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Are comic books reaching the fisherfolk?

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Is It Getting Across?

Evaluating the comic book – 'Our Fish, Our Wealth' – as a tool for communication.

by Rathin Roy
(Snr. Extension Adviser)

The proof of the pudding is in the eating. In communications, the question simply is: Is the message getting across? The Bay of Bengal Programme (BOBP), having produced a comic book, *Our **Fish, Our Wealth,*** to promote awareness about the need for, the benefits of and the mechanisms of fisheries management among small-scale fisherfolk, evaluated it in the second half of 1992. S Chandramohan, who heads the Integrated Fisheries Development Project in Pulicat, Tamil Nadu, an NGO, undertook the evaluation for BOBP.

Who received the comic books?

The comic book, simultaneously brought out in the Tamil and Telugu languages, was aimed at fisherfolk along the Coromandel Coast, which covers part of the Tamil Nadu and Andhra Pradesh coasts of southern India. There was a reason for this geographic restriction: the ecosystems and fisheries practices referred to in the comic book are unique to this region, so are the fisher communities depicted in the book.

Some comic books were mailed out, others personally handed to individual fisherfolk, members of fisheries cooperative societies, non-governmental organizations working with and for fisherfolk, adult and non-formal education centres catering to fisherfolk communities, schools in fishing communities and **to** selected subscribers of a monthly magazine aimed at fisherfolk. The very task of collecting the addresses in the two states took over two months of hard work and probing. State Departments of Fisheries, the Directorates of Adult and Nonformal Education, State Resource Centres in both the states, church organizations and, particularly, NGOs helped in putting together a list which, while reaching a wide and representative group of fisherfolk, would not in any way restrict itself to the literate or the elite. The mailout covered three districts in Tamil Nadu (Qaid-e-Millath, South Arcot and Chengai-Anna), the Central territory of Pondicherry, and two districts in Andhra Pradesh (Nellore and Prakasam).

A total of 2188 Tamil and 774 Telugu comic books were distributed. Each book was accompanied by a letter explaining the objectives of BOBP, the reason for publishing the comic book, and requesting the response of the reader. A self-addressed, stamped inland letter, printed with a one-page questionnaire, was included in each book. The questionnaire asked for three types of information: it asked for some basic information about the responder, particularly in terms of location, age, occupation, level of formal education and sex; it then posed seven statements which could either be agreed or disagreed with, in order to check whether the key messages of the comic book had been correctly absorbed by the respondent; and, a final section. which queried the respondent on what s/he felt about the comic book, its content, the way of presentation, and its usefulness.

Who responded?

When agencies seek responses to mailout questionnaires, a 3-7 per cent response rate is expected, and this is so even in the case of educated and reasonably well-to-do consumers of this-or-that soap or shampoo. So it was but natural that BOBP's expectations were modest. The fisherfolk shattered our pessimistic expectations by responding overwhelmingly. In Tamil Nadu 739, or an incredible 33.7 per cent of the people who received the book, responded. What was particularly interesting was that of the 739, 136 responses were from women: unusual, because women **had** not been targeted in the mailout! The response in Andhra Pradesh was also very good, but at a lower level of 27.3 per cent. The details of the responses by category reveal some interesting facts.

In Tamil Nadu, where there is a government-organized adult and non-formal education programme specially targeted at coastal fisherfolk, the response from the Adult Education Centres was higher than in Andhra Pradesh where no similar focus exists in the fishing communities. But the response from schools was disappointing: only 23 of the 172 schools in fishing communities bothered to respond (see table below).

BOBP had at one time considered that perhaps one sure way to communicate with fisherfolk would be to approach them through their children in schools, the future fisherfolk. That option still may be worth considering, but the children would have to be approached out of the school framework. Discussions with school teachers and heads of schools indicated some of the possible reasons for the poor response rate

- Teachers in small rural schools are already overburdened, and do not want more responsibilities;
- The school curriculum and system is fairly rigid and it is difficult to incorporate new reading materials and subjects;
- There just isn't enough time; and so on and so forth.

TAMIL NADU		*ANDHRA PRADESH*	
Category	*Response %*	***Category***	***Response %***
Fisherfolk	34.2	Fisherfolk	27.3
Adult Ed. Centres	43.2	Adult Ed. Centres	20.0
Schools	13.4		

Fisherfolk's families in Puilcat discuss the comic book 'Our Fish, Our Wealth

A survey team meets fishermen on the beach to get their views on 'Our Fish, Our Wealth'.

Women who replied, were a little upset that we had not particularly targeted them! They agreed that they were not personally involved in fishing, but they did want to know what was going on. A point well made!

The age distribution of the respondents was also interesting: almost all the women respondents were equally distributed between those attending school and young adults in the community (below the age of *35).* But in the case of males, most of the responses came from adult men only, including older men, with those attending school hardly represented. It is difficult to draw any clear conclusions from this, but the information is valuable in planning information campaigns.

The responses did not cease with the mall-in of the questionnaire forms. BOBP received letters, fisherfolk dropped by the office to discuss the comic book and the implications of the contents, in a few cases they even went to the expense of calling in long-distance to tell us what they felt. Going by the response, it was obvious that the fisherfolk were at least intrigued, if not pleased, by the comic book. But, did the message get across?

Getting the message across

The seven statements that respondents were asked to agree or disagree with covered, by and large, the key messages of the book. To make sure that respondents were not mechanically responding to the statements, two false statements were incorporated into the set. About 20 per cent of the respondents got the correct responses to all the statements, and most of them were

practising fishermen. But some women got it right too.

Nearly all repondents, however, had trouble with two of the questions. An in-depth series of interviews undertaken wiih a subsample of the respondents, to flesh out the figures, clarified some of the peculiarities. The problem was with the language more than the content. For example, in a statement which juxtaposed the pros and cons of 'active' versus 'passive' gear the phrases used in Tamil and Telugu to specify 'active' and 'passive' had connotations which confused the readers. Also, some respondents felt that the way the statements were phrased it was not clear to them whether BOBP was interested in knowing what they did or what they were supposed to **do** *a la* the cojnic book. The point was that fisherfolk were, by and large, absorbing the messages and understanding them in the right context.

However, understanding and knowing is one thing and doing something about the understanding is quite another. Only time will tell whether knowledge will express itself as practice. But the responses made it quite clear that a lot of thought has to go into the language and expressions used.

One concern of the technical staff, that fisherfolk would have trouble understanding complex information, was put to rest. Obviously, fisherfolk, dealing with fishery aspects all their lives, have very little problem comprehending facts and descriptions of their environment, provided they are clearly and well presented and take into consideration the way fisherfolk give meaning to their environment.

How do comic books measure up as a medium?

The fisherfolk, across the board, liked thecomic book. But why did they like it? Some said that the subject was important, given the fact that the community was really facing problems with declining catches and incomes. Others said they learnt useful things by reading the book. Surprisingly, or perhaps not so, quite a few said that it was a matter of pride that someone had taken the trouble to produce a book exclusively for fisherfolk and their needs. It felt good to know that someone out there cared! Such responses, while encouraging, need to be taken into consideration with some caution: the fishing community have so little matter specifically aimed and created for them that they are bound to be enthused with whatever that comes along.

Would they pass the comic book along to others to read? Would they buy it? 'Yes' and 'Yes': Fisherfolk mentioned Rs. 2-4 as an indication of what they were willing to spend for such books. Why those numbers? Most magazines of a weekly or monthly periodicity available happen to cost in that range.

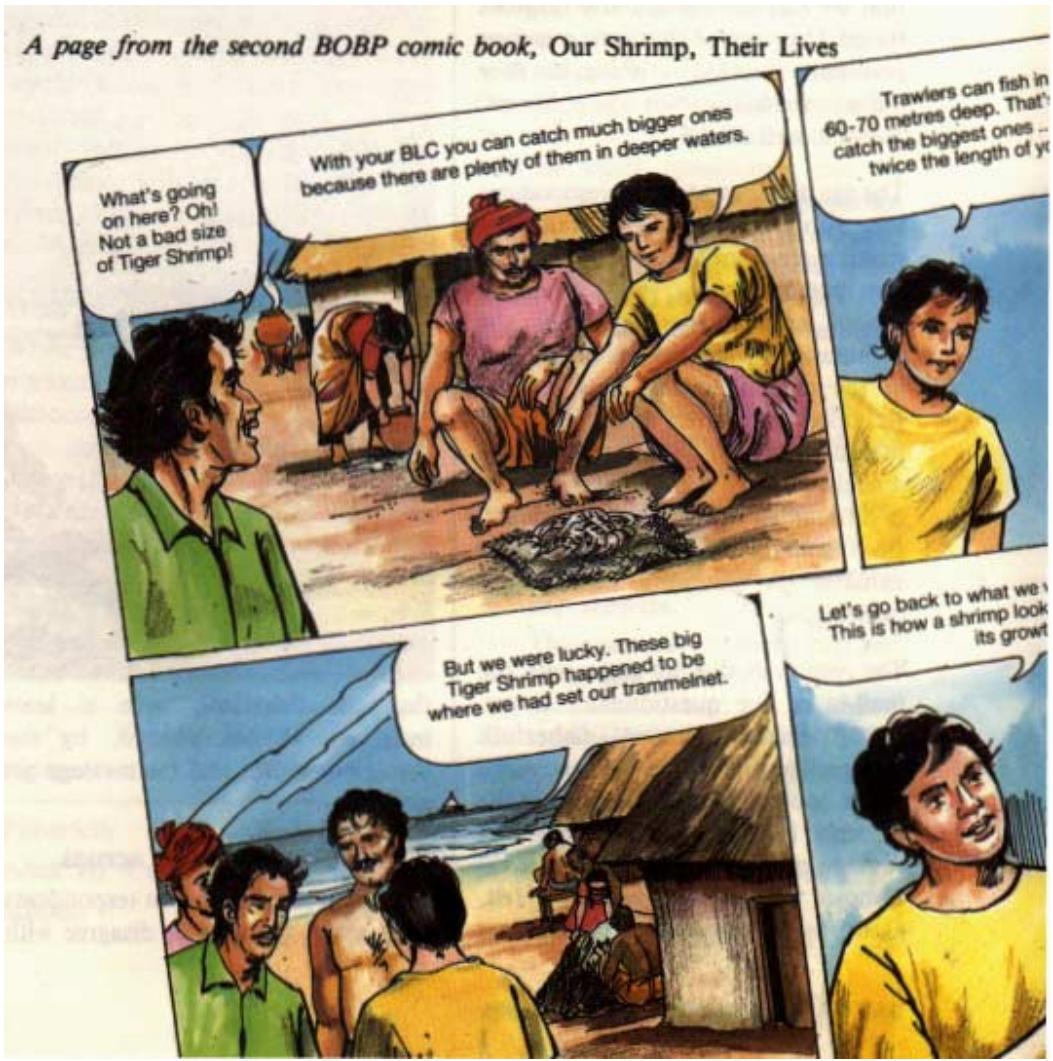
What clinched their commitment was that they came up with prioritized lists of subject matters which they felt should be covered in future comic books. Some fisherfolk interviewed even came up with suggestions of how a fisherfolk distribution network could be established to ensure sales and distribution of future comic books.

That was the good news. There was some bad news too. Fisherfolk complained about the language used in the book; they felt it was a little too stylized, and definitely not the language they spoke on the beach. Some complained that the terminology used to specify different types of fishing gear was confusing, because names vary from locale to locale. But, most importantly, fisherfolk objected to us stopping with just the message. If BOBP (or the Government) is really serious about the measures suggested, they should help fisherfolk with technical and credit assistance to put the ideas into practice, they said. In other words, they were politely pointing out that it is necessary to put one's money where one's mouth is! BOBP cannot but agree. Comic books, or any other medium, cannot stand alone; they can only be part of a larger, more comprehensive, campaign or programme.

The way ahead

It is obvious that comic books do get their message across. It is also clear that fisherfolk want information and enjoy the medium. It is cost effective: even with the small numbers BOBP printed, the cost per unit was only Rs. 5. The evaluation has given BOBP the confidence to go ahead and use the comic book format, and, in fact, the article on the next page refers to the 'second comic book', due in October '93.

A page from the second BOBP comic book, **Our Shrimp, Their Lives**



Raghu is back on the beach in BOBP's second comic book

Raghu's now dealing with tiger shrimp life cycles, fisheries and management.

It is tempting to follow success. The enthusiastic response from fisherfolk to the first comic book gave the Bay of Bengal Programme (BOBP) staff the confidence to continue the awareness building effort with a second comic book. The first book, *Our Fish, Our Wealth,* dealt with how various fishing practices affect the fishery resource, and therefore what should be the sensible way to fish to ensure fisherfolk a sustainable future. The second comic book moves into a new and different aspect of fisheries management. It considers the lifecycle of a particular species, *P. monodon*, or the tiger shrimp, in order to understand how existing fisheries affect the tiger shrimp stock and why. The book goes on to suggest the optimal ways of fishing for tiger shrimp while ensuring that there will be enough to fish for tomorrow.

Titled Our *Shrimp, Their Lives,* the second comic book is in Tamil (and in English) and is aimed at the fisherfolk of the Coromandel Coast. With this book, BOBP hopes to convince its counterpart governments in the seven member countries about the advantages of using the comic book format in awareness building for fisheries management.

The evaluation of the first comic book helped guide us in the design of the second. Special care was taken in the translation into the Tamil to ensure that the language was colloquial and similar to that spoken in fishing communities, and not the formal, stylized version that academicians indulge in. But the very content proved problematic.

The first book being more general, and dealing with subjects that were more familiar to fisherfolk, allowed itself to be moulded into a narrative story form. Lifecycles of shrimp can be interesting and even intriguing, but they are not really the stuff of fiction. How do you tell a story about something not very story-like? One idea was to create a character out of a shrimp and let it tell its own story. This is a fairly well-known way of doing comic books, but we were not sure how fisherfolk would react to a talking, 'humanized' shrimp. The idea was dropped. The approach finally agreed to use the information about the lifecyle of the shrimp as the foundation, but kept it a little in the background, focussing all the while on the more visible, and understandable, management aspects which are basically social and economic issues. This also allowed the story format to be used to make the narrative more interesting. Only time and the fisherfolk will tell whether this was the right way to do things.

One of the concerns in producing the second book was that the matter was more technical and complex, and the BOBP staff felt that there was a danger of overloading the reader with complexity. However, the first comic book's evaluation suggests that fisherfolk, familiar as they are with the details of their life work, are able to effortlessly absorb information which, to a non-fisherperson, may seem formidable.

It may well be asked how the comic book meets the requirements of awareness-building. Going by our limited experience, the comic book may well be the most suitable medium because:

- Its emphasis on visual presentation makes it easier for people with relatively low levels of literacy to use the material;
- The combination of visuals and text in a story narrative definitely makes it more interesting and easier to absorb; and
- The permanence of the print medium helps people to pass it around and go back to it, unlike in the case of the electronic medium, which, though more dramatic, tends to evaporate from people's attention.

The real benefit of using a permanent visual medium is that with good design it is possible to dramatically expand the attention span of the mind and address complexity graphically. The cost of using comic books seems quite reasonable when you take into consideration the fact that the books are passed around and kept for further reference. Importantly, in several of the BOBP member countries the comic book is an accepted and popular medium and, therefore, local talent exists which can be tapped by fishery agencies to write and illustrate the books.

With BOBP's proposed third phase focussing almost entirely on enabling fisheries management, we can look forward to a lot more comic books on the beach!

Post-Harvest Goes Participatory

Participating and learning in a fishing village

by Peter Colaco* and Tim Bostock**

Participatory Rural Appraisal (PRA): What is it really? A technique for data collection? A set of methods for dialoguing with village people? A new philosophy of development? A few simple answers emerged in the course of a five-day workshop on PRA (June 28 - July 2, 1993) conducted in Madras by the BOBP's Post-harvest Fisheries Project and Outreach. This is a report of, and some reflections on, those five crowded days.

The 20 participants who assembled at the Dhyana Ashram, Madras, were not a homogeneous group – except for being partners in the Bay of Bengal Programme's Post-harvest Fisheries Project.

After an ice-breaking introductory exercise, in which participants were paired in a find-your-partner game, each of us introduced his/her partner and a profile of the group emerged – field officers of the Fisheries Department, workers from partner NGOs, and programme staff from BOBP.

In a follow-up participatory exercise, each member of the group wrote on a soft board a topic for study during the PRA. The topics seemed to fall almost naturally into four clusters:

- Post-harvest activities;
- Credit;
- Women;
- Government links.

(see chart - 'Topics of Study')

A key question, often asked in development circles, is – "How do we enhance people's participation?" But are we ourselves able to participate?

If we look inside ourselves, what are our attitudes to village people?

"They are ignorant. We know better."

"They are the problem. We bring the solution."

There is always some off-loading of accumulated mental and attitudinal baggage to be done, if we are to be open-minded enough for real participative planning.

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* **Of** Biamedia **and the recorder** of the **workshop.**

** Post-harvest Fisheries Adviser.

The fisherfolk of Alikuppam participated actively during the appraisal of their village near Madras by participants in the BOBP Post-harvest Fisheries Project's workshop on PRA. Here they present a map of their village on the ground.

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But PRA is not just a sobering process of introspection. It should function as an energiser where everyone has fun, while learning is shared. A body of participatory learning techniques, which are largely visual, has been evolved:

Time line

A re-creation of vifiage history, using elders as resource persons for the very early history, with group support on more recent events. When did the community come to live here? Who founded the village? Major events. Major crises. Major achievements. Epidemics. Tidal waves. The coming of electricity — and so on.

Seasonality

Getting attuned to the seasons and how they affect the rhythm of life in the village. Not by the city calendar, but by their's. For instance, studying the relationships between income and expenditure to identify critical periods when credit is in short supply.

Transect

Walking a cross-section of the area. Observing the environment, talking with people. Jointly making notes on a map (resource inventory, problems, opportunities).

Trend diagrams
(Historical transect)

A comparative chart of change. In the environment. In land use. in quality of life and related factors. What was it like 50 years ago, 20 years ago? What is it like today? What do we want to make of it tomorrow?

Mapping

Social mapping by various means — spatial *(e.g.* village maps) and symbolic (Venn diagrams) — help to know the village, its social environment,, its institutions. Resource mapping of the village and its environment is an important basis for planning.

Livelihood analysis

Most communities have a dominant occupation — like farming or fishing. But how do other people make a living? How can we provide for these in a development plan?

Wealth ranking

By counting assets of households — identifying on the village map the rich, the poorest of the poor. What is the village criterion for deciding poverty? How can it be eradicated.

Matrix ranking

Using seeds or stones as counters (shells, perhaps, in a fishing village), people are able to quantify the relative importance of anything comparable *(e.g.* different species of fish). They list their own criteria of judgement —value as food/market value/availability/ easiness to catch/seasonal availability! preservability/ taste, etc. A matrix ranking of trees, for instance, can help decide the mix of species for a social forestry programme.

One factor common to most PRA methods is that they are completely visual. Information is recorded on large sheets of paper or on the ground. Everyone can understand what is being discussed, everyone can join the discussion.

Most of these methods are directed towards enhancing participation. They are not likely to be precise enough to satisfy a scientist, but they can be useful indicators of important issues and trends which would otherwise be overlooked. As the PRA dictum goes, "It is more important to be approximately right than to be precisely wrong".

* * *

Smaller groups of 4 or .5 did a round of 'dummy' exercises — historical transects, seasonality charts, matrix scoring and *Venn/chappati* diagramming. Each group selected a topic from its own area of direct knowledge. Half the group 'facilitated' the exercise, using the other half as 'informants'. Both parties used the experience to understand the dynamics of the exercises, and how to use it in. the field.

Participatory learning methods are not as simple as they sound. A problem that often emerges is that the facilitating group tends to dominate the informants' group, thereby cutting off the flow of information or distorting it to meet the facilitators' perceptions. It is important to facilitate — without interfering. *"Don't lecture if you want to learn. Listen..."*

A list of DOs and DON'Ts — a brief manual on the etiquette of participative dialogue in a village — evolved. It is a paradox that the relatively unstructured approach of participatory learning methods demands meticulous planning, formal structuring, efficient management, accurate documentation.

On the third day we piled into two mini-buses for the 80 km drive to Alikuppam. The 'real' PRA was set to begin.

* * *

Alikuppam is a small coastal village, somewhat isolated from the main roads. It depends totally on fishing. There is no arable land.

Jayalakshmi, an extension officer of a participating NGO, presents a seasonality chart.

We arrived at Alikuppam at 11 a.m., to find a sprinkling of village people awaiting our arrival in an open-thatch shed which serves as the non-formal schoolroom.

Immediately, other people began to arrive. This being a slack time for fishing (the boats would go out in the evening), people were generally free to participate. In a farming village this would have been the middle of the working day and few people would have been free till late evening.

How would we enter into a collective dialogue – this inhibited group of 20 outsiders and about 50-60 expectant but reticent villagers of all ages? Once again there was ice to be broken!

Self-introductions were made – by everyone present. The purpose of our visit was explained. A time line exercise was initiated. To begin with, an old man, with a remarkable memory for incidents and dates, was the sole informant. But gradually the whole group got involved: Who started the village? When was the highway built? When did the first bus service start? Who was the first person to complete a high school education?

A sixteen-year-old boy was identified. Rather shyly, he came forward to take over the writing of the chart which, till then, was being done by a member of the team. The process of participation (transferring the initiative to the village community) was gaining momentum.

Among other objectives, a PRA session tries to reinforce the sense of collective identity and of shared inheritance among the village community, as a prelude to group action.

During a good team line exercise, as the village history emerges on paper, you can almost palpably sense the feeling of village identity being reinforced. Like a family at a reunion, looking at old albums, sharing the joys of rediscovery.

After the team line, the trainee groups of the previous day teamed with village groups to start the PRA exercise. The exercises included:

- A Venn (or ***chappati)*** diagram of the problems faced by women in fish marketing.
- A matrix scoring of pre-harvest and post-harvest activities, showing the role played by men, women and children in each.
- A matrix scoring of the species of fish in the area, in terms of their utility for the people of Alikuppam.
- Seasonality exercises and the patterns of life in the village.

The groups later made presentations to the entire assembly, so that the information obtained could be cross-checked.

The common perception that villagers are ignorant is often shared by villagers themselves. A PRA can come as a surprise to them, when they realize how much they actually know (though they may not have previously pooled their knowledge and presented it in such an integrated fashion). If empowerment is a valid goal in development, then this single aspect of PRA may justify the time and cost expended.

* * *

On the next day, two new mapping exercises were initiated:

- One depicted the sea off Alikuppam, its resources and hazards.
- The other was a village map, which was used to indicate occupation, health, economic status, children's education and so on.

You can never stop being fascinated by the village people's knowledge of their habitat and creative ability to present it. With coloured chalks, stones and dried fish as specimens, an open patch of ground became a sea-map with the kinds of fish to be found at different depths and offshore distances. And the dangers the fishermen face – such as submerged rocks or shoals of lethal stingrays.

The energy released in a PRA, the sense of focus and involvement it generates is unique. In the process, it can pinpoint specific problems and opportunitiàs, which differ from micro-environment to micro-environment. But, beware! You can also get carried away by the charm of PRA outputs as folk art. In the process, do we lose sight of them as tools for shared learning? Do we invest them with unexamined credibility, when we should be building on them for questioning?

* * *

This being a training exercise we were forced to omit the integrating final session where needs and problems would have been defined and prioritized. Where development plans would have been formulated. But the thought did arise: Were we merely using the villagers? And did they feel used? Hopefully not. Many villagers told us they had found the exercises thoroughly stimulating. And the local NGO, a partner in the Post-harvest Project, will take up the next stage of development planning.

* * *

During the training programme (and particularly in the last day's summing-up) one question loomed large – Why PRA? Is it a potentially valuable new approach to participatory planning or simply a fashionable new fad?

One problem that PRA seeks to address is the several types of biases that commonly occur with conventional methods of data collection for development planning. For instance:

- Do we favour villages which are nearer to a big town or highway, which are more comfortably accessible for the visiting researcher (the phenomenon called 'development tourism' or 'roadside research')?
- Do we visit villages in seasons and times of day which are comfortable and convenient for us, rather than appropriate for the village?
- Are we blinkered by our specialized field of interest, shutting out information that does not fall within our framework?
- Do we relate more to the rich than the poor, the talkers *versus* the silent, the landed rather than the landless, men rather than women?

In a well-planned PRA there is an attempt to involve the whole village. The team itself is multidisciplinary. The sessions are public. Hopefully, a more integrated and less biased picture is likely to emerge.

* * *

PRA methods seemed of obvious relevance to the NGO field staff in our group. Three of the opinions expressed in the summing-up session illustrated this point.

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"Usually villagers cannot express what exactly their problems are. PRA methods enable the women (and..other villagers) to express their ideas 'In a clearer, more organized way."

"Working in groups helps in cross-checking of information — between groups and through different learning methods. A better quality of information can be collected."

"Initially the women were inhibited. Later the women got interested and participation increased."

* * *

For senior staff involved in policy formulation and programme monitoring, there is a very practical problem: How can PRA be used for getting micro-level data?

One of the participants, a senior consultant and researcher from Shri Lanka, is involved in the protection of river system ecology. For such geographically vast areas, is it not more appropriate to use satellite imaging and survey-type data? Even in such cases, PRA can provide the kind of qualitative insight which enriches survey designs, and the kind of information which reveals dots on the satellite map as human settlements with real people.

* * *

PRA exercises conducted over the last few years in India, and elsewhere, have established its potential usefulness in projects for environmental and resource management, with community participation. PRA has been used for identification of beneficiaries in direct assistance programmes to poor families. For planning integrated development and community facilities.

But does it have any relevance to fisheries, fishing villages and the Bay of Bengal Programme?

Look at the charts reproduced in the following pages (information and analysis generated in the space of a few hours on two successive half-days). Would such techniques and insights fill a need expressed in many forums, including a consultation of senior officials from the Bay of Bengal area, held at Madras?

"What communities seem to need are forums for discussion and action to address their needs. This kind of activity requires of extension staff learning, teaching and mobilizing skills that they rarely have. 'And this training need was highlighted as an important task.

"Participatory research used in needs assessments and in opportunity searches for solutions not only builds awareness and skills, but encourages cømmunication and interaction between fisherfolk and extension staff," felt a participant.

Perhaps the time has come to take the dialogue about participatory learning methods from the library shelves of development literature and into the field where it belongs.

An opportunity to care for the earth again

James Mascarenhas, Director, OUTREACH, was the principal resource person at the PRA Training Workshop. Here are excerpts from a conversation he had with Peter Colaco.

What was the purpose of the PRA Training Programme in Madras?

The sustainability of development projects depends on the participation of local communities — in planning, implenıentation, monitoring, evaluation and management — and, so, the need to develop appropriate participatory approaches. The programme in Madras explored the use and effectiveness of PRA in coastal area development.

That participants were drawn from both Government agencies and NGOs underscored BOBP's commitment to appropriate institutional building that will consist of the Government, NGOs and the people themselves as partners in development.

What was the outcome? What kind of follow-up do you envisage?

The outcome of the programme was a mixed bag. On the one hand, participants were exposed to PRA methods and were able to try them out in the field. But there was not enough time for a greater appreciation of the information generated or to develop an actual micro-level plan along with the community of Alikuppam village.

However, most participants gained important insights into the use and application of PRA methods and felt there was need for developing and using more participative approaches in the entire Bay of Bengal region to enhance fishing communities' participation in improvement programmes.

How can PRA approaches help programmes like BOBP?

PRA stresses qualitative information, perceptions, opinions, experiences and feelings of the community, local knowledge and indigenous management systems.

Through the dialogue of PRA, local communities are given the opportunity to participate in, and contribute towards, the development process. A tremendous human force is released in terms of human creativity, motivation, ideas and suggestions, participation and responsibility. This is an extremely valuable input into development, particularly when women and children also begin to participate.

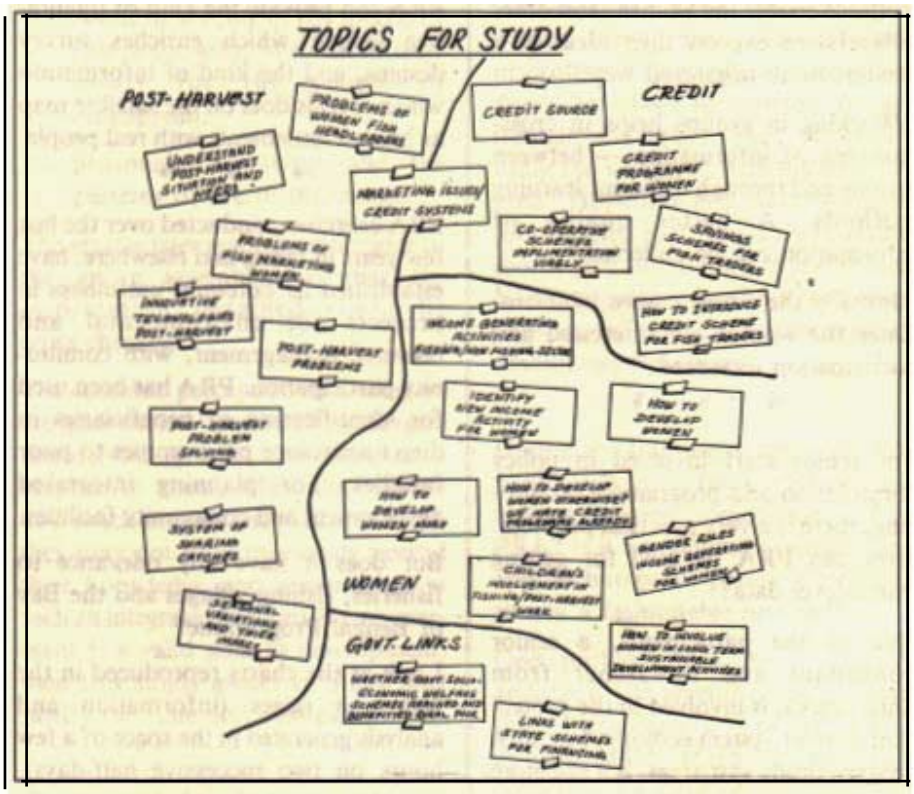
PRA reveals that indigenous systems considered primitive or suboptimal are, in fact, extremely sustainable means of harvesting nature's bounty. Many of these systems have been destroyed and desecrated with the advent of modern 'hi-tech' development. The adverse effects of the latter are being increasingly felt. PRA is an effort to arrest and reverse the process of further deterioration of the earth's resources. It gives local communities the opportunity to take charge of the development process and, in doing so, to take charge of their own lives and destinies — and that of the earth.

The trainees' topics — and the fisherfolk's views.

An important ingredient for success in a PRA Ls being clear about what we want to find out

At the start of the training programme each participant was asked to write down a topic for study. And the topics fell into four main clusters. The topics reflected the concern of the participants not only for the technical aspects of fisheries, but also for issues of local management systems, problems and opportunities, indigenous technologies and so on.

The training group had an unusually large proportion of women participants (from field NGOs), which. possibly explains the large area of interest in WOMEN and their situation. Or Ls the developing world becoming more gender sensitive?!



DISTRIBUTION OF LABOUR BY FISHING ACTIVITY
- ALIKUPPAM -

PRE-HARVEST	WOMEN	MEN	CHILDREN	POST-HARVEST	WOMEN	MEN	CHILDREN
1. CREDIT FOR CRAFT AND GEAR	10	15	—	AUCTIONING	—	2	—
2. PURCHASE OF MATERIALS	—	5	—	SORTING	5	—	—
3. SETTING THE GEAR AND CRAFT	—	15	—	MARKETING	10	—	—
4. FISHING	—	8	2	PROCESSING	4	—	2
5. UNLOADING ON THE SHORE	—	4	1	REPAYMENT	17	—	—
	10	47	3		36	2	2

PARTICIPANT VILLAGERS:

MANORANJITHAM, VALLI, MUTHU, RAJAMMA, DEVI, JEYAGANTHAM, ADILAKSHMI, LEELA, SAMBAVATHI, AVARANGI

The *output was arrived at by a group discussion in which the village group was given 100 counters to be allocated among all fishing activities (suballocated to men, women and children). The limit of 100 counters forced a more serious attempt at balanced quantification; an indefinite number of counters often makes scoring more random and arbitrary. Men, women and children were involved in the fishing activity — children to a very small extent (5 per cent of the work). For the rest, men played a greater role in pre-harvest work (47 per cent) and women in past-harvest work (36 per cent). In all, it was said that men did 49 per cent of the work and women 46 per cent.*

Everyone seemed satisfied with thefr data. The men also looked .smug that it was 'proved' that they were doing more work than the women. Till ***it*** *was* ***pointed out that*** *this* ***only*** *reflected* ***the amount of*** *work* ***done in terms of the fishing activity.***

The whole area of *housework —* ***child-bearing child-rearing, cooking, collecting water, collecting fuel, managing*** *the house (sick children and drunken husbands as well) — was not considered in the calculation. The women felt another 50 points could easily be added to their column for these activities.*

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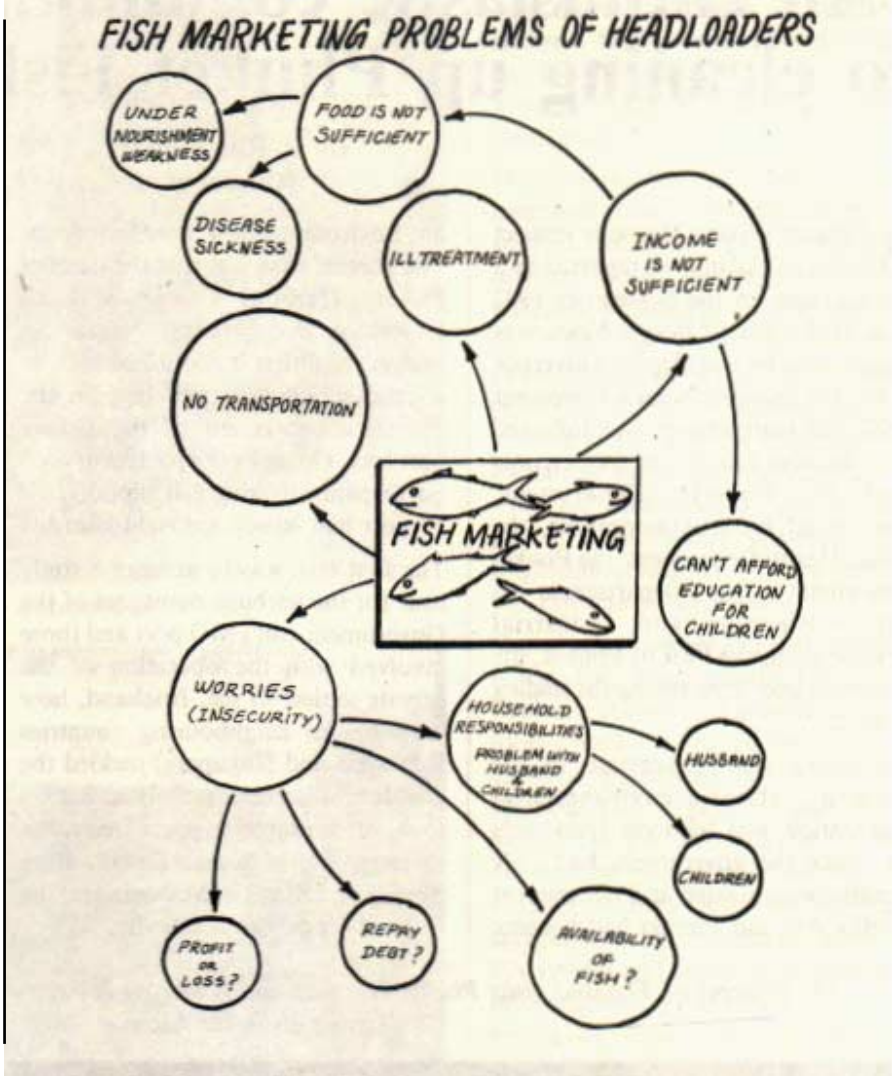
The focus on 'marketing problems' took an unexpected dimension when the women began to speak of other anxieties.

***Venn diagramming, often used to** examine the social institutions in relation to the village, was adapted to measure anxieties in the group. Big circles for big worries, smaller circles for small ones.*

The women spoke of ill-treatment by fish dealers reflecting their vulnerability — as women trying to sell a perishable ***product. Of** anxiety about availability of fish. Could they transport it? Could they sell it? Would they make a profit or loss? Could they repay their debts? Would they catch the bus at night? **Would they get home that night?** Would the husband be drunk? Would she be beaten up?*

*In the women's minds, the relationships of all this to marketing was clear, because it was part of their daily experience and their feelings. For the first time in their lives they were trying to articulate it — in a visual form. Which gave us — **and them** — something to think about.*



BOBP Publishes RRA Manual for Coastal Communities

The trouble with concepts like Participatory Rapid Appraisal (PRA) and Rapid Rural Appraisal (RRA) is that they put off about as many people as they attract. And a lot of this is because they mean different things to different people.

Development workers have, over the years, had several methods in their tool kits which now form a part of the RRA/PRA repertoire. Only, they did not call them RRA or PRA. So there is nothing alien about the approach; what is new is **the systematic and combined use of assessment methods,** and, more importantly, **the credibility the approaches have gained** during the last decade in academic and development circles, making them legitimate, as it were. Then, there is the confusion about participatory rapid *versus* the merely rapid. In the right hands, many techniques become participatory, while legitimate, certified participatory approaches when mechanically used often fall flat on their faces: it all seems to be a question of degree and depends considerably on the attitude of the practitioners.

The Bay of Bengal Programme used RRA approaches extensively in Indonesia, Bangladesh and the Maldives, starting early in 1988 to develop projects and to tune in the projects to local communities. The involvement of fisherfolk was enough to change the very objectives of the project in North Sumatera, Indonesia, and help focus the objectives in the project in the Maldives. Our experience also showed that RRAs can be done by 'non-expert' extension staff from fisheries agencies and local fisherfolk with some help and training.

With this experience, BOBP decided to evolve a manual on RRA methods for particular use in coastal small-scale fisherfolk communities, and this was done by conducting a full-scale RRA to test and develop the methods in a fishing village of Tamil Nadu, with the assistance of Ms. Jennifer McCracken of IIED, one of the pioneers of RRA/PRA. The manual, to be published in October, should be considered a working document, which will evolve and improve with use, with users contributing new techniques and modifying techniques and approaches through practice. The illustrated manual, Rapid Appraisal Methods for Coastal Communities, by Philip Townsley, Bay of Bengal Programme of FAO, Madras, India can be acquired by writing to the Information Officer, BOBP-FAO, P.O. Bag 1054, 91 St. Mary's Road, Madras - 600 018, India. It will be nominally priced.

— R.R.

An enthusiastic community sets down to cleaning up Phuket Fishery Harbour

by R Ravikumar
(Consultant)

The Cleaner Fishery Harbour Project in Phuket, Thailand, as reported in a curtain-raiser in the September 1992 issue of the *Bay of Bengal News*, was inaugurated by the Deputy Governor of Phuket Province in early November 1992. The inauguration was followed by a one-day meeting of participants from the Fisheries Department, commercial fisheries enterprises, the Public Health Department, the Phuket Municipality, the Departments of Urban Planning and Industrial Development, the Port of Phuket, the University and from among the leading citizens.

The timing was appropriate, as the concern about environmental degradation was high on everyone's list, since the government had only recently promulgated an Environment Quality Act and Phuket had become an Environmental Protection Area. The general view was that the Cleaner Fishery Harbour Project was an important one, though 'small' in budget, and that it should be seen as a catalyst which would help in the overall improvement of the fishery port area. Going by the pledges of each participant, offering full support, the Project had struck the right chord.

The first task was to arrange a study tour for the harbour managers of the Government-run FMO port and those involved with the operation of the private jetties, to see, firsthand, how harbours in neighbouring countries (Malaysia and Singapore) tackled the problem of harbour pollution. Such a tour was arranged in early December to the ports of Kuala Kedah, Batu Muang and Klang in Malaysia and the Port of Singapore Authority.

The five participants returned with ideas and decided that priority should be given to

- solid waste disposal, and
- creating in the community an awareness of pollution problems and their mitigation.

A working committee was formed to steer the project and it got down to business straightaway by negotiating with the Rasda Subdistrict Authority, who are responsible for the fishery port area, to arrange for garbage collection from the premises. The RSA provided two garbage trucks and agreed to collect garbage every two days. Sixty garbage bins – locally made from used truck tyres – were purchased and deployed at convenient locations. Forty more were deployed later, besides providing at twenty locations

The Princess of Thailand visits Phuket Harbour and is briefed about the Cleaner Fishery Harbour activity going on in the harbour.

Garbage bins made with discarded truck tyres.

The three bins for separated garbage at a central collection point.

The 1000-litre mobile tanker with vacuum pump to drain oily bilge water from boats.

central collection points consisting of sets of three large bins for separated garbage. Arrangements were also made for the collection of flotsam by 'sea gypsies' (native islanders) using small boats.

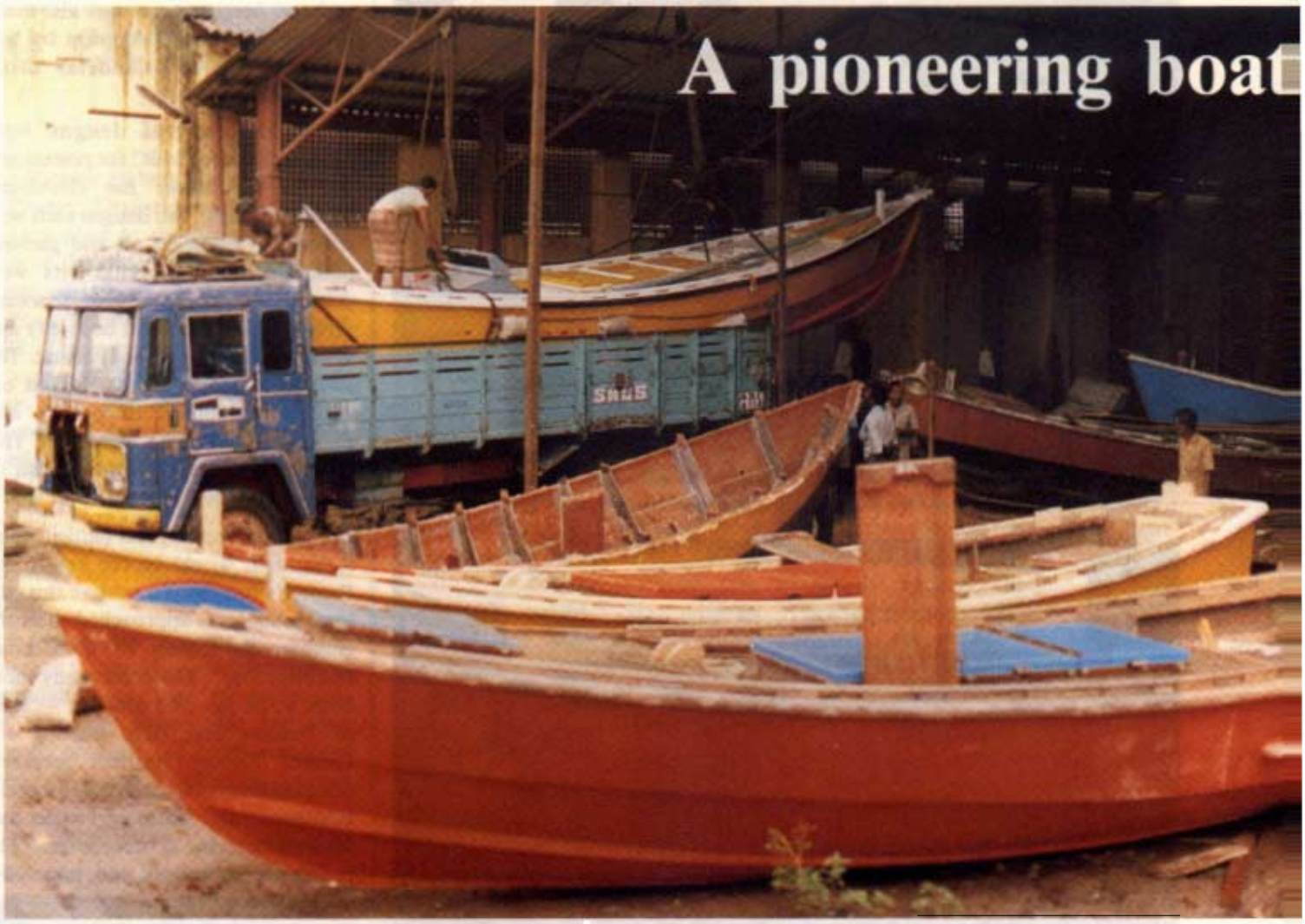
Meanwhile, several designs' were generated at the PMBC for posters and stickers to convey the cleanliness message. Finally, two designs each were selected to highlight,oil and garbage pollution. iWo thousand sets were printed for display at the FMO terminal, private jetties, the tourist boat jetty and at other fishery ports in Thailand. The awareness campaign was flagged off with an exhibition of posters and photos at the Phuket Aquarium. This exhibitIon coincided with the visit of the Princess of Thailand.

Communty support and participation, it was felt, would be the key to the Project's success. To achieve this, the local school was approached to let the children participate in a 'Cleaner Harbour Day'. There are many more ideas to be put into practice – sales of buttons and flags bearing the Cleaner Fishery Harbour message, competitions between jetties, using the PA system and featuring articles and information in a newsletter. The people are enthusiastic and, hopefully, this feeling will be sustained.

Provision of reception facilities for oily waste is next on the agenda. Though skeptical about its need, the working committee has agreed that this should be tried on a small scale at the FMO port to assess its practicality. A 1000-litre mobile tanker, with a vacuum pump to drain oily bilge water from boats, has been procured. A fixed tank to receive this oily waste will also be installed and the oil separated from the water will be sold.

More serious is the pollution of harbour waters by the inflow of domestic sewage from the town. Mitigation of this problem is only possible by installing a treatment plant with the outfall well out at sea. Providing adequate fresh water is another important requirement. While these inputs are beyond the scope of the present project, there is good news! The Director General of Fisheries, after visiting Phuket recently, has agreed to a proposal for a larger national project, under the DOF budget, to address these issues. The comment that the BOBP Project is a catalyst is indeed coming true.

A pioneering boat



Kakinada is an old port town in Andhra Pradesh, India. It is a centre for the export of rice bran and tobacco. The town itself has grown outward from the canal which meanders its way to sea a few kiometres away. This canal, crowded with large wooden barges that move cargo from ships anchored out at sea, hundreds of fishing boats both modern and traditional, tugs, dredgers and assorted other craft, gives an immediate impression of a town buzzing with maritime activity. All along the canal banks there is frenetic activity; boatbuilding, barge repairs, timber sawing and the inevitable fish drying. The APFC Government Boatbuilding Yard, popularly known as 'The Boatyard', is situated a fewminutes walk from the town centre and right in the midst of all this bustle.

The boatyard, and its sister organization, The Fisheries Training Institute, were set up as early as 1953 by the Department of Fisheries to meet the needs of a fishing boat motorization programme which also included the construction of motorized boats of 'modern' design. It was viewed as a cornerstone of the Department's development efforts to uplift the fishing community.

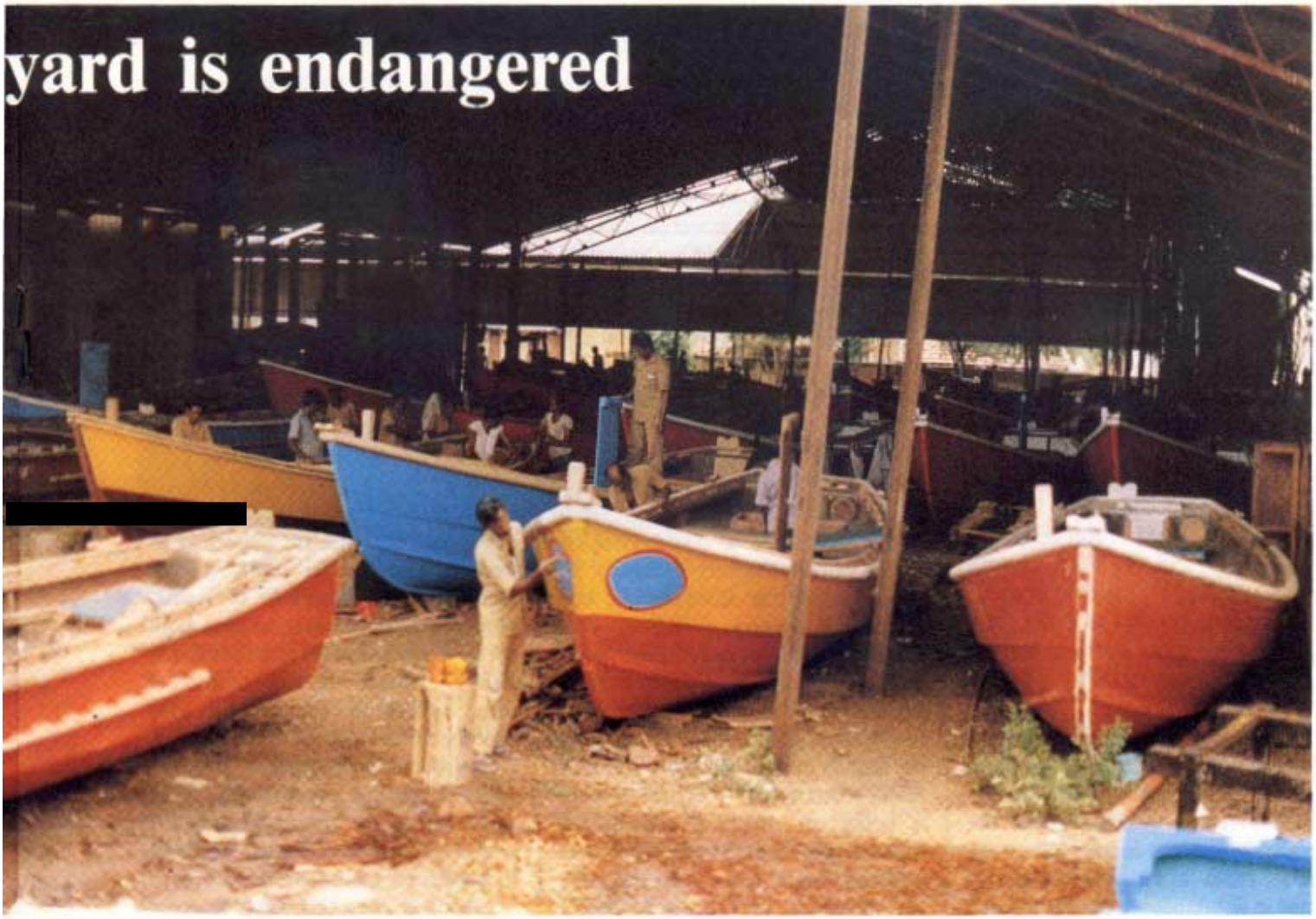
Spread over two acres, the boatyard is well planned and has large building bays, a machine shop, foundry, stores and a slipway. It is equipped with all facilities for wood and metal work to make it self-sufficient in the production of boats.

Starting with the motorization of the popular Kakinada *nava* in 1956, the boatyard has produced fishing boats in a wide variety of sizes and materials, such as wood, ferrocement and fibre-reinforced plastic (FRP). During the late 60's and early 70's, the 'trawler boom' had its impact on the boatyard. Over 600 boats of modified Bay of Bengal Programme (BOBP) designs were built between 1968 and 1974 for the Departments of Fisheries of Andhra Pradesh, and other maritime states of India, under their various schemes of providing boats to fishermen. It must be noted that, during this period, private boat-building was limited to a few yards not equipped to mass produce and, probably, unable to meet specifications.

In Andhra Pradesh, as in many other states, the increasing commercial importance of the fishery sector resulted in the formation of several quasi-governmental agencies to commercially tap the potential of boatbuilding. The Andhra Pradesh Fisheries Corporation (APFC) was one such organization. It took over the boatyard in 1974, to run it as a profit-making enterprise. The reasons were fairly clear. Enormous funds were involved in the many government-sponsored schemes, including cyclone relief, for supply of fishing boats to fishermen and this was an opportunity to meet the demand and make the boatyard self-sustaining in one go.

It is debatable whether this was the right choice. Perhaps it could have resulted in a more organized private sector otherwise. Perhaps the boatyard should have limited itself to research and development of new designs. The fact is, most of the 'corporation' boatyards soon became unprofitable and have been closed down. Large overheads and the lack of a competitive edge over the slowly-growing private sector, besides the drying up of schemes to supply trawlers, have been the main reasons. The APFC boatyard too is now a victim, but more about that later.

yard is endangered



In recent times there have been two noteworthy events that need to be mentioned: The advent of FRP boatbuilding and the construction of two 25-metre trawlers using teak! The former was a result of BOBP's beachlanding craft development and the latter resulted from an Integrated Marine Fisheries Project with support from the World Bank. These two proved a radical departure from routine boatbuilding at the yard. Needless to say, these developments were considered only because of the reputation of the boatyard to meet the challenge of changing technology. While building the large wooden trawlers was a daunting experience for the yard, the rapid adaptation of FRP technology so alien to the workforce was never imagined.

The end result of BOBP's beachianding craft development was the design of IND-20, an 8.5-metre FRP boat. During the production of its prototype in Madras in 1982, three persons from the APFC boatyard (Messrs Babu Rao, Prasad and Swamiji) were given hands-on training in FRP boatbuilding.

The formulation of several credit schemes for the introduction of beachianding craft in India, viz, the NCDC, DRDA and HPS, resulted in bulk orders for the IND-20 to be built at the Kakinada boatyard. By 1986, the shift to FRP boat production was near total. Till date, nearly 300 BLCs have been built. The initial assistance from BOBP in streamlining FRP boat production and supervision during construction was fully utilized by the boatyard to establish confidence among the design team and workforce in handling this versatile material. In fact, several nonfishing boats were designed and built by the boatyard for the Indian Navy and for the tourism industry in order to supplement earnings.

A major spinoff from all this FRP activity has been the ability of the boatyard to adapt the new technology to meet the needs of the traditional sector. The IND-20 hull was modified (stretched) to produce the FRP *nava,* and FRP versions were made of the popular *teppa* or *kattumaram.* The former is in great demand among *nava* fishermen to exploit offshore shark resources and the latter among fishermen from Puri as a low-cost alternative to the BLC. Incidentally, both boats cost more than their traditional wooden counterparts, but the advantages of the material, savings in maintenance costs and easier motorization have caused the more affluent fishermen to opt for these designs.

The APFC boatyard has been a major partner of BOBP by providing facilities for development work related to fishing craft. It is perhaps the only institution in India at present that works with development agencies (national or international).

Despite this enviable record, an alarming decision has now been taken: to close this boatyard! It has become a victim of high overheads and losses due to a surplus workforce. Perhaps a careful look at pruning the costs and reverting to the original objective of utilizing the boatyard as a leading edge of the development effort could still save this institution and prevent a great loss not only to the state of Andhra Pradesh but to the nation itself. An alternative might be to privatize it as a commercial operation since profitability is unlikely to result from developmental work. But whatever the decision, the APFC boatyard, with its record of pioneering several boat-building efforts, should not be left facing closure. It is too valuable an asset.

— **R.K.**

Radio Training Pays Dividends in Maldives

The Bay of Bengal Programme's (BOBP) regional workshop on the use of radio as a tool for fisheries extension and development, held in Colombo a year and a half ago, was primarily intended to share with the member countries of BOBP the learning of the Shri Lanka fisherfolk radio project. The workshop was well attended and seems to have spun off activities in three countries: Bangladesh has established a weekly radio programme for fisherfolk; Thailand sought BOBP's help to create organizational strategy for a fisheries radio programme which will, in time, be broadcast from three dedicated radio stations; and, the Maldives, with the oldest fisherfolk radio programme in the region, decided to make their programming more participatory in nature, and requested BOBP's help to train their staff.

Given the logistic problems of a nation with 201 inhabited islands scattered over 90,000 square kilometres of the Indian Ocean, radio has been the binding force of the country. The twice weekly radio broadcasts exclusively aimed at fisherfolk are eagerly listened to. However, the Voice of Maldives (VOM) and the Ministry of Fisheries and Agriculture (MOFA) were looking to the future when formulating the request.

Fisherfolk are becoming increasingly concerned about the sustainability of their reef resources, given that at least two fisheries, the beche de mer and the giant clam, had run into problems with overfishing in the recent past. MOFA and other key ministries, like the Ministry of Planning and Environment and the Ministry of Atolls Administration, have, as part of a much larger exercise, already started on the task of enabling sustainable development of the country's natural resources. Manpower has always been a problem in the Maldives, and the participation of fisherfolk in managing the resources was seen to be an absolute necessity, simply because it would be impossible to enforce unless fisherfolk understood and wanted it.

Interestingly, another BOBP activity, an extension project with MOFA, was also looking at the same issues, and is developing a manual to help fisherfolk better understand the need for, and the mechanisms of, reef resource management. The cooperation that this project received from VOM clearly showed that radio can be a powerful tool for building awareness and for initiating the consultative processes that would, in time, lead to management. It was in this context that VOM and MOFA requested BOBP to assist in training staff, not only from VOM but, more importantly, from MOFA and from the islands, in participatory fisherfolk radio programming.

In late April and early May 1993, BOBP organized a training input, during which Michael Pickstock of World Radio for Environment and Natural Resources (WREN), UK, trained ten persons. Two were producers from VOM, four came from MOFA's extension and marine research sections, and four came from the islands of Meemu Atoll, south of Male, where BOBP's extension work is going on. In fact, one of the islanders was a Magistrate, one was an Assistant Island Chief, and the other two belonged to the Atoll Chief's Office. The training covered both theory and practice and included hands-on experience during a field recording trip to some of the islands in Meemu Atoll. On their return, the trainees put together radio programmes based on their recordings and VOM broadcast them.

As traiings go, it was a success. But the real test of training is what happens after the training! And during a recent visit to the Maldives, BOBP was told about what might be described as a dividend from the training.

Recently, some fisherfolk, who for the most part exclusively target tuna in a pole-and-line fishery, came across large schools of sprat (a variety of anchovy) which they netted and brought into Male. The demand was good and so were the prices and this encouraged the fisherfolk to do more of the same. Now Maldives depends on tuna both for local consumption and for export, and the head of the municipal organization in Male, who also controls the fish market operation, was concerned about fisherfolk diverting their energies into a new fishery, at the cost of tuna. He approached MOFA and asked them to do something about it. MOFA found themselves in a bit of a spot: they knew this was a seasonal fishery, and that a few fisherfolk, with access to Male, would temporarily get into it, because the economics made sense, but would then go back to the

The trainees on their way to an island to record a programme. Trainer Michael Pickstock is seated at the extreme right and Badru Naseer of the Voice of Maldives is seated extreme left.

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Adam Manik receives his certificate at the end of the radio training programme from Hassan Maniku, Director, Fisheries Research and Development.

pole-and-line fishing of tuna as soon as the season for sprat blew over. But they did not want to dictate to fisherfolk and tell them what to do. And yet, some response was called for to clarify the issue raised by the Municipality.

In mulling over the options, Adam Marnk, a young officer in the extension section, who had been trained in radio, suggested that perhaps the best way to tackle the situation would be to do a radio programme which would present all sides of the issue, but from the fisherfolk point of view. He studied the issue, took his tape recorder and started interviewing fisherfolk, fish dealers, even some consumers and put together a 15-minute programme which gave a balanced view of the whole issue and defused a rather tricky situation.

Here was a good instance of media playing a mediating role by getting the involved parties to share their views, and resolve matters without direct intervention of government. Without the training, the officer may not have thought of the option, and definitely would not have been able to do something about it even if he had.

One small step for radio; one slightly bigger step for fisheries management. With the Third Phase of BOBP, and its focus on enabling fisheries management, around the corner, a good foundation is already being laid with awareness being enhanced at all levels. The Maldives may well have a headstart in evolving participatory fisheries management approaches, with fisheries officers beginning to use the media as a tool of fisheries extension and management.

— **R.R.**

Fish Fortnight '93 in Bangladesh

The Government of Bangladesh declared August 1-15, 1993 as Fish Fortnight and celebrated it with fish fairs, awareness building programmes, workshops, reclamation of derelict ponds, releasing of fish fry in open waters and campaigns to augment fish production and conservation of open water resources. These programmes were undertaken in the capital, Dhaka, and at district and thana *levels all over the country.*

The Government, concerned with the gradual decline of fishery resources in its waters due to overfishing, environment degradation and reduction in water areas, hopes to create a social movement to build awareness and to enable increased production of fish, while ensuring the conservation of fishery resources in the open waters.

The photograph shows Prime Minister Begum Khaleda Zia releasing fish fry into a flood plain near Dhaka.

Large pelagic fishing in India

by **0 Pajot**
(Sr. Fishing Technologist)

India is best known as a shrimp fishing nation. In the Sixties, high priority was given to the development of export-oriented shrimp fisheries and during the next decade shrimp fishing turned into a bonanza.

Although the importance of these fisheries (trawling, gillnetting) remained undisputed, fishing entrepreneurs had, in later years, to turn to other fisheries in the coastal areas to cope with reducing catches and rising operational costs resulting in diminishing returns.

In the early Eighties, large pelagic species made only a very small contribution to the fish production in India. Except in the Laccadives, where pole-and-line fishing for tuna was the predominant small-scale fishing method, the Indian fishing fleet concentrated its fishing effort on the resources of the continental shelf, where large pelagic species were only occasionally caught. Eviderice, however, from the operation on an experimental basis of a few large as well as small fishing boats in the offshore areas pointed to the availability of large pelagic species in most of the offshore waters of India.

Triggered by a Bay of Bengal Programme (BOBP) demonstration of large pelagic fishing with a BLC IND-20 in the Kakinada area, Andhra Pradesh, in 1986, pelagic shark drift-longlining as a fishing activity has grown rapidly and there is, today, a fleet of about six hundred fishing craft operating from Andhra Pradesh and Orissa. And more fishermen of India, it appears, are turning to offshore fisheries in search of good returns. For instance, lucrative shark fishing has caused a virtual gold rush in Pun, Orissa (see *Bay of Bengal News*, No. 46). A fleet of about two hundred small multiday boats from Shri Lanka too has been fishing for large pelagics regularly in Indian offshore waters.

Obviously there is potential for the development on a wider scale of small-scale offshore large pelagic fisheries in India. However, there are too many hurdles for the small-scale private sector in India to develop this fishery by itself. The main ones are:

- Limited knowledge of large pelagic resources;
- Day boats being too small to fully exploit the offshore resources;
- Market for tuna and billfish species not yet developed; and
- Viability of small-scale multiday fishing operation still to be established for India-based fishing boats.

In an attempt to show that the hurdles could be overcome, BOBP in 1989 provided assistance to the State Fisheries Department of Tamil Nadu, in South India, to demonstrate to the private sector the technical and economic viability of small-scale multiday offshore fishing for large pelagic species. Exploratory fishing operations were to be conducted on a commercial footing to establish viability in a scenario that the private sector could replicate.

Two multiday offshore fishing boats (SRL-l5) built in Shri Lanka and used by BOBP for driftnetting and drift-longlining trials in Shri Lanka were

An SRL-15, loaded with catch, heading for the landing jetty at the Mpdras Fisheries Harbour.

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brought to India for these demonstrations. This type of boat and its fishing gear could easily be operated by small-scale fishermen with some training.

To cover the south and east coasts of Tamil Nadu, the fishing operation was carried out from two bases that had the required infrastructure and facilities – Chinnamuttam in the south and Madras in the east. Exploratory fishing was carried out in offshore areas where large pelagic species are available – 20-80 n miles from shore. Depending on the type of operation, each fishing trip lasted from two to four days. The catch was preserved in ice for marketing through commercial channels.

Three years of fishing operations with the two boats, from 1990 to 1993, did not, however, provide all the information required to support investment by small-scale fishing entrepreneurs in large pelagic fisheries. But there were enough positive signs to indicate the potential for development of offshore areas and these reinforced the view that large pelagic resources off the coasts of Tamil Nadu could be exploited by small fishing boats. They also provided further evidence that the scope for development of large pelagic resources differs from species to species, season to season and area to area.

Perhaps the trials on the south and east coast were not intensive enough and two boats too small a sample to arrive at firm conclusions. More fishing trials carried out commercially with more boats are required. But a foray into offshore fishing for large pelagics using small boats had been made and the learning will come in good stead.

What have we learnt?

The market is of paramount importance to the success of a new fishing activity. In small-scale fisheries, high catch rates seldom compensate for low market prices of fish. If they do so, it is not for long. It proved to be so in this exercise.

Because of good demand and relatively high prices in domestic and export markets, pelagic shark were the main source of revenue. The market for shark has developed significantly since 1986 and continued to do so during the trials. It is the most established among large pelagic species in India. Though the increase in price of pelagic shark may not be as high as in the past and may even stagnate in the near future, it will very likely continue to be the most marketable of the large pelagic species for years to come because of the large price difference with other species. The shark trade was discussed in the *Bay of Bengal News* of December 1992 (No. 48).

Unlike shark, the market for tuna and billfish species has not developed. These species have a demand in the local market, but at very low prices and as substitutes for other low-priced species. The export market for these species has also not been developed. Unless ways and means to preserve, process and export these species are established, this situation will prevail and these resources will not be attractive to the fishermen. Among the tuna species, large tuna, available mainly at greater depths, may be the most promising fish to target.

The size of the SRL-15 offshore boat is suitable only for about three-day trips. The experiences during the last three years strongly suggest that commercial exploitation of India's large pelagic species resources would require larger boats with endurance at sea of 7 or 8 days. This is particularly evident on the south and west coasts of India where the continental shelf extends from 40 to 60 n miles from the shore, making access to large pelagic resources difficult with a small boat. Also, successful round-the-year offshore fishing operations not only need to be diversified but also have to be carried out in as large a geographical area as possible due to the migratory nature of large pelagic resources.

Potential investors in small-scale offshore fisheries believe that existing 3-6 t motorized boats could, with some improvements, do the same 2- or 3-day fishing trips as SRL-15s but at lower investment costs. Looking back to the development of other fisheries in India, they are not wrong. Wooden *navas* were preferred to BLCs for offshore shark drift-longlining. The demonstration of drift-longlining with a BLC in Kakinada first resulted in a *nava* shark drift-longline fishery because these fishing craft were availabi,e, were cheap and were something with which the fishermen were familiar. This is the same case in Tamil Nadu;

Existing 3-6 t motorizdd boats engaged in coastal fisheries in Tamil Nadu are underutilized, most of them are paid for and they are much cheaper to build than the ***SRL-15*** type boats. These *pablo* type boats already engaged in coastal fisheries and shark bottomset longlining in deep waters on the east and south coasts, are likely to be the most feasible boats for small-scale offshore large pelagic fishing operations in Tamil Nadu. Encouraging the entry of these improved boats in offshore day and multiday fisheries would be the first practical step in the right direction and would be a step fishermen and fishing entrepreneurs would welcome.

Viability

For a boat to be viable it needs to be well-equipped with diversified fishing gear in adequate quantity. Revenue being a sensitive area of viability, the experiences in Chinnamuttam and Madras showed that more intensive use of drift-longlines for shark would significantly increase the viability of the offshore fishing operation. The catch of large tuna with shark drift-longlines also indicated that large tuna drift-longlines used at greater depths may be feasible and reduce the lean fishing time in offshore areas. Good supply of whole bait fish for tuna drift-longlining is available at a reasonable cost and should facilitate the development of small-scale drift-longlining for shark and tuna fisheries. Driftnets, a well known fishing gear for catching large pelagic species close to the surface, have not been very efficient and cost-effective so far in India.

This subproject may not have been a great success in bringing new innovations to small-scale offshore fishing, but it certainly has been one more exercise which convinced various official and private parties that, when

An SRL-1S unloads a shark into a kattumaram *in the Madras Fisheries Harbour to be taken to the auctioning point.*

planning development of large pelagic fisheries, the small-scale sector must also be thought of. Six years ago, large pelagic fishing in India was only thought of as a large-scale operation involving mainly foreign-owned ocean-going vessels. That has definitely changed. Large pelagic resources are, if not the main, one of the main resources still to be developed in India. What share of that resource will be exploited by the small-scale sector will depend very much on the level of cooperaUon between the Government of India, the state governments and the small-scale sector. Without financial management, technical knowhow and support, the small-scale sector will not be able to get a fair share of the offshore large pelagic resources.

Shark and tuna fishing in India at present

Of the large pelagic resources, shark are the most exploited all along the east coast. The level of exploitation on the east coast of Tamil Nadu is less than in the states of Orissa and Andhra Pradesh, but is growing slowly and will continue to do so.

But shark, being a longliving species and with a very good market, are becoming a vulnerable resource. Rapid expansion of fishing effort by Indian-based fishing boats on the east coast could lead to resource depletion. Monitoring the expansion of the local and foreign fleet of boats should be given due consideration (see 'Pelagic Sharks in the Indian Ocean', *Bay of Bengal News,* No. 48).

Tuna and billfish species, on the other hand, are not commercially exploited by small India-based fishing craft. But early demonstrations in Andhra Pradesh and Tamil Nadu as well as this exercise have not resulted in a commercial fishery. The catch rate of these species do not compensate for the low market prices to make this fishery feasible. Worse, these species are mainly caught by driftnets which are expensive to make and very risky to use on the east coast due t.o predators such as the large skate.

Going by the experience in Shri Lanka and the learnings from the trials in Tamil Nadu, development of the offshore fishery for large pelagic species — whether shark, tuna or billfish — will best be achieved step by step. Fisherfolk need time to adopt new technologies and commit and adapt themselves to a new way of life, which offshore fishing will demand. New fishing boats, built in India, will almost certainly need government subsidy if small-scale fishing entrepreneurs are to be encouraged to venture into this fishery. Most importantly, measures should be taken at the outset to prevent uncontrolled develop. ment. Let it not be another case of killing the goose that lays the golden egg.

Can "Trickle Down" Economics Work in the Shrimp Culture Industry?

Shrimp culture is booming all over Asia. But will any of the wealth reach coastal fitherfolk? BOBP tried to introduce nursery cage culture to fry-catchers in West Bengal and Bangladesh to help them get better prices for their catch. Charles Angell, BOBP's Senior Aquaculturist reports on the results.

If you should happen by the banks of the Ishamati River on the India-Bangladesh border in February or March, the sight of thousands of people, mostly women and children, lining the river bank will astound you! Upon closer inspection, you'll see they are all tending nets jutting out from the bank into the river's swiftly flowing current. Much to your amazement, when you peer into their aluminum and clay *hundis,* you may not see much until your nose is almost in the water! Then, suddenly, you notice hundreds of tiny 'threads' darting about in the murky water. You're looking at the dark stripe along the back of the tiger shrimp post-larva or fry or 'seed.'

The scene you've witnessed along the banks of the Ishamati River is repeated in every tidal stream and channel from the sea beaches of Cox's Bazar in southeastern Bangladesh to the backwaters of Andhra Pradesh, Orissa and West Bengal in India during the northeast monsoon. What has brought on this frenetic activity and who exactly are the 'fry catchers'?

The seemingly insatiable hunger .of Japanese and American consumers for shrimp has touched even the remote coastal areas of South Asia, where the desperately poor fisherfolk have been galvanized into capturing more and more tiger shrimp fry to stock the shrimp ponds that ring the coastal zones of the Bay of Bengal. Has Buckminster Fuller's 'global village' come to this?

Let's backtrack a moment and consider what's happening in the shrimp industry. Globally, total production of shrimp and prawn has increased from 1,920,000 tin 1984 to 2,530,000 tin 1990. As marine shrimp stocks have come under increasing fishing pressure, rising prices have made shrimp farming possible. Thus, the cultured shrimp and prawn harvest grew from 163,000 t in 1984 to 600,000 tin 1990, comprising an ever-increasing percentage of world production. Indian aquaculture production exploded from 10,000 t in 1984 to 26,000 t in the same period! We can be pretty sure the proportion of cultured shrimp 'will increase as capture fisheries continue to decline.

Woman catching fry at Dubda levy gate, West Bengal.

Shrimp were traditionally harvested along with finfish from brackishwater ponds, particularly in Indonesia, the Philippines and West Bengal. Yields were low and much of the production was for local consumption. Several decades ago, brackishwater fish farmers discovered that intentionally stocking shrimp fry would dramatically increase income. During fishing for milkfish fry, Indonesian and Filipino fry catchers caught the tiger shrimp 'seed.' Thus, traditional, extensive shrimp culture developed along with fish culture.

About 30 years ago, the first commercial shrimp hatcheries were established in Japan. While not directly applicable to tropical species. the success of the technology stimulated research in both Latin America and Southeast Asia. Eventually, the success of hatchery technology led to very intensive monoculture of shrimp. The tiger shrimp, *Penaeus monodon,* proved to be the most profitable species in tropical Asia. It's larvae can be readily produced in large numbers in hatcheries with relatively simple technology and it grows rapidly in brackishwater ponds, even when stocked at high density. With these developments, investor interest in shrimp culture quickened in the early 80's and modern shrimp farms are today found throughout the Southeast Asian region.

Hatchery development, however, is lagging in India and Bangladesh (South Asia) in relation to the demand for fry. Hence, the industry in these countries depends overwhelmingly oh wild fry and will probably continue to do so for some time. This dependence has created income opportunities where none existed before. It is a relatively rare example of an export industry

benefiting landless rural folk. Surveys done by the Bay of Bengal Programme (BOBP) and other organizations indicate that tens of thousands of people are directly involved in shrimp fry-catching in India and Bangladesh. Employment is also generated in the trading and marketing system that has grown apace with the increasing demand for shrimp fry.

Fry-catching is a seasonal occupation. Catches and prices fluctuate during the season. Each fry-catcher hauls in only a few hundred or, at best, a few thousand fry during the fishing period of three days on either side of the full moon and new moon. Dealing in such small quantities, they have no market leverage.

The delicate fry are severely stressed during fishing, sorting, counting and their journey through the market chain. Mortality at each step ranges from 20 to 50 per cent. On top of the poor handling, farming practices in most of the extensive ponds of the region are crude. From collection to harvest, wild fry mortality is probably in the neighbourhood of 90 per cent, representing a shameful waste of a valuable resource!

There are also nagging questions as to the effect of fry-catching on the offshore shrimp fishery as well as the estuarine ecosystem. Studies done by the Central Institute of Brackishwater Fisheries (CIBA) in West Bengal estimated that several thousand million fry and larvae of species other than tiger shrimp may be destroyed and that only 0.6 to 36 per cent (at most) of the catch consists of *P. monodon* fry!

Involvement in hatchery production and grQw-out operations are out of the question for coastal fisherfolk. Most of the communities are destitute, with no access to land or capital. Possible alternatives, for example bivalve molluscs, are not viable at this point in time. Domestic markets are too limited and such products are unlikely to be competitive in international markets. While there are a few local exceptions, BOBP felt that alternative species would require a great deal more research and are not suitable for the type of community-based pilot projects it normally undertakes.

Several studies funded by BOBP revealed common problems in both West Bengal and Bangladesh. It commissioned a rapid rural assessment by the Indian Insiitute of Management in the coastal districts of West Bengal. The RRA reinforced BOBP's initial impressions that fry-catching was a significant and, often, sole source of income for thousands of coastal fisherfolk. The percentage of families involved in shrimp fry-collection varied from 41 to 67 per cent in the three areas surveyed in West Bengal. Women and children numerically dominated the fry catching community. Medinipur District, in the southern part of West Bengal, was identified as the most disadvantaged in terms of income generated through fry sales due to its remoteness from the main market centres (Figure 1).

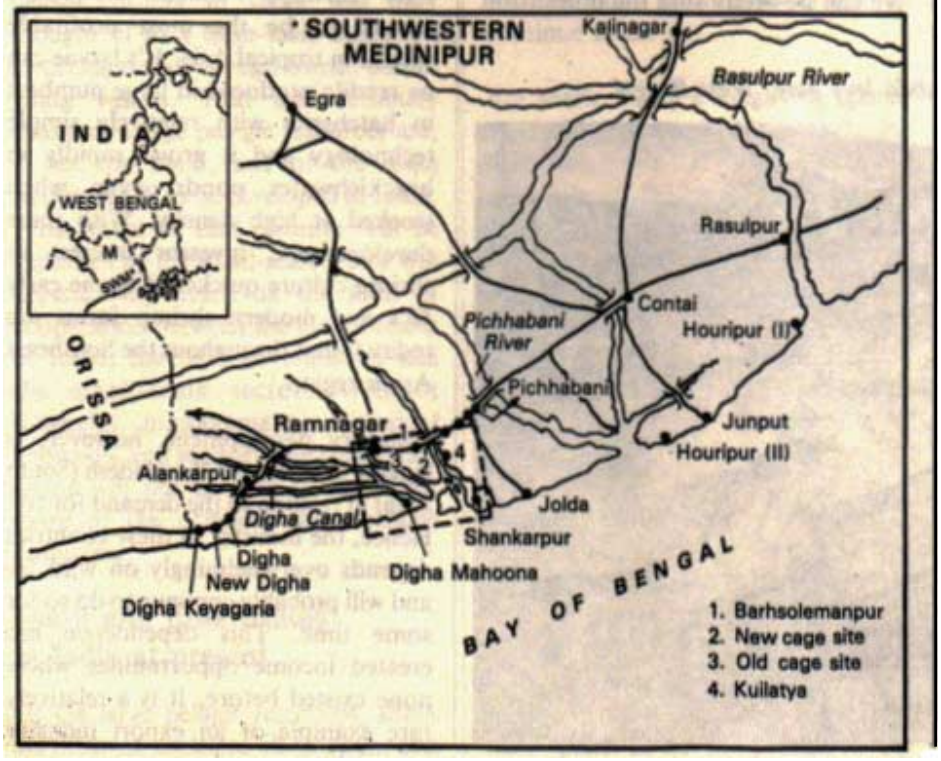
The farming area in West &ngal is North 24 Parganas. Shrimp fry-collection is widespread in the southern part of the district, where, as in Medinipur, women are very much involved in the fry-catching. BOBP attention focused on the small village of Moynapara, near Kakdwip.

Shrimp culture in Bangladesh is concentrated in the southwestern and southeastern coastal regions. Extensive farming, using low stocking densities and rudimentary water management is still the rule, but some intensification is taking place. Several of the best shrimp farms are to be found in the Cox's Bazar District of southeastern Bangladesh. Tiger shrimp fry collected in the district are sold not only to the Chokaria shrimp farms but are marketed as far away as Satkhira, in southwestern Bangladesh. The only shrimp hatcheries in the country are located on the Kalitali beach. Several nurseries on the same beach purchase fry from the catchers, hold them several days and then sell them to local farmers or ship the fry to Satkhira buyers.

UBINIG, a Dhaka-based NGO, undertook a short-term study of the fry-catchers and their communities in both Satkhira and Cox's Bazar. The general picture that emerged was similar to the situation in West Bengal – few employment opportunities, very high illiteracy and low status of women. Here too, women and children were very much involved in fry-catching and sorting. The latter is an important aspect of fry-catching and can consume considerable time.

UBINIG found strong interest in the idea of shrimp fry nursing amongst the fry-catchers of Mognamapara, located on a branch of the Matamuri River (Figure 2). Villagers were willing to participate in trials, even though they understood the outcome would be uncertain. Marketing problems would

Fig. 1. The Ramnagar blocks I and II in southwestern Medinipur, West Bengal.



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be•few since Mognamapara is located in the midst of the shrimp farming region of Cox's Bazar.

Market data collected in 1990 during the UBINIG survey and by SANLAAP in West Bengal revealed that relatively low prices were paid to fry-catcners who usually sold very small quantities. Larger fry and juveniles, although scarce, fetched higher prices. If collectors could hold their fry, or rear them tojuvenile stage, they might get higher prices.

Nursery rearing of tiger shrimp fry is widely practised in the Philippines and Indonesia, opening an opportunity for technolcgy transfer. The method of choice was cage culture because it is relatively cheap and does not require land acquisition.

With the help of SANLAAP, nursery cage culture was undertaken in Ramnagar. The first approach focused on households. Everyone in the family who wished could be involved. The cages were supplied to each of the ten participants. Because these where trials with an unknown outcome, SANLAAP purchased fry for stocking the cages from the participants. They would then look after them and repay the purchase cost of the fry in the event of any profit.

The participants were organized and encouraged by a motivator, Ms. Pompa Biswas. Pompa lived in the village, maintaining almost daily contact with all the participants. She encouraged and assisted the involvement of female household members in the activities.

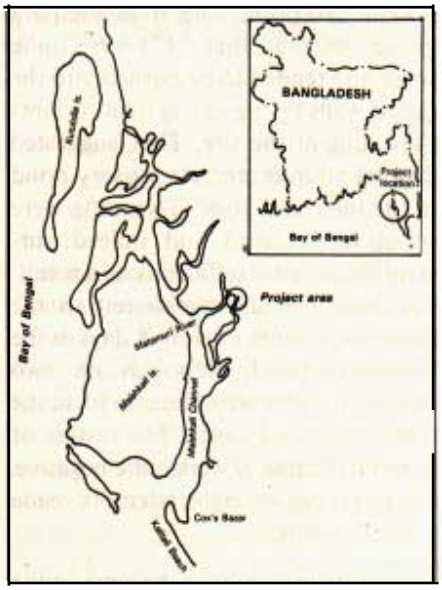
Henrik Nielsen, a BOBP aquaculturist, trained the group in cage construction, operation and maintenance. The standard cage consisted of a bamboo frame 6 m x 3 m with 4 or 6 floats to hold it up. Th•ree *happas* were suspended inside the frame, two of which measured 2m x lm x im and the third had dimensions ef 2 m x 3 m x 1 m.

Post-larvae were to be stocked in the first cage and then sorted into the second and third as they grew. In practice, most batches were not sorted, but simply held in one *happa* (cage) throughout the nursery period of 4 to 40 days. Stocking rates varied, as shown in the Table 1. The post-larvae were fed a paste of ground fish and small prawns caught by the shrimp fry collectors during their search for tiger shrimp post-larvae. The paste was spread on a screen, dried in the sun a few hours, following which the screen was suspended inside the *happa.*

The results of the 1990-91 season (Table 1) were quite variable. Out of 15 trials, nine showed some positive revenue, although in some cases this was too small to realize a profit after deducting feeding and amortization costs. Nonetheless, the experience of that first season indicated that cage culture could be profitable given the right circumstances.

Changes in fry availability during the 1991-92 and 92-93 seasons have shed doubt on the initial optimism. Tiger shrimp fry have become scarce in the tidal channels and creeks in both Medinipur and Cox's Bazar. It has become increasingly difficult to stock the cages to capacity and maintain production targets. The highest price fry catchers could obtain during the 1990-91 season was IR5* 200/1000. By 1993, this had risen to IRs* 300. Prices held very firm even as the season drew to a close. For example, during April 1991, PL's started the month at IRs 118/1000 and finished at IRs 95. In 1993, the same period saw dramatic increases to IRs 270 and 300, respectively! This looked very favourable, but any gains were offset by the fry shortage (See Table 2).

Fig. 2. Project location map indicating nursery cage culture site in southwestern Bangladesh.



A similar situation has prevailed in Bangladesh. While fry catches along the beaches of the Bay of Bengal appear to hold good, abundance has dropped in the tidal channels of the Chokaria, where Mognamapara is located. Prices for nursed juveniles reached Tk** 400/1000 for large lots! Unable to fully stock all their cages, the Mognamapara participants could not take advantage of the improved prices! UBINIG was forced to purchase fry from sea beach collectors to get enough stocking material to evaluate technical aspects of nursery cage culture. Because of the narrow price margin that resulted, most of the trials lost heavily.

Table 1 Results from first year of culture at Ramnagar

Trial	*Participants*	*Culture days*	*No. stocked*	*No. harvested*	*Survival rate %*	*Price at stocking Rs/1000*	*Price harvested*	*Revenue Rs.*
I	A	40	6500	1600	25	50	120	.133
	B	40	6500	4300	66	50	120	91
	C	40	10000	2800	28	50	120	.164
	D	40	6000	4000	67	50	120	180
	E	40	10000	3490	35	50	120	-81
	F	40	9000	3940	44	50	120	23
	G	40	6500	2536	39	50	120	.21
	H + I + J	40	3x10000	17064	57	50	120	548
II	D	21	15000	8402	56	50	100	90
	H	21	7200	4800	67	50	100	120
	I	21	7000	5003	71	50	100	150
	J	21	5000	4200	84	50	100	170
III	J	10	4000	3200	80	50	100	120
IV	D	14	8944	4300	48	50	100	17
V	D	4	6712	700	10	50	100	-265

Cage design and rearing protocols were almost identical to those employed by the West Bengal participants, with a notable exception. The Mognamapara group observed that PL's were quite weak and tended to be pushed into the *happa* walls by the strong tidal currents prevailing at the site. They suggested digging an intermediate nursery pond in the intertidal zone. Two rafts were set up in the pond, and, indeed, survival improved significantly as a result. Fry were usually transferred to the open water cages after 3 - 5 days in the transition pond, although on two occasions, sales were directly from the transition pond cages. The results of the trials (Table 3) were quite negative. Only two out of eight attempts made a slight profit.

Cage nursery culture became quite risky at the end of the season in June. Sudden, unpredictable heavy rainfall led to greatly reduced survival in both transition pond. and open water cages in both Ramnagar and Mognamapara. At the end of the trials at Ramnagar, 3600 fry remaining in the trial cage were killed by a sudden downpour which reduced salinity toO ppt in a few hours!

Much organization work and supporting services were required to provide a framework within which the trials could be carried on. The two NGO's that worked with us, UBINIG in Bangladesh and SANLAAP in West Bengal, were key elements in the process. Selecting participants is fraught with problems and it is only through the day-to-day contact of NGO staff with villagers that the necessary rapport can be built.

Both UBINIG and SANLAAP became deeply involved in community development issues. UBINIG launched a wide-ranging programme in Mognamapara. Activities included mangrove reforestation, savings schemes, pre-and post-natal care for mothers, women's literacy, a self-supporting primary school and many other activities. The programme was developed with UBINIG's funds. More than 600 families were involved.

SANLAAP concentrated on girls' education and adult literacy, setting up 13 resource centres. In 1993, they introduced freshwater fish culture in several leased ponds. The results were so encouraging that SANLAAP intends expanding its efforts in this area. The organization has secured funding from Germany, assuring the continuation of their work.

And that is the most constructive aspect, of the NGO involvement. Their committment is a long-term one and all the activities will continue beyond the demise of BOBP's involvement. Technological innovation by itself will lead nowhere without the basic improvements. A strong foundation for development has been set in the villages — a very positive spinoff!

The jury is still out on nursery cage culture. Tiger shrimp fry nursing will have to be tried over a 'much wider area. Possible sites exist in Orissa and Andhra Pradesh, as well as West Bengal. Unless fry become more abundant in the tidal channels of Cox's Bazar, nursery cages cannot be viable if wild fry continue to be the only source of stocking material.

Linking tiger shrimp fry nursing with hatchery sources of PL can develop as the hatchery industry expands, particularly in India. The biggest issue will be the price of PL510's at the hatchery. Fry-catcher groups will have to be strongly supported by an NGO which can finance the basic inputs.

The question remains: "Can a bit of the wealth from the shrimp culture bonanza trickle down to the fisherfolk?"

Table 2 : Results of nursery cage culture at Ramnagar, 1993

Week	*No. stocked*	*Purchase price lRs/1000*	*Total cost, IRs*	*No. sold*	*No. fry in cage after sales*	*Selling price IRs/IOtA)*	*Sales IRs*
14	2766	180-200	497	—	2766	—	—
15	1030	180	228	2180	1616	270	589
16	732	180-200	115	—	2348	—	—
17	1185	180	247	1000	2533	300	300
18	160	180	29	575	2118	250	144
19	1594	160	255	855	2857	230	200
20	629	160	107	—	3486.	—.	—
21	290	160	47	—	3776	—	—
22	2460	60	147	650	5586	180	117
23	—	—	—	1983	3603	157	298
Total	10846		1672	7243	—	—	1648
% Survival	66.8%						
Revenue	-24 IRS						

* **US$1** = IRs23appx.(1991) = **lRs3lappx.** (1993)
US $ 1 = **1k 39 appx.** (1991-1993)

Table 3: Results of nursery cage culture trials at Mognamapara, 1993

	TRANSITION NURSERY POND							*OPEN WATER CAGES*							
Trial No.	*Week*	*No. stocked*	*TX! 1000*	*Total cost*	*Rearing days*	*Yield*	*Survival (%)*	*No. stocked*	*Rearing days*	*Yield*	*Cost, TK/1000*	*Selling price TK/i000*	*Gross revenue*	*Grass income TX*	*Survival ¼*
	12	14621	200	2924	5	10650	72.8	Sold directly from transition pond				300	3195	271	—
2	14	6482	230	1491	5	5993	92.5	3744	5	2701	—	300	810	-51	72.1
3	14	5625	230	1294	5	3625	64.4	22259	9	11373	200	270	3071	.1381	51.1
4	16	7529	230	1732	4	6205	82.4	6205	4	3863	—	300	1159	-573	62.3
5	16	11073	230	2547	3	9809	88.6	9809	4	6821	—	300	2046	-500	69.5
6	16	Stocked directly in open water cages						11349	5	4856	230	300	1457	.1153	42.8
7	18	35810	200	7162	12	5389	15.0	Sold directly from transition pond				300	1617	.5545	
8	20	20654	200	4131	4 .	14334	69.4	14334	4	5591.	—	300	4300	169	39.01

Asian Development Bank lends a hand to develop Shri Lanka's fisheries

Shri Lanka is currently implementing a six-year (1993-1998), US $ 33 million fisheries project with the assistance of an Asian Development Bank (ADB) loan.

The ADB's loan amounts to US $ 26m (79%). The Shri Lanka Government's contribution is US $4.1 m (12°lo)and the balance will be met by commercial banks, participating credit agencies, NGOs, sub-borrowers and the cooperatives.

The project will initially cover the coastal areas of the North Western, Western and Southern Provinces of Shri Lanka. This includes the administration districts of Puttalam, Gampaha, Colombo, Kalutara, Galle, Matara and Hambantota.

This project, along with a technical assistance project on marine fisheries management, funded by UNDP, forms the cornerstone of the Government of Shri Lanka's ongoing Fisheries Development Plan (1990-1994). The project implementation has been so designed as to interact and coordinate closely with the UNDP project and its endeavour to build and strengthen fisheries management. The project encompasses several subsectors within fisheries, the more important of which are infrastructure, fishing community development, credit, research and training.

The primary objectives of the project are to:

- Increase fish production and fishermen's earnings;
- Improve resource use while ensuring their sustainabiity; and
- Strengthen the institutions and agencies which support and serve the fishing industry.

The project will have as its primary focus the rehabilitation of selected all-weather fishing harbours and anchorages to enable offshore and coastal fishing fleets to increase their fishing efforts and improve their economic efficiency. Together with coastal protection and conservation measures in selected fishing communities, the project will help small-scale fishermen diversify their livelihood to shore-based, fishery-related and nonfishery -activities, thereby contributing to the Government's objective of growth-oriented poverty alleviation.

The project comprises the following subprojects:

The crowded Negombo fishing harbour — to be assessed ***for rehabilitation.***

1. **Individual harbour anchorage rehabilitation** *(54.4% of expenditure)*

Coastal engineering studies and environmental impact assessments are to be conducted in the existing fishery harbours at Chilaw, Negombo and Puranwella while preliminary engineering studies will be carried out at Dikkowita (near Colombo), Panadura, Ambalangoda, Hikkaduwa, Dodanduwa, Kapparatota, Kottegoda, Gandara, Kudawella and Hambantota. Based on the findings, rehabilitation is to be undertaken to ensure that the harbours and anchorages will be able to provide the services required to support multiday offshore and deepsea fishing. The rehabilitation programme will include dredging, repair and construction of marine structures – such as jetties, breakwaters, quay walls, revetments, cutoff walls – rockexcavation, and associated facilties and services.

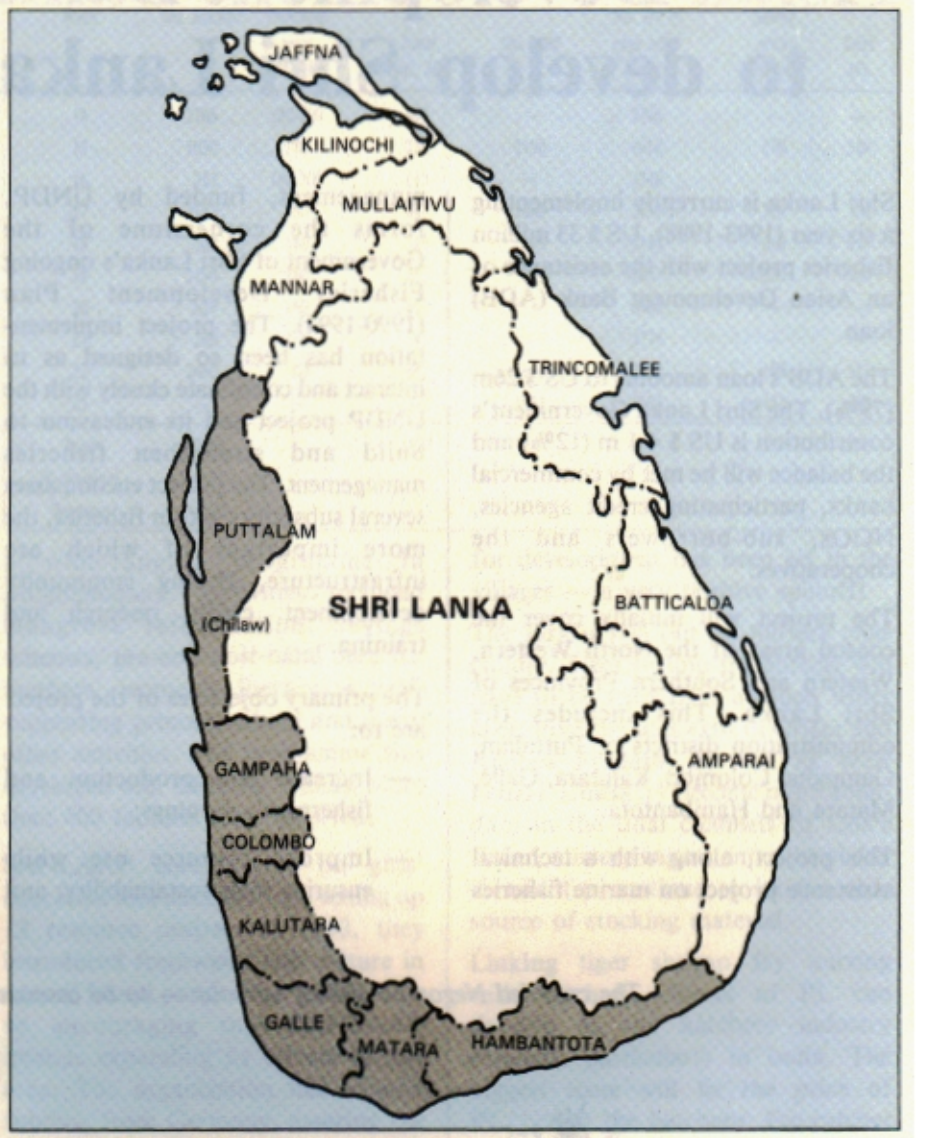
2. FIshing community **development** *(22.8% of expenditure)*

This has three components. One is coastal conservation and protection, which comprises coastal investigations, aerial surveys and base mapping as well as construction of coast protection structures at six coastal sites in the project area. The sites chosen are Kandakuliya, Ambakandawala in Puttalam District, Payagala in Kalutara District and Kottegoda, Mirissa and Edandamulla in Matara District.

The second component is social infrastructure development, which aims at upgrading and strengthening the basic social infrastructure and amenities in fishing villages, particularly access roads, toilets and drinking water, health and education facilities and marketing and other infrastructure.

The third component is the provision of credit and requisite training to help fishermen and rural women diversify their livelihood to onshore activities. The two latter components will be supported by a social mobilization programme. One noteworthy aspect about social infrastructure development will be that it Will involve total beneficiary participation at all levels; village-level activities will be implemented and supervised by village-level organizations themselves.

The ADB Fisheries Project area, Shri Lanka.



3. **Research and institutional support** *(20.8% of expenditure)*

This subproject aims at strengthening the research efforts of the National Aquatic Resources Agency. This will be done by providing two specialized vessels with facilities and experts for the conduct of an exploratoEy fishing and stock assessment survey of Shri Lanka's coastal and offshore fisheries resources in order to provide a basis for more systematic exploitation and monitoring subsequently. Assistance will also be provided for the following through appropriate training:

- Upgrading the multiday fishing skills of the crews of bigger fishing vessels;
- Upgrading the management of fisheries cooperative societies;
- Improving the capabilities of the Fishery Harbours Corporation and the Coast Conservation Department to undertake environment-related assessments;
- Improving the capabilities of the trainers in the National Institute of Fisheries Training, and
- Upgrading of the organizational and extension capabilities of the Department of Fisheries.

The project will also assist in the establishment of a project benefit monitoring system and provide facilities and equipment to improve the functioning of the Ministry and its agencies.

– **C.F.**

LETTERS TO THE PUBLISHER

End-user focus

It was a great disappointment to learn about the future funding prospects for BOBP in the June 1993 issue of the *Bay of Bengal News.* I learned about BOBP when I worked temporarily *at* Chilika Lake, Onssa, India, as part of a CIDA (Canadian International Development Agency) feasibility and design project in 1991. My work in India was facilitated by the BOBP's publications and I have kept abreast of BOBP's recent work by reading the *Bay of Bengal News.*

One thing that impressed me about BOBP is the applied, end-user focus of the programme, and the practical nature and value of the projects. Based on a world-wide comparison, the BOBP stands as a prime example of effective foreign aid development. It will be a significant loss to the countries of the Bay of Bengal region if the programme is terminated.

In view of the high human population growth in the Bay of Bengal region, and the real prospects for intensified fisheries resource utilization in the future, it will be a positive legacy to future generations if international support enables the programme to continue and be enhanced.

David A Levy, PhD.
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Increasing knowledge

It was very disheartening to read in the *Bay of Bengal* ***News*** that donor nations to, BOBP have doubts about the validity and usefulness of such regional programmes.

I do not know about other regions, but we have for many years been regularly receiving from BOBP printed material and information on request and these have definitely benefited us all, increasing 'our knowledge and giving us a wider view on fishing and aquaculture activities. Through the printed information, we have been able to compare and study fishing methods, equipment, design, maintenance etc. being practised by us with that in other places and have tried to adapt and adjust to better methods and ways.

It is said that 'Knowledge is Power'. If this is so, then, for us, BOBP's indirect help through printed information has increased our knowledge many-fold and has definitely benefited us. We sincerely hope BOBP is kept alive for many more years and may it keep up its good work in those years.

Nilasaila Nayak
P O Ranital, Balasore Dt.
Orissa

Impact outside region

The impact of BOBP's work outside the region has been very impressive, and we have been able to collect a large amount of valuable information on the fishing pattern, fishing activities, changing scenario in the small-scale sector and introduction and demonstration of more efficient craft and gear. Further, its Newsletters, Working Papers, and periodic Reports have provided us with much-needed information on the small-scale fisheries development in neighbouring countries, such as Shri Lanka and Maldives.

I hope and wish that the third phase of the Programme will materialize, and we will be fed with multifarious information on the development and management of marine fisheries along the coastal waters of India, Shri Lanka, Bangladesh, Maldives and Andaman and Nicobar Islands (India).

I hope that the validity and usefulness of this Regional Programme in a wider context will be appreciated by the Donor Nations.

Dr P Parameswaran Pillai
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Central Marine Fisheries Research Institute (ICAR)
Cochin 682 014, Kerala

A viable strategy

I subscribe to the view that a really modern and comprehensive subject called 'Small-scale Fishery Development' started only in 1980, with the 19th IPFC Conference at Kyoto (Japan). The proceedings of this conference, along with the 'Small Farmers Development Manual 1976', form a code on SSF Development. All publications prior to these, inclusive of 'Advances in Aquaculture 1976', are sectoral, incomplete, too theoretical, and are of limited validity. In a way, the *Bay* ***of*** *Bengal News* updates one's knowledge on fishery development on the lines laid down by these two seminal documents and maintains a consistently international standard.

The strategy followed by BOBP is perhaps the only viable one for SSF Development. So the practical validity of the newsletter is second to none. The only problem is that it is not easily accessible to those who would benefit most from it.

BOBP should

- initiate NGOs actively in the development process, meeting with them once a year in the 8/9 maritime state capitals of India and sending them the ***BOBN*** regularly;
- request newspapers published in local languages to translate in their languages the *BOBN;*
- expose Extension Officers at the grassroots level to its films and the *BOBN.*

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NEW PUBLICATIONS

BOBP/WP/86 — Nursery Rearing of Tiger Shrimp Post-larvae In West Bengal, India

This paper describes trials with nursery rearing of the tiger shrimp *(Penaeus monodon)* in floating cages in Ramnagar, Medinipur District, West Bengal, India, from 1990 to 1992. The purpose was to introduce a technology by which the fry-catchers could augment their income by nursing the shrimp fry to a larger size, with higher market value, and be in a better bargaining position *vis-a-vis* the traders. The trials were undertaken by a group of shrimp fry-catchers, with support from the Bay of Bengal Programme (BOBP).

BOBP/WP/87 — Market Study of Tiger Shrimp Fry In West Bengal, India.

Rice-fish polyculture in *bheries* (enclosed paddyfields) has been a tradition in the West Bengal delta. With the growing shrimp export market, shrimp culture in the *bheries* has proved economically attractive and the supply of tiger shrimp fry to the *bherles* is now, a burgeoning business in West Bengal. The Bay of Bengal Programme (BOBP), at the request of the Government of West Bengal, studied the problems connected with the supply of tiger shrimp fry to the *bheries.* The problems were seen as a constraint to the development of the mainly export-oriented shrimp culture industry. BOBP looked into both natural collection and hatchery-reared supply of shrimp fry. The study was seen as a step towards a better understanding of the existing tiger shrimp fry market and the fisherfolk involved in it. This, it was hoped, would lead to an elimination of some, if not all, the problems associated with the business.

BOBP/WP/88 *The Shrimp Fry By-catch in West Bengal.*

Tiger shrimp have become a major foreign exchange earner in India, with West Bengal the largest culture centre. The basic input of tiger shrimp fry in West Bengal is met from the wild, with a large number of the rural poor engaged in shrimp fry-catching and trading in the 24 Parganas (N and 5) and Medinipur Districts. However, the destruction of by-catch captured during fry-collection has been causing concern. By-catch is 64-99.4 per cent of the total fry caught. The fry by-catch destroyed over a period of one year is estimated at 62 million - 2592 million.

This working paper, based on work done from October 1990 to September 1991, gives an overall picture of the shrimp fry by-catch and assesses quantitatively the seasonal and spatial variations in the species composition.

BOBP/WP/91 — Further Exploratory Fishing for Large Pdaglc Species In South Indian Watenc.

Despite the substantial increase in the traditional small craft fishing fleet of Tamil Nadu, India, production has remained more or less constant in the last few years, indicating that fisheries resources within the range of this fleet have been fully exploited. From the Sixties, however, introduced small fishing craft in neighbouring Shri Lanka have been operating in deep sea waters and reporting good catches of large pelagic species, particularly shark.. Although Tamil Nadu is geographically well placed for the exploitation of these resources, the potential has not been realized.

In order to introduce fishing for large pelagic species in Tamil Nadu by demonstrating the experience in Shri Lanka, two 10 m FRP boat (SRL-lS) tested in Shri Lanka's commercial offshore fisheries were selected by BOBP for exploratory fishing trials from Chinnamuttam fishing harbour near Cape Comorin and Royapuram fishing harbour in Madras. The results and conclusions of the Chinnamuttam and Madras trials are reported in this paper.

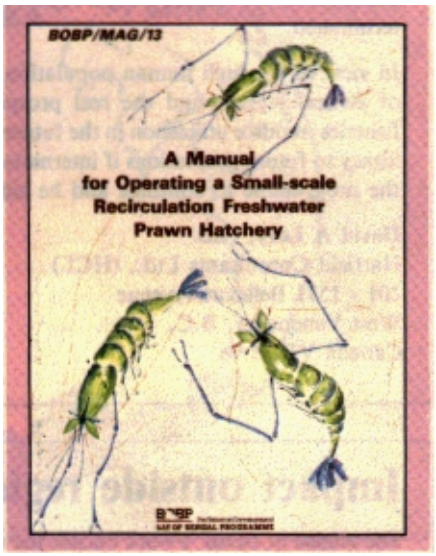
BOBP/REP/61 — Small Offshore Thlthzg Boats In SM Lanka

The Bay of Bengal Programme (BOBP) was invited in the early Eighties by the Shri Lankan Ministry of Fisheries to evaluate the offshore fisheries and the fishing craft being used in it. Subsequent to this evaluation, the BOBP helped to develop and introduce two small multiday offshore fishing boats, the SRL-34 and the SRL-15.

When Shri Lankan fishermen began fishing further offshore, more and more boats began to disappear at sea. The BOBP was requested to provide assistance for studying the reasons for the disappearances and to help in making recommendations for the development of search-and-rescue facilities for the island's fishermen. The report summarizes BOBP's assistance provided in offshore fishing boat development and related safety-at-sea aspects.

BOBP/MAG/13 — A Manual for Operating a Small-scale Recirculation Freshwater Prawn Hatchery

This manual, based on the experience of the Bay of Bengal Programme (BOBP) project in Potiya, near Chittagong, Bangladesh, is written for those interested in establishing a small-scale inland freshwater prawn hatchery using the clear water method. It is assumed that the reader has some basic knowledge of aquatic biology, but is not necessarily a degree holder in the subject. The method described is based on the use of brine obtained from salt pans. The brine is diluted with well or surface water to make up the rearing water. Such technology is widely used in commercial hatcheries in Thailand. As brine is not always available, a simple biofilter, for recirculation of the water, is



incorporated in the tank design. The bioffiter greatly reduces, or eliminates, the need for water changes during the rearing cycle. The hatchery system described consists of larvae rearing tanks, mixing and brine storage tanks, *Artemia* incubators and supporting mechanical equipment.

Recirculation systems are becoming increasingly popular and have now been shown to give consistent production of quality post. larvae. All the necessary details for setting up such a simple system are included in this manual, which is also profusely illustrated to make what is described in the text clearer.

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, Sweden 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 Agricuhure Organization of the United Nations).

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