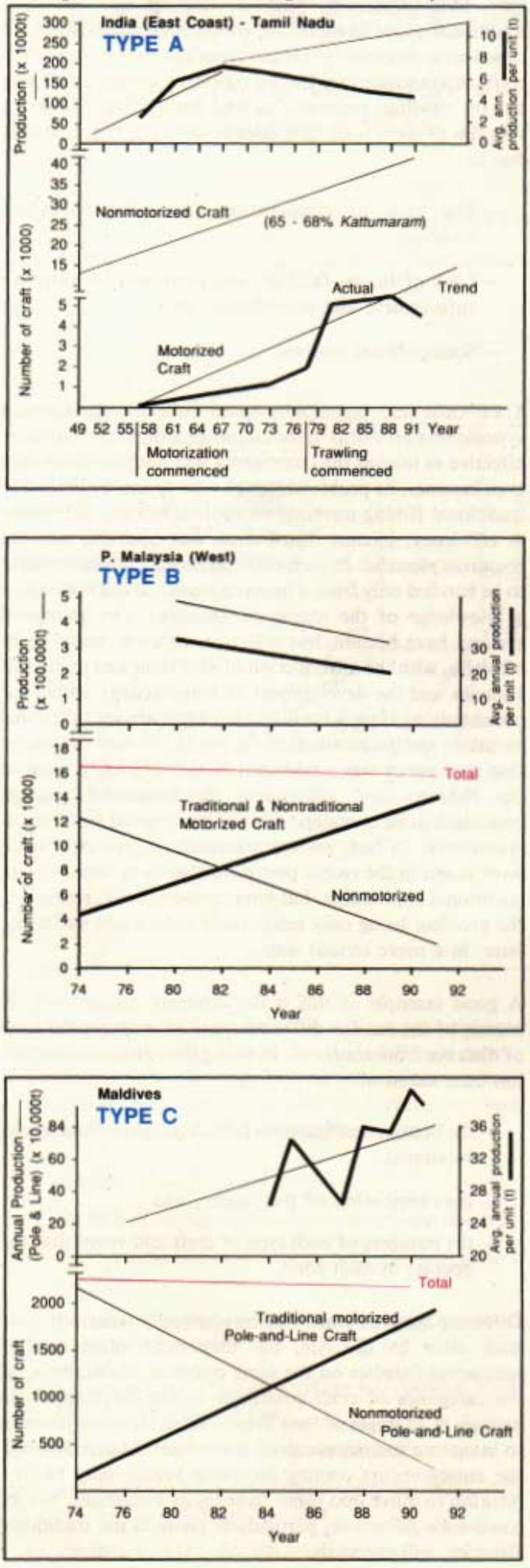
Traditional and community-based fisheries management systems that prevailed in the countries around the Bay were effective as long as the community was homogeneous with even incomes, its problems/issues were primarily limited to traditional fishing methods without significant differences in efficiency, income distribution was equitable and the resources plentiful. In such circumstances, the issues needed to be handled only from a humane angle and did not require a knowledge of the resources. However, the traditional systems have become less effective, or even ceased to be effective, with the introduction of multigear and multicraft fisheries and the development of heterogeneity within the communities. If such traditional systems are yet functional in certain specific locations in the world, it would only mean that the system was established in the very early years of the fisheries and subsequent developmental changes continued to be contained within that original structure or framework. In fact, several management problems which have arisen in the recent past have also been handled with traditional approaches, but have, consequently, resulted in the problem being only temporarily solved and surfacing, later, in a more serious way.

A good example of this is the arbitrary decision on the zoning of she sea for different types of craft on the basis of distance from shoreline. In doing this, no consideration, has been taken of

- the bottom configuration (which is highly variable with locations),
- the distribution of fish stocks, and
- the numbers of each type of craft and vessel that can operate in each zone.

Different types of craft may be physically separated from each other by distance, but they quite often conduct interactive fisheries on the same resource. Collectively, all the categories of craft contribute to the catching of the animals at all stages of their lives – from larvae or juveniles to immature and mature sizes. If the resource gets depleted, the entrepreneurs owning large-size vessels may be in a position to move into other fisheries or businesses, but the small-scale fisherfolk, particularly those in the traditional fisheries, will succumb.

Fig. 1 Pattern of fishing fleet development



In this context, it would be useful to examine the three different basic patterns of marine fisheries development evident in the Bay (see Figures 1, Type A – C, alongside):

Type A: Traditional nonmotorized fleet increasing, or not decreasing, and newer small-scale and large-scale fleets also increasing, ***e.g,*** in India and Bangladesh.

Type B : Traditional nonmotorized fleet decreasing significantly and newer small-scale and/or large-scale fleets increasing significantly, ***e.g.*** in Malaysia, Thailand, Indonesia and Shri Lanka.

Type C: Traditional nonmotorized fleet (fecreasing significantly and motorized traditional fleet increasing significantly, ***e.g.*** in the Maldives.

The fleet structures in the countries around the Bay (see Figure 2 on facing page; Note: the relative proportions and not the exact numbers should be considered) not only exhibit the differences in the composition, but also reflect successive stages in the development. The fleet compositions of the countries are arranged in the order of relative development. Table 1 (facing page) shows that the marine fishery resources in this region are in four major categories – small pelagics, shellfish, large pelagies and demersal finfish and that, on an average, there are nearly 20 interactive craft-gear combinations under each category of fishery in the countries around the Bay of Bengal, except in the Maldives. The degree of diversity in the fisheries created by the structure of the fleet and the number of interactive fisheries, as seen in the figures and table, contribute to considerable widening of the income structure which increases heterogeneity in the life within, and between, fisherfolk communities and leads to numerous fisheries management problems.

The future needs

The interactive nature of most fisheries in this region demands that management of a particular resource or a fishery requires examination of the role and impact of all interactive fisheries exploiting the same resource or resources – both from the biological and economic angles. Considering the relative effects of these interactive fisheries on the life and living conditions of the fisherfolk engaged in the respective fisheries, it has become essential to understand the socioeconomic implications of the interactions. Therefore, an integrated multi-disciplinary approach to the assessment is required for fisheries and fishery resources management purposes.

Those at the lower end of the income scale, often struggling for survival, will fail to heed the cry for management unless they are made to understand why fisheries management is necessary and how it could be done. This requires understanding of their attitudes, perceptions,. educational levels etc. to identify appropriate media/material and approaches to awareness-building. Achieving this is vital to any success in the implementation of management measures, because without the fisherfolk's understanding, cooperation and participation management cannot be achieved.

The experience gained over the last two years under the UNDP-funded regional (BOBP) project on 'Bioeconomics of Small-Scale Fisheries in the Bay of Bengal Region' (RAS/91/006) reveals various shortcomings of the institutional setups which severely hinder appropriate approaches to, and effective implementation of, fisheries management studies, plans and measures in the region.

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Fig. 2 Status of fishing fleet (marine) in the Bay of Bengal Region
(countries arranged in relative order of development of the fleet)

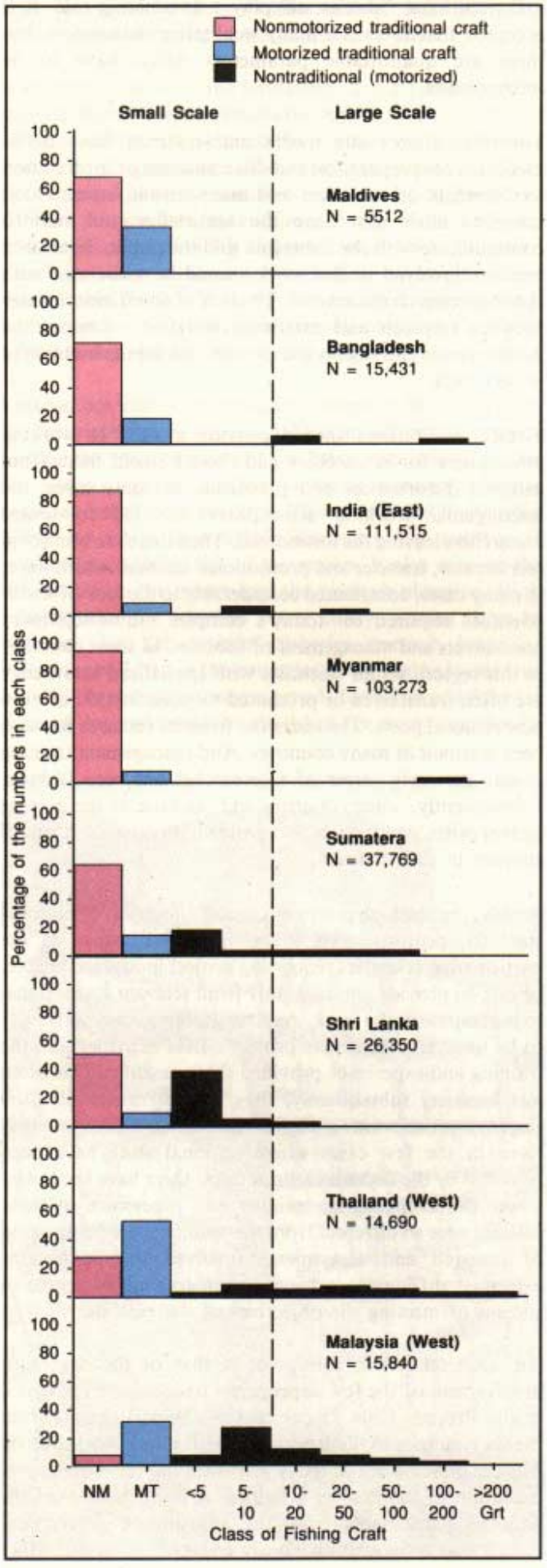

Table 1
Examples **of interactive** fisheries **in the four major** categories **of** marine fisheries **in the countries** around the Bay **of** Bengal

Fishery — Class	*Small-Scale*		*Large.Scale*
CRAFT CATEGORIES USED:	*Traditional (Nonmotorized)*	*Traditional+ Nontraditional (Motorized)*	*Nontraditional (Mechanized)*
I. SMALL PELAGICS			
Species caught	—	Sardine, anchovy and **mackerel**	—
Gear interactive	Beach seine **Boat** seine Set bagnet (estuarine) Liftnet Small mesh gilinet	Set bagnet (marine) Liftnet Small mesh gillnet Purse seine	Purse seine
Fishing depth	1 — lOm	10—20m	20—50m
Size/Age of animal	Small	Medium + Large	Large
H. SHELLFISH			
Species caught	—	Penaeid shrimp	—
Gear interactive	Pushnet/Dragnet Set bagnet Boat seine Beach seine Trammelnet Trawlnet	Set bagnet Pushnet Trammelnet Trawinet (shrimp)	Trawinet
Fishing depth	0.5 — 10 m	10— 20 m	20— 60 m
Size/Age of animal	Larvae, juveniles, sub-adults (small)	Sub-adults, adults (Medium+ Large)	Sub.adults+ adults (Large)
ifi. LARGE PELAGICS			
Species involved	—	Tuna and pelagic shark	—
Gear interactive	Drift.longline Pole-and.line Trollingline Handline	Large mesh driftnet Drift.longline Pole.and.line Trollingline Handline	Pole-and-Line Drift.longline Purse seine Drift-gillnet
Fishing depth	<200 m Periphery of the C. Shelf (Inshore)	)200 m Beyond C. Shelf(Offshore)	>1000 m (Oceanic)
Size/Age of animal	Small	Small+ Medium	Large
IV. DEMERSAL FINFISH			
Species involved	Demersals — Croaker, Catfish, Bombay Duck, jack, Ribbonfish, snapper, grouper, shark and skate		
Gear interactive	Set bagnet Boat seine Beach seine Bottom.set gillnet Bottom longline Handline	Bottom longline Bottom-set gillnet Trawl (shrimp) Handline Set bagnet	Trawl (finfish + shrimp)
Fishing depth	<10 m	10.100 m	30-80 m
Size/Age of animal	Small	Medium	Large

First and foremost is the weakness of that most essential tool, fisheries statistics, in the detail and reliability necessary for the assessments envisaged. This lacuna has been repeatedly voiced over the years, but progress has not been satisfactory in many of the countries in the region. Consequently, the Project has had to spend considerable time, labour and funds to collect data and estimate production of relevant species and effort applied, according to seasons, areas, type and size of craft and gear. It is the same with economics of the fishing operations. Even socio-economic baseline information related in time to the production by the fisheries is lacking. Data collected by projects are seldom incorporated into a general database for continuous, or periodic, updating and use in the future. Hence, future studies too will have to keep repeating these time- and effort-consuming baseline information-gathering exercises. All the countries around the Bay of Bengal are aware of the deficiencies of fisheries statistics and the steps necessary to be taken to improve the situation. But they have yet to act to raise the standard of fisheries statistics to the level necessary.

Secondly, fisheries research or survey institutions in most of the countries are not yet organized for present-day needs which call for an integrated, multidisciplinary approach. Our attempts in the bioeconomics project to draw different institutions together to combine such disciplines as fishery biology, fishing technology, environmental studies, economics, sociology and extension, so that a coordinated execution of workplans becomes possible, have not been successful. As a result, some surveys had to be redone in a number of countries. Project arrangements for coordinated work also tend to be temporary, with very weak linkages, and insufficient for continuation of an integrated approach on a long-term basis.

Thirdly, economics, and particularly socioeconomic surveys as required in the present context, must deviate from traditional ways. The specific pattern of fisheries operations – seasonality, craft-gear combinations and ownership, catch composition, geographic locations, etc. – influence incomes. Stratified sampling of income on a monthly or seasonal basis from various fisheries and stratified sampling of households must be matched to link the fisheries with the households. Socioeconomic issues and alternative fisheries or nonfishery income activities must also be identified before management measures can be introduced and fisherfolk enlightened on the alternatives available to them. Income distribution should be highlighted, because it determines welfare or the material well-being of the fisherfolk. Such a biosocioeconomic approach has to begin with micro-community level studies and lead to macro-level policy determination.

Many publications on socioeconomic aspects of fisheries were found to be contrary to the actual situation because of the failure to draw conclusions in the light of the resource status. Further, consensus is also needed on the manner in which such interdisciplinary parameters can be incorporated into basic biosocioeconomic models for management decision-making. Most of the existing bioeconomic models fail to take the socioeconomic aspects into consideration. The few biosocioeconomic models that have been proposed are based on conditions in the developed world and are not appropriate to the conditions in the Bay where small-scale and traditional fisheries still play a dominating role. It is accepted that there are many qualitative parameters, but there are quantifiable parameters which have to be incorporated.

Fourthly, appropriate media and material have to be identified for preparation and dissemination of information to fisherfolk on resources and management issues. Good scientists must also have the knowledge and skill to communicate with the fisherfolk and the public. Extension workers involved in this work should be associated with fisheries research institutions. The lack of an efficient linkage between research and extension workers is one of the weaknesses in this region and the need for inputs in this area is very high.

Fifthly, institutions should provide a suitable working atmosphere for researchers and should shield them from external disturbances and problems. In some cases, the uncongenial working atmosphere has led to senior researchers leaving the institutions. Then there are prevailing recruitment, transfer and promotional schemes which have, in many cases, contributed considerably to the lack of senior scientists required for today's complex multidisciplinary assessments and management of fisheries. In some countries in this region, senior scientists with specialized knowledge are often transferred or promoted to nonscientific or even nontechnical posts. The cadre for fisheries research has also been stagnant in many countries. And management training during the early career of a researcher has been lacking. Consequently, some countries will, as long as the present system exists, continue to be dependent on external technical support in such matters.

Sixthly, the research priorities of, and allocation of national staff to, projects need to be improved. Most of the participating countries requesting project inputs are unable, or fail, to provide national staff from relevant institutions, to participate in the work. As a result, temporary staff have to be hired to execute the project's field activities and the training and experience provided these casual staff is often lost because, subsequently, they do not necessarily find employment relevant to the field of training and experience. Even in the few cases where national staff have been provided by the Fisheries Directorates, there have been cases where the background, training and experience of these officers were so different from the requirements for the kind of research and assessments involved that it became extremely difficult to achieve even a reasonable degree of success of meeting the objectives of the case study.

An issue related to this point is that of the degree of involvement of the few appropriate national staff assigned to the Project. Only 25 per cent of the participants from the six countries to the Regional Meeting and Workshop on Bioeconomics were directly involved in the subsequent execution of the Project activities. A large number of the national participants from the appropriate government institutions were simultaneously engaged in various other

official activities outside the Project. Consequently, there was discontinuity in the monthly sampling of catch, effort and income and seasonal testing of gear and other devices. Part-time input by the staff also resulted in the piling up of unprocessed data and incomplete analysis.

Seventhly, in view of the limitations in staff and funds in national fisheries institutions in the region, urgent short-term investigations should be preferred to long-term fundamental research programmes. Breakthrough research of a fundamental nature is common in many fields, including fisheries science, but, by and large, many of the demands of fisheries research in this region are applications of known principles and techniques for immediate development and management needs. Unlike the former, which requires long-term projects, the latter are often issue-oriented, for which solutions are-required at relatively short notice.

Last but not least is the necessity to improve library facilities for fisheries research and to establish an information service to meet the growing needs of the fishing industry. Fisheries libraries in some countries are starved of necessary reference material essential for research. This is reflected in the poor references made to available literature in a number of publications coming out of the region. It also exposes the deficiencies in the inputs into the research planning. With subscriptions for journals being costly, getting them in exchange for the national fisheries research journals! bulletins published in the countries of the region is one way of fulfilling this need to some extent. Sadly, several fisheries research journal/bulletins published for many decades by national institutions in the region have ceased to come out. In other cases, opportunities for establishing a bulletin/ journal are being overlooked.

The capacity of research personnel and the research output of the national fisheries institutes/agencies would be enhanced significantly with better access to updated information and reference material on multidisciplinary approaches to fisheries development and management.

With weaknesses in the organization and in the strength of relevant institutions, with limitations 'in the output of research and the instruments of management, sociopolitical influence appears to sway most decisions on development and management in the region. Many, or ALL, of the points listed above apply to most of the participating countries — and with most projects that have been, or are being, implemented in them. The situation becomes even more difficult when there are several projects at the same time, all competing for qualified national staff. Yet, as these projects have the primary objective of institutional strengthening, the recipient cOuntries should ensure that their inputs are provided with this objective in mind. Half-hearted responses result in national staff not taking their roles seriously.

If the needs listed are not improved, the attainment of institutional strengthening necessary for appropriate assessments and the readiness for coping with the development and management pians already awaiting action will be inordinately prolonged. The fisheries resources of the region can ill-afford such delay.

Well-stocked fisheries libraries like this are few and far between in the region.

Malaysia

BOBP AWARDS FOR

As reported at the end of last year i
Bengal Programme (BOBP) involved
fishing villages in the countries of
enrolled in the coastal primary scho
invited to participate in a drawing co
their versions of 'Life on the Beach

Besides the winner and two runners
prizes, there were consolation prize
a standard very close to that of the
All winners received cash prizes exc
opted for hand-picked gifts — kna
they would not find in their own a

In every country, the local organizati
the competition held a well-attende
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with fisheries, ranging from Ministers
field trainers. Featured on these tw
the prize distribution functions hel

Indonesia

Shri Lanka

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Thailand

R THE CHILD ARTISTS

in the Bay of Bengal News, *the Bay of*
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the BOBP region. About 200 children
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s-up from each country being awarded
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winners. In all, 32 prizes were awarded.
ept in the Maldives, where the children
psacks, stationery and so on — which
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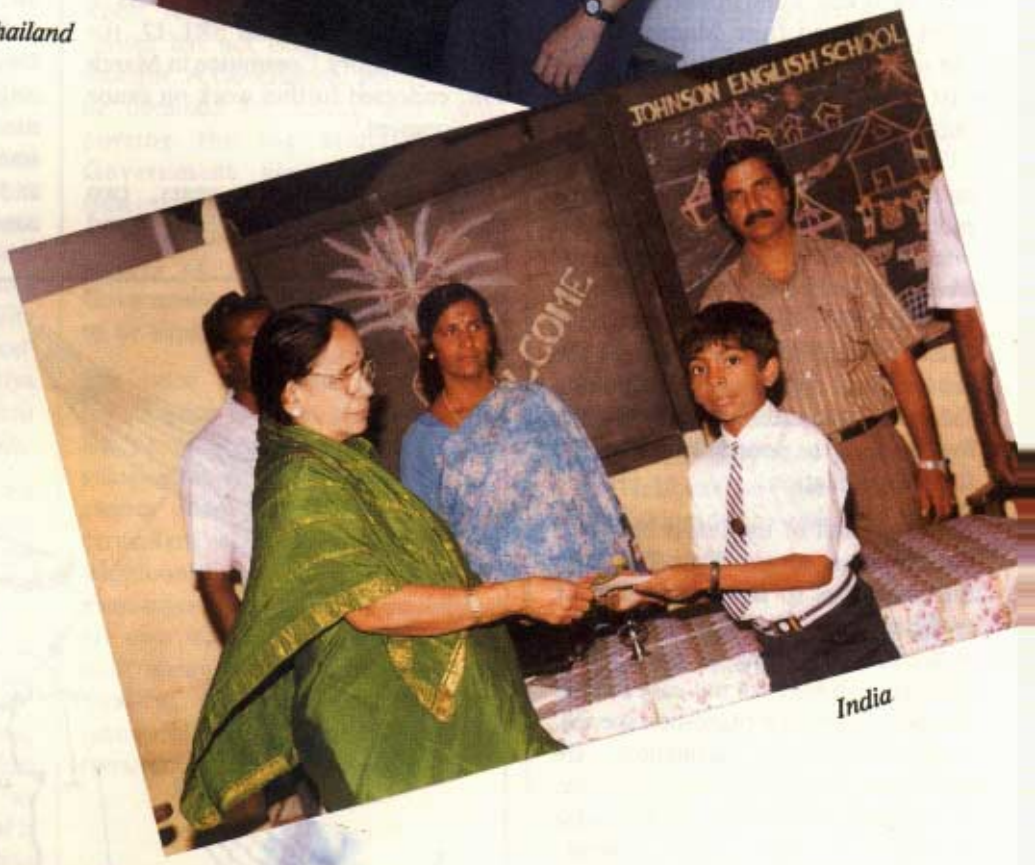

India

Maldives

Bangladesh

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HAVE THE NEW OUTRIGGER CANOES IN SHRI LANKA COME TO STAY?

by G. Pajot

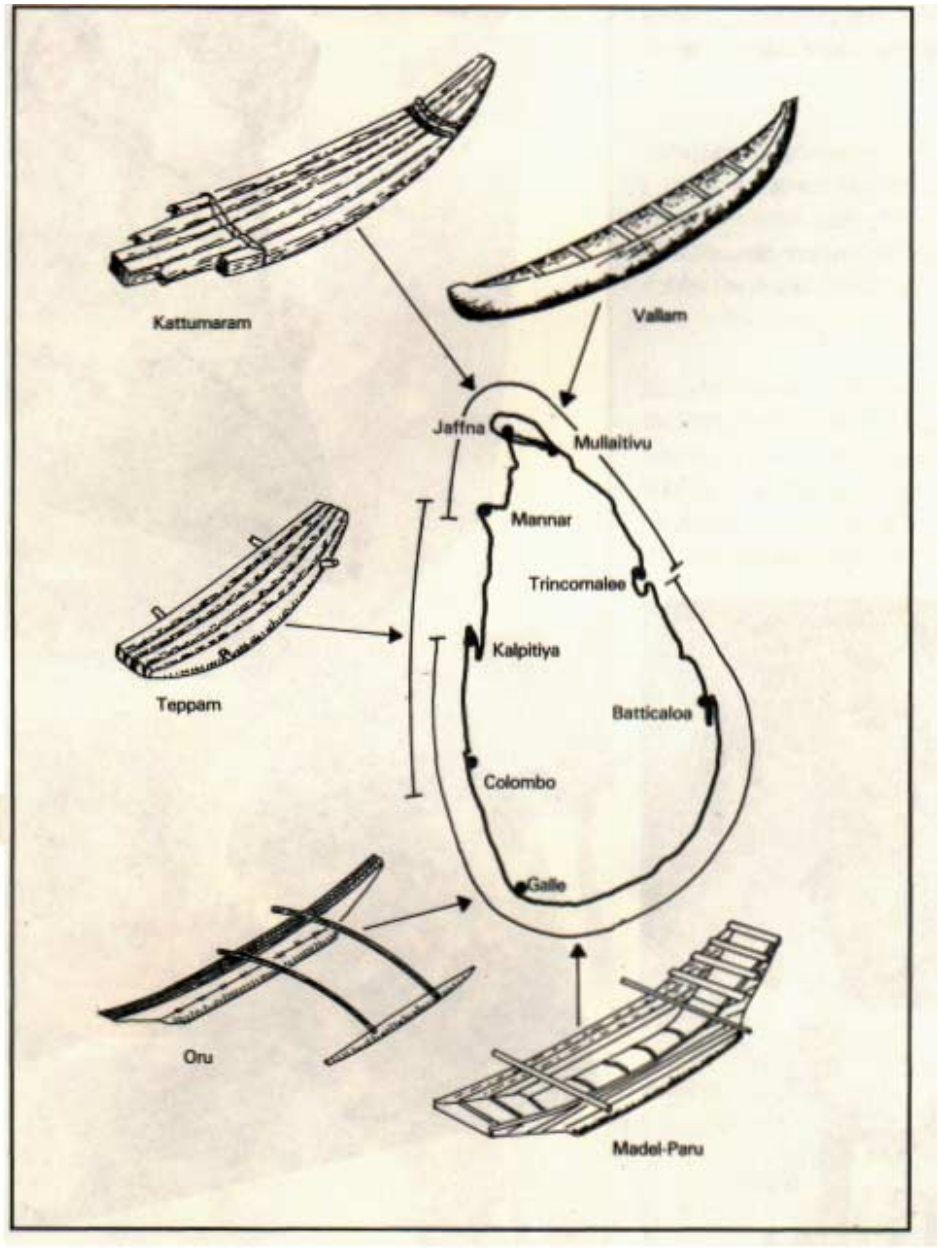
(Senior Fishing Technologist)

Canoes of single and double outrigger types are found from Madagascar in the west to the Pacific islands in the east. In Shri Lanka, the single outrigger canoes, locally called *oru,* are still a popular fishing craft, whether paddled, rowed, sailed or outboard motor-driven. In 1979, some 10,000 *orus,* most of them non-motorized, were the backbone of the coastal fisheries on the Island's south and east coasts. Owned and operated, for the most part, by very small-scale fishermen, they helped to secure the livelihood of the poorest section of the fishing population.

The main hull of the *oru* is hollowed out from a single log. The log, therefore, has to be straight and of sufficient girth and length. Due to indiscriminate felling in the forests, large enough logs are not easy to find nowadays. The new plantation species, such as teak and eucalyptus, are unsuitable for making dugouts. Even if available, hollowing out logs also wastes a lot of timber. OGulbrandsen, Naval Architect and designer of canoes in the Pacific and elsewhere, says that, if the same log is sawn into planks, at least two planked canoes of the same size as the *oru* could be made and there'd be wood still left over. But such a canoe would need a new design.

After several trials with design, a BOBP subproject working on an *oru* design focussed on a canoe whose size, 7-9m was popular in the Doddanduwa area, Gale District. An 8 m plywood canoe SRL-17 developed here was, despite its different hull shape, accepted by the fishermen on account of its fuel economy, fishing potential and better working space (see *'Development of Outrigger Canoes in Shri Lanka'* BOBP/WP/6l). As a result of the trials with SRL-17, the BOBP Advisory Committee in March 1987 endorsed further work on canoe development.

During the next few years, two prototype wooden canoes, SRL-18 and SRL-19, were designed, constructed and extensively demonstrated for the Doddanduwa fisheries, mainly ringnetting and gillnetting for small tuna, Halfbeakfish and a variety of small pelagics (small tuna, mackerel and sardines). The two different construction methods were tested to



determine which would be more satisfactory from the point of view of local timber resources, village-level construction ability, the rigours of beaching and, not least, acceptance by the local fishermen.

The acceptance of the round bottom hull of the SRL-19, a strip-planked canoe, prompted the subproject to build a similar FRP canoe, SRL-19A, as many parts of Shri Lanka have been much exposed to FRP construction. This also gave the fishermen a wider choice.

To reduce cost of fuel further, an inboard diesel engine with a liftable propulsion system, the BOB Drive, already developed and introduced for monohull fishing craft in India, was tried out as an alternative to outboard motors. Converting from kerosene to diesel was also attempted to reduce costs for fishermen and canoe owners. The good performance of the canoe with the BOB Drive and its viability convinced the fishermen of Dod-danduwa and neighbouring Balapitiya that an economic alternative to their traditional *oru* was at last available.

In January 1993, when the subproject came to an end, more than 20 canoes were commercially operating in the Galle District, reflecting achievement of its objectives.

SRL-18A Wooden Canoe

Over five years of fishing operations, the SRL-18A short-planked canoe has proven economical as well as technically viable. It has shown that it can take the beating of beach landing even during the monsoons and has suffered no structural defects. The only repairs have been: changing the outer layer of bottom planking of the hull (as a consequence of normal wear resulting from hauling the canoe on to the beach), applying mastic (a glue-like filler) on leaking joints, and painting the craft from time to time. Of course, like any wooden planked fishing craft, the hull is not leakproof, as a FRP hull would be. Fishermen using this type of canoe must expect a few leaks and do the necessary maintenance.

To find Jak, Sandal, Mara and Mango wood for construction of wooden canoes has not been as easy as first thought. A Government permit has to be obtained for felling and transporting the log selected in a Government plantation by the fisherman and carpenter. For future construction of wooden canoes, sources of supply other than the Government teak plantations may have to be explored.

But once the wood is available, construction of short-planked canoes has proved easy and appropriate at village level. After construction of two canoes under supervision, the local carpenters were capable of building additional canoes on their own. The most experienced carpenter established his own workshed and subsequently built several woQden canoes of high quality. The subproject, thus, successfully. transferred the skill to construct new wooden canoes.

SRL-19A FRP Canoe

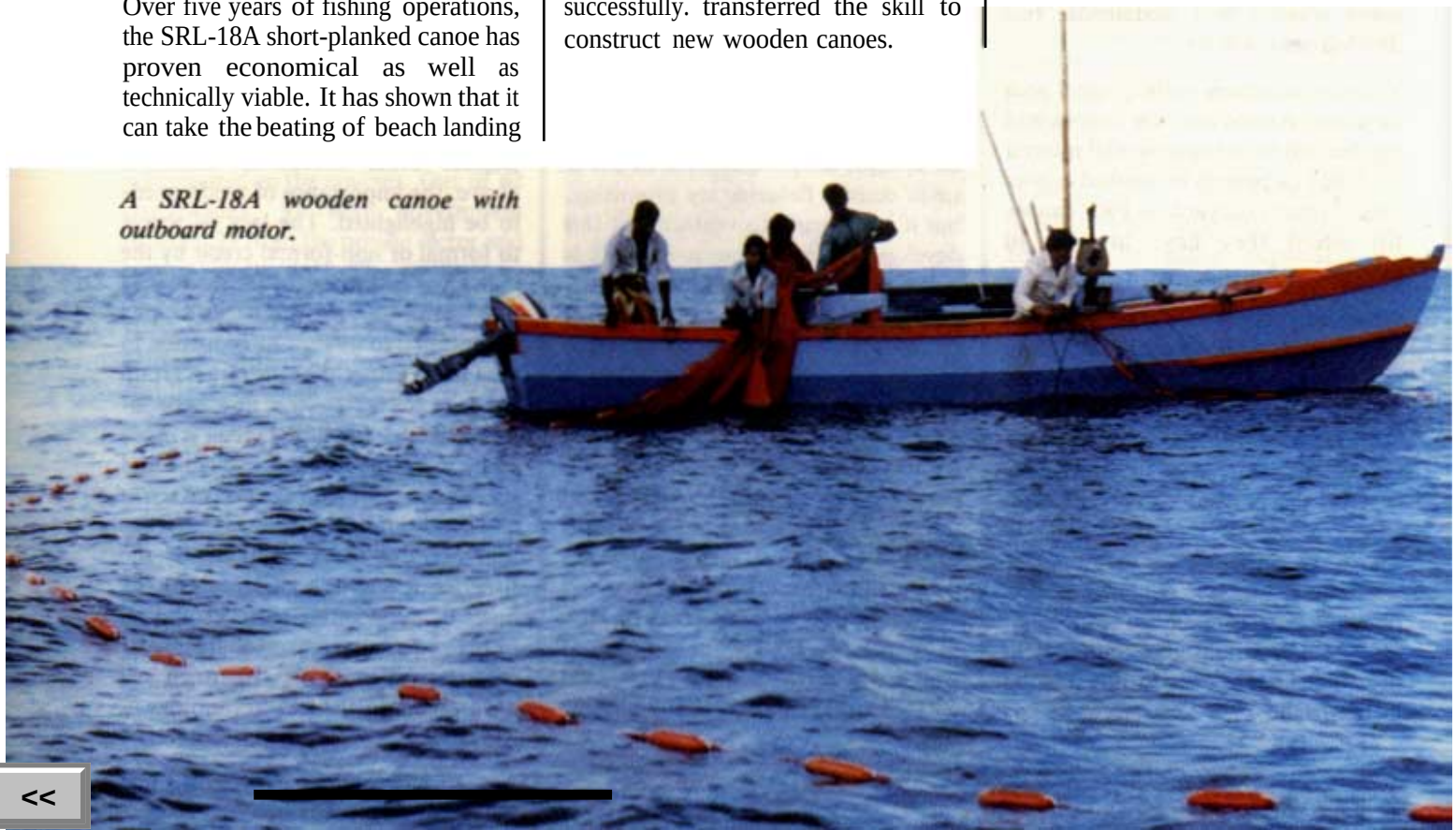
The high price, mainly due to overheads and profits charged by large boatyards for one-off construction of SRL-19A FRP canoes, has resulted in few orders despite the craft having proved itself. Fishermen owners of new wooden canoes would buy FRP canoes if they were no more than 20 per cent more costly than the former.

Advantages of new canoes

The new canoes are primarily designed for motorization with kerosene OBM or a diesel engine with BOB Drive, but perform well under sail. However, the use of sail is mainly limited to emergencies at present; when canoes are motorized, Shri Lankan fishermen are not keen to use sail and often even do not carry sails to sea.

Because of its hull shape and width, the new canoe not only has better fuel efficiency but its fishing potential is also better than the traditional *orus.* It has the following advantages:

- it can carry a large insulated ice box to preserve a larger catch;
- it can carry two ringnets for Halfbeakfish and small tuna fishing during the same trip;
- it provides more space and crew comfort; and
- it can be fitted with a diesel engine with BOB Drive.



A SRL-18A wooden canoe with outboard motor.

This makes the new canoe more versatile and adaptable to most of the important coastal fisheries of Shri Lanka. And, except for trawling and purse-seining, it can do, at a fraction of the cost, all the fisheries presently done by the 3 1/2" t boats.

The BOB Drive

Prolonged technical trials and fishing demonstration of the wooden and **FRP** canoes with a diesel engine and a liftable propulsion system called the BOB Drive established the viability of this system as an alternative to the outboard motor. Besides its longer service life, the diesel engine consumes, for the same power, 50 per cent less fuel than the OBM. The additional cost can easily be offset by a yearly saving of about Rs.17,000.

However, its main disadvantages are

- its weight, 140 kg versus 50 kg for an OBM;
- its higher cost, 40 per cent more than an OBM of the same power;
- its lack of reverse gear; and
- its lack of appeal when compared to the sleek-looking OBM.

The future

As this subproject comes to an end, **many wonder how** sustainable this development will be.

The *oru* fishermen in the project area have appreciated the new canoes and this has led to the commercial interest of skilled carpenters in planked canoes and of small boatyards in FRP canoes for which they have invested in moulds.

However, there has to be a careful approach in introducing new fishing craft outside the Galle District. As in Doddanduwa, the fishermen must get the chance to try out and observe the craft over a long period to see whether it fits their needs. The manual BOBP/MAG/12 : *How to Build a Timber Outrigger Canoe in Indonesia,* which also shows diagonal short-planking construction of canoes in Shri Lanka, should go a long way in disseminating this construction method in the Island.

The SRL-19A FRP canoe with BOB Drive.

For further introduction of the SRL-19A FRP canoe, a reduction in the selling price is essential. This can be achieved in one of two ways:

- By being mass-produced, as the 18-footers have been, by large boatyards. However, this is very unlikely to happen in the near future, as the demand is unlikely to be large enough. Because of the level of exploitation of Shri Lankan coastal pelagic fisheries, the need for a new canoe is mainly as a replacement for the traditional *oru* and not for large introduction of new craft.
- By being built in smaller boatyards with lower overheads and less profit margins. Diyakawa, a small boatyard in Moratuwa, which bought the moulds of the hull and outrigger of the SRL-19A, could, it would seem, popularize this canoe.

As for the air-cooled diesel engine with the BOB Drive, of the type installed in the two canoes operating from Balapitiya, the prospects for its use in small coastal fisheries are promising, but it is too early to venture that this development has come to stay. It is conceivable that in the future a mass-produced, low-cost, industrial water-cooled horizoiital cylinder diesel engine of 5-15 hp could also be used with the BOB Drive. However, the fishermen's present perception of the need for fuel saving, where fuel cost is a substantial part of gross earnings, should be taken into account for selection of locations of future trials. It is pointless to demonstrate the merit of a diesel engine with BOB Drive to the fishermen of Chilaw or Negombo, who are used to 18- footers propelled with 25 hp OBM, or in Doddanduwa, where the fuel cost in the ringnet fishery is only 10-15 per cent of the gross earnings. The BOB Drive would be much more attractive for trolling, handlining and gillnetting in more distant grounds requiring many running hours every day.

In the case of canoes, it will need state sector funding for pilot projects and sufficient economic incentives for fishermen to change to diesel propulsion. As developed in India, and shown in picture, the BOB Drive is best fitted to a monohull fishing craft. Given the popularity and the large number of 18-footers (7000), it may be best to demonstrate the BOB Drive with this type of craft. This might facilitate acceptance by the fishermen and could be a spin-off of this subproject,

If used properly, the BOBP Manual MAG/14 – *Building a Liftable Propulsion System for Small Fishing Craft - The BOB Drive* – may go a long way in helping to produce and popularize the BOB Drive.

Besides other incentives discussed above, the importance of credit needs to be highlighted. The lack of access to formal or non-formal credit by the individual fishermen for the new canoe has been a problem and has contributed to its slow introduction in the Galle District. For the target group to have access to the new type of canoe, it is essential that credit is made easily available for canoe, engine and fishing gear as a package and on terms and conditions flexible enough to take into account the seasonality of the fisheries. It is to be hoped that with the onset of cooperative societies and an improved delivery mechanism of credit, many more *oru* fishermen will have access to the new technology.

TRAINING OYSTER FARMERS IN MALAYSIA

The Malaysian Department of Fisheries, through its Fisheries Research Institute (FRI) in Penang, has been implementing an oysteE culture project since 1987. The Bay of Bengal Programme (BOBP) has provided financial and technical support for this effort.

Oysters are a traditional seafood in Malaysia and, over the years, have generally been harvested from the natural oyster beds found on intertidal rocks. It was felt that modern culture techniques could be introduced after the required technology had been field tested. When we were convinced that the major constraints could be overcome and that profitability was possible, it was time to pass the technology on to the fisherfolk.

Five three-day courses were held at the National Prawn Fry Production and Research Centre (NAPFRE) at Pulau Sayak in Kedah between 1990 and 1992. NAPFRE is one of, if not, the finest training centres in Southeast Asia. Lecture halls, laboratories and accommodation are outstanding and there is a well-trained and highly experienced staff to assist. The first four courses were held with BOBP support, but the last and most recent, at the end of 1992, was solely DOF-funded.

Trainees from all states of Malaysia participated in the courses. Out of 62 participants, 31 were government officers, 28 from the private sector and two university staff. The government officers were mostly extension agents. Private sector participants were primarily fisherfolk, but there was a sprinkling of small businessmen. Only a few women attended.

The course curriculum covered all aspects of oyster culture and was divided between classroom lectures and practical work in the field. The tendency has been to increase the amount of time devoted to practical work. Bank officers from the Agriculture Bank gave lectures during the two most recent courses.

A follow-up survey of participants was conducted last year to try to assess the effectiveness of the courses. Questionnaires and, in a few cases, field visits were used. In summary, 80 per cent of those answering thought the course was too short, but 90 per cent said such courses should be continued. Dissemination of information, the 'ripple effect' by trainees, could be effective in increasing the awareness of fisherfolk of the possibilities of oyster culture. Indeed, 80 per cent of the respondents said they had discussed the course with friends and provided information to interested people in their villages. We were surprised to learn that 30 per cent had been attempting some sort of oyster culture before attenaing the course. These fisherfolk were from Kelantan and Trengganu on the east coast of Peninsular Malaysia. Most of the trainees (90 per cent) face problems in financing oyster culture. Again, 90 per cent of the participants felt some agency should set oyster prices.

The fisherfolk attending the courses suggested that an association of oyster farmers could be formed to promote their interests, discuss problems, try to reduce price volatility, promote oysters with the public and assist those of its members with less resources.

An oyster farmer in Malaysia.

Most felt that the DOF should continue to assist farmers, principally with setting up and financing their operations. They would appreciate monitoring and evaluation of their farms on a continuing basis.

Trainees recognized that spat supply has 'to be assured. The hatchery development work being undertaken by FRI is a step in this direction.

Visits to the field during the past few years seem to indicate that the courses have had an impact in Kelantan and Trengganu on the east coast. The 17 trainees from these states have been very effective in spreading information on oyster culture. The estuary of the Kelantan River is a prime culture site and is now supplying spat to west coast farmers. The number of farmers in Kelantan is growing and it is encouraging to note that this is being done entirely on the initiative of the fisherfolk, with no government inputs. Also encouraging is the participation of women in oyster culture. Although no detailed surveys have been done, women appear to make up the majority of oyster culturists in Kelantan.

With a few exceptions, west coast fisherfolk seem to be far less aggressive in pursuing this new opportunity. They tend to be more dependent on government aid and subsidies. We do not know why this is so, except perhaps that employment opportunities on the east coast are far less and fisherfolk have to scramble harder to make a living. The role of women cannot be underestimated' either; women play a very important role in the commercial life of Kelantan, so their entrepreneurial skills may be a crucial input in oyster culture development as well. It must, however, also be noted that there is a shortage of seed on the west coast.

C4.

The container that's become a symbol

by Ruth Crossan *

In northern Tamil Nadu, in South India, an aluminium fish marketing container — designed byfisherwomen participating together with Britain's Overseas Development Administration and BOBP's Post-Harvest Fisheries Project in a local subproject — has become a symbol of women's ability to access statefunds, improve thefr social status and, most importantly, become actively involved in the process of development so that thefr specific needs are met.

The Bay of Bengal Programme's (BOBP) Post-Harvest Fisheries Project funded **by** Britain's Overseas Develop.. ment Administration and managed **by** the Natural Resources Institute (NRI), has been involved over the last two years in implementing a programme of support to itinerant women fish vendors in South India. The marketing and distribution of low-value fish by these women 'head-loaders' is employment of last resort for a large number of women (at least **10,000** in the project area alone). The women fish vendors operate on very low margins, buying 20-35 kg/day of fish at the beach for resale in local markets reached by foot, bus and, increasingly, rickshaw. In common with most small-scale fisherfolk, these women suffer from low returns from their labour as a result of poor fish handling, the high cost of informal credit, problems in the marketing of fish and a lack of awareness of processing options. These problems are compounded by the fact that the marketing of fish is considered a very low status occupation for both cultural and practical reasons.

Fisherwomen involved in marketing suffer the double burdens of being women in a traditional and very prescriptive society and of being engaged in a form of employment which is considered suitable only for older women, widows and the destitute. Due to the unpleasantness of having to transport malodorous baskets of fish, and the unprecedented contact with external society which is necessary for marketing fish, social mores dictate that only women "past the age of desirability or child-bearing" should be occupied in this way. For women who do not fall within this category but.are forced into the trade due to economic necessity, the stigma is still greater: as Mariyammal from Killai puts it, "Fish trading is socially degrading, but giving my children a better life requires money".

The focus of this article is on South Arcot District, northern Tamil Nadu, and specifically, on the two fishing villages of Killai and Devanampattinam, which have been among the beneficiaries of the ODA's fish marketing container scheme for the last two years.

Role & status of the women in fishing communities

Killal, a village of about 1000 households, is situated about 15 km from Chidambaram. Approximately 80 per cent of the households pursue some sort of agricultural activity as well as fishing, while the rest engage solely in fishing. Most of the fishing in the area is in estuarine waters (about 75%) and the catch is largely shrimp, mud crabs and miscellaneous marine fish. Fisher women market the catch locally. They are also employed as wholesalers, selling shrimp to agents of large export houses.

Devanampattinam is a hamlet of 1,250 households situated within the boundaries of Cuddalore, a busy market town and the administrative headquarters of South Arcot District. The vast majority of the population is engaged in marine fishing or related

* **A** Development Writer currently working with **the ODA-BOBP project.**

activities. The catch, made up of some shrimp, Seer, Ribbonfish and other marine fish, is sold by the fisherwomen in the nearby towns, mostly on a retail basis.

Despite socioeconomic and structural differences between the two villages, the situation of the women involved in marketing fish has certain characteristics which are also common to many other settlements along this stretch of coast.

Women in fishing villages in this area are mainly involved in shore-based activities, such as fish handling, processing and marketing (as agents, auctioneers, and retail and itinerant stall holders). Because women are prevented from actually fishing themselves, due to the prevailing cultural norms, their work is not generally assigned a cash value. Research shows that women who are involved in the marketing of fish play a more important economic and decision-making role in their families; however, an independent income is not a sufficient condition to ensure independence or equal access to resources at a family or village, far less, national, level.

A woman's status is more likely to be determined by her husband or male kinfolk's status, or by social factors, than by her own position in society or her employment. There is also evidence to suggest that where women have been successful in marketing fish, they turn to wholesale rather than retail business. This effectively means that the woman withdraws., from the market: with successful women withdrawing from the marketplace, fish trading, thus, continues to be 'perceived as only an employment of last resort.

Women's relatively low status in a typical fishing village is reflected in the fact that women are regarded as political nonentities. Religious and cultural barriers also militate against women actively participating in the community and exacerbate the problems of illiteracy and ill-health which are more frequent in women than in men, on account of entitlement differentials.

Fisherwomen's associations

The formation of Fisherwomen's Cooperative Societies (FWCSs) – and informal working parties, *or sangams,* in recent years has, however, given women a forum to discuss their problems and search for solutions. In general, these societies, or *sangams,* are able to regulate only their own affairs and have a limited effect on village policy, but there are signs that the women are gradually making their voices heard.

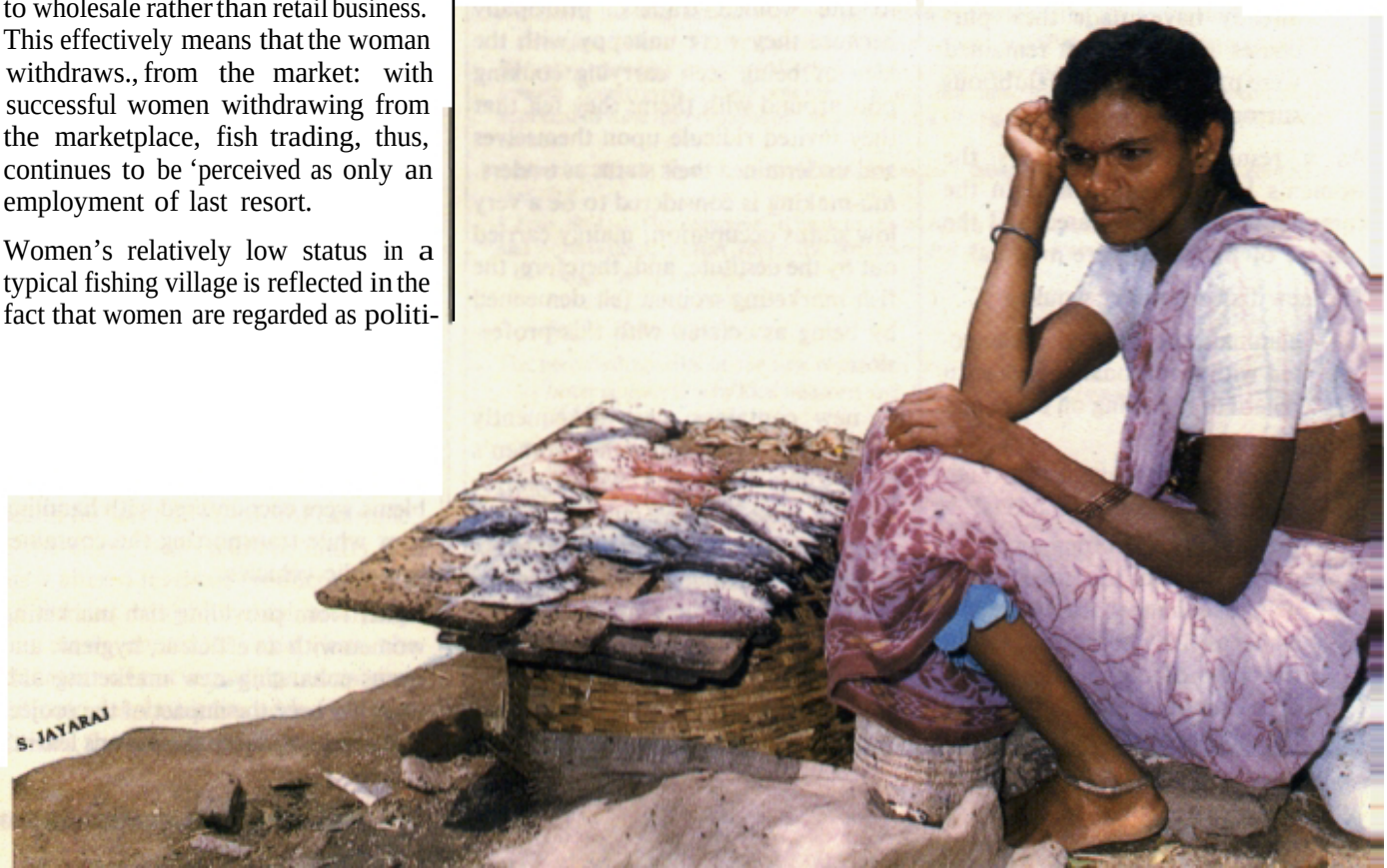
The fish container scheme has helped to strengthen the FWCSs by providing them with tangible proof of their efficacy: in many cases, the FWCSs had never before benefited from any government initiative, and organizing the design, purchase and distribution of the new containers has helped to increase their profile, and credibility, amongst their members and other women in the villages. The cooperatives should now feel better able to approach State institutions, such as the Department of Fisheries (D0F) and Social Welfare Board (SWB), directly with their problems and gain access to resources, such as training and the extension of formal credit systems, which have, for the most part, only been accessible to fishermen. Many of these issues will be tackled in the current, recently initiated, third phase of the ODA-BOBP project.

In the meantime, the project has achieved the aim of sensitising the State to the needs of a community previously excluded from the prbcess of development. This is demonstrated by the DoF's commitment to continue distributing the new fish containers. The container has provided the DoF with a vehicle with which to approach this largely informal sector, and, in this specific case, interaction between the State government, the DoF, the SWB and 'NGOs has been encouraged so that all these organizations can continue to work catalytically with the fisherwomen.

While it may be difficult, or undesirable, to change the cultural factors which determine women's status in society, and specifically in the fishing villages, there are many positive, practical steps that can be taken to improve the quality of their lives.

Development of the container

Initially, the fish container project focussed on ways in which to alleviate the physical and social problems facing



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Women enter a bus with their containers — and find a warmer welcome than in the old days.

the women in their daily work, by providing them with an improved fish marketing container. The traditional baskets had several drawbacks:

- being made of palmyrah leaves or bamboo, they were not watertight and had a tendency to leak on the women's heads as they carried them — as a result both the women and their load became smelly and dirty;
- conductors on the buses which were used by the women to transport the fish to market were often reluctant to allow the women on to the buses as the odour offended other passengers;
- by the time the women eventually reached the market many of their potential clients would already have made their purchases and those that remained were put off by the insalubrious surroundings.

As a result of these factors the women's low personal status in the community was exacerbated and the volume of fish sales were minimal.

The new fish container would:

- eliminate the problems connected with traditional vessels with regard to travelling on buses and leakages;
- increase their incomes through improved access to markets;
- provide the women with a distinct 'tool of the trade' which would enhance the women's status as fish marketers, both in the view of the public and in their own opinion and attitude to their profession; and
- reduce distress sales through improved storage and marketing facilities.

The target group was women retail headloaders who sell in the streets of neighbouring villages, who generally walk to market, and those who take the fish to market by bus. After consultation with NOOs and the fisherwomen, a new fish marketing container was designed: it was felt that if the container resembled a widely available cooking utensil (the idli *kundan),* it would prove cheaper to manufacture and more socially acceptable to the women than introducing a completely alien design.

Subsequent research revealed, however, that these pots were unacceptable to the women traders, principally because they were unhappy with the idea of being seen carrying cooking pots around with them; they felt that they invited ridicule upon themselves and undermined their status as traders. Id/i-making is considered to be a very low status occupation, mainly carried out by the destitute, and, therefore, the fish marketing women felt demeaned by being associated with this profession.

A new container was subsequently designed — based on the women's suggestions — which would suffer none of these negative cultural associations and 1357 were distributed to six villages. A summary of the implementation of the project appears in the box. This new fish container was pronounced "attractive and elegant" and proved very popular. In fact, it was so much in demand that there were reports of at least one woman renting hers out to colleagues.

Impact of the container

As the project progressed, further advantages of the fish container began to emerge. It appeared that the container had acquired a social status in its own right — quite apart from the contribution made to its owner's status by providing her with a 'toçl of the trade' and, thus, a more professional image. A survey carried out in the villages showed that no one was precluded from purchasing the container because of its cost, as had initially been thought, although its unavailability on the market has certainly contributed to making it a coveted item. However, the container has achieved a status which far surpasses Its monetary or novelty value: being divorced from any cultural context, it has created its own perceived status by virtue of being a symbol of the women's ability to access State funds. In this respect, the idli *kundan* was doomed from the start.

Some women in Killai and Devanampattinam, however, remained unimpressed by both the practical advantages of the container — "It is too small for my needs", ... "I don't trade enough fish to make this a worthwhile investment" — and its apparent ability to confer status on those who possess it : "I have no social life so do not yearn for status symbols."

On the whole, though, most beneficiaries were content with their new acquisition. A survey carried out in six villages, a year after the containers had been distributed, reveals that utilization of the container amongst beneficiaries remains gratifyingly high: over a period of two months, beneficiaries of the scheme reported that they used their ODA containers, on average, on 70 per cent of the occasions when they were selling fish. The main reason for not using the container on a specific day was lack of capacity. In addition, very few problems were encountered with handling it or while transporting the container in public vehicles.

Apart from providing fish marketing women with an efficient, hygienic and status-enhancing new marketing aid, what has been the impact of the project and what have been the lessons learnt?

Achievements of the project

In brief, the project has:

- Shown women within the FWCSs how it is possible to access State and national financing schemes.
- Helped to increase the fish trader's women market radius by improving their access to the transport system. This should also maximize their potential sales and profit.
- Strengthened the role of NGOs and participating institutions in addressing the needs of the target groups and grassroots organizations.
- Provided women with a "store of value" and one more economic prop. For example, in a disaster scenario, all brass and stainless steel vessels and pots would be pawned: in this case, the women would at least be left with an aluminium container which would allow them to carry on their economic activity, provided there was fish to sell and clients with the money to purchase them.

The long-term and more far-reaching effects of a project of this type are in the contribution that it makes both to our understanding of the process of development and the difference it brings to the lives of the people who have participated in it. Through engendering a degree of status enhancement to a group of women often regarded with contempt, this project has gone some way towards integrating the fishing villages into a predominantly agrarian society: the improved fish marketing container makes fisherwomen more acceptable to the norms of a wider society and also improves their access to that society by enabling them to expand their markets and raise their incomes.

Furthermore, by introducing a technologically neutral input, the project has not caused a concentration of wealth (as has happened, for example, in the case of mechanized craft) nor has it altered levels of production with the ensuing environmental problems. The new container also has the advantage of not crowding out existing technologies, but it has added another option; the container and traditional fish basket co-exist, and it is the fisherwoman's personal choice which to use in specific circumstances.

***Current** activities*

Now that the promotion and distribution of the new marketing vessel has been handed over to the DOF, the ODA programme will be able to focus on several problem areas which have been highlighted by its research. The next priority for the fisherwomen's project is to concentrate on certain basic facilities which will help women to improve the quality of their own lives and to raise their families' standard of living. This will be achieved in conjunction with several local NGOs already actiw in the villages. The emphasis. will be on providing:

- credit facilities;
- training and alternative income generation,
- transport facilities;
- fish storage facilities;
- childcare facilities; and
- higher income levels, to improve the women's socio-economic status.

Raising the income level of women will have a more beneficial effect on the family's health and welfare than raising by a corresponding amount the income of' the male head of the family. However, women's inability to access low-cost credit on a formal level contributes to a large extent to their continued economic marginalization.

Fisherwomen's intrinsic entrepreneurial spirit needs to be encouraged by demonstrating that, by using improved technologies in post-harvest fisheries activities, it is possible to raise incomes and, thus, the women's control over their lives and the well-being of their families. By showing that solutions can be found to some of their problems and by identifying their needs – and putting into practice comparatively simple and socio-economically viable mechanisms – fisherwomen are able to empower themselves. In many cases, the national or State government or multilateral agencies are able and wiffing to provide funds and technical assistance and it is essential that the women themselves are involved in the process of development at every level to ensure that their real needs are not only identified but met – and in a way that is acceptable and beneficial to them in both the short-and long-term.

IMPLEMENTATION **OF** THE **PROJECT**

* July **1989** – BOBP is contacted **by** Shantidan (an NGO working in 92 villages **in** Tamil **Nadu)** and invited to investigate the problems inherent in the traditional **fish basket** used **by** itinerant women fish vendors.
* **Mid-1990-1991** – After eliciting recommendations from the women through a series of questionnaires, **ODA develops a fish** marketing container made of aluminium to replace the traditional bamboo baskets used by the women to transport the fish to the marketplace.
* December 1990 – The first prototype manufactured by ODA, based on a design **by** ITF, Bombay, resembles an enlarged version of a commercially available aluminium pot, the *id/i kundan.* Ninetyseven of these pots are made and distributed by Shantidan. The new containers appeared to solve the problems of leakage and lack of hygiene which had plagued the traditional, baskets.
* March 1991 – **A** survey reveals that the women have rejected the *id/i kundan* container (see text).
* June **1991** – The designers go back to the women s groups and based on their comments and observations, further refine the container and test it in three different sizes:
  - Large, 50 kg capacity.
  - Medium, 30 kg capacity.
  - Small, 20 kg capacity.

The perceived benefits of the new containers include:

- better acceptability by local transport and, hence, improved access to markets and reduction of losses;
- improved hygiene and cleanliness in usage;
- improved appearance and attractiveness of the fish for retail sales.

* **July** 1991 – A meeting is called with the representatives of 62 FWCSs and the Shantidan villages to invite applications for purchasing the new containers.
* December 1991 – The Social Welfare Board agrees to subsidise 50 per cent of the cost of the container and distribute it through the FWCSs.
* May 1992 – Distribution of 1357 containers to 24 FWCSs is completed.
* November 1992— **Impact monitoring** survey carried out by the ODA in six of the beneficiary villages
* Febniary 1993— **The** State government the Department **of** Fisheries and the Social Welfare Board take **over the promotion and distribution** of the marketing contamer

A PATH TO EXTENSION HAS BEEN LAID

by Lisa Durante

Field level fisheries officers have it harder than most in Bangladesh. Fisherfolk scattered in villages along the coast are, for instance, difficult to reach and, at times, getting to them is even dangerous. Career incentives are scarce and the chances of being arbitrarily transferred ever present. This, compounded by the constant lack of funds the extension sector is faced with, makes for a depressing state of affairs in fisheries extension. Together with the Directorate of Fisheries, the Bay of Bengal Programme has helped train a small group of Fisheries Extension Officers to take pride in their work and has encouraged them to explore new ways of reaching target communities more forcefully. But what are the chances of their putting this training to regular use in the future?

It has been said again and again. All is not well with fisheries development and extension in Bangladesh. Fish production figures fall short of population growth. There is, therefore, lower availability per capita of what is, for the Bengalis, the principal source of animal protein as well as a lucrative foreign exchange earner. A.Z.M. Nasiruddin, Secretary of Fisheries and Livestock, says it; and Ataur Rahman, Director of Fisheries reinforces it — adding that it is not only manpower and fund shortages or lack of training that exacerbate the situation. It is the limited approach towards extension, as well as the wider fisheries infrastructure, which needs revitalizing. And, possibly, also recharging with the right energy to cope with the problems and to address the needs of fisherfolk and the fisheries authorities in Bangladesh.

Fisheries extension came into being in Bangladesh during the early 1960s with a cell of its own in the then Directorate of Fisheries. Since then, its overall approach to extension has been to act as a "marketing agency for the products or fruits of research institutes" Shahid Talukder, a well-known extension consultant, explains. "Products, in terms of innovative technologies, at times unwanted or mis-understood by the recipients, the fisherfolk," he adds. High-product, instead of high-process or people-oriented, development was meted out to fishing communities. Clearly, with this system, a "gap between genuine fisherfolk needs and what is actually received, becomes the crux of the problem" he points out.

The Bay of Bengal Programme (BOBP) came in on this scenario at the request of the Government of Bangladesh in April 1987 with an innovative scheme for extension development aimed at extension staff and selected NGO personnel. The idea was to "put these individuals through an ongoing participatory training exercise that would give them the knowledge and confidence to understand the


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local fishing communities," explains Mia Haglund-Heelas, a socioeconomist involved with the Project. Extension officials as well as bank and services staff "should and probably could be more intimately involved with fisherfolk if only they knew how," she feels. Discovering fisherfolk needs, and implementing mini-pilot projects to answer these, can only be effectively carried out if this miscellaneous cadre of people are taught how to effectively extend their array of services to the target communities.

To begin with, the scheme, limited to the Borguna and Patuakhali Districts, two of the most' backward areas of coastal Bangladesh, envisaged an in-service training programme for *thanä*, or sub-district, officers and their assistants. The implementation of selected pilot projects would come after the initial core training which was entirely co-ordinated by nationally available expert manpower. "I was nervous to begin with," remembers 35-year-old M.A. Razzak, one of the trainers BOBP employed. "It is one thing to help implement new fisheries technology, for instance, but it is quite another to act as a driving force in changing ingrained attitudes and behaviour," he explains. "The jargon would term it 'people-oriented' as opposed to 'services-oriented' development. I would just call it a big challenge," he adds.

The 'big challenge', born out of the extension officers' rapid rural appraisals and consequent fisherfolk needs analyses, involved developing,. implementing and monitoring with the community. 18 pilot projects with a total of 342 fisherfolk (187 male, 155 female) actively involved in groups. It also involved imparting training to the fisherfolk group members in the areas of:

- Health, Nutrition and Family Pranrnng,
- Social Forestry,
- Poultry rearing and management,
- Fish culture and management,
- Fish nursery and management, and
- Hilsa salting.

Prior to this, as well during the pilot project phase, the officers and their assistants participated in numerous workshops, reviews and appraisals organized by BOBP. Initially, training on participatory rapid rural analysis, to grasp the dynamics and status of rural communities, was given. Subsequently, training on needs identification, problem analysis, the generation of solution options and group formation as well as on savings and credit management was imparted. "The trainees were brought together and systematically taught the A to Z of extension," says Talukder, who wrote the fisheries extension manual that evolved out of the effort.

The objectives of the three-year **BOBP** extension development scheme, which terminated **in** December 1992, did not try to address the structural changes that should be made within the extension sector in Bangladesh. These are several, ranging from endemic manpower shortages to scant travel allowances and unpredictable job transfers. According to Talukder, the fisheries extension world "merely represents a microcosm of the national civil service as a whole". And, he adds, "we cannot hope to transform the structure itself unless we start by sensitizing those who work within the ranks."

"Yes," agrees Razzak, but points out that "Government fisheries people can really be creative if they get motivated enough." Building on this latent interest in, and enthusiasm for, genuine fisherfolk development is not as difficult as it may seem, he claims. The basic premise **is** learning by doing. Fatuous development-speak? Not according to him.

The BOBP co-ordinators were actively and regularly involved with the *thana* officers. Together, often by trial and error, "action research" was carried out. This is the method by which indigenous technology is empirically tried out to check its true effectiveness in the implementation process. Razzak claims that after the initial training workshops, many of the officers modified their very outlook towards fisherfolk. Before this, the poor literacy rates and scant cohesiveness among them underlined the necessity, for many officers, to deliver a pre-packed package of services to a group which otherwise would be unable to identify and work towards set goals.

Once they actually started going to the villagers with more questions and less answers, however, their intractable bureaucratic persona was, to some extent, "dismantled", Razzak claims. A two-way process of communication and development was established.

Several of the less technical (in a fishery sense) pilot projects organized in the fishing villages reflect the need – often vital – to enhance the general quality of lifç of those involved in the marine sector. In comparison to the culture fisheries sector, which avails of relatively more finance and regular monitoring, marine fisheries are less well served. The accent in this area has traditionally been placed on increasing production yields, therefore extension work was usually limited to craft and gear development. The needs analysis clearly ievealed, however, that wider issues – health, nutrition, alternative employment strategies and, wth these, a sharpening of fisherfolk consciousness – were perhaps more important than catch volumes. Also, observes Talukder, the concept of "fisheries management has creptinto the Ministry. The political will to shift focus is beginning to materialize," he feels.

Sustained abject poverty in the fishing villages causes a total development paralysis. Families are systematically crippled by interest payments on monies borrowed, dowry and unfair middlemen who chain them to a below-subsistence livelihood for much of the year. For these reasons, the credit components attached to several of the pilot projects were seen by everybody as a means to foster economic independence whilst encouraging groups – proverbially un accustomed to, and incapable of, thrift – to save. A savings-liuked incentive scheme for some of the Patuakhali and Borguna fisherfolk groups was, therefore, devised to encourage a savings habit, develop income-generating activities after the end of the project, rewarding high savings performance, effective group work and project implementation. Most of the groups were organized to work with revolving funds. (See box).

THE MONEY **INVOLVED**

Total credit disbursement at commercial rates **of interest amounted to TK** 2,32,665* –

Patuakhali: **TK** 1,33,068;
Borguna : TK 99,597.

Total savings amounted **to:**

TK 1,02,960

Total credit repayment = 100%

At the end **of the** credit repaymentperiod, **the** savings accrued **by the groups** amounted **to over 40% of** the total credit disbursed.

At the fmal two-day review of the pilot projects, the performance evaluations by the DOF and NGO staff were announced.

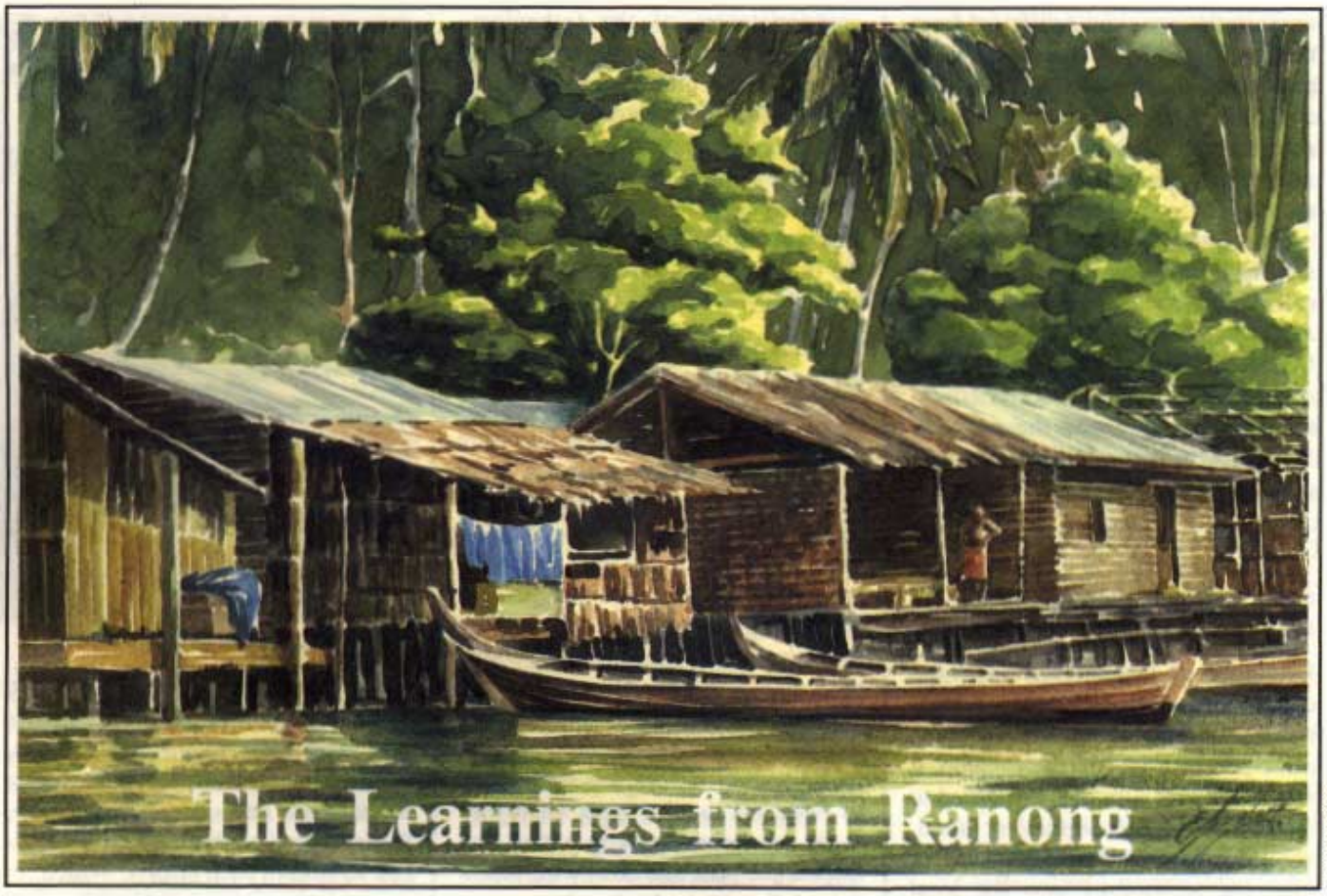
Groups were ranked and set multiples of the savings were transferred to the group accounts to reward performance and encourage the continuation of their current activity. The tree planting projects ranked at the top end, whilst the health education projects did less well. This may be duoto the fact that female trainers were not available for the all-women groups and this hindered frank discussions. The 17 fisherfolk groups were also requested to evaluate their performances and the activity in general according to similar set parameters. On the whole, fishertolk ranked the projects less generously than the officers and NGO staff. This, according to Rathin Roy, BOBP Extension Adviser, is due to the fisherfolk's "greater candour or skepticism". The others are likely to upgrade the projects more in order to "boost their own images", he ventures.

Now that the BOBP project has ended, what can be said about the future Of extension training in Ban'gladesh? According to Shahid Talukder, the project represents a "low-cost extension model which can be effectively duplicated all over coastal Bangladesh", He also stresses the strong correlation between ,professional recognition and performance: "When somebody is constantly backstopped by colleagues and, supervisors, their confidence grows, and, as a result, they do their jobs better", he feels. The fisheries authorities are also now aware of what can be done to improve the extension sector, and with how "little" money the extension training can be carried out. (Even though the DOF is always short of funds, it can, according to several development experts, provide the TK 50;000 the project provided for each *thana* **(A** *thana* comprises approximately fifty villages with up to one million inhabitants in all.)

IsaqueBhuiyan,oneoftheDistrictFisheries Officers involved in the training, believes that whilst the project in itself was worthwhil; the core capacity of the marine extension sector must be extended. An "in-house extension service training programme must be implemented for everyone", he feels. Razzak claims that if the newly trained officers do not, in their turn, help train more extension staff, all the struggles faced ,over the past three years would have "gone to waste". Rathin Roy, however, does not believe that BOBP objectives were centred on encouraging trainers to go on to train others. He thinks that a successful – cheap, useful, replicable – model for fisheries extension training has evolved. Whether the Bangladeshi fisheries authorities have the political will to foster a conducive management environment that will bring about a change in the overall organizational culture is yet to be seen. The path is "by no means an easy one' Roy says, "but at least now there is a path".

A thana *Fisheries Officer regularly offers advice to fish farmers at Patuakhali.*

* **US $** 1 = **TK 37 (appx.)**



The Learnings from Ranong

E. AMALORE

Ranong, Thailand.

by Rathin Roy
(Senior Extension Adviser)

Something unusual happened earlier this year in Thailand. Twentythree heads of Provincial Fisheries Offices from all the coastal provinces of Thailand, the four General Inspectors from the Department of Fisheries (DOF) headquarters who, together, supervise the coastal provinces, a Division Director, the Fisheries Development Adviser to the DO, and some supporting DOF staff met for two days in the seaside resort town of Cha-am late in February. Senior offipers don't get too many opportunities to gather like this, and have even fewer opportunities to set aside their daily workioads to think about and reflect on larger issues and concerns confronting their organizations. And that was precisely what all these officers had gathered to do: to think about fisheries extension in the coastal provinces of Thailand.

They spent the two days discussing the objectives, approaches and methods, manpower and the organizational aspects of fisheries extension in the coastal provinces in the context of:

- The long-term fisheries development plan of the DOF; and,
- The learnings from an extension project of the DOF in Ranong, which had been supported by the Bay of Bengal Programme (BOBP) of FAO.

The idea was not to come up with an ideal model, or even a set of recommendations, but rather to think through the situations, the needs and the learnings. It was presumed that if senior policy-makers were to see sense in something, and if they, by and large, agreed on it, the chances are that it would get into the mainstream of their work.

So what were these learnings that these officers had gathered to discuss? Perhaps it would be appropriate to spend a little time talking about the project which generated the learnings in the first place.

Established in 1987, the BOBP supported subproject, 'Extension Services for Small-Scale Fisheries in Ranong, Thailand' – or just the Ranong Project – set out to develop a model for enabling integrated development in selected fishing villages of Ranong Province. The project undertook several activities, including technology transfer in the areas of aquaculture and capture fisheries, it provided credit for various fisheries and non-fisheries activities through revolving funds, it promoted' skill development among women in the hope of enhancing their incomes, it facilitated access to health education and healthcare of remote and almost inaccessible villages, it helped in the provision of non-formal education, the setting up of little libraries, and in giving fishing communities access to community development programmes of the government. It even helped some of the villages to create some infrastructure like water tanks, roads and guardhouses. It did all this and spent quite some time towards the end trying to extract the learning from its work and in sharing this learning with' others in the DOF.

The Ranong Project had a fairly large staff of fishery officers, technicians, support staff and even social scientists and WID workers who were, of course, specially hired for the project and not deputed from the DOF as were the others. The staff size and the

organization were quite different from the traditional DOF presence at the provincial level. And the DOF were obviously quite clear that they were not going to replicate the whole project; given shortages of trained manpower and funds, it would be impossible. So, while developing and undertaldng various extension and development activities, some of which succeeded and some failed, the idea was to learn from the doing and evolve an extension system which would meet the aspirations of the DOF and the needs of fisherfolk, a sort of 'the art of the possible'.

So let us take a look at what we learnt. To put the learnings in perspective, and also to facilitate their use, let us look at them under some broad headings.

Extension of technology: In aquaculture extension, even when a technology is functioning well in some other part of the country or region, it was found that a lot of time needed to be spent on developmental (and, occasionally, even research) work to tune the technology into the local environment. This raised several issues: extension services often dO not have research staff amongst them and to succeed would need improved linkages between research and extension and a good system of technical backstopping. Of course, it could be asked whether, given the amount of research and development necessary, such effort should be the responsibility of extension in the first place? And, what are the implications to extension success when a technology which, for all practical purposes, is not ready is extended? Aquaculture extension faced problems of poor site selection, non-availability of inputs like feed and seed, and even the possibility of creating a resource depletion when destructive methods of fishing were resorted to, to meet the needs of feed. This would suggest that, even before extension, careful surveys, keeping in mind the ecosystem needs of the particular species, need to be undertaken to identify proper sites, the availability of seed and feed and the resource implications of acquiring these.

In capture fisheries extension there has been two major learnings. Firstly, think of the resources and what the new technology could do to it before starting. And, second, think of the appropriateness of the technology, keeping in mind the lifestyles and present fishing practices of the fisherfolk. Minor refinements, increased efficiency, conserving particular materials used in the gear may sound extremely important to scientists, but may not appeal to fisherfolk who, in the final analysis, have to take up the technology.

Methods of technology extension: The project's learning was that the best way to help fisherfolk to learn a method and decide on adopting it is by letting him or her actually work on it in demonstrations in conditions and locations where the technology is ultimately meant to be used. But how do fisherfolk make.up their mind whether it is worth the time, cost and bother to even participate in a demonstration? Video programmes of similar efforts elsewhere turned out to be good promotion and a whetting device. But what really seemed to work was study tours by fisherfolk to other areas where they could see technologies in action and discuss the pros and cons with fellow fisherfolk who had taken it up.

Credit: Who is going to pay for the technology and how? In almost every extension activity this question haunted the project. There seems to be no substitute to the practice that fisherfolk, to begin **with,** need some sort of incentive, whether it is free materials or a cash grant, to justify the risk of moving into the unknown. The project, however, learnt that the longer the incentives lasted and the larger they were, the more problems the extension effort faced. In providing credit to help fisherfolk take up technologies, the problems were far more serious. No institutional source of credit at reasonable terms (which also did not require collateral security) was available. The project solved the problem by developing group based revolving funds. They worked quite well, provided

- the groups were well formed and cohesive,
- the leadership legitimate and good,
- the follow-up and monitoring rigorous and frequent,
- the technology successful and actually made money, and
- there were markets for the products and services generated.

Medicare for fisherfolk in Ranong.

A lot of provisos, but there is no question that it works. The problem is that, in addition to various other tasks, this requires extension services to also be bankers, and, in our experience, fishery agencies often find it very difficult to sustain such efforts. Which, in a roundabout way, brings us back to square one. A lot more work and thinking is needed in the area of fisheries credit.

Working with groups: There is a strong feeling in developmental circles that poor and disadvantaged people can do more for themselves by organizing themselves and using their collective strengths. By and large, true, but it does seem to differ considerably from society to society. In cultures where there is experience of, and support for, collective action, groups are often quite successful, but the project in Ranong found that most of the fisherfolk communities it dealt with preferred to work individually or as a family. Groups were successful, in the running of revolving funds, for example, but they needed an enormous input from the extension staff to keep them together and functioning well.

Income-generation activities **for** women: At the request of the women, several types of income-generation activities were promoted through skill training, credit inputs and even assistance in marketing. They worked, but while several of the enterprises made products available for household

consumption, causing some savings along the way, the amount of incomes generated was less than had been hoped. Several reasons emerged for this. Marketing ones, as listed belaw, were the most predominant:

- The production levels are often too small to justify a serious marketing effort;
- It is very difficult for small village-based enterprises to compete with the quality of product of the more organized sector; and,
- Enterprises often face managerial problems which the extension service personnel find difficult to deal with as they rarely have the expertise in enterprise management.

Provision of integrated development services: The needs of fisherfolk, more often thari not, go beyond fisheries. And in Ranong, the project had quite some success in facilitating fisherfolk access to services like healthcare, nonformal education and community development by playing a catalytic role and persuading other government agencies. It is possible to do this without slowly becoming a rural development agency. But, and there is always a but, it requires good interpersonal contacts between the leaders and staff of the cooperating agencies, which sometimes is not there. Every agency has its own workplan, agenda and budget, and that is its priority; doing more would require setting aside its own tasks, or injections of funds which are not sustainable over long periods.

All this learning still did not provide a categorical answer to the question: What is Fisheries Extension? But we did learn, that there were several important factors which any fishery agency should look into and evolve answers for. A broad vision began to emerge.

The felt and actual needs of fisherfolk often go far beyond the aspirations of fishery agencies. Healthcare, education, community development, water supply, even road access, may have far higher priorities than fishery-related problems. So what should fishery agencies do, particularly keeping in mind the fact that, given the remoteness of some fishing communities, they may be the only agency reaching 1he community? Should they transform themselves into rural development agencies and build up expertise, capacity and budgets, or should they take on a catalytic role and facilitate the involvement of other government agencies whose mandate it is to handle these areas? It really depends on the agency and its mandate, but in Ranong the learning was that the second method, while not perfect, is definitely more feasible than the first.

But even assuming that fishery agencies decided to focus almost exclusively on fisheries, in Ranong a host of new .demands arose – as varied as communicating with fisherfolk using various media, providing credit support for fishery technology extension, promoting and enabling product and market development, and enabling participatory fisheries resource management, all of which require skills, approaches and methods which are often new to fishery agencies. It is quite obvious that in order to do justice to the fisheries extension needs of the future, fishery extension services and fishery agencies will have to develop and transform themselves considerably.

But how do we do all this? What kind of manpower, with what kinds of training, would fishery agencies and extension services need to answer the new challenges? How would agencies have to organize themselves and **their** work? How should agencies become more responsive to the needs of fisheries and fisherfolk? These and several other underlying questions came **up** time and again in Ranong and we really did not have the time or the expertise to come up with even directions, leave alone answers. But there were road signs. And it was these that were discussed at the senior **officers' meeting in Cha-am.**

The officers were almost unanimous that there was no sense in trying to replicate the Ranong effort in its entirety. They wanted the learning documented in detail, printed and distributed to all officers concerned with fisheries and fisherfolk development in the coastal provinces.

They also agreed on some guidelines:

- While fisherfolk had a wide range of development needs, the DOF Extension Service should focus on enabling coastal **fisheries management and** rational **and** sustainable coastal **aquaculture** and **only play a catalytic role in** addressing social and community needs.
- There is need for more applied research to provide answers for questions that resource management is raising, and research and extension, therefore, need to be linked to enable each to guide and help the other.
- The success of extension depends on building a trained and motivated cadre of staff who have the appropriate support and managerial environment to do their work well.

One of the unsaid learnings of the meeting in Cha-amn was that such opportunities for senior and middle level staff to get away from their daily, hectic schedules and spend some time on sharing, reflection and discussion is also vital and important for good management. The Ranong Project closed **down in** September 1992, **but if** this meeting was an indication, its learnings, both positive and negative, may **well** play some role in guiding the DOF in its future efforts at enabling fisheries and fisherfolk development in Thailand.

NEW BOBP PUBLICATIONS

BOBP/REP/55 — *A SbriLwika Credit Project To Provide Banking Services To Thberfolk*

A report on a Fisherfolk Credit Project that would provide comprehensive banking services to the fishing community in Shri Lanka through the introduction of need-based lending schemes, incorporating the principles of simplicity, timeliness and flexibility. The project involved a series of activities such as the conducting of a socio-economic survey, a number of training programmes and several studies of past fisherfolk credit activities, cost and earnings of small-scale economic activities, marketing strategies for fisheries credit and training needs of banks, training and orientation of fisheries and bank officers and the prospective borrowers, all ultimately leading to thedesign and implementation Of a viable fisheries credit scheme.

BOBP/REP/56 — *A Studyon Dolphin Catches in Shri Lanka*

This report presents the results of a one-year study of dolphin catches in Shri Lanka. Very high estimates of dolphin landings, based on studies of limited coverage and questionable sampling techniques, had been made in the past and were causing much concern in Shn Lanka. The study was, therefore, commissioned to obtain a reliable estimate of dolphin catches and their economic importance as well as to gather information on the attitudes to and perceptions of dolphin catching, trading and consumption. The study, carried out from September 1991 to September 1992, included both bioecomnomic and socio-economic components.

BOBP/REP/57 — *Introduction of New Outrigger Canoes in Indonesia*

This report gives an account of the successful attempts to develop and introduce a new type of outrigger canoe for the benefit of small-scale fisherfolk in Nias Island, North Sumatera, Indonesia. It summarizes the activities of canoe construction and training of carpenters, demonstration, fishing and long-term fishing trials and discusses the impact and prospects for further development.

BOBP/REP/58 — *Report of The Seventeenth Meeting of The Advisory Committee*

This document records the recommendations of the 17th meeting of the Advisory Committee of the Bay of Bengal Programme for Fisheries Development (BOBP), held 6-8 April 1993, in Dhaka, Bangladesh. The Advisory Committee is composed ofmember countries, agencies funding BOBP projects, and the FAO. The Committee meets once a year in member-dountries on a rotational basis.

The document contains the annual reports (or status reports) of the projects in the Programme. These reports briefly recapitulate the objectives and status of the activities, describe the work and achievements during 1992, assess the progress and indicate the work plan for 1993.

BOBP/MAG/9 — *Guidelines on Fisheries Extension in The Bay of Bengal Region*

Fisheries extension has its own complicated features, compared, for example, to agricultural extension. Fisheries extension cannot always be given 'on the job', which is at sea. And in a fishing village it is often difficult to gather together a group of fishermen, for they are frequently away fromtheir homes at irregular times. Furthermore, while an agricultural community might have relatively homogeneous farming systems, most fishing communities have diverse ranges of 'fishing systems', each with its own extension requirements.

This publication is NOT a manual; it does not provide a step-by-step approach to fisheries extension. Rather, it explains that every single programme has its own specific features, depending on such factors as the target group and the resources, and that a learning approach has, therefore, to be used, the different situations having to be analyzed before the most appropriate extension service can be provided. The publication provides, in this context, iguidelinesi for the planning and implementation of fisheries extension programmes and activities in the countries of the Bay of Bengal region. The main focus is on field-level fisheries extension activities.

The guidelines can be utilized as a textbook for training of lower and middle level FEAs as well as to provide reference material for extension policy-makers and programmers at higher levels.

BOBP/MAG/12 — *How to Build a Timber Outrigger Canoe*

Outrigger dugout, traditional fishing craft found from Madagascar in the west to Indonesia and the Pacific Islands in the east, are made from tree trunks of adequate diameter. But logs for construction of large canoes are becoming difficult to fmd and construction is consequently becoming more and more expensive. Dugout construction also wastes alot of timber. For each dugout, two or three planked canoes can be built. The Bay of Bengal Programme (BOBP) undertook a project in Nias Island, Sumatera, Indonesia and Shri Lankato design and construct planked outrigger canoes that would provide an answer to the problems now being faced in building the traditional outrigger canoes.

The outrigger canoe developed by BOBP was fully tested and found acceptable by fisherfolk in several villages of North Sumatera. This manual describing the design and construction of this BOBP- designed canoe, is presented in a simple 'how-to-do' format that can easily be used by any boat-builder or carpenter with a little experience. The manual shows, step by step, how to build the main hull of the 8.6 rn-long INS-S canoe using sawn planks. The same method of construction may be used for canoes from 7.5 m to 10.8 m length.

Though this manual has been prepared specially for small-scale carpenters with basic tools, engaged in the construction of small timber craft in remote villages, it could also be useful for trainers teaching in fisheries schools and extension workers in small-scale fisheries.

BOBP/MAG/14 — *Building A Liftable Propulsion System for Small Fishing Craft — The BOB Delve*

The Bay of Bengal Programme (BOBP) undertook a project for development of beachianding craft and their propulsion systems in India and Shri Lanka in 1979. The main challenge was todevelop a propulsion system that could be fitted to a variety of air-cooled and water-cooled diesel engines that were available locally, provide good manoeuvrability .when crossing the surf, permit rapid retraction of the propeller and the rudder and be strong enough to withstand both the impact when landing on the beach and the rough handling by users.

This manual, describing the final version of the liftable propulsion system developed by BOBP and calledthe BOB Drive, is intended to be used by skilled mechanics in small workshops having a lathe and welding equipment. If should also be of interest to engine manufacturers, boat-builders, teachers in fisheries training institutes and extension workers in small-scale fisheries.

BAY OF BENGAL NEWS

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

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