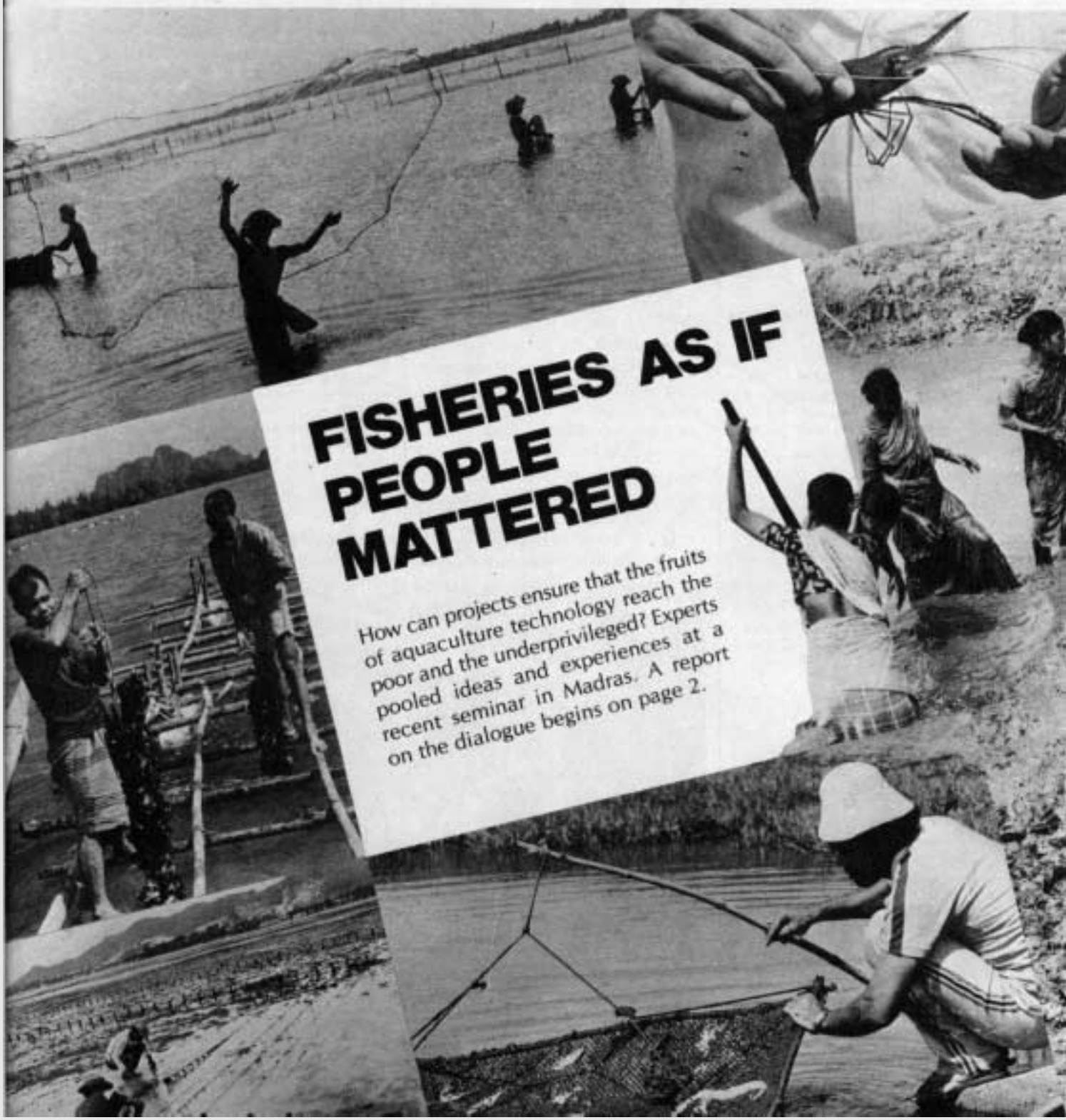
BAY OF BENGAL NEWS

MARCH 1985
ISSUE NO. 17

A PUBLICATION OF THE
BAY OF BENGAL PROGRAMME FOR
FISHERIES DEVELOPMENT



FISHERIES AS IF PEOPLE MATTERED

How can projects ensure that the fruits of aquaculture technology reach the poor and the underprivileged? Experts pooled ideas and experiences at a recent seminar in Madras. A report on the dialogue begins on page 2.

<<

by Rathindra Nath Roy

Late in November 1984, 35 aquaculturists, project administrators, government officials, social scientists, international donor agency representatives, bankers and representatives of fisherfolk came together in Madras, and spent six days exchanging experiences in coastal aquaculture, especially in terms of those social and cultural factors that affect the success of such projects. The idea was to arrive at recommendations on how this type of fishery technology could be used so as to benefit the socially and economically weaker segments of society.

The Consultation on the Social Feasibility of Coastal Aquaculture was organized by the National• Swedish Board of Fisheries (NSBF) and the Bay of Bengal Programme of the FAO (BOBP) and brought together participants from Bangladesh, England, India, Malaysia, the Philippines, Sri Lanka, Sweden, Thailand and international agencies such as the ADB, ICLARM, ODA and SEAFDEC.*

Why social feasibility?

The NSFB and BOBP were concerned about certain trends that they had begun to discern from experience with aquaculture in general and coastal aquaculture in particular. This concern led to the Consultation. The main issues were:

Firstly aquaculture tends to' be a complex enterprise and often requires considerable capital. This makes it **more accessible to the upper social** and economic groups, which tends to concentrate incomes and wealth in the hands of the few instead of distributing it amongst the more needy, as several development programmes set out to do.

Second, the products of aquaculture, like shrimp, fish and shell fish, are expensive and often beyond the reach of those who toil to produce them, and who need it to enhance their nutrition. So the products find their way to those who can absorb the high prices – urban and export markets.

Thirdly, in spite of technical viability and economic (or, at least financial) feasibility, some aquaculture projects have failed to meet the social equity and development needs of the very communities that the programmes set out to help.

And yet, in spite of all these problems, aquaculture has great.promise, and this made the Consultation an even more urgent need, for it was necessary to understand social factors and, more importantly, to devise socially feasible means of utilizing a valuable resource. With fish supplies dwindling as limits to capture fisheries are reached, many countries are viewing aquaculture as the primary means of achieving increases in fish supply to match increases in population and demand.

Dr. P V Dehadrai, Fisheries Development Commissioner, Government of India, inaugurated the meeting by describing India's experience with coastal aquaculture, and underlined the need and urgency to better understand the social dimension of the task.

Dr. Ian Smith, Deputy Director General of ICLARM, in his keynote speech7addressed the task of building the foundation of ideas and issues on which the discussions and deliberations of the Consultation could be built. With a group of participants drawn from diverse environments and functional specialities, the address had to not only review the state of art of the subject but also to evolve a common understanding and language to promote discussion

* ADB: Asian Development Bank, Manila. ICLARM. International Center for Living Aquatic Marine Resources, Manila. ODA: Overseas Development Authority, U.K. SEAFDEC: South-East Asian Fisheries Development Center, Bangkok.

Dr Ian R Smith of ICLARM who delivered the keynote address fields a question from a participant at the Madras consultation.

of the major issues relevant to assessing the social feasibility of technology for coastal aquacutture in the tropics.

Dr. Smith began by looking at the role of technology in development : for technology, and the structural change it has wrought, is the centre-piece of claims to current prosperity in the developed countries and is, therefore, espoused by planners and policy-makers as the solution to under-development and poverty elsewhere. He felt, that at the heart of the discussion regarding development should be concern for the means of development and its purpose and impact; we cannot measure development solely in terms of increase in total output or monetary value, but need to determine the fashion in which such benefits are distributed and how they impact on various strata of society.

Focusing on coastal aquaculture in the tropics, he pointed out that there was a critical need to determine its social feasibility because of several factors.

- Many countries are actively promoting aquaculture by creating favourable economic conditions because they view it as a means to overcome the constraints that capture fisheries are facing.
- The expansion of export markets for the products of coastal aquaculture (especially Shrimp) is further fueling this expansion.
- The fragile nature of the coastal zone, particularly mangroves, and the potential competition for its use that aquaculture development can bring.
- The general lack of institutional preparedness to deal with this competition in the coastal zone.

Coastal aquaculture for whom?

Dr. Smith said that at the heart of deliberations on social feasibility is the question : "Coastal aquaculture for whom?" A socially feasi ble aquaculture system, he added, required that coastal communities participate in decentralized planning for the adoption of aquaculture technologies and that benefits be widespread. He warned that the interests of coastal communities were being overlooked in the drive by many nations for foreign exchange earnings from such coastal cultured species as shrimp which require large-scale investments.

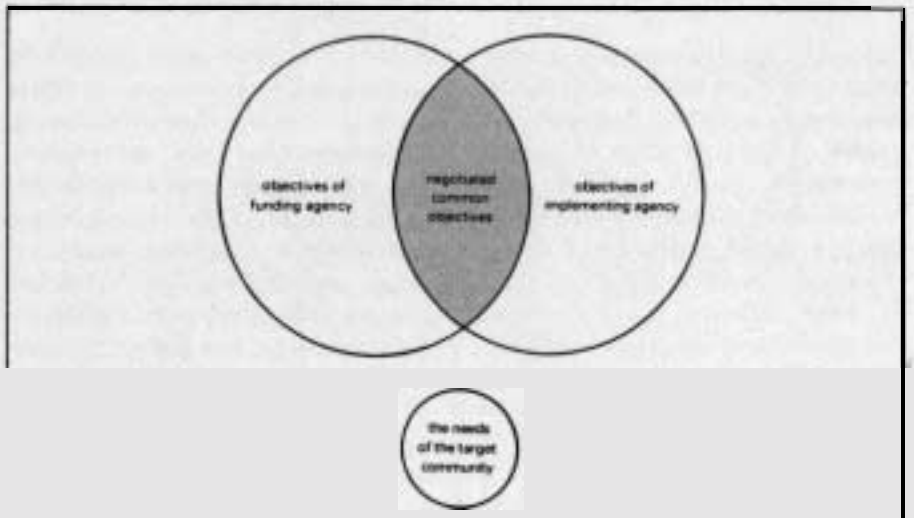


Figure 1 : Needs and objectives

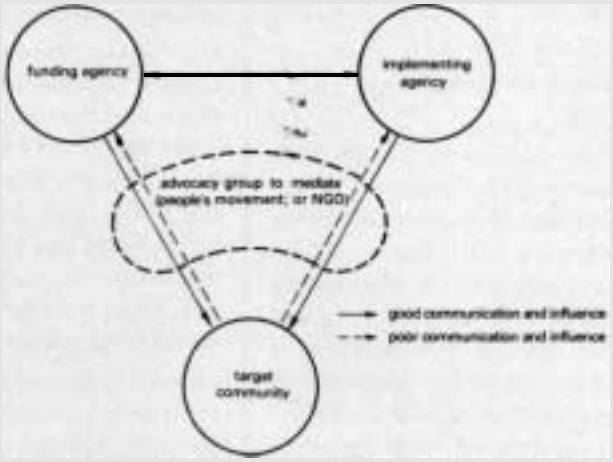


Figure 2 : The need for a voice for the target community

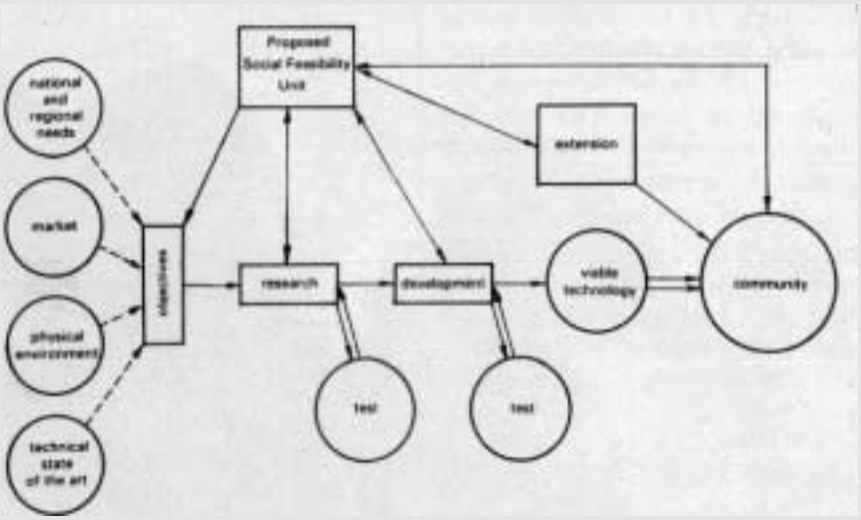


Figure 3 : Incorporating social feasibility

learning from the Green Revolution

Determining social feasibility requires prediction, and being able to judge a priori whether or not to proceed down a particular path – a difficult proposition in the best of times. However, it was suggested' that valuable lessons for aquaculture development planning and implementation could be learned from experience with the Green Revolution and the'appropriatetechnology' movement. He identified and examined the factors that need to be taken into account when planning socially feasible coastal aquaculture systems. These include : 1. Informal and formal institutions, especially

those of a legal nature, that govern property and use rights in the coastal community wealth; 2. Sources and degree of concentration of coastal community wealth; 3. Male and female labour use patterns and availability; 4. Extent of previous community collective action and the strength of local leadership; 5. Previous experience with aquaculture or technological change in other sectors; 6. Present technical and managerial skill levels; 7. Extent of community linkages with external institutions such as those concerned with credit, extension and markets; 8. Socio-cultural aspects of community power structures, role of local elites, and consumer preferences.

Aquaculture can benefit thepoorif.....

Dr Smith concluded his presentation by suggesting that coastal aquaculture systems of an extensive rather than intensive type that could be integrated with existing community activities be developed. Examples: shell fish culture, pen culture of finfish and integrated poultry-fish and pig-fish pond culture. To facilitate this, he felt the need for legislative change or enforcement to reserve parts of the coastal zone exclusively for small-scale aquaculture activities of coastal communities which might otherwise be displaced by large-scale capital-intensive, corporate-managed shrimp farming; long-term support; subsidies, and, of course, decentralized and participative planning and implementation. All this will bring about the type of change which may be disruptive to existing community structures, but, as Dr Smith pointed out, this change can also be liberating for the majority of coastal residents, who presently live in conditions of poverty and oppression.

Case studies

The keynote address had raised several issues, and there was need for a debate which would firmly root these ideas and concepts in the reality of planning and implementation of coastal aquaculture projects. The participants formed themselves into smaller groups and spent the next three days discussing four cases that had been specially researched and written for the Consultation. The cases were developed around four coastal aquaculture projects in various stages of planning, implementation and functioning, and were drawn from Bangladesh, India and Thailand. Background materials for each case were provided, and each case study session was preceded by a presentation by the authors of the particular case study. The task set for the participants was to identify the social and cultural factors that could affect the success of the project under study and to suggest a strategic plan to make the project socially feasible. The groups had the option of rejecting the project as socially infeasible.

The first case was of a planning study undertaken prior to extension of shrimp pen culture in the backwaters of Killai in Tamil Nadu, India. A technical effort undertaken by the BOBP and the Government of Tamil Nadu had indicated technical and economic viability, and the case described a social feasibility study and the subsequent planning effort.

The second case was quite different in that it was not a project- Local farmers and entrepreneurs of Satkhira in south-western coastal Bangladesh had responded to market conditions and had upgraded the existing technology of shrimp-paddy culture, which has been practised locally for years. The technology used the special environmental conditions created by a series of protective dykes that the government had built to prevent infiltration of brackish-water into agricultural land. What had begun as a means of protection had turned out to be an ideal way of containing the brackishwaters for shrimp culture. The question in this case was to look at the impact of such development on the local economy and the poor of the region, and then to recommend regulations and modifications.

The third case concerned a project in Orissa, India. The Brackishwater Fisheries Development Agency in that state had developed a technology of contained tank shrimp culture, which had been discovered quite by accident, and had begun a successful extension of the technology along the shores of the Chilka Lake, India's largest brackishwater lake. The programme seemed to be technically and economically viable and was obviously being transferred to the poor of the region. Here, the participants were asked to identify

potential social problems, recommend policies and programmes and to learn from the effort the methods, if any, that had been used to ensure successful implementation of the project.

The last **case** was from Phang Nga in southern Thailand, a tourist resort made famous by a James Bond film that was shot in its beautiful surroundings. The poor fishermen faced with depleted stocks were in trouble, when the Government of Thailand and the BOBP developed and introduced cage culture of finfish and various forms of shell fish farming. The idea seems to have caught on and several communities have taken up culture. The participants discussed the case with an eye to social and economic problems that the project expansion may cause and suggested strategies to overcome the problems.

Out of the discussions, multidisciplinary and often heated, there seemed to evolve a consensus that technically viable and economically feasible proiects can, and often do, fail to meet the social equity and social development needs of the very people the proiects set out to help. More importantly, the discussions threw up several ideas and strategies that could be used to create socially feasible coastal aquaculture proiects.

The final session of the Consultation was devoted to evolving, from the particular cases discussed, general recommendations and guidelines which would enable agencies to develop, plan and programme socially feasible coastal aquaculture projects.

Findings and recommendations

The complexity of the concept of social feasibility and its subjective nature, dependent as it is on the particular project, agency, policy, objectives and communities, required the output of the Consultation to be checklists of ideas and methods from which agencies could choose those relevant to their circumstances. In brief, some of the ideas and methods were:

Technological development agencies, while initiating research, rarely have any idea of the particular communities to whom the technology will be extended; target communities are selected on the basis of prevailing government policies or at the convenience of the concerned agencies, and after the fast of technology development. In effect, solutions are generated, which then look for problems that need them!

Funding agencies and implementing agencies have their own objectives deriving from their particular ideologies, national needs, market conditions, the physical environment, and the state of art of science and technology. While these agencies. usually negotiate a common set of objectives, the target communities' needs are not necessarily satisfied by such objectives. In fact as Figure 1 shows, the need profile of the community can be in at least four locations but will be satisfied only in position 4 where it coincides with the common, negotiated objectives of the agencies.

While funding agences and implementing agencies can communicate freely, nogotiate and influence each other's decisions and objectives, the target community, assuming it is identified and known, does not have the ability to communicate, influence or participate in the negotiations which decide its development As shown in Figure 2, this suggests the need for a mediating agency that will be the community's advo-

(Continued **on page 13)**

<<

Non-Formal education for fisherfolk: The participatory process at work

A whole package of learning materials to be used in a non-formal education programe for Tamil Nadu fisherfolk has been prepared during the past two years by a BOBP team in cooperation with an array of experts. This article describes the package, and the process by which it evolved.

by Valli Seshan and L S Saraswathi

Several thousand fisherfolk and their teachers in the coastal districts of Tamil Nadu will soon begin using materials developed by the BOBP as pdrt of a major project in non-formal adult education (NFAE).

The NFAE package developed by this project includes three types of materials- for the fisherfolk; for those who train them (animators); and for those who train the trainers. Tamil versions of the material are being printed by the state's Directorate of Non-Formal and Adult Education at its own cost.

Where will the material be used? One hundred NFAE centres have already been established in Kanyakumari district; a further 300 are to be set up in South Arcot, Tirunelveli, Thanjavur and Pudukkottai by September 1985.

This article describes the curriculum package and discusses how it evolved and developed. Taking part in the process during the past two years – through discussion, participation in workshops and feedback – were fisherfolk, educationists, officials*, BOBP staff and associates. Sdys a BOBP project associate :

"The concept of non-formal education is intellectually appreciated by all those active in adult education. However, getting this concept to work – "operationalization" of this concept – has been difficult. That's what BOBP has been trying to do.

"Constant interaction took place at all levels during the production of curriculum materials. The quality of human interaction was such that it had a direct impact on the quality of the product.

"The process that unfolded was also recognized as the process of operationalisation of the non-formal education concept.... It was long and collaborative.... It ensured both the appropriateness of the curriculum and its high quality....

"The people who took part in preparing the curriculum strongly believe that fisherfolk have a deeper understanding of their needs and problems than is apparent, but lack the opportunity and the environment to find solutions. They also believe that development is an internalized process, not an outsider's activity... It is this conviction that ensured the participatory nature of the project all along."

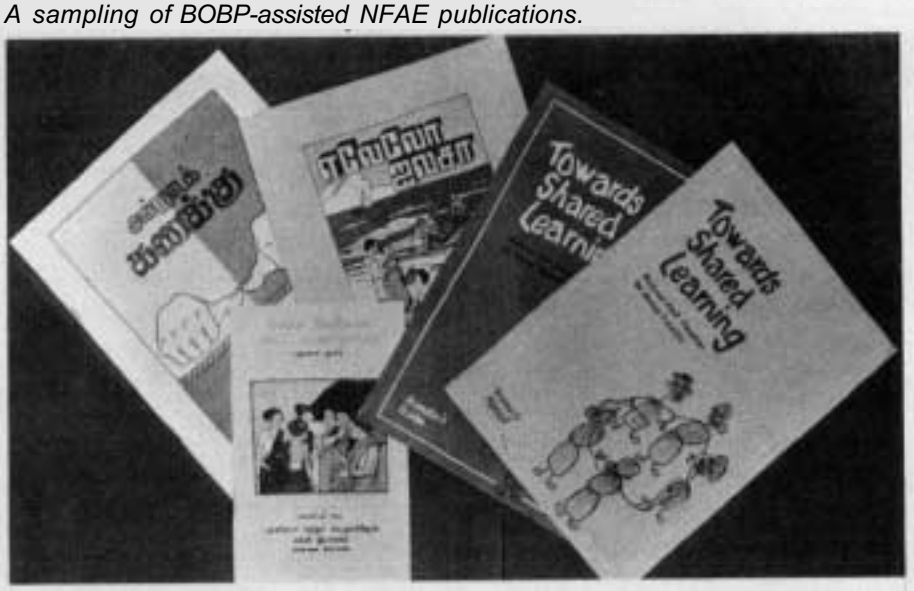
Origins of the project

BOBP commenced its NFAE work in Tamil Nadu under a pilot project in Adirampattinam. The fisherfolk of Adirampattinam had accorded a high priority to education and requested that an educational programme be initiated in their village (see Bay of *Bengal* News, July and December 1983).

Since the fishing occupation makes regular school impractical, the idea of a NFAE programme was born. Since available materials concerning non-formal education were found to be inadequate, the BOBP began developing a model curriculum after discussions with the Tamil Nadu Directorate of Non-Formal Education, the Tamil Nadu State Resource Centre and the Directorate of Fisheries. The four institutions agreed that the curriculum should :

- help meet the basic problems and needs of fishing communities
- be in accord with the government's adult education policies;
- involve the learners, secure their participation, and stimulate self-analysis and self-help.

A sampling of BOBP-assisted NFAE publications.



*** Officials from the Directorate of Non-Formal Education, the Directorate of Fisheries, the Tamil Nadu State Resource Centre.**

NFAE material prepared *by BOBP teams is being tested at Arunachalapuram in Tirunelveli district. Two fisher-*women-/earners *execute a role play* – a powerful teaching technique *to involve* learners.

The idea of non-formal adult education on a wider scale for Tamil Nadu fisherfolk took off from there.

A.B.C. OF THE CURRICULUM PACKAGE AND ITS EVOLUTION

The NFAE package developed by BOBP during the past three years in cooperation with the advisers and associates who took active part in the project, consisted of :

- Animator's Guide
- Numeracy Primer and an Animator's Edition of the Numeracy Primer
- Trainer's Manual
- Supplementary Readers

Let us examine each element of the package.

Animator's Guide (for the animators) (June 1982 – February 1985)

An "animator" in a NFAE programme is a person who organises the local NFE centre and teaches the target population of "learners" – in this case the fisherfolk.

The Animator's Guide developed *by* the project is a handy book/et, a mix *of* words and sketches. Itconsists of a *set of* 33 lessons discussing eight areas of *life in* Tamil *Nadu coastal villages :* community, occupation, health and nutrition, *social* problems, leadership, income and savings, cooperation, education. The guide lays emphasis on *the* aware*ness* and functionality objectives *of the* National Adult Education *Programme. It helps the* animators to *encourage learners to discuss their lifestyle, workstyle, environment and* attitudes, and active/y *involve* them *in their own learning process. It is also intended that the animator, over a period,* ***will*** *himself be able to develop new lessons* to suit local *needs and situations.*

Evolution of the Animator's Guide : The animators were recruited from the local community with advice and help from the State Resource Centre for Non-Formal Education and the Directorate of Fisheries. They were trained by personnel from the State Resource Centre. The training emphasized skills in organizing adult education centres, motivating learners, developing curricula, and in using the participatory approach. A second training exercise was organized by BOBP specially to develop discussion skills. Emphasis was on the use of techniques such as role plays, pictures and questioning that would enhance learner participation.

A third training exercise was held to review the topics identified and prepare lessons and teaching aids. Several efforts were then made to develop appropriate lessons.

The draft lessons and the participatory approach in using them were then 'tested at a few non-formal education centres opened in Adirampattinam. Animators and learners in these centres were aware that they were taking part in a test activity. The level of content and presentation, and the quality of teaching aids, formed the criteria for testing the lessons; while the performance of the animator, the comprehension and involvement of the learners and the atmosphere were the criteria for testing the approach.

Two animators were attached to each test centre, taking turns to teach and observe. Three field workers of BOBP and the Directorate of Fisheries provided support and supervision.

The results of the field-testing showed that the animators and learners took keen part in the discussions and enjoyed them. The animators would be able to facilitate the discussions among learners with sufficient training and field support.

In all, 54 lessons in 10 areas such as community, occupation, etc., were prepared by several small groups at a number of sittings. These lessons were reviewed and analysed at a week-long national workshop held in November 1984. Fifteen experts from India and Bangladesh' with experience in non-formal education

evaluated the lessons. The comments made by the experts were about the format of the questions, the attitudes implied, the participatory nature of the approach, the relevance and the level of content in relation to the needs of the learners. The lessons were revised on the basis of these comments.

literacy Primer and Workbook (for the learners) : (November 1983 — February 1985)

The *Literacy* Primer is an attractive publication titled Elelo Eilasa (a *theme* song *of* fisherfolk in *Tamil Nadu* coastal areas). *It has 76 lessons* that introduce *the 147* functional *letters of the* Tamil alphabet; and 12 drawings *in colour* on fishing *village* activities illustrate *the theme of each lesson. Letters of the* alphabet *are* taught through *words* and pictures. *The* learner's workbook contains *exercises* that enable *the* learners to practise reading and writing at *home.*

The November 1983 national workshop that reviewed the Animator's Guide also provided some guidelines for the development of a literacy primer for the fisherfolk. Workshop participants suggested that the primer being developed should concentrate on "functional" letters of the Tamil alphabet; that each lesson should stress a single concept or issue; that the primer's vocabulary should be confined to what the fishrfolk know and to words found in the lesson plans.

A study was made of daily newspapers and magazines available in the village to arrive at a set' of functional letters. A week-long workshop with eight participants drawn from BOBP, DNFE/AE, SRC and university linguistics experts with experience in teaching Tamil to adult learners, was held in December 1983. A literacy primer and a workbook were developed.

The literacy component of adult education is seen here as a book of information or knowledge to help improve the calibre of the learners over a period of time.

Numeracy Primer & Animator's Edition of the Numeracy Primer (for both learners and animators) : (March 1984 — February 1985)

Titled Andradakanakku (day-to-day arithmetic), *the* Numeracy Primer *has* separate *sections* that *focus on the* counting *of* numbers; *the* derivation of numbers from numbers (about addition,- substraction, multiplication, division, etc); *how* villagers tell *the* time; *money* and currency; measuring *length;* measuring *volume;* measuring *weight; A* special *animator's* edition *of the* Numeracy Primer was also produced, *to enable* animators to use *the primer effectively.*

Counting and arithmatical skills form an integral part of daily life. In preparing the numeracy primer, the stress was on understanding the basic concepts of numeracy and their relationships in a real life context. It was believed that such an understanding would give the learners confidence to handle numbers as part of their written culture — at present they do calculations mentally.

The numeracy primer draws on the author's extensive experience from her study of the day-to-day practices of the use of numbers and arithmetical calculations in rural Tamil Nadu. Besides, a brief study was specially undertaken in coastal villages for the purposeof the primer.

Trainer's Manual (for the trainers of animators) : (March 1984 — February 1985)

The Trainer's Manual contains profiles of the animators, a description of the participatory training approach, its beliefs and assumptions, and notes for trainers, besides a 12-day training model (suggested daily exercises for the training of animators) divided into five stages. These are "Understanding oneself and others"; "Understanding the community"; Understanding the present education system and its relevance"; "Practising the role of the animator"; and "Designing the workplan for NFE centres".

The Trainer's Manual contains easy-to-use step-by-step explanations for trainers in their conduct of various sessions. A set of questions for each session serve as guidelines. "Support papers" or essays on subjects like "Poverty" and "Health problems in India" are meant to help both trainers and animators.

As part of the preparatory work for a workshop on developing the Trainer's Manual, a field survey was undertaken. This was meant to acquire a better understanding of the social, cultural, economic, health and educational life of fisherfolk along the coastal areas of Tamil Nadu.

The week-long workshop in April 1984 was attended by 14 participants representing the Directorate of Fisheries, the Directorate of Non-Formal Education, the State Resource Centre, the NCERT (National Council of Educational Research and Training), voluntary agencies working in the field and BOBP. The participants reviewed the curriculum already developed; familiarised themselves with learner's and animator's profiles (see box) made available from field studies; identified the training requirements of animators; and developed an outline for the trainer's manual.

Workshops to discuss non-formal adult education often led to small working groups such as these — to clarify concepts and propose alternatives.

Bhavani — Profile of an animator

Bhavani is a 20-year old animator from Alandalai fishing village 6 kilometers from Thiruchendur with a population of about 1800. She is a very intelligent person, speaks well, is fond of singing and has had 12 years of schooling. She shows deep emotional concern about her village. In one of the training sessions that discussed 'our community', Bhavani said :

"In our village there were only kattumaram fishermen. The village looks good from the outside but once you go inside you see the poverty. Most people are very poor.

"There is no school. Children run around without clothes, an eight year-old still does that. The village faces severe sea erosion. Three years ago 15 houses went down due to this. Many people came and looked at it and asked questions about a dam to protect the village. But nothing has been done so far and I don't think it will be done. The village has had the same population for the past 40 years. Those who improved their lives went away, no one wants to stay in the village if they have the choice. There are people who went to Sri Lanka and came back; they have now moved away."

Bhavani participated fully in the training. She is always interested in learning more, particularly about what can be done to improve her village. She represents those who are deeply, quietly concerned about their village and its people. They are at an age when they are full of energy; they want to learn and do something new. With good training and guidance, they will be a major resource for the development of their villages.

Subsequently, a training model was worked out in detail during May 1984 by a committee of four members, as a follow-up to the workshop. A draft copy of the Manual was circulated for comment to over 150 agencies and individuals engaged in education and training in India and abroad.

A system of proper evaluation is built into the whole process of training by making the participants conscious of their learning. It is ensured that the learning responsibility is shared between the trainers and animators and then between the animators and learners. It is hoped that the manual can be adapted for training field workers in many other areas of development as **well.**

Supplementary Readers (for animators and fisherfolk) : (September 1983-March 1985)

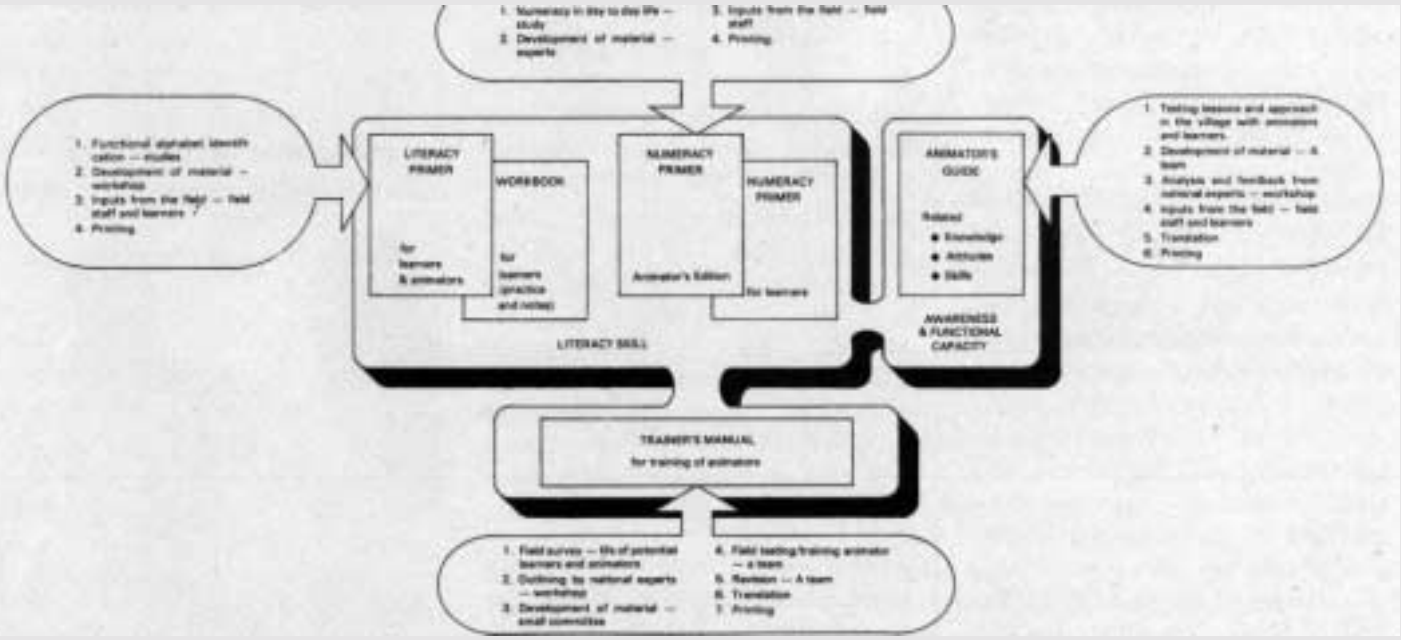
These are easy-to-read, well illustrated booklets. They provide *the* fisherfolk with *reading* materials to sustain their interest in reading, enhance their knowledge and self-awareness. *About 50 such booklets have been* prepared *at* three levels. Picture content is *the* highest in the first level and *the lowest in* the *third level.*

The supplementary readers deal with the subject areas indicated in the Animator's Guide. When topics were identified, popular authors were contacted for writing them up. Some of these booklets were also tested with the learners. Currently the printing of these materials is being undertaken by the Directorate of NFE/AE, Tamil Nadu.

In conclusion, it may be stated that in the evolution of the curriculum package a great deal of effort has gone into thinking through the basic NFE approach, in the hope that it would enable people going through the educational processs to acquire better control of situations that affect their lives. The package lays stress on human development.

This chart illustrates the stage-by-stage preparation of various elements of the curriculum package.

TOWARDS SHARED LEARNING : EVOLUTION OF CURRICULUM



improving the living conditions of fisherfolk is a great challenge. To attain this goal, it is essential to improve the education of small-scale fisherfolk. Better fishing techniques, fish handling, fish marketing — as also better standards of housing, nutrition, hygiene and health — call for an effective system of dissemination of knowledge.

The training 'of fishermen, and of the rural population in general, poses several constraints.

Take India. How can a large coastal multi-lingual population be reached with a limited rural extension budget, lack of adequately trained extension personnel and inadequate communication facilities?

Perhaps video offers an answer. Let us consider the experience of a farmer video training project in Peru executed jointly by FAO/UNDP and the Peruvian Ministry of Agriculture where the author worked from 1981 to 1 983.

The Peru experience

In 1976 FAO and UNDP decided to support an experiment to assess the effectiveness of using video as a medium to train rural people. It was carried out in cooperation with CENCIRA, the organization for land reform of Peru's Ministry of Agriculture. The project started group training with black and white video equipment. In 1981 CENCIRA was dismantled. The video project received the status of a special project of the Ministry of Agriculture under its direct responsibility. It became known as CESPAC (Audio Visual Pedagogic Service Centre for Training), and received a Peruvian government grant of US $ 500,000 for the purchase of new video equipment.

Some 40 people trained in the production of pedagogical packages and in training methodology were working in CESPAC at that time, with an equal number of administrative and service personnel (for printing additional training materials). The number of so-called audio-visual pedagogues has since doubled; new groups have been trained for CESPAC itself as also for other Peruvian institutions, such as the Ministry of Education.

The project has prepared and conducted video courses on subjects relating to agricultural technology, forestry, dairy farming, and health and nutrition. Each course consists of about 10 programmes; thus several hundred programme have been prepared. A course takes about 3-5 months to produce; it runs for anywhere between a fortnight and a month; the "recipients" are usually about 30-40 people for a single session from a single village.

But two or three courses may be held the same day in one village for different groups being trained in different subjects Further, the project can concentrate on a cluster of villages in a region for a whole week or fortnight, moving back and forth. Thus its impact on a village or a region can be maximized. On agricultural technology, there are courses on such subjects as tractor maintenance, individual courses on crop improvement (rice, potatoes, wheat etc), use of fertilizers, disease control

The successful health and nutrition course spanned topics ranging from the human body, nutrition requirements and environmental sanitation to care of pregnant women and child rearing — even to rearing of guinea pigs by mountain tribes. Some of these programmes were accompanied by practical exercises such as oreparing rehydration drinks for diarrhoea-affected children; building hygienic water wells and latrines from locally available material.

A course on vegetable gardening 'or women in urban slums was produced and successfully applied in :he field by various private organizations in Peru trained by the project. In general the courses, as core elements of a wider pedagogical package, proved to be a very effective means of knowledge transfer. Moving images in colour accompanied by a concise commentary in the local language turned out to be an ideal way to explain new concepts, processes and procedures to a non-literate audience.

From Peru, this method of rural training has spread to other countries of the region — such as Brazil, Mexico, Colombia, Paraguay, Honduras.

Using techn to train f

BY HANS D

Recalling the methodology of video trai **outlines the elements of a similar video-l**

<<

video

ology

isherfolk

ORRESTEIJN

ing in a farm project in Peru, the author ed package for training fisherfolk.

Besides farmers and slum dwellers, poor fisherfolk too form an obvious target group for video training. In fact the Peru project started working with Peruvian fishing communities – basic fish biology, fish movements and behaviour, navigation, different types of gears and fishing methods, construction and maintenance of boats, sailing rigs, fuel saving practices, engine maintenance and repair, fish handling and conservation, aquaculture and, of course, topics directed at improvement of the habitat like health and sanitation can be covered by this training method.

The methodology of video training

It is obvious that people do not learn from viewing video programmes alone; this is even more true of the practically oriented people that form our target groups. That's why video is to be regarded as an element of a more comprehensive pedagogical package. Let us now consider this pedagogical package :

Video programmes, as we have seen, are the medium for transferring new knowlege; existing practices are evaluated and reinforced if they are useful, processes explained and new concepts and procedures introduced. A video course will consist of 5 to 10 programmes, each 12 to 18 minutes long. The 18 minute limit should not be exceeeded; a longer duration may generate viewer fatigue.

Video programmes can never be a substitute for inter-personal communication. After viewing the programme, people need to react, raise questions, seek clarifications about the programme (which may be shown again and important aspects analysed on the spot) and discuss with the training unit. For this purpose, the training unit is assisted by a local technician specialising in the subject area covered.

3. For acquiring the skills to apply the newly attained knowledge, each class is followed by a practical exercise surpervised by the local technician. Skills in net making and repairing, boat construction, diesel engine maintenance, house building, health care, etc., are attained this way.

4. **Each training course participant** receives a small booklet. It contains very little text but a lot of illustrations, which refer to the video programme images. Some additional information, not suitable for showing on the screen (tables of motor oil grades, growth seasons of different. vegetables, etc.) may also be presented in the booklet. It serves to support the participants' memory.

5. Finally each pedagogical package contains an instructor's guide, which delineates the special characteristics of the course on hand, the place and time of its production, the intended target audience, and the major focus of the package, as well as guidelines for the application of the course.

The central place occupied in this package by the video programmes makes it necessary to consider these programmes as much more than just audio-visual aids. They form the main carriers of the knowledge to be transferred and are thus an effective counterpoint to the work of field personnel who have to pass on the message through a hierarchic extension organization.

Advantages of video

A full assessment of the impact of video training, as compared with that of films, filmstrips and audio-visuals, has not been made so far. Video's impact on target groups is generally supposed to be similar to that of films, but video has the advantage that it can be used in open air locations – under a tree for instance – while a film requires a darkened room. As for production, video is a much more flexible medium. After shooting no chemical processing is needed and immediate playback is possible to check whether the shot meets the requirements. During editing, no cutting of film is necessary; instead a process of electronic editing is used which facilitates quick changes in finished programmes – either after field trials, or for adapting the content to other areas or for updating programmes. Copies of the original programme can be made easily and quickly.

When compared to slides, which are stationary images, the moving

<<

images of video provide an obvious advantage. It is a much better medium to demonstrate processes and actions naturally, and uses a lesser degree of abstraction from reality. Finally, the possibility of creating portable video training units, consisting of a small video cassette recorder, a monitor and a power inverter to convert the 12 volts direct current from a car battery into 220 volts alternating current for the monitor, guarantees energy independence and versatility. Even far off places can receive proper educational attention.

Video programmes to train rural people should be produced locally; target groups cannot identify with what they see in imported European or Australian programmes. Therefore, local people should be trained in video production techniques. In Peru, this production is done by units of two persons; each unit is responsible, start to finish, for production of the pedagogical package – from investigations among the target group through script writing and editing. So people should be trained in all these aspects. The trainees should preferably have a university education in social sciences, agricultural sciences or fisheries.

The training imparted to them should be of a practical nature: learning by doing is more effective than learning by listening (to lectures) or reading. The course will have a duration of six months; pedagogical and technological principles of producing and applying video training packages will be dealt with.

Apart from this course, separate courses in video training methodology may be organized to train extension personnel of several organizations concerned with rural development so that these organizations can use available video courses in their own area. In this way the target population to be reached can be greatly extended.

Both types of training should be conducted by those who have had experience in the use of video in a rural environment.

While we are accustomed to rising costs in everything, there is one range of products that is becoming cheaper, namely electronic goods like microprocessors and video equipment. Stiff competition among manufacturers has made video equipment smaller, better and cheaper.

The cost of the video installation also depends on the quality standards adhered to and the technical complexity of the production facility desired. Prices of video cameras vary from about US $, 700 to US $ 3000 (for a three tube colour camera); of VCRs from US $ 700 (for 1/2 inch video portable) to US $ 7000 (for a recorder with full electronic editing facilities for 3/4 inch tape).

The BOBP's basic production equipment unit, consisting of a three tube colour camera, two cassette recorders with limited editing capacity (for 1/2 inch tape), two monitors and peripheral equipment **costs about** US $ 10.000. For better quality, the U-matid system using 3/4 inch tape is still to be preferred. The costs of this equipment :

- Field recording unit (camera, VCR, etc) : US ¦ 5000
- Field play-back unit (VCR, monitor. etc) : US $1500
- Complete studio editing unit : us $ 20000

It is clear that the choice of equipment depends mainly on the scale on which video programmes are to be produced and the number of organizations that can be mobilized to use the video courses produced in their own working area.

A rough indicator of the costs of video training can be obtained by dividing the costs of a video training project over a period of five years (the lifespan of video equipment) . by the total number of classes held.

For a five year project which devotes half the time to production of courses and half the time to rural training; which uses a good 3/4 inch production unit, trains 10 pedagogues at the beginning of the project and another 10 at the beginning of the third year; the total costs work out to $688,000. If 245,000 video classes are held during the period (which could mean 10 classes each for 24,500 people or any other combination), the cost is less than US $3 per class per person trained. In Peru, a similar calculation yielded a cost of about $1 per person per class.

The fisherfolk learners are concentrating hard — so is BOBP video specialist Hans Dorresteijn, author of this article.

<<

(Continued from page 5)

cate. This could be a people's movement or a non-government organization.

Development agencies need to have clear and well thought out policies and strategies which define the target, the concept of development being adopted and the means to achieve it. It was suggested that agencies should shift their emphasis from the development of fisheries to the development of fisherfolk. For example, as Arne Andreasson of NSBF and Casse Krantz, consultant to SIDA, pointed out, SIDA sees aquaculture in the context of rural development, and has a clearly stated rural development strategy that defines the target as the socially and economically weakest groups.

The strategy recommends that a majority of the benefits should flow to the target group but it does not suggest that all the others should be excluded, as that would not be socially feasible. The strategy focuses on resource growth through people's participation. It works towards greater economic and social equality, better access to services for all, greater influence on decision making, especially in the political arena, promotes self-sustaining development, and requires thecommunity to get involved in the process through organizing itself and taking independent decisions.

A strategy that incorporates social feasibility can be useful only if it is practical to implement. And this requires that the agency should have the manpower with the specific skills to ascertain the needs and problems of the community, understand it, and involve it from the very beginning and do so within the resource and time constraints that development projects and agencies usually have. Therefore, there is a need to develop manpower resources and rapid and cost effective appraisal procedures and methods. There is also a need to evolve 'indicators' of social feasibility which would help the agency to know in a concrete way that social feasibility is being achieved.

But what is social feasibility? Most generally stated, it means that the benefits of a program reflect the needs of the community it sets out to help; that the benefits reach them; that there is equitable distribution of the benefits; that the community participates in its development; that social conflict is minimized; that effort begins where the people are but does not keep them where they are; and that the development is self-sustaining.

Agencies need to specialize to improve their efficiency and quality; people on the other hand have several problems, interlinked and prioritized within their own systems of logic. There is a need for a holistic approach to development which may require agencies from various specialities working togetner or agencies widening their areas of work to meet the need profile of the community.

An agency ought to ask itself certain questions before it decides "Which technology" and the "process of extension" :

- for whom specifically is the effort?
- do we know them and of them?
- do they know us, and understand why we are trying to assist them in their development?
- what are their needs as expressed and prioritized by themselves?
- do we and they understand the causes of their problems?
- how is the community organized socially and commercially to "carry" new technologies?
- what are the people willing to do for and by themselves?
- do we understand their concept of advantage!
- will one particular technology ensureequitablespreadof benefits or would a range of technologies be required?
- what constitutes 'appropriate' technology for these people at this point of time and at this stage of development?
- are we committed to (and will the people) participate in the planning, choice and development of technologies and implementation?
- keeping in mind the existing social and power structures, who will get which benefits and why? **How,** if at all, can we ensure that those who need benefits the most get them, while minimizing the social tension and conflicts along the way?
- who else will benefit and how?

If the agency can honestly answer these questions and act on their findings a first important step towards social feasibility in development projects would have been taken.

To achieve socially feasible implementation, an agency would have to build into its structure a socio-economic group which works with the target communities and affects policy and the very direction of research and development, instead of coming in after the fact of technology development as traditional extension efforts do. To do the job, such agencies will have to evolve several instruments:

- a community need and status statement;
- a socio-economic impact statement;
- in-process social impact appraisal statements;
- a socio-economic audit.

The agency may also have to help the community organize itself. Most importantly, the agency must consider the option of saying "no" to particular technologies or approaches in spite of pressures on it to go ahead. Figure 3 suggests an organizational form to incorporate such an activity.

The Consultation raised more questions than it answered. This was only to be expected considering the nature of the subject. It allowed people and agencies to articulate thoughts, feelings and ideas which most agencies hesitate to do because of their sensitive nature and political implications. This is very important, as unless a problem is articulated it cannot be solved. A problem has been stated and the first few tentative steps taken towards its solution. The dialogue must, and we hope will, continue.

glimpses into BOBP projects

Fishery resources : training courses in Indonesia and Bangladesh

Under the auspices of the FAO/UNDP project "Marine Fishery Resources Management in the Bay of Bengal," (RAS/81/051), two training programmes were conducted recently. The first was on mackerels and tunas in Indonesia, the second on the hilsa shad in Bangladesh.

Banda Aceh, Indonesia, was the location of a training programme conducted from October 18 to 28, 1984, for fisheries field officers. The programme included .

- Identification of the mackerels (Decapterus *spp. and Rastrelliger spp.)* and tuna species around Aceh and North Sumatra provinces;
- Sampling commercial catches of these'species for length frequency distribution and catch and effort;
- Compilation of data on forms specially prepared for the purpose and carrying out estimation procedures.

Two fishery biologists from Indonesia served as course instructors. The course consisted of theory, field sampling, laboratory examination of samples collected, and estimation of catch, catch composition and fishing effort. The sampling programme has been made operational at five centres – Banda Aceh, Lhosemawe, Langsa, Asahan and Behawan – subsequent to the completion of the training course. Other biological investigations required are to be carried out by Indonesian fisheries biologists themselves.

The training course was a follow-up to the working group meeting on mackerels in the Malacca Straits, held 12-16 December, 1983, in Penang, Malaysia (see Bay of Bengal News, june 1984).

Four fisheries biologists from Bangladesh underwent a six-week training course on the hilsa resources of Bangladesh from October 28 to December 8, 1984. The course was conducted by BOBP consultant Dr. B.T. Antony Raja.

The hilsa shad is a major fishery resource in the upper Bay of Bengal. Both Bangladesh and India tap this resource . A workings group meeting on the hilsa resource was held in Dhaka, Bangladesh, from September 22 to 26, 1984 (see Bay *of* Bengal News, December 1984).

The working group meeting recommended immediate follow-up on a variety of subjects – one of which was the collection of catch and effort data at three sampling stations in Bangladesh. The training course was in pursuance of this recommendation.

The consultant himself collected available information on the craft used in the hilsa fishery from the FAO/UNDP Fishery Resources Survey System Project. The trainees concentrated on

- correct identification of hilsa species of which there are three : *the hilsa ilisha, H. toli and H. kelee;*
- collection of catch and effort data;
- catch sampling for length/depth frequency distribution;
- biological investigations on length, depth, weight, maturity, spawning and sex ratio; and
- experimental fishing.

The course was conducted in four segments :

(a) d&ailed briefing of the four scientists at Chittagong.

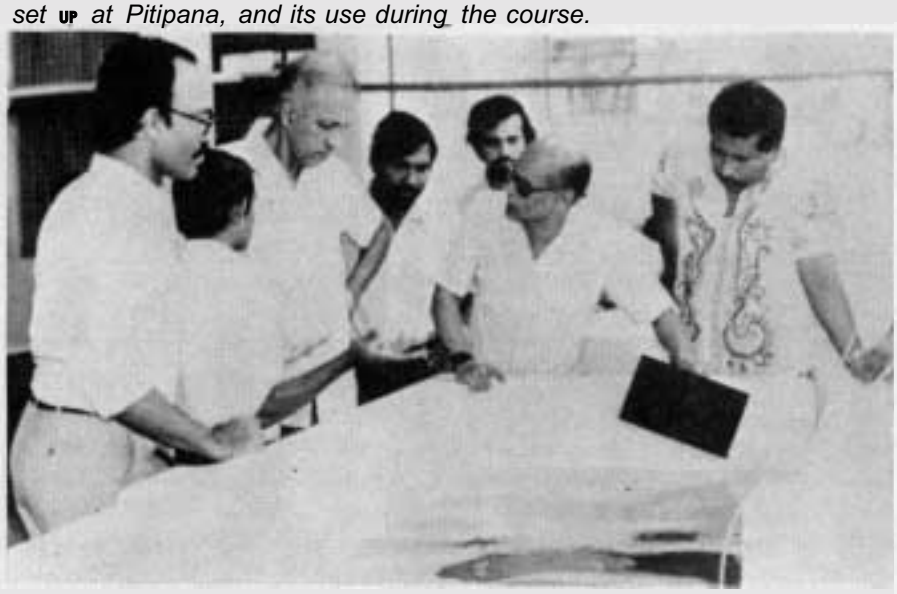
(b) visit by Consultant to the sampling stations (Cox's Bazar and Chittagong for the marine environment, Charfasion in Bhola district for the estuarine area, Chandpur for fresh water zone) to train the biologists in collecting field data and recording the various biological parameters; and to conduct a fortnightlong field cum-laboratory programme.

(c) Examining and discussing data sheets prepared by the biologists.

(d) a second meeting of the biologists at Chittagong to exchange experiences, compare data and assess the training course.

The trained fishery biologists will conduct more detailed investigations beginning February 1985 at the four sampling stations.

Sri Lanka's Minister for Fisheries Festus Perera inaugurated a training course on shrimp breeding for Sri Lankan officials *at Pitipana near Colombo. Consultant K H Mohammed briefs the Minister about the makeshift hatchery set up at Pitipana, and its use during the course.*



BOBP stall at trade fair in Trang province, Thailand

At a trade fair held December 1984 in Trang province of southern Thailand, women groups from the BOBP's aquaculture demonstration project exhibited products such as shrimp paste, fish sauce, and fish cracker, and bagged several prizes. The fish products were displayed at a small-scale fisheries stall put up by the project. Pictures on culture of seabass, mussel and oysters were also on view. More than 35,000 people visited the fair which was inaugurated by the Governor of Trang province.

Shrimp culture workshop in Sri Lanka

Eleven Sri Lankan fisheries officials and researchers took part in a 10-day workshop on techniques of breeding, rearing and culture of shrimp that began January 24 at the shrimp hatchery in Pitipana near Colombo (see Bay of *Bengal* News, December 1984). The workshop was officially inaugurated January 28 by the Minister for Fisheries, Mr Festus Perera, who lauded the close co-operation between his Ministry and the BOBP.

The workshop effectively combined theory and discussion with practical work. Lecture subjects included "Recent developments in marine prawn hatchery techniques," "Selection of spawners, transportation and spawning procedures," "Feed and feeding schedule of larvae," "Developing live feed culture for feeding larvae," "Importance of water management and aeration for rearing penaeid prawn larvae," "Nursery management for better survival of post-larvae," "Role of hatcheries in the development of shrimp culture," "Larval mortality — remedial measures," "Recent shrimp breeding experiments in Sri Lanka" and "Trials in pen culture for shrimp in Sri Lanka."

Practical work began with the collection of spawners. The trainees went on a pre-dawn trip by hired trawlers to Chilaw and Negombo and managed to obtain spawners of the three major shrimp species — *P. merguiensis,* P. *monodon* and P. semisulcatus. They spawned within two days of the commencement of the course. The first batch of larvae obtained from a *P.* semisulcatus specimen on the night of January 24 reached the post-larval stage on the final day of the course (February 3). The trainees were thus able to observe and take part in a full cycle of rearing and culture operations.

The workshop also initiated the trainees into pen culture techniques. At the pen farm adjoining the Pitipana hatchery, trainees spent many hours under a blazing sun collecting shrimp fry from the Negombo lagoon, erecting a pen, feeding the juveniles.

Besides consultant K.H. Mohamed and BOBP aquaculturist J.A. janssen, project team leader R.A.D.R. Samaranayake and aquaculturist R.P. Samarasinghe took active part in organizing the workshop, which brought to a fitting climax BOBP's demonstration of the setting up and operation of a makeshift hatchery and of pen culture techniques for the first time in Sri Lanka..

Abstracts of BOBP Publications

Abstracted *here are BOBP* papers *out in* recent months.

1. BOBP/WP/30 : Mackerels *in the* Malacca Straits.

The chub and scad mackerels (Rastrelliger and Decapterus) are an important fishery resource in the Malacca Straits. They are shared by three countries in the area — Indonesia, Malaysia, and Thailand. This paper attempts to summarize the present knowledge of mackerel resources in the Malacca Straits. Based partly on a working group niieting held 12-16 December 1983 in Penang, Malaysia, the paper consists of a summary report and individual country papers from participating countries.

2. BOBP/WP/31 Tuna *Fishery in the* EEZs of India, Maldives and Sri Lanka.

The paper attempts to summarize the present knowledge of those tuna' resources, especially yellowfin (Thunnus albacares), b i g eye (T-*obesus)* and skipjack (Katsuwonus pelamis) tunas in the EEZs of India, Maldives and Sri Lanka that are likely to be shared stocks. It contains a summary report, a survey of the tuna fishery in the three EEZs and country reports from Maldives and Sri Lanka. The paper was put together following a working group meeting of scientists from Maldives and Sri Lanka in Colombo, 4-8 June 1984.

3. BOBP/WP/32 : *Pen* Culture *of* shrimp *in the* Backwaters *of* Killai, Tamil Nadu — *A* study *of techno-*economic and social feasibility, *by* Rathindra Nath *Roy.*

This report describes the findings and recommendations of a techno-economic and social feasibility study of shrimp pen culture in the back-waters of Killai,Tamil Nadu. It is based on field surveys in communities of the region in the latter half of 1983 and on three culture trials at Killai undertaken during an earlier 21-month technical programme conducted by BOBP and the Department of Fisheries, Government of Tamil Nadu.

Commercial test fishing by BOBP beachcraft: What does the data reveal ?

During the past year, seven BOBP beachcraft have been fishing at five centres in Tamil Nadu, Andhra Pradesh and Orissa. Catch data, costs and earnings are being systematically monitored. In this interview, BOBP socio-economist Edeltraud Drewes discusses the findings.

** The gross earnings of BOBP craft are twice as much as the nava and three times as much as the kattumaram.*

** Investment costs of the craft have increased substantially. To ensure economic viability the crafts' potential has to be fully utilized — which means fishermen may have to engage in night fishing and make longer trips out at sea than they do at present. Futher, adequate repair facilities must be made available wherever the craft operate.*

The Government of India proposes to introduce 90 BOBP beachlanding craft along its east coast under a subsidy scheme. The earnings and acceptability of BOBP beachcraft under the scheme must be studied before they are introduced in larger numbers.

The BOBP boats (IND-25 in the background) were leased out to the highest bidders at auctions like this.

Q : Have the investment costs of the BLC (beachlanding craft) risen since the development of the first prototype? What's the reason for this rise?

A : Yes, they have, by more than 50%. The rise is mainly on account two factors: technical improvements (to the hull and engine installation); and price escalation in raw material.

It is because of this rise, and the limited data available on earnings, that BOBP decided to undertake systematically planned commercial test fishing, and to tnonitor data closely.

Q : Which beachcraft have been undergoing commercial fishing and where? What are the specific objectives of thesetests?

A : During 1984, seven beachcraft – five in fibreglass, one in aluminium, one in wood – underwent cotnmercial test fishing by traditional fishermen from Tamil Nadu, Andhra Pradesh and Orissa. (The fishing and monitoring are still going on.)

The locations (see map), selected in cooperation with these governments, were:

Injambakkam near Madras (Tamil Nadu)
Manginapudi near Machilipatnam (Andhra Pradesh)
Uppada near Kakinada (Andhra Pradesh)
Bandaravanipeta near Srikakulam (Andhra Pradesh)
Copalpur near Ganjam (Orissa)

The tests were meant to secure reliable data on costs and earnings of the craft and their acceptance by traditional fishermen in different locations and varying conditions. (Conditions differ from one location to 'the other as regards the beach and the sea, working patterns of fishing, the facilities for marketing, and for maintenance – engine servicing and repair).

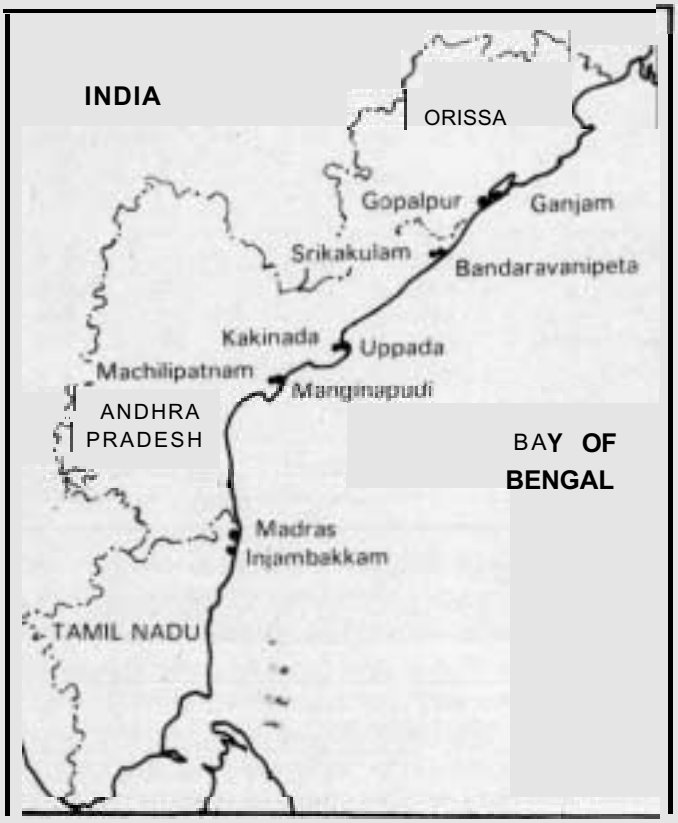
Q : Could you detail the arrangements made to monitor data?

A : An official at each test village collected catch and operational data every day for a BOBP beachcraft and for two traditional craft. In charge of the monitoring were inspectors of fisheries and assistant directors of fisheries. Regular district-level review meetings to discuss data collection were arranged by BOBP in which middle-level and higher-level officials and district collectors took part.

Q : How were fishermen crew for the BOBP boats selected from the test villages?

A : In each test village, BOBP demonstrated the launching, surf-crossing and hauling operations of BOBP craft. Training on the use of these craft was then offered to those who were interested. (It's the younger fishermen who responded.) Two fisheries inspectors, S.B. Sarma (Andhra Pradesh) and E. Srinivasan (Tamil Nadu), BOBP's counterpart officials who were keenly associated with the technical testing of beachcraft, provided the training.

The next step was to select the crew. Here there was a problem: some of the villagers protested that a single boat would benefit only 4 to 5 fishermen. In agreement with village leaders, the project then decided that the boats would be given out on hire to the highest bidder in a public auction. Two of the test villages insisted on receiving 10 per cent of the hire charge as village tax.



Locations of trial *centres* for *BOBP* beachcraft.

In one village, the government insisted initially on a 50% share of catch, instead of monthly hire for the craft. This system led to concealment of catch and inflation of fuel consumption figures by the crew, and the system of monthly hire of craft had to be introduced.

In three of the test villages (Injambakkam, Bandaravanipeta, Copalpur), each hire period was limited to three months; a chance for using the craft had then to be given to another lessee. In the other two villages, Manginapudi and Uppada, this problem did not arise, as local leaders handled the matter strictly. The craft operators were appointed for an open-ended period. The crew had to be replaced only once.

Q : How did this system work? Was it equally effective in all the villages?

A : The system worked well: the hire charges amounted to about 70 per cent of the fixed costs. Operating costs, but for major engine repairs which were attended to by BOBP, were also met by the operators. Earnings, after deducting diesel and maintenance costs, were shared equally among the crew members.

Q : What was the gear used with the craft?

A : Each BLC was equipped with fishing gear worth about Rs. 35,000. The quantity of gear differed a little from place to place depending on (a) the fishing ground, and (b) unfortunately, also on timely availability of government funds to buy gear.

The type of gear used 'were mainly large mesh gillnets of 90 to 120 mm mesh size and 1200 to 1600 m length. The exception was Gopalpur where a variety of gear was used (50 mm prawn nets, 60 mm mackerel nets, and 110 and 120 mm nets for other pelagic species). Except at Uppada, traditional fishermen have experience only in operating small mesh gillnets close to the shore

Table I Gross Earnings of Beachianding Craft in Various Test Villages

Test Village	Monthly gross earnings in Rs.	Fishing trips per month	Gross earnings/ fishing trip in Rs.[1]	Price of catch/kg in Rs.
Injambakkam	2945	9	327	8.60
Manginapudi	3957	15	263	6.20
"	8920	18	495	4.30
Uppada	5668	21	270	6.70
"	4275	20	213	6.60
Bandaravanipeta	2245	7	320	3.40
Gopalpur	2813	9	312	11.20 (incl. prawns)
Average	4403	14	314	6.70

[1] Variations of Rs. 1 are due to rounding off of average fishing trips.

Table II Costs and Earnings of Beachlanding Craft IND-25'

I.	**Investment Costs**		Total Rs. 108.000
	1. Hull	Rs. 48.000	
	2. Engine with installation	23.000	
	3. Sailrig	2.000	
	4. Fishing gear Large mesh gillnets (95. 110 & 115 mm) 40 pieces	35.000	
	Total	Rs. 108.000	
II.	**Annual Operating Costs**		
	Total including crew wages		Rs. 30.476
	1. Diesel and oil (for 18 trips/month) (Rs. 19/trip × 216 trips)	4.104	
	2. Engine repairs and maintenance	2.000	
	3. Hull repairs	500	
	4. Net repairs (material only)	2.000	
	5. Insurance	2.000	
	6. Crew wages based on 1/3 crew share of gross earning per craft/trip Rs. 314	19872	
	minus costs 1—6 277		
	Crew share per trip 92		
	(4 men = Rs. 23 per man per trip 5 men = Rs. 18 per man per trip)		
	Total	Rs. 30.476	
III.	**Annual Fixed Costs**		Total Rs. 26.983
	1. Depreciation	Rs. 18.550	
	Hull (10 years) Rs. 4.800		
	Engine + installation (5 years) 4.600		
	Gear (4 years) 8.750		
	Sailrig (5 years) 400		
	2. Interest (equalized over 4 years) 12.5% on investment capital	8.433	
IV.	**Annual Total Costs (II + III)**[2]		Rs. 57.459
V.	**Annual Gross Earnings**[3]		
	18 trips/month/Rs. 314/trip		Rs. 67.824
VI.	**Annual Net Profit**		Rs. 10.365
	Rate of Return		+9.6%

1 **IND-20** costs have still to be worked cut, as commercial production o this type will start only by mid-1985 in the Kakinada corporation boat-yard. They are higher than for IND-25 as the craft is larger.

2 Breakeven point for IND-25: earnings of Rs. 57.459/annum or Rs. 4.788/ month.

Based on 12 months data from all 7 BLcs.

(in fishing grounds between 4 and 50 m depth) during the day. This is mainly because of the technical limitations of their country craft: kattumarams/teppas . small navas. Uppada fishermen, however, have experience with large mesh gilinetting in-fishing grounds up to 110 m depth, and with fishing trips of three days' duration. This difference in the fishing practices of country craft fishermen has had a strong bearing on the BLCs' performance — as we will see from our data analysis.

Q : **What results were obtained from the BLC trials? What are the findings and observations?**

A : Different types of BLC were used during the trials, but returns from fishing cannot be attributed to the type of craft alone. Other factors are also responsible, such as type and quality of gear used, availability of good fishing grounds, and working patterns of fishermen. Continuous commercial trials are necessary to eatablish whether the IND-20 or the IND-25 is the most suitable craft for a particular location. (See *Bay of Bengal News,* December 1984, page 21)

The performance of the BLCs varied from village to village as can be seen in Table 1. The results can, however, be grouped into two broad categories — the four BLCs tested in villages traditionally using navas and practising night fishing (Uppada and Manginapudi) on the one side; and the BLCs tested in the traditional kattumaram villages of Injambakkam, Bandaravanipeta and Gopalpur, on the other.

— **Number of fishing trips** : Whereas the BLC at Uppada and Manginapudi achieved 15 to 20 **fishing trips** per month and 192 to 378 monthly fishing hours, the other three test villages recorded only 7 to 9 trips and 70 to 126 monthly fishing hours. The main reason for this big variation is that in the former case, fishermen engaged in night fishing and possessed the skills to operate large mesh gillnets required for adequate utilization of the **BLC.**

Another factor influencing the number of fishing trips is proper maintenance of gear, craft, and engine, which is a matter of **adequate technical and management support services.** In locations such as Bandaravanipeta **and** Gopalpur, where no private engine mechanics and workshops are within easy reach and no spare parts are available, fishermen often lost their motivation to use the BLC. Better technical and management support could have been provided by all concerned institutions. Though various mechanized boats (trawlers) operating along the coast of Orissa, Andhra Pradesh and Tamil Nadu are maintained and repaired rather easily in major landing centres by local mechanics, village-based mechanics seemed to lack the experience, the tools and the spare parts to do a satisfactory repair job with BLCs, which have a new type of engine installation. Moreover, the engine used is a recent type too, not known to most local mechanics in remote villages.

In Uppada and Manginapudi, systematic training of government-employed mechanics and supporting staff, as well as a set of spare parts stored in the local fisheries office, helped to overcome major problems of engine maintenance and repairs. A pointer to what could be done in the other three villages.

Variations in **earnings per fishing trip** also accounted for the disparity in economic performance of the BLCs. This in turn was due to variations in type and quantity

Table III Monthly Costs and Earnings of Craft

Type of craft	Monthly total costs Rs.	Monthly gross earnings/craft Rs.	Monthly profit Rs.	Gross earnings/craft per fishing trip Rs.	Gross earnings/ craft/hour Rs.
BLC	4788	5652	864	314	21
Nava (Uppada)	2421	2814	393	201	14
Kattumaram (Injambakkam & Bandaravanipeta)	1469	1908	439	106	18

Table IV Earnings of Crew Members

Type of craft	Monthly earnings per member assuming 4 crew members in Rs.	Monthly earnings per member with equal share of profit in Rs.	Earnings per hour based on unshared profit in Rs.	Earnings per hour based on equally shared profit in Rs.
BLC	414 with 1/3 crew share	630	1.53	2.30
Nava	318 with 50% crew share	416	1.10	1.50
Kattumaram	216 with 50% crew share	326	2.00	3.00

1) Equal share of profit applies in cases of cooperative ownership patterns which the Govt. promotes and it also applies to extended family ownership patterns where all crew members belong to one family.

of fishing gear, in prices of fish catch, and in fish resources. Available fish resources have been the most crucial factor as a comparison of the Bandaravanipeta and Injambakkam BLC shows. The former was equipped with half the quantity of gear used on the latter, but landed four times more fish per trip than the latter.

The high annual average earnings per trip of one particular Manginapudi BLC resulted from a combination of three factors: large quantity of gear, very experienced crew (in large mesh gillnet fishing) and change of fishing grounds (migration) to avoid lean fishing seasons.

Q: **This brings us to the question of economic viability. Do the BLCs' performance stand rigorous statistical scrutiny of viability?**

A : Table II shows the breakeven point to be Rs. 4788 monthly gross earnings. Only two test craft (at Uppada and Manginapudi) achieved earnings higher than this figure, on account of the reasons stated earlier.

One Uppada BLC did not touch the breakeven point mainly because of too low average earnings per trip – which in turn seems to be due to less active migration practices by the crew as compared with the other Uppada BLC crew. As suggested by the concerned officer at Uppada, there seems to be some scope for diversifying the gear and for slightly increasing the quantity of fishing gear on both Uppada BLCs, which might increase the catch per trip.

The BLCs at Injambakkam, Bandaravanipeta and Gopalpur are far from the breakeven point. Inadequate utilization of the BLC is the main problem. The prevailing working patterns of kattumaram fishermen – such as short fishing trips to grounds near the shore and fewer working hours compared with nava fishermen – will not ensure remunerative returns. The problem is aggravated by lack of craft and engine maintenance and inadequate mechanical services.

In the case of Bandaravanipeta, extremely low fish prices have compounded the problem of low earnings per trip. The low prices are because of the way fish marketing is organized there, also because the post-harvest infrastructure (transport and ice) is rather poor.

A word about how kattumaram fishermen react to the BLC. They appreciate the reduced physical workload on the BLC as compared with their craft; yet they are slow to take to new working patterns, such as night fishing in more distant fishing grounds, even though their annual earnings could double as a result. They realize that they would then spend twice as much time out at sea as they do now, and reduce (see Table IV) their rest and leisure time.

Continuous BLC operations under improved mechanical and management services will be needed to establish whether BLC can become economically viable when operated by kattumaram fishermen. There is evidence that the Bandaravanipeta and Gopalpur BLCs will improve their earnings per trip and increase the trips as well – if the required services improve and fishing gear is diversified.

BLC performance and acceptance will not be achieved as quickly in kattumaram villages as in nava villages. BLC trial operations should, however, be continued in those areas of kattumaram operation where sufficient fish resources are available. This may not be the case in Injambakkam (around Madras) where the reported landings per trip are much lower than in Gopalpur and Bandaravanipeta.

One year's trials with the BLC have shown that in spite of a tremendous increase in investment costs, the craft can still be economically viable, provided that we have not been too over-optimistic in expecting a lifetime of 5 years for the engine and of 10 years for the hull. As the lifetime at this stage is still an uncertain factor and since it will take time for kattumaram fishermen to adjust to the new working patterns of regular night fishing and more hours at sea, it may be advisable for government to subsidize the investment costs for a limited number of BLC in the initial phase. This would help the fishermen to go in for the craft and enable the government to observe the earnings, performance and acceptance of the BLC on a wider scale than at present before promoting a full-scale introduction of the craft through bank loans.

Q : Could you compare the gross earnings of the beachcraft with those of traditional craft?

A : The monthly gross earnings of BLCs are twice as high as those of the Uppada navas and nearly three times higher than those of kattumarams from Injambakkam and Bandaravanipeta, reflecting a remarkable increase in fish landings. It must be noted that higher landings are to a great extent due to increased fishing effort.

Reasons for the superior performance of the BLCs

- Motor power enabled access to different and distant fishing grounds that could not be reached by navas and káttumarams.
- Carrying capacity for gear and catch was more than that of kattumarams; motor power enabled BLCs to cross the surf even during the monsoon, when kattumarams normally stay ashore and lose fishing days.

Q : Finally, could you summarize the advantages of BICs over traditional craft?

A : The advantages of the motorized beachianding craft over the non-motorized country craft are

for fishermen
- higher monthly and annual incomes through more fishing opportunities (full employment)
- less physical exertion

for fisherwomen
- more employment opportunities in fish marketing through increased fish landings

for boatbuilders and **other ancillary industries**
- greater employment opportunities

for fish consumers
- improved supply of food fish for local consumption through high increase in fish landings.

Investigators engaged by BOBP (below) recorded catch and operational data both for BOBP craft and for traditional craft like kattumarams (top) or navas (above).

Published by Lars O. Engvall for the Bay of Bengal Programme, Post Bag 1054, Madras 600 018, India. Phototypeset at Mesvag Process, Madras 600 041, processed at Color Grafiks, Madras 600 028, and printed at Nagaraj & Co., Madras 600 041. Editor: S. R. Madhu. Layout Artist: E. Amalore.

<<