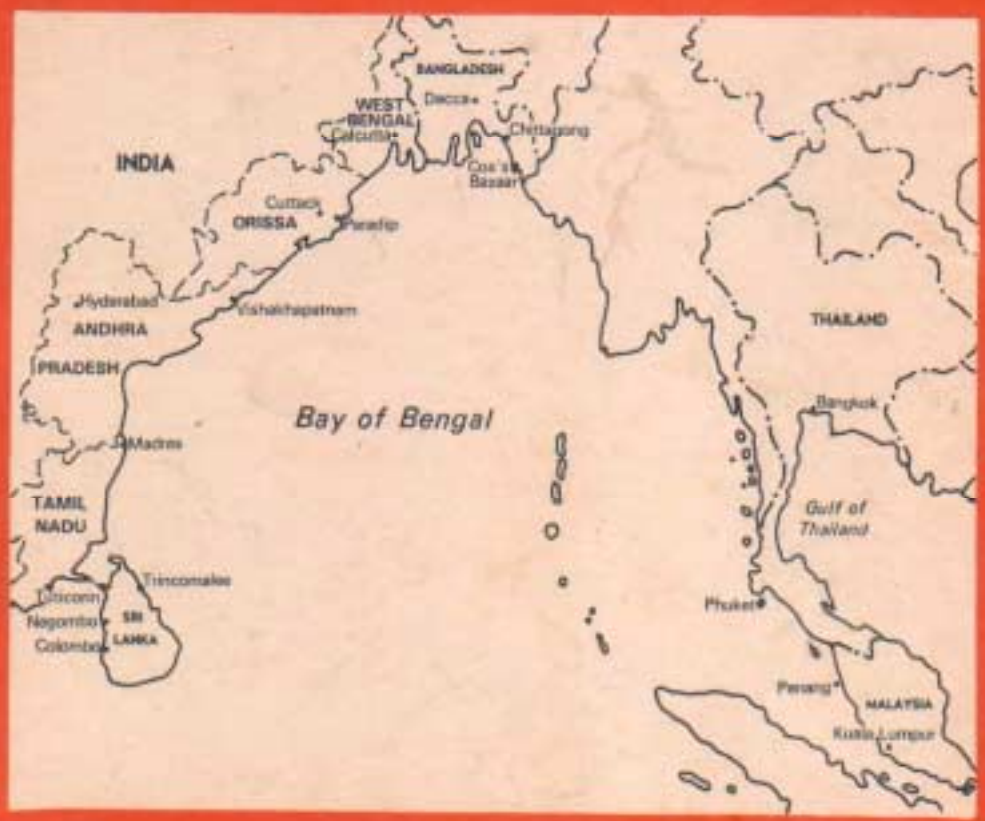
BOBP/REP/6
(GCP/RAS/040/SWE)

Report of the Workshop on Extension Service Requirements in Small-Scale Fisheries

Colombo, Sri Lanka
8-12 October, 1979



SWEDISH INTERNATIONAL DEVELOPMENT AUTHORITY

FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS

BAY OF BENGAL PROGRAMME BOBP/REP/6

Development of Small-Scale Fisheries (GCP/RAS/040/SWE)

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Funding Agency :

Swedish International Development Authority

Executing Agency:

Food and Agriculture Organization of the United Nations

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PREFACE

This document is a report of a five-day workshop on "Extension service requirements in small-scale fisheries" held in Colombo from October 8 to 12, 1979. It was hosted by the Government of Sri Lanka and conducted by the regional FAO Programme, "Development of Small-Scale Fisheries in the Bay of Bengal," GCP/RAS/040/SWE, referred to in brief as the Bay of Bengal Programme. Some 20 representatives from four countries attended the workshop, besides consultants from the Food and Agriculture Organisation of the United Nations and staff of the programme.

The report sets out the programme secretariat's understanding of the views expressed, the discussions that transpired and the conclusions reached at the workshop.

The opinions expressed at the workshop do not necessarily represent the official views of the programme's member-governments or of the FAO.

The Bay of Bengal Programme is funded by the Swedish International Development Authority (SIDA) and executed by the FAO. Five countries — Bangladesh, India, Malayasia, Sri Lanka, Thailand — are members of the programme. Its main aims are to improve the conditions of small-scale fisherfolk and the supply of fish from the small-scale sector in the Bay of Bengal region.

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SUMMARY

The main objectives of the existing fisheries extension services in the Bay of Bengal region include increasing fish production, promoting fish culture, improving the socio-economic status of fisher-folk, introducing new habits and attitudes among them. To promote these objectives, extension services in the region undertake many activities : they support programmes for mechanization of fishing craft, hold audiovisual demonstrations, publish literature, conduct training programmes, help organize cooperative societies and provide welfare facilities. In some areas they are also involved in compiling statistics and collecting revenue.

Problems faced by the extension service include financial constraints, very poor transport facilities, absence of a satisfactory monitoring mechanism, resistance to change on the part of, fishermen.

The work plan of an extension service should be based on a country's development objectives. If high employment is desired, the service should concentrate on artisanal fisheries and seek high community participation with a low technology and capital input. If higher production is the main objective, the extension service should opt to strengthen productivity through improved small-scale or industrial fisheries.

Extension workers may be either generalists, who work with the fishing community on solving its problems, or specialists (in fishing methods, fishing gear technology etc.) In marine fisheries, the generalist has insufficient impact unless backed up by specialists. Women could make fine extensionists, given their easy access to fishermen's homes, and an extension officer, male or female, would be all the more effective if he or she sought to motivate the women and children in the fishing community.

Recruiting fishermen as extensionists may have some advantages but it is impractical : fishermen with the necessary qualifications are rare, and such people often tend to seek jobs outside the fishing community.

The extension service can be effectively involved both with fisheries development and fishermen's welfare: in fact, the development and welfare functions reinforce one another. The extension service should have no role in resolving conflicts between the mechanized and the artisanal sectors, but its role as a medium of feedback to government can be valuable. As for the responsiveness of fishermen to change, their "slowness" may sometimes reflect their scepticism rather than their obscurantism : new ideas do gain acceptance once they are shown to work.

A monitoring system for an extension service should oversee such factors as fishermen's costs and earnings, loan applications processed by cooperative societies, non-operable time of fishing boats. The goals set should be very specific, and if they are not met, either the goals or the ***modus operandi*** should be changed.

In devising a fisheries extension service for a developing country, several approaches are possible. A case-study exercise at the workshop (where participants devised an extension system for an imaginary country, Ruatha) brought up three possible approaches. In the first, the problems of the fishing industry were identified, an overall development plan was framed to overcome them, and the role of the extension service in it was identified. In the second, specific areas were taken up as the most advantageous for extension, and plans were drawn up accordingly. A third

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approach postulated that the extension service should secure higher fish production by motivating the industrial sector, and encourage community participation to develop small-scale fisheries.

Many ideas were proposed on how the Bay of Bengal Programme could help extension services in the region. These included training for women extensionists and in-service training for existing extension officers (Sri Lanka) ; establishment of brackish water shrimp farming (Bangladesh) ; training courses for shrimp farmers on the management of nursery ponds (Thailand) ; pilot projects to test and demonstrate extension methods in aquaculture, fishing techniques, handling and processing of fish (India); training for specialist extension officers in marine fisheries (Orissa) ; assistance in designing and implementing an extension plan (West Bengal) ; help with refresher courses for extension personnel and the supply of vehicles and audiovisual equipment (Tamil Nadu).

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CONTENTS

INTRODUCTION

The main objective of the Workshop on Extension Service Requirements in Small-Scale Fisheries was to provide a regional forum for senior fisheries officials concerned with extension services. They were expected to critically evaluate the organisation and the work of existing extension services and suggest how they could be improved, modified or supplanted by better mechanisms. It was hoped that the workshop would formulate guidelines for action that the Bay of Bengal Programme and other agencies should take to strengthen and support extension services in the participating countries.

The workshop's inaugural session was highlighted by the active participation of Sri Lanka's Minister for Fisheries, Mr. Festus Perera. In his inaugural address, Minister Perera reviewed the current status of small-scale fisheries in Sri Lanka and stressed the key role of the extension service in the strategy for this development. He expressed the hope that the workshop would suggest ways to strengthen the extension service of the project's member-countries.

In his keynote address to the participants (list in Appendix I), Mr. E. R. Kvaran, Senior Project Operations Officer of FAO Rome, defined extension work as bringing to the fishing community "practical advice and technical assistance of immediate and direct benefit to the fishermen". Other points in his address:

-The work of the extension service must be supported by a consensus of opinion in the community.

— Higher fish catch, better cash return : these are the areas where the fishermen want help most. If the extension service is effective in these areas, fishermen will readily accept help from the extension service on other matters, such as maintaining systematic records of fish catch, sale price, and operating costs.

— Once the extension service proves itself, feedback from it will definitely influence government decisions.

— Extension workers must be well trained, and the training should include practical work in fish capture, rigging of fishing gear, maintenance of vessels, fish handling and processing. fish culture.

— It is true that fishermen are by and large conservative, because they cannot afford to take risks, but many changes have occurred over time, unrecorded and unnoticed. Fishermen do accept new ideas once their workability is demonstrated.

— There is no universal work plan for the extension service that can be adopted in all areas and situations. The extension service must formulate its plan for an area on the basis of the problems and conditions of that area.

During the discussion following Mr. Kvaran's presentation, Minister Perera posed the question : Sometimes government has to work within the limitations of the existing extension service. Pending the creation of a new order, how can the existing system be streamlined? What can be done in the quickest possible time to improve the lot of the fishermen?

The answer: A series of short-term extension plans to solve the immediate problems of fishermen, along with a long-term plan to improve the extension service, may be the best approach.

As for the most effective way of reaching the fishermen-another question posed by the Minister — it would vary from situation to situation. The extension service could work through fishermen's cooperatives, group meetings or individual fishermen.

Two examples of fishermen's response to extension were cited. In one of them, the fishermen had persistently refused to heed extensionists' pleas for hygienic handling of fish; but their attitude changed after a consignment of prawns exported by them was rejected by the importer. In the other example, fishermen had turned down the extension officer's suggestions that they should refrain from capture of small-sized prawns. But a big slump in prawn catch the following year made them change their minds.

The two examples raised the poser: is a crisis in the fishing industry necessary to make extension effective? Participants agreed that this was not the case. An extension officer has to be both patient and persuasive in inducing change. It cannot be effected overnight. It was pointed out that fishermen have sometimes opposed development projects, such as the building of harbours or the setting up of fish farms. But over a period of time, they have come to accept these projects.

There was some discussion on the relative roles of the welfare and development components in the extension service. One view was that the immediate goal of the extension service is higher productivity; those welfare activities that improve productivity therefore automatically qualify as extension functions. It was also pointed out that if the extension service succeeds in promoting fishermen's welfare, the development component of the service will be more easily accepted. There was, thus, general agreement that the extension service can combine development and welfare functions.

Referring to the controversy over pollution on the beach, Minister Perera said that close co-ordination was essential between authorities in fisheries, the environment and sanitation. This was because strict enforcement of environmental measures could hurt small fishermen.

One participant suggested that wherever fishing activity causes environmental pollution, extension agencies should bring home to the fishermen the loss of markets caused by the presence of bacteria in fish and by unhygienic preservation practices.

The inaugural ceremony, the keynote address and the discussion that followed it took up the morning of the first day's session. The remainder of the workshop was organised as follows :

- Reviews by participants of the existing extension service in the Bay of Bengal region.
- Open discussion on specific extension problems.
- A case-study exercise in which participants devised an extension system for an imaginary country, Ruatha, after studying a detailed paper on Ruatha's economic geography and its fishing problems.
- A field trip to Negombo, a fishing centre north of Colombo, which included visits to two fishing communities, a cooperative fish market and two boatyards.
- A study of the interaction between the Bay of Bengal Programme and the fisheries extension service of participating countries.
- A final evaluation.

EXISTING EXTENSION SERVICES IN THE BAY OF BENGAL REGION

The workshop heard representatives from Sri Lanka, Bangladesh and Thailand and from four Indian States — Orissa, West Bengal, Tamil Nadu, Andhra Pradesh -give an overview of the existing extension service in their respective regions. Their presentations are summarised below :

Objectives and philosophy: Put in a nutshell, the philosophy behind the extension services in the Bay of Bengal region is to help fisheries departments secure efficient utilization of the region's fish resources and better living conditions for its fisherfolk. Within this framework, the main objectives would appear to vary in emphasis from one area of the region to another. They are :

- Introducing new or improved habits, attitudes and practices in the fishing industry and the fishing community (Andhra Pradesh).
- Increasing fish catch and improving the socio-economic status of small-scale fishermen (West Bengal, Bangladesh and Orissa).
- Carrying the fruits of the latest technology and research to the fishermen (Tamil Nadu).
- Solving the problems fishermen encounter in increasing fish production, and providing feed-back to the government on fishermen's problems (Sri Lanka).
- Promoting fish culture, since marine resources in the region have been extensively utilized in recent years (Thailand).
- Supporting/administering/implementing programmes for mechanization of the fishing industry (Andhra Pradesh, Tamil Nadu, Sri Lanka).
- Publication of leaflets, brochures, pamphlets (Tamil Nadu, Thailand).
- Organizing audio-visual demonstrations, film shows/radio broadcasts (Tamil Nadu, Andhra Pradesh, Sri Lanka, Thailand).
- Demonstration of fishing gear (Andhra Pradesh, Sri Lanka)
- Organisation of seminars and training programmes (Tamil Nadu, Sri Lanka).
- Assistance in setting up cooperative societies of fishermen (Andhra Pradesh, Sri Lanka, West Bengal).
- Demonstration of fish preservation methods (Tamil Nadu).
- Assistance in the marketing of fisheries products (Sri Lanka).
- Demonstration of improved aquaculture techniques (Thailand).
- The provision of welfare facilities such as wells, houses, camp sheds (Sri Lanka, West Bengal).
- Training in handling improved varieties of craft and gear (West Bengal).
- Collection of revenue (Thailand).

The basic set-up of **the** extension service is similar in many states of India, with minor variations.

In West Bengal and Andhra Pradesh, extension officers are located at blocks under the administrative control of block development officers, with technical guidance extended by assistant directors of fisheries.

In Orissa, extension officers report either to agricultural extension officers or to fisheries officers.

In Tamil Nadu, extension work has been performed for many years by the fisheries department without a separate extension unit. But an extension cell has been set up at Tuticorin, and another is likely to begin functioning from Thanjavoor.

The set-up in Sri Lanka is somewhat different. The island is divided into 13 coastal divisions headed by district fisheries extension officers; they function as local heads of the Fisheries Ministry at the district level and work closely with members of Parliament and Government departments. Each district fisheries extension officer supervises a staff of more than a dozen -a fisheries assistant, a marine engineering assistant, and 10 to 15 fisheries inspectors, and reports to the Director (Extension and Regulation).

In Thailand, the Conservation and Extension Service Division is one of the eight divisions under the control of the Director General of Fisheries. This division operates a Fisheries Extension Service that conducts training, information and audio-visual programmes. In addition, fisheries officers located at fishery stations and 51 provincial fisheries officers also perform extension work.

Qualifications of Extension Officers: The qualifications laid down for extension officers by fisheries authorities in the region are fairly high. A B.Sc., Fisheries (Thailand), a B.Sc. (Sri Lanka) ; a degree in biological science (West Bengal) ; an M.Sc. or B.Sc. or Licentiate in Fisheries Technology and Navigation (Andhra Pradesh) ; an M.Sc. in Zoology (Orissa).

Transport Facilities Available to Extension Officers: In India, regular official transport is normally provided only to senior officers. It is also provided to extension staff for special occasions such as film shows or the distribution of fish seed to fish farmers. On normal days, the extensionist depends for transportation on what can be spared by his supervisor or by his department, or on available public transport such as buses.

In Sri Lanka, district fisheries extension officers are provided with jeeps and motor cycles, or bicycles if the roads are not motorable. There is a proposal to provide them regularly with audio-visual equipment. The publicity division in the Ministry of Fisheries is equipped with films and film projectors. Steps are being taken to provide all extension officers with official housing.

Training for Extension Officers: In India, state governments provide in-service training to fisheries extension officers. In addition, extension personnel are also trained at institutions such as the Central Institute of Fisheries Education, Bombay, the Central Institute of Fisheries Technology, Cochin, and the Extension Training Centre, Hyderabad.

The Sri Lanka Government gets some of its district fisheries extension officers trained abroad under schemes financed by FAO or the Colombo Plan. The officers go to India for postgraduate diplomas in fisheries science, to Japan for training in coastal fisheries or to the United Kingdom for training in fisheries management.

Communication Channels: In India, policy is generally planned at the level of Director of Fisheries and percolates to the extension officer through assistant directors and/or block development officers. The extension officer is in direct contact with beach-level fishermen and is often the chief implementing agent of policy.

In Sri Lanka, the district fisheries extension officer is the local head of the fisheries ministry at the district level and a key policy coordinator. The extension officer and the fishery inspectors who work under him are also in direct touch with the fishermen.

In Thailand, the extension service division that maintains links with fishermen is one of eight divisions under the Deputy Director General of Fisheries. Besides, provincial fisheries officers are in charge of extension in 51 of Thailand's 72 provinces. They report to the Director General of Fisheries.

Can Extension Effectiveness be Measured? At present there is no reliable mechanism to gauge the effectivenss of extension. Governments fix targets-such as a certain number of "night halts" at fishing villages per month -for extension workers, but such "target reports" tend to become a routine exercise eventually. Further, these reports can be faked, and there is no fool - proof monitoring mechanism.

Major problems in extension: Participants referred to the following major problems faced in extension work :

— Financial constraints.

— Inadequate training facilities for extension staff.

— Lack of research institutes for applied research on specific problems.

— Poor transport facilities for extension staff.

— Use of extension staff for tax collection or for statistics.

— Absence of a satisfactory mechanism to review the effectiveness of extension.

SPECIFIC EXTENSION PROBLEMS

In open discussion involving the total membership of the workshop, extension problems were considered in relation to the following topics:

- Strengths, limitations, and organisation of the extension approach.
- Community participation in the extension process.
- Extension and training
- Monitoring and evaluation of an extension programme.

Strengths, limitations and Organisation of the Extension Approach

With regard to the first topic, the following questions arose:

What can an extension service achieve? What are its strengths and its limitations? What are the different kinds of extension services, and their positive and negative points, and how can one choose an appropriate extension service?

One approach postulated that extension can be visualised as having three main components — technological aspects, community participation and community welfare. An important aspect of community participation is a two-way flow of information. These components vary in strength depending on development objectives and the nature of the target audience. If the extension service is working with a capital-intensive industrial fishery, for example, the technical component is strong but the social component is most likely weak. On the other hand, extension work with an artisanal fishery has a lower technological level but may have a much stronger social component and degree of community participation. Assuring a successful two-way flow of information is a more difficult problem for the extension service with artisanal than with industrial fisheries.

The type of extension service suitable for a given situation depends on the development objectives of the country concerned. If the main objective is higher employment, it will usually concentrate on the artisanal fishery sector, and may seek high community participation with a low technology and capital input. If the main objective is higher production, it might opt to strengthen productivity through either improved small-scale or industrial fisheries, depending on the particular circumstances.

Extension workers are of many kinds. They may be generalists who work with the community on its problems, help with credit matters and distribute extension literature. But in marine fisheries the generalist usually has insufficient impact unless backed up by specialists in fish catching methods, fishing gear technology, fish handling and processing, fish distribution and marketing and community organisation.

Thus, in many regions of the world, generalists are found working closely with specialists in serving the fishing community.

Often, extensionists are recruited from among university graduates who have little or no previous connection with fishing and scant commitment to the fishing communities. A possible alter-

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native approach exists in which extensionists are picked from the fishing community itself. Two obvious advantages of this system are that this kind of extensionist is already a good fisherman, and since he is from the community he is serving, he is likely to be better motivated and able to communicate this motivation to the fisherfolk. A disadvantage perhaps, is that he is very likely to be associated with one of the rival power groups often found in fishing villages.

Yet another system is based on a network of community fishing centres, which are staffed by the local people, one centralised technical team providing technical backup and training to a number of community fisheries centres.

What should be the range of extension service activities? Various participants suggested that its functions would be :

— Providing technical assistance and education.

— Strengthening fishermen's institutions, such as fishermen's cooperatives, marketing and credit organisations.

— Introducing appropriate technology.

— Strengthening two-way flow of information between fishermen and government.

— Promoting an innovative attitude among fishermen.

— Improving the family welfare of fishermen.

— Providing technical services.

There are some things an extension service should not do, some functions it should stay away from — such as tax collection, licensing and other enforcement functions -since the extension worker's effectiveness depends on his retaining the fishermen's confidence. If he is perceived as being part of an oppressive government mechanism that collects taxes and imposes unpleasant regulations and duties on the community, he will not be regarded as a friend.

Participants did not reach a consensus on the desired scope of the extension service, in particular on training for fishermen and community welfare.

One participant made a distinction between development and extension in fisheries. For example, a harbour is a basic infrastructural facility, and providing one is the responsibility of the government, not of the extension workers. The extension service is in some ways a missionary service. It does not span the entire spectrum of development; it limits itself to changing attitudes and habits, to providing up-to-date information, to spurring adaptive innovation.

Another point of view was that while development is the government's responsibility, the extension worker can serve as a feedback channel to the government on the development needs of the community.

Some other observations :

— Extension services do not have a major role in resolving conflicts between the mechanised and the artisanal sectors.

— Any activity that involves legislation should not be given to the extension worker. Wherever the government's resources do not permit separate agencies for enforcement and extension, extensionists should handle their enforcement functions with tact. Several participants agreed with this approach provided the fisheries staff in a locality consists of one man,

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but insisted that if two or more men are employed, the extension and enforcement functions should never be assigned to the same person.

There was disagreement concerning the amount of statistics collection which could be done by extensionists without compromising their effectiveness as change agents, but it was agreed that collecting statistical data was not as harmful as enforcing regulations.

It was also suggested that wherever fishing activities cause environmental pollution, extension agencies should bring home to the fishermen the loss of markets caused by the presence of bacteria in fish and by unhygienic preservation practices.

Community Participation in the Extension Process

Community participation can be a great stimulant to the success of any extension scheme. How such participation can be obtained, then sustained throughout a project, and how the community gains in consequence, were discussed by the Workshop.

This session was chaired by Fr. Sextus Kurukulasurya, a Catholic priest-cum-fisherman. An autonomous organization set up by him helps develop a fishing community near Colombo — both the adults, with whom he has many programmes, and young boys, for whom he runs a sea-scout movement.

Fr. Kurukulasurya said that an extension officer should seek to understand fishermen and their rhythm of life, and try to integrate them with the community. He could change fishermen's value systems in various ways — by persuasion, by personal example, by immersion, or total involvement with the community.

Fr. Kurukulasurya pointed out that the fishermen he works with are oblivious to his religion despite his robe, and note only his profession -fishing. This is because he has identified himself entirely with the fishing community. Illustrating this with an example, Fr. Kurukulasurya said that a police inspector on one occasion upbraided the fishing community for indiscipline, drunkenness and loose living. Fr. Kurukulasurya joined issue with the police officer, emphasizing his own origins as a fisherman and his continuing membership of the fishing community.

Fr. Kurukulasurya stressed the fact that an extension worker need not be a specialist. He is a generalist, a good Samaritan, a "fix-it" handyman, a jack-of-all-trades. He doesn't have all the answers but knows where to find them. He knows who can handle small children, who can offer loans, who can fix an engine, who can provide the right kind of net. He is an efficient problem solver.

Techniques for mobilizing community participation were discussed. It was agreed that an extension worker could be very effective if he sought to influence the women, who run the fisherfolk's homes, and the children, the key to their future.

It was noted that Sri Lanka has many of the elements of a matriarchal society. Women control the home, decide the needs, regulate the finance. They are active in fish processing, handling and canning. Their sense of economy helps the family make ends meet. The fisherman, on the other hand, is economically imprudent. When he is hungry he goes to the wayside shop, has his fill, then asks the price- which is invariably marked up after the product has been consumed.

One delegate observed that there are spendthrifts among women too. But their spending often goes into jewellery which is a form of investment.

In Tamil Nadu too, it is the woman who controls the purse strings. "Men are mostly at sea and too tired for pep talk when they reach the shore." The Workshop agreed that women are not merely good agents of influence but would make good extension officers themselves because of their freer access to fisherfolk's homes.

Is it practical to recruit extensionists from fishing villages to ensure strong community participation? Often it is not. It is rare for a fisherman to possess the qualifications the government prescribes for extension officers, and the rare ones who do may seek employment outside the fishing community. Some participants felt that these difficulties should not preclude efforts to recruit extensionists from the fishing community itself. The work of Fr. Sextus Kurukulasurya was cited as an example of the creative commitment of such individuals.

Some otherpoints: A community should be so organized that an extension service is effective. The extension worker should identify groups within a village -such as people with a flair for tailoring -and set up an organization for them. Once an organization as contact point exists, extension is easier. Rapport and support can be built up, better feedback is possible. Similarly, an extension worker should make maximum use of voluntary or social welfare organizations in the village.

Extension and training

Extensionists may be involved both in receiving and imparting training. The workshop discussed both categories. It also discussed the educational and temperamental requirements of extension workers, recruitment policies for extensionists, and the training structure of extension services.

Receiving training: It was suggested that a distinction can be drawn between extension services which attempt to deal with all the aspects of small-scale fisheries development and those which restrict their approach to the less technical matters. For the first, broader approach, extensionists would need solid technical training — relating to fishing gear, the use of craft, fish handling and so on. For the second approach, which aims at changing the attitudes and habits of fishermen and spurring adaptive innovation, extensionists would require training in public relations techniques, knowledge of the fishing community's history, culture and ethos, and other related matters, but not higher-level technical competence.

Imparting training: What should be the scope of training imparted to fishermen by the extension services? One view was that the extension service should be involved in all village-level training, since non-involvement in training would cut down the access of extensionists to villages. The training could be imparted through group discussion and seminars, formal training centres, or short, practical demonstration courses.

Another participant postulated that training has two components -fisheries education, dealing with the science of fishing, fish-handling and so on, and training in fisheries skills, such as how to find out the sex of a fish, or how to operate a boat, how to construct an efficient net, etc. If the extensionist is to be effective, he should be as well-trained as the fisherman he is dealing with. He should be fully professional in his training approach. If he doesn't have the needed knowledge in a given situation he should locate the correct source of information rather than impart erroneous knowledge.

The extensionist's sense of commitment to the community he is serving must be strong. Both capability and commitment are essential for the good extensionist.

Education of Extensionists: It was agreed that one should not set educational standards too high in recruiting extensionists. High qualifications may be an asset, but over-qualified people are both difficult to hold and often lacking in a real commitment to field-level work with fishermen.

On the other hand, it was stated that there are drawbacks in not prescribing minimum educational criteria, in trying to recruit generalists committed to village uplift but without a good education. The system is capable of abuse since a number of non-qualified people could be recruited, ostensibly as extensionists, but really to serve political ends or further private interests.

Another drawback with the extensionist lacking higher educational qualifications is that he can't rise up the ladder. This can demoralize the entire extension service. It is partly for this reason, delegates said, that governments prescribe fairly high qualifications for extension officers.

As for the subject specialization, a degree in zoology is often prescribed for fisheries extension officers. Although a knowledge of zoology enables one to understand some aspects of fisheries, it is not adequate by itself and selected candidates need further training for effective fisheries extension.

In addition to education, an essential requirement for extensionists is a fondness or aptitude for field work.

One recruitment approach suggested was to pick a man with some experience in the fisheries department, give him a few years of specialized training on the philosophy and methodology of extension, and on particular skills. He may turn out to be an excellent extensionist.

Extension training structure: The structure may vary from place to place. One arrangement would be to have layers of technical specialists coordinating with the technical branches of fisheries departments for direct training of both field extension officers and fishermen. Training at a lower technical level would then be carried out by field generalists under the supervision of extension administrative officers.

One participant emphasized that whatever be the arrangements, the linkage between the policy-maker and the extensionist should be short, because implementation of fisheries policy very often depends directly on the extensionists.

Other points- The education and training requirements of extensionists vary for marine fisheries, inland fisheries and aquaculture.

— Extension officers should feel that they are being paid a fair wage in comparison with officials of parallel government departments.

Monitoring and Evaluation of an Extension Programme

The workshop discussed the need for continual appraisal and modification of extension activities. This action normally includes co-ordination, monitoring, evaluation and revision.

Why coordination? A multiplicity of agencies, operating at different levels, are involved with the fishing community. There should be a mechanism to coordinate the activities of these various agencies so that they reinforce each other, the resulting whole being greater than would have been the sum of the individual agencies' uncoordinated inputs. When the coordination is effected both at the policymaking and the field levels, a great deal of the red tape, conflict of interest, and duplication of effort seem to disappear.

One participant noted that for India's rural sector, there are three levels of coordination. At the block level, district collectors have to coordinate with officials of the health, agriculture, fisheries and animal husbandry departments. Heads of research institutions in these fields interact with one another and there is technical coordination among scientists of agricultural universities and research stations.

Better coordination should be sought everywhere through better communication and information flow.

As regards monitoring and evaluation, the view was expressed that while everyone agrees on their importance, there are very few effective systems to bring it about. A monitoring system for an extension service would aim to keep a tab on such factors as fishermen's costs and earnings, applications for loans received and processed by cooperative societies, non-operable time of fishing boats. This information could be a useful index of productivity and efficiency.

Another way to measure and thereby improve results is to set very concrete goals. "If you do not achieve them, change either what you are doing or where you want to go."

Some otherpoints: A system of monitoring and evaluation could strive to set up incentives and rewards for good performance. Example : Publicity through a printed pamphlet or bulletin may not merely reward the performer but spur the non-performer.

- Targets should be attainable. Often they are fixed at impractical levels, and failure to achieve them causes frustration and subsequent giving up.
- There is no foolproof monitoring system but the effort to establish a reasonable and cost-effective control system should be well worth the time and trouble.
- The job of evaluating an extension officer is easier if data collection is one of his functions.

A CASE STUDY OF RUATHAN FISHERIES

Ruatha is an imaginary country with "'data"-physical, economic, social-picked from countries within the Bay of Bengal region. This paper on Ruatha. prepared by Bay of Bengal Programme consultant J. Johnson, served as the basis for a case-study exercise for participants in the Colombo extension workshop.

The participants were divided into three working groups. Each group was asked to devise a five-year extension service plan for Ruatha within a pre-determined budget to fulfil agreed objectives. The information and insights provided by earlier sessions of the workshop was to be made use of by the participants.

The plans recommended by the three groups were later critically evaluated by the workshops total membership. A summary of these plans, and of the reactions to them, appears on pages 24-25.

Ruatha has a coastline of approximately 850 km. with the shelf extending about 100 km. from the coast to give a total area of some 98,000 sq.km. The total catch of marine species is approximately 30,000 tonnes per year, and this figure is likely to rise.

At one end of the coastline is a large fast-flowing river which also acts as a primary transportation channel. A maze of mangrove swamps with some navigable channels for small craft and lower currents extend alongside the main river almost up to the capital city which is situated about 200 km. up river from the coast.

There are three major fishing ports other than the capital city (see map) :

"Port One" is near the opposite end of the coastline from the river.

"Port Two" is approximately two thirds of the way between Port One and the river mouth.

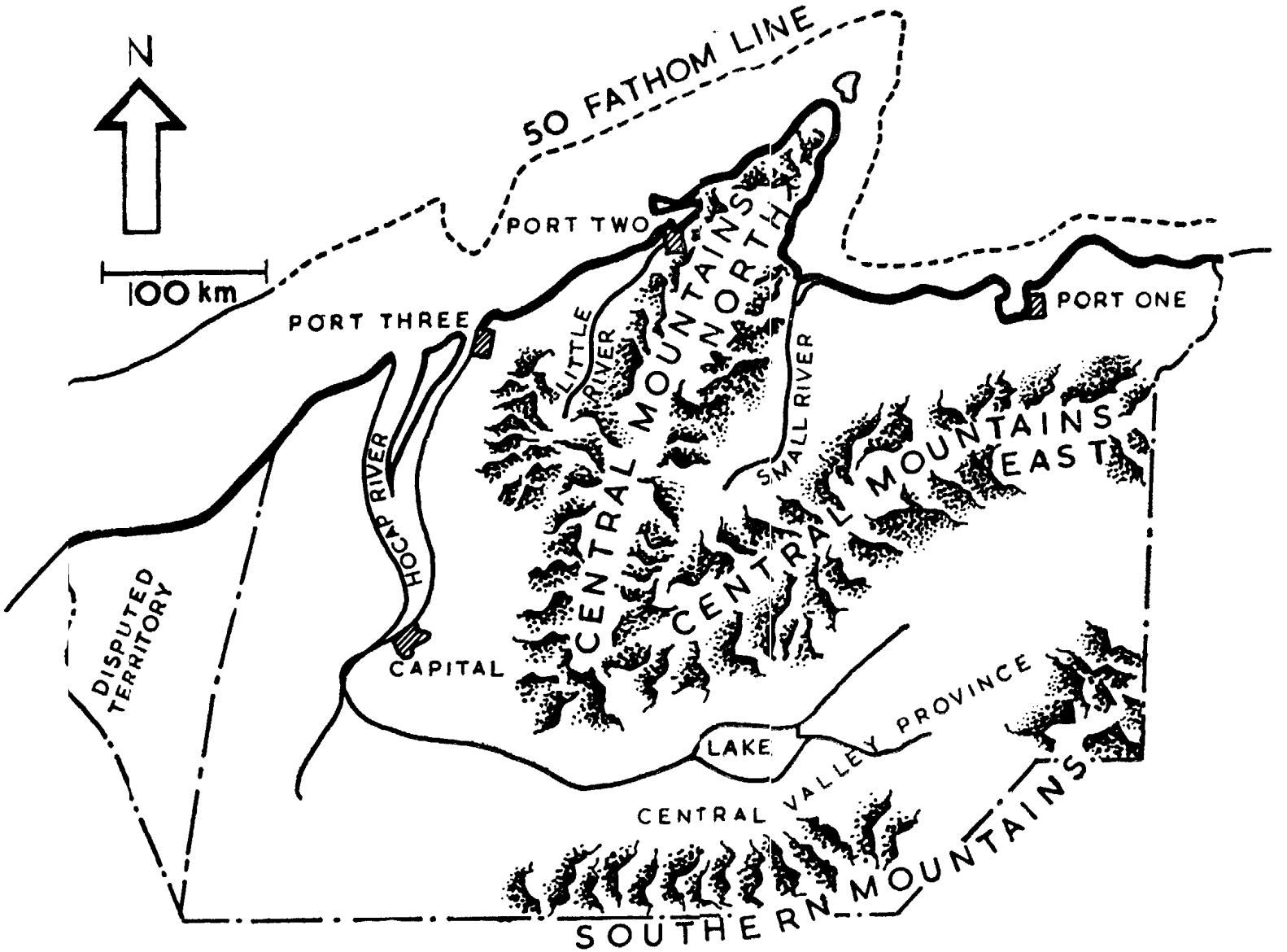
"Port Three" is at the river mouth.

A number of lakes are grouped in the centre of the country some 150 km from the coast; the only large lake has an area of about 200 sq. km and for the most part is about 30 metres deep. These lakes support an artisanal fishery using canoes and a number of 7-metre boats which use sail and paddle for propulsion. The largest lake is considered to have excellent potential for a much greater catch and the bottom is suitable for trawling.

Much of the central valley area surrounding the lake is considered suitable for fish farming or combined fish and rice culture.

The principal marine fisheries of Ruatha include those for shrimp, tuna and lobster all of which have a strong export orientation, as well as domestically oriented fisheries for mullet, milkfish, a variety of other estuarine species, small pelagics, a typically tropical assortment of varied reef fish, and significant resources of other demersal species.

Shrimp are prevalent in the major estuary of the Hocap river and as far down the coast as the peninsula after Port Two. The shrimp fishery is carried out on both a commercial/industrial



MAP OF RUATHA

and an artisanal level. The primary artisanal techniques are stownets set in the tidal channels and bottom-set tangle nets, as well as operations in the small-scale motorised sector whera vessels under 10 metres in length with a crew of four tow a single shrimp trawl in near-shore waters. Intensive commercial trawling is carried out by a fleet of double rig shrimp trawlers in the 20 metre length range, 200-400 hp, with an average crew of 15 men.

Shrimp captured by artisanal fishermen are delivered direct to the central processing plant where this is nearby. Otherwise shrimp are bought from the individual fishermen and batched by a middleman with a small truck for subsequent transport and sale to one of the freezing plants.

Since the artisanal fishermen fish intensively in the shrimp nursery areas with fine-meshed nets, much of their catch consists of small juvenile shrimp with no export market. These small shrimp are mostly sun-dried for domestic distribution and consumption. The traditional processing and distribution in the rural areas is generally carried out by women related to the fishermen.

The industrial shrimp boats catch mostly larger size shrimp which is held on ice for up to 10 days before being delivered to one of the freezing plants. Virtually all this shrimp is exported. The industrial shrimp companies are putting pressure on the Minister of Natural Resources to close all fishing for shrimp in the estuarine nursery areas, arguing that if the juvenile shrimp now captured by the artisanal fishermen were allowed to grow up the total value of shrimp landed in Ruatha could be increased by some 20-30%. At present the artisanal fishery accounts for 25% of the total weight of shrimp landed, but for only 10% of the value, due to the generally smaller size and inferior handling technique in the artisanal fishery.

Total landings have oscillated in the range of 6000 tonnes per year for the last six years in spite of a doubling in size of the industrial shrimp fleet during that period.

Shrimp are landed in the capital at the head of the large Hocap estuary, where about 80 large vessels supply four plants, at Port Three, where 40 vessels offer their catch to two processing plants ; and at one plant in Port Two, which purchases shrimp from 15 locally based commercia l shrimp boats. Although shrimps do occur to the east of the peninsula they ,are not in dense enough population to economically justify trawling for them; thus there is no shrimp fishery based in Port One.

In the long coastal mangrove zone between the capital and the peninsula there is a belt of brackish water backwaters with n-any channels to the sea. On the land side of these backwaters there is a belt of swampy land, about 60,000 hectares in extent, mostly owned by the Government. Some 1000 hectares are currently enclosed for low-technology level shrimp and milk fish culture by small-scale fish farmers. The average pond holding is one hectare.

Tuna are fished both on a small scale and on an industrial scale. Principal species are skipjack (Katsuwonis pelamis) and some yellow fin (Thunnus albacares). The small fishery is carried out by small motorised and sail-powered trollers, each trailing about six shallow lures. The catch per day is relatively low, but then so were expenses before the price of oil began to rise, and the technique is simple. About half the fish are juveniles under 1.8 kg. in size (considered the minimum acceptable size for commercial processing). About 200 small-scale trollers are in operation, principally from Port One which is near the zone through which the tuna migrate. It has been recommended that the trolling fleet learn the techniques required for deep trolling in order to capture more of the larger tunas and also that modern design improvement work be done for the sailing trollers in view of the constantly increasing price of diesel fuel, but no action has yet been taken. Many fishing villages between Port One and the peninsula could capture more tuna, but there is no reliable purchasing and collection network, and sailing into Port One with each day's un-iced catch is physically impossible because of the long distance involved.

The trolling fleet lands about 3000 tonnes of tunas in an average year. The overlapping long-line operation of these and other similar small-scale vessels is mentioned in the section on large pelagics.

The industrial tuna fleet is largely based on live-bait pole and line fishing. The 20 metre pole and line vessels carry either ice or refrigeration and a crew of about 15. The best tuna bait resources are in the region between the Hocap estuary and Port Two, while the tuna processing plant in Port Two is a joint venture with a Japanese firm. Twenty pole and line vessels owned by the packing plant operate with Japanese skipper and engineer, but a Ruathan crew. Another 15 vessels are run by a wholly national company, and there are about 10 individually owned vessels all delivering to the same plant, which processes about 6000 tonnes of tuna per year.

Traditional small-scale fishermen complain that the near-shore use of the small tuna bait purse seines is stealing the fish which the artisanal fishermen require for their living. Feelings run high and shots have been fired at tuna boats catching bait at night in inshore waters. A commission has suggested that a royalty be paid to the village by the tuna boats for each basket of bait taken from waters traditionally controlled by the village. No action has been taken on this recommendation. The fishermen say this is because highly placed politicians are shareholders in the industrial tuna fleet, and the fisheries department says it is awaiting a major policy decision on free access to national marine resources.

The tuna plant in Port One is nationally owned and supplied by ten local pole-and-line vessels as well as the trolling fleet. There has been some bad feeling between the local boats and those from Port Two with respect to rights to the limited bait fish in the Port One region, to which the local boats feel they have priority.

The equipment in the Port One plant is getting old and lost time due to machinery malfunctions and scheduling problems is increasing. An American tuna firm is attempting to get a joint venture arrangement going in which the foreign firm would bring in capital for up-dating the plant and also bring in expatriate top-level managers. The Americans also want to bring in a large tuna seiner to operate in national waters. Current production of the Port One plant is about 2500 tonnes per year.

Spiny Lobster is captured in various rocky reef areas by divers in a purely artisanal fishery. The captured lobsters are transported in live wells to the shrimp plants for purchase, processing and export. Total capture is about 200 tonnes per year and appears unlikely to increase.

Small Pelagics of several species are plentiful in the region between Port Three and Port Two, chiefly because of the nutrients contained in the Hocap river outflow. Various lift nets and surround nets have traditionally been used to capture these fish for subsequent salting, sun-drying, and consequent domestic distribution by women from the fishing communities. At present, however, the major portion of the catch is taken by a fleet of twenty locally built 16-metre motorised purse seiners with a crew of about 15 men.

The captured fish are kept without ice or refrigeration and returned each day to the fish meal factory in Port Two. Efforts have been made to can some of the sardine-like fish, but poor quality and the continued need for heavy government subsidy caused the canning operation to be shut down two years ago. The industrial fleet lands about 20,000 tonnes per year.

It has been suggested that fermented fish products could be made instead of the canned variety, and a professor at the Ruatha polytechnic is carrying out some trials along with his regular teaching duties.

The artisanal fleet capture is down to about 2000 tonnes per year of small pelagics, all of which undergoes traditional processing. The price of fresh small pelagics has fallen by a factor of

two since the industrial purse seine fishery began, and it appears that the traditional lift net fishery is in permanent decline. About 1000 men still participate in this fishery.

Large Pelagics are fished primarily by small-scale (10 metre) motorised vessels with a crew of four who generally use large mesh drift nets to capture around 50 tonnes per year of Spanish mackerel, skipjack, small tuna etc. About two hundred of these vessels follow the fish all along the north coast for an annual yield of some 10,000 tonnes. These fish are generally consumed domestically rather than exported. Fishing experts have suggested that the seasonal catch of these boats could be increased by shifting to pelagic long-lines as the driftnet season draws to a close, and tests using this method have been promising.

Mullet (Mugil spp) are primarily estuarine and brackish water fish captured along the entire coast by artisanal fishermen with nylon gillnets. Current landings are uncertain but estimated at around 3000 tonnes per year for about half that number of fishermen. The product is sold fresh, or may be salted depending on the time of the year.

Reef Fish are taken in an artisanal fishery which uses mostly hand-lines and some gill nets. Vessels rarely carry more than three people, and only about half are motorised. Many of these boats can shift from reef fish to lobster and could also fish the bays and estuaries. The production of the shallow reef fishery is inherently limited, and the current landings of around 1000 tonnes per year are probably about the maximum continuous yield. Some reefs appear to have been virtually fished out.

Demersal fish are caught by long line, hand line and trawl. Many of the small fresh fish in the capital fish markets are by catch from the shrimp trawlers while ten small wooden trawlers operate out of Port Two specifically for bottom fish. The shrimp trawlers land about 5000 tonnes per year of saleable fish (5 times as much “trash fish” is dumped back over the side) while the fish trawlers land nearly 2000 tonnes of somewhat larger bottom fish, most of which is consumed fresh. There are moderately good resources of bottom fish, but given the high cost of fuel it is not a high-profit enterprise.

Better prospects exist for the high-value snapper and grouper fisheries around the deep reef and the continental shelf drop-off. These species have a good export market as well as a high domestic price and are as yet only lightly fished. The best technique is hook-and-line either in some very strong arms or on a powered reel. The coast from Port Two to Port One is the most favourable zone, and it ***is*** estimated that between 1000 and 5000 tonnes could be landed per year, or 5-10 tonnes per year per fisherman. A fisherman’s cooperative from Port One has asked for a loan to buy a refrigerated steel mother vessel (25 metres) and ten small dories for the snapper fishery. The largest vessel owned by a cooperative member is ten metres with a 25 hp in-board diesel.

Shrimp Culture

In the swampy land bordering the brackish water backwaters between Port Three and the peninsula, there are about 500 hectares where a single crop of saline paddy is being cultivated on land leased from the government. During the rainy season, when the paddy fields get flooded with an overflow of brackish water from the backwaters, there exists a traditional practice of culturing shrimp in the flooded paddy fields using fry collected from the sea. A station established in this area has conducted experiments on brackish water pond culture, also using fry collected from the sea, and has developed techniques by which a production of 600 kg/ha of shrimp has been obtained from the brackish water ponds attached to the station.

Statistical Summary of Ruathan Marine Fisheries

Fishery	Landings		No. of fishermen		*No. of boats	
	Art.	Comm.	**Art.	Comm.	**Art.	Comm.
Shrimp	1500	4500	4000	2000	N/A	135
Tuna	3000	7500	1000	820	200	55
Small pelagics	2000	20000	1000	300	300	20
Large pelagics (gillnet & longline)	10000		800		200	
Lobsters	200					
Mullet	3000		1500		500	
Snappers and other demersals	5000	***5000	2000	N/A	1000	N/A
Fish trawlers		2000		200		20
	24700	39000	10000	3320	2200	230

**"artisanal" includes small-scale motorised vessels.
*some artisanal boats/and fishermen are undoubtedly counted twice.
***shrimp by-catch.

The Government is now putting together the next five-year fisheries plan. A tentative overall goal of an increase of 25,000 tonnes per year has been set, 20,000 tonnes of this to come from the industrialised fishery and 5,000 tonnes from the small-scale/artisanal sector.

The National Planning Council has requested detailed recommendations on the role of marine fisheries extension over the next five years, and suggested a budget of 250,000 Rutis for total capital expenditure for the entire period, and an operating budget of 200,000 Rutis per year, excluding aquaculture extension. Approximately half these sums are expected to be available for the aquaculture portion of the extension service.

The extension service has available in the capital a central office with reasonable secretarial equipment and about 500 sq.m of office space. There is in addition office and storage space of 50 sq.m. available at Port Three and Port Two at no purchase cost to the extension service. Fisheries department community offices must be shared with the extension service at no cost. All additional buildings and equipment must be purchased.

Average prices for marine catch in 1978-79 were as follows :

Large shrimp	Rs 1 0.00/kg.
Small shrimp	5.00/kg.
Tuna and other large pelagics	0.80/kg.
Small pelagics (for meal)	0.05/kg.
Small pelagics (for food)	0.10/kg.
Lobsters	15.00/kg.
Mullet	0.30/kg.
Snappers etc.	1 .00/kg.
Trawled fish	0.20/kg.

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Some Socio-Economic Observations

There are two major ethnic groups in Ruatha, namely the Siddis of the North Coast and the Hocap River estuary, and the Arthas of the central valley, uplands and the capital region. Artha is the primary official language, but Siddi is still widely used in the coastal areas, and the capital has a mixed ethnic composition.

In the coastal fishing villages the traditional social structure is still relatively strong, as evidenced by the fact that the official village headman, required by the central government to be elected by the villages, is almost invariably also the traditional village headman who consults with a more-or-less formal traditional council of respected village elders on all important matters. There is some degree of rivalry between the secular (civil) village leadership and the religious leadership for influence with the villagers, although both religious and civil leaders usually (but not always) present a united front in dealing with people from outside the village area.

Extended families are common, the bride going to live in the house compound of her husband's father. A marriage feast, paid for by the father of the groom, is a very major but also necessary expenditure. It is often financed by a loan from a larger fish buyer, who then is paid back from the fish catch over the next one or two years.

All income from sons living in the extended family house is considered as belonging to the head of the household, as is the money earned by unmarried sons living away from home. Even married sons living away from home are considered to have a major financial obligation to their fathers, although this is much less clear-cut. In addition to the extended family, clan ties are also strong, at least to the extent that destitute, unemployed clan members can claim support and assistance from their more well-off clan brothers.

Most of the village fishing is done with hand-lines, liftnets and gillnets, operating from one-man craft, more sophisticated dugout canoes, and some larger locally built planked craft, all of which are capable of being landed through the surf on to the beach. The larger planked craft are mostly for use during the four months of bad weather when up to ten fishermen may go out in each larger vessel. The crews of these larger vessels have some tendency to be related to the owner, but there is no real rule about it. The share of catch going to the vessel (and its owner) is little more than what is required for vessel maintenance, and the crews do not seem to regard the boat owners as exploiters of their labour.

Motorization of the village vessels has been slow, however, since the price of small pelagics especially has been falling after the introduction of purse seiners in Port Two and the sale of by-catch from theshrimp trawlers. Thus there is not enough money saved from the village fishing industry to buy motors or newer and better boats.

Improvements in the vessels (including motorization) and gear in the village have been financed from two principal sources : funds sent back to families in the village by sons who have found jobs in the industrialised, commercial fisheries of the major ports, and by loans from fish-buying middlemen. Because of falling fish prices (or prices which do not keep up with general inflation) some of the formerly independent village boat owners have had difficulty repaying their loans and remain in debt to the middlemen.

Fishing operations in the Hocap estuary and extensive delta region are not interrupted by the north-east monsoon, and the large village boats are not found in this area. Scarcity of appropriate wood is forcing up the cost of the one-man fishing raft (kattumaram) to the point where soon the artisanal fisherman will not be able to afford to buy his own.

Although in the past a fisherman's family often raised some agricultural crops on nearby plots, this has become less common as the population of the coastal villages increased, and there has been a tendency for some young people to specialise in agriculture and for some others to specialise in fishing.

Employment outside fishing in the coastal villages is scarce, although there is some trade in coconuts and copra. Some former fishermen in the Province of Port Two have given up fishing and migrated inland to work as rubber tappers.

Roads to the fishing villages on the north coast are often in bad repair or viritually non-existent. This makes it much more difficult to have fish landings transported to larger urban markets, and sometimes serves indirectly to lessen the competition between fish buyers, since many do not wish to risk using their vehicles on the very bad roads.

Housing in the rural fishing villages is of reasonable traditional quality, but small fishermen in the cities often live in squalid shanties. In the urban areas there is often a lack of water for washing fish and people at the landing sites as well as at the fishermen's houses have no provision for dealing with the offal from gutting catches, and only a mud bank on which to discharge the catch.

A number of rural villages suffer from salt-water intrusion into the village wells during the dry season, especially in those areas where small-scale irrigation is carried out.

Each of the major ports has a large group of small-scale fishermen, but the traditional village authority structure is absent and extended family groups are less common. Small-scale fishing shades imperceptibly into commercial industrial scale fishing in the port areas.

Fishermen's cooperatives have been tried in a number of locations along the coast as part of the government's effort to accomplish small-scale fisheries development, but for a variety of reasons they have not been successful. The cooperatives would often include rival fishing villages together, were open to all (including middlemen) and were based on European-modelled by-laws. The cooperatives which still function operate mainly for the purpose of importing fishing gear for their members free of customs duty.

Government Fisheries Service

The service has developed since its establishment 25 years ago. It is headquartered at the Fisheries Development Centre in the capital city. Here, some 20 officers are involved with general administration and management duties and six specialists with research and development. They are assisted by a staff of about 50 other grades.

Field offices are located at each major port, principally for management including statistics and revenue duties. Each of these units has four officers together with a dozen or so other grades. Smaller offices manned by one or two other grades are located in 20 centres along the coast used as artisanal landing sites, at the large lake and in the aquaculture area.

Initial recruitment of the officers is now from the oceanography programme run by the polytechnic located at Ruatha's capital or from the fisheries biology sub-option of the university also in the capital. Six officers have received additional training abroad to the level of a master's degree; one has received a doctorate.

The Fisheries Development Centre: This is located in the capital close to the polytechnic and is administered by the Department of Fisheries.

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Well equipped facilities are available together with a 20 metre ex-shrimp trawler which is used regularly for research and development activities.

The Government Fisheries Service is headquartered at the Centre.

A group of young specialist staff, all of whom received initial training at the polytechnic, are available for the extension service, and several have had further overseas training in fisheries biology and management. Specialist staff include two biologists, besides experts in management, exploratory fishing and gear development, statistics, boat design and construction.

The staff are keenly interested in cooperating in all aspects of fisheries development, education and training.

Fisheries Education and Training: *1.* A technical school (secondary) at Port One offers a fisheries course during the final year which provides basic training in fishing gear, seamanship, basic navigation and marine engines. About 15 students complete the programme every year. In the matter of staff, equipment and practical training the school's facilities are somewhat inadequate.

2. The technical school at Port Two is comparable to that at Port One.

3. A national school for fisheries is located at Port Two and concentrates on preparing officers for the merchant marine. From time to time it operates courses to prepare fishermen for the certificate of competency examinations, in association with the directorate of merchant marine.

4. A programme in oceanography is offered at the polytechnic in the capital, in association with the fisheries development centre. The programme is of a reasonable standard and includes biological, physical and chemical oceanography, with the students undertaking practical work aboard the centre's vessel.

5. A "sub-option" in marine (fisheries) biology is offered by the University in the capital city as part of its natural sciences programme. This is highly theoretical, and students undertake little or no practical work.

The General Education System: Eleven years of general education are provided beginning from the age of six. This consists of six years of elementary education followed by five years of secondary education. An additional year is taken up by students proceeding to the University.

Approximately 65% of the young in Ruatha complete elementary education and 20% complete secondary education, some 2% continue education at the University.

At the secondary level, students may pursue either traditional or technical education in special high schools. About 60% follow the traditional route and 40% the technical route. Technical schools cover the usual range of vocations and two of them offer a "fisheries preparation" during the final year.

There are four universities in Ruatha's major cities, in addition to the polytechnic in the capital. An agriculture college exists in the interior.

In addition to the Department of Fisheries, some other agencies concerned with the fisherman and his community are:

— The Ministry of Education, through schools and adult literacy programmes.

— Department for the Promotion of Cooperatives in the Ministry of Commerce and Industry.

— Ministry of Public Health (inoculations and family planning).

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- Customs Department (smuggling).
- Ministry of Agriculture (fish farming).
- Department of Roads and Transportation.
- National Electricity Generating Board.
- National Council for the Welfare of the Family (headed by the wife of the President).
- National Sea Fisheries Corporation (tuna, bait boats, some shrimp vessels, one packing plant).
- University of Port Two and University of the Capital (some of the graduates in sociology or economics get their degrees in fisheries-related subjects. Usually their theses do not relate to Ruatha's fisheries development plan. They are read only by the students and their professors and then forgotten),
- Various non-governmental organisations devoted to such things as the welfare of Siddis, Arthas, women, children, farmers, fishermen, students, labourers, Muslims, Buddhists, Hindus, Christians, boat owners, animals and the environment.
- Various development aid agencies from developed countries, which often are receptive to requests for small amounts of money to help carry out small well-conceived development schemes, especially if initiated by the fishing community itself.

Outline Solution for Ruatha's Extension Service to be Suggested by Workshop's Working Groups

1. Determine objectives for an extension service for Ruatha under the conditions described in the foregoing paper.
   (See ranking exercise instructions.)
2. Decide the organizational format of the extension service and the approach selected. Briefly describe the role of each category of extension personnel, and how they interact.
3. State the type and extent of community participation required, and the extent of complementarity between extension plans and the traditional village structure.
4. Describe the interaction of the extension programme with the efforts and responsibilities of other agencies.
5. Set down the planned investment in durable goods : vessels, motors, fishing gear, processing equipment, trucks, jeeps, motorbikes, bicycles, buildings, piers, etc. All these purchases should be made at the beginning of the five-year period.
6. Specify staffing requirements by category. Include a description of the minimum education or experience necessary for people to be hired for each position.
7. Work out the operating expenses budget,
8. Specify the training programme for extensionists and others.
9. Set down the statistical or enforcement duties of extensionists, if any. Give reasons why these duties must be carried out by extensionists rather than by other personnel.
10. Specify the provisions for (self) monitoring, and for ongoing revision of the programme in the light of results being obtained.

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BUDGET: RUATHA'S FISHERIES EXTENSION SERVICE

ITEM	Purchase Cost per Unit	Number of Units (Or People)	Investment	Maintenance and Depreciation	Cost of M & D	Operating Expense per Unit (Gas, Oil etc.) Year	Overall Yearly Cost per Unit	Total Yearly Cost	Salary	Field Subsistence Allowance	Field Time	Field Subsistence Cost	Additional Costs (Transportation, Training etc.)	Total Cost per Person per year	Total for each level	Total Operating Cost
EQUIPMENT																
Bicycle	400			20%	80											
Motorbike	2000			20%	400	400										
Jeep	10000			20%	2000	4000										
Truck (2 ton cap.)	40000			20%	8000	15000										
Boats7m	10000			20%	2000	4000										
10m(40hp)	20000			20%	4000	16000										
18 m(100 hp)	200000			20%	400000	40000										
Equipment (sub-total)																
BUILDINGS																
Temporary persquare	4			25%	1											
Permanent metre	100			5%	2											
Buildings (sub-total)																
PERSONNEL																
G1 fisherman									1200	400x						
G2 assistant									2400	600x	=					
G3 extensionist									4800	1200x	=					
G4 supervisor									9600	2400 x	=					
G5 director									12000	3000x	=					
consultant									12000	6000 x 100%=6000				18000		
Other																
Other																
Other																
Personnel (sub-total)																
Total																

Ranking Exercise

Each case study working group was presented with the following list of suggested objectives for Ruatha's extension service and asked to (i) recommend their order of importance and (ii) to use the list as a guide in establishing the desired extension service for (Ruathan) fisheries.

The working groups had the discretion to totally discard any of these objectives as inappropriate for the concerns of an Extension Service, and to formulate new objectives.

Objectives for Ruatha's Extension Service

— Increased Productivity Through Training and Technology.

— Maximum Employment of Fishermen.

— Higher Income for Fishermen.

— **Increased** Fish Landings.

— Lower Fish Prices for Consumers.

— Strengthening Social Structure in the Fishing Community and Increasing Community Participation in Development Plans.

— Better Utilisation of Fish Catch.

— Increased Net Profit from Fishing For the Good of The National Economy.

— Improved Social Welfare for Fishing Communities.

— Good Fishing Statistics.

— Effective Enforcement of Regulations and Issuance of Proper Permits.

— Better Credit Facilities For Fishermen.

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RUATHA CASE STUDY:
PRESENTATIONS BY WORKSHOP PARTICIPANTS

In brief, the case study paper on Ruatha (pages 12-23) presented Ruathan fisheries as having important shrimp, small pelagic and large pelagic fisheries in both the large-scale/commercial and small-scale/artisanal sectors, as well as several smaller fisheries which were being exploited largely by the small-scale fishermen. The major problems outlined in the case study included competition for resources between small-scale and large-scale fishing operations; fishermen's territoriality; resource management conflicts; productivity/capital/labour relationships; technical change; village welfare; capital formation, and cultural factors, all supported by moderate quantities of physical, economic and cultural data.

The workshop participants were divided into three working groups. Each of them was given the task of recommending to the Ruathan National Planning Council a fisheries extension service plan for the next five years, designed to fit the working group's own priority of objectives within specified budget constraints and a government-determined target for increase in tonnage landed. Not unexpectedly, each of the working groups devised its own distinct approach.

The method of Group A was three-phased, involving identification of problems, elaboration of a development programme, and finally the identification of the role of the extension service within the development program. Apparently acting in accordance with priority for the entire country's overall welfare, Group A assigned production and productivity first level priority, followed by improved utilization, and lastly direct benefits to the fishermen. This group identified five appropriate areas for extension service activity, namely small-scale shrimp culture, technical upgrading and modernised re-conversion to sail of the small tuna trollers, supervision of baitfish capture by large tuna boats in traditionally village-controlled waters, a fish silage program for shrimp fleet bycatch, and improvements in the handling of both shrimp and tuna.

Their extension service organisation was based on each extension officer being a specialist in his own subject field, with the result that two gear technologists or masterfishermen, two processing experts and five biologists were required to fill the field positions, assisted by at least double that number of lower level extension workers, clerks, secretaries, etc.

The biologist extension officers would deal with shrimp farming or fish-and-shrimp handling/ processing, according to their specialization. Transportation would be provided by the two motorcycles and additional bicycles allotted to each of the three major ports, since in the interest of economy neither jeeps nor trucks were attached to the three main extension centers. Additional equipment would include field camping gear, audiovisual equipment, gear for catching and handling shrimp fry and quality control tools.

In the discussion following the presentation of Group A's plan there was general agreement regarding the thorough analysis of problems, but some questioned the effectiveness of bicycles relative to small motor-cycles, and some felt that a specific social component could have usefully been included, especially for the small-scale shrimp fishermen who were to be prohibited from shrimp fishing and converted into shrimp farmers.

Group B identified mostly the same problem areas as Group A but proposed the following areas for extension work :

— shrimp and milkfish culture

— deepsea reef fishing for snapper, grouper

— tuna marketing

— processing and handling improvements

— collection of statistics.

Each of the three major ports would be under the direction of a District Extension Officer, with seven or more extension officers working under him. In addition to the various master-fishermen, aquaculturists, processing and marketing specialists, each of the three extension stations would have a data-gathering specialist whose task would be to collect information (landings, economic and socio-economic indicators, etc.) which could be used to follow the progress of fisheries development in realms falling under the extension service. The extension service would thus have its own built-in monitoring function. No enforcement duties would be given to any extension officer.

Group B would have preferred to station the extension officers in smaller towns along the coast, but could not do so because of the budget restrictions imposed in the case study exercise. This group saw extension as being restricted to small-scale fishing and expected that the interaction would not be restricted to purely technical interactions in the four identified project areas, but could legitimately spread to all fisheries-related concerns, and to a lesser extent, to interaction with the welfare needs of the fishing communities.

The extension service would be supplied with one jeep for each center, plus a truck and two small boats for the reef fishing port, as well as motorcycles for all extension officers.

The Director and the District Extension Officers should initially have a university degree plus several years of fisheries experience, while the extension officers need have only the equivalent of GCE "0" level plus fisheries training in the polytechnic. Future promotion to DEO or Director could be from the ranks, without the requirement of a university degree however.

In the discussion of Group B's plan, it was suggested that the proposed arrangements might leave the extension service short for operational expenses.

Group B agreed and stated that their planned strategy was to get some of the additional funds earmarked by the Ruathan Ministry of Agriculture for aquaculture to fill the financial need.

Group C, taking a somewhat different approach, felt that the extension service should support the industrial/commercial-scale and the small-scale fisheries with market information and advice, both daily and longer term, on the location of good concentration of fish stocks. Specifically for the support of small-scale fisheries, there would be ten small extension units (gear, processing and scientific specialists, with a jeep and motorcycles) spread along the coast, as well as an extension unit in each of the three major ports. Community participation would be encouraged by six mobile units dealing with local motivation, persuasion and community contributions in an effort to avoid the dangers of planning from the top down. Encouragement would be given to the recruitment of extensionists from among the fishing population itself.

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IDEAS FOR BAY OF BENGAL PROGRAMME INTERACTION

As the final substantial item on the workshop agenda, the delegations from each country (each state, in the case of India) were asked to suggest ideas for specific projects in the realm of training and extension which might benefit by technical support from FAO's Bay of Bengal Programme. It was clearly stated before this session that the participants' ideas were only designed to test approaches that had emerged from the workshop. The ideas should not in any way be construed as implying official support or sanction on the part of participating countries, FAO or even the individual participants themselves.

The Sri Lanka delegation split up into subgroups and presented two specific ideas concerning training for 300 women extension workers, and assistance for a five-year extension service system.

The women extension workers would be principally concerned with family activities. They would be recruited from already accepted leaders with an interest in community work and training in welfare and socio-economic matters. According to this idea, the training programme of 300 women fisheries extensionists would be supported by the Bay of Bengal Programme.

The second extension idea from Sri Lanka dealt with the training of 20 higher-level and 200 lower-level fisheries extension officers for a five-year period in the planning, organisation, implementation, evaluation and revision of extension projects directed towards specific objectives. The Bay of Bengal Programme would assist in the areas of planning, training materials, and perhaps actual training.

A number of ideas came from the Indian participants. On the national level, it was suggested that pilot projects to test and demonstrate effective extension methods in aquaculture, modern and traditional fishing methods, and fish processing and handling, could be very useful. The Bay of Bengal Programme could assist in various degrees with consultants, trainers and training materials depending on the specific project.

An idea from Tamil Nadu envisioned a several-fold increase in the size and intensity of operations of the current extension service, with refresher training in extension methods. The Bay of Bengal Programme could help through the provision of jeeps, boats, and audiovisual equipment.

A possibility suggested for Orissa was Bay of Bengal Programme assistance for training specialist extension officers in the field of marine craft and gear technology at the rate of about 10 per year. Assistance could be in the form of planning consultancies, perhaps some subject matter expertise, and the purchase of fishing gear, engines, various tools and equipment for extension and training.

In West Bengal, it was suggested that the Government's decision to intensify marine fisheries extension work presented an excellent opportunity for assistance by the Bay of Bengal Programme. It could recommend the desired extension approach and the required training component, help finance training, provide advisory services and help prepare pilot projects to demonstrate effective extension methods. Several promising areas for such extension work were mentioned.

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An idea for Bangladesh dealt with the establishment of low-intensity brackish water shrimp farming by fishermen who seasonally migrate to the suburban area on the coast. The extension service would provide specialist inputs from a shrimp aquaculturist, a pond construction expert, a fry capture specialist, and a marketing specialist, assisted by a resident extension generalist. The project would operate in a pilot phase for one to several years while the approach was being tested, and could then be expanded. The Bay of Bengal Programme could possibly assist in the initial planning, provide regional fellowships for the national experts, and finance tools and items of gear possibly not readily available through normal national funding.

For Thailand, it was suggested that training courses for shrimp farmers in the effective use of nursery ponds would enable the present shrimp hatcheries to supply farmers with sufficient seed stock for their needs. A training course for extensionists, emphasizing the management of nursery ponds as well as the use of regular grow-out ponds, would be very useful. Both training courses could be attached to the already existing Phang Nga Project, which is being carried out by the South China Sea Programme with Bay of Bengal Programme funding.

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VERBAL EVALUATION OF WORKSHOP

Following the distribution of an evaluation questionnaire, the workshop reviewed the week's proceedings. It was felt that some useful information came from the workshop, and that the Bay of Bengal publications were in general a very useful source of information. It was said that the workshop had helped to clarify the extension situation in the region, and identify good areas for extension activity, with scope for technical advice from the Bay of Bengal Programme.

Existing Extension Services: Many participants found these reviews adequate and informative.

What is extension ? Different countries had varying ideas as to what could be included under the elastic heading of extension, but agreed that they should all be based on what the fishermen need.

Several participants felt that their idea of extension had widened during the workshop to include for example the idea that direct technical demonstrations from a static centre could fall within the scope of an extension service. Others indicated that their own ideas of extension had not changed, but they had a better appreciation and understanding of other ideas.

How is extension done? There was a general feeling that the workshop had not explicitly got into this topic but it was pointed out that a good deal of agreement on the "how" was implicit in the discussions — including the idea that extension work links government with villages. It was suggested that the case study exercise could have been used to focus discussion on how extension should be carried out; it was, however, conceded that this might be an appropriate part of a future workshop.

Workshop approach: It was felt that the four general discussion topics on the second day needed a more specific framework, possibly a delivered paper around which the discussion could focus. It was felt that the workshop packed a lot into a short time, but it was agreed that the pressure of other commitments would have prevented the higher level participants from attending a longer workshop. Longer working hours than those of a 9 a.m. to 6 p.m. format were suggested by one member as a possible alternative. Arguments were made for and against a designated workshop officer summarizing and presenting the country extension service reports or putting a 5-10 minute limitation on presentations, with no clear consensus emerging. The case studies were felt to be very useful.

Appendix 1

WORKSHOP ON EXTENSION SERVICE REQUIREMENTS IN SMALL-SCALE FISHERIES

List of Participants

Bangladesh	
Mr. Matiur Rahman Sarker	Project Manager Bangladesh Fisheries Development Corporation, Barisal
India	
Dr. T. A. Mammen	Jt. Commissioner-Fisheries Ministry of Agriculture New Delhi 1
Mr. M. M. Mohanty	Director of Fisheries Orissa
Mr. A. Sreenivasan	Jt. Director of Fisheries Tamil Nadu
Mr. A. Mahalanabish	Superintendent of Fisheries Directorate of Fisheries West Bengal
Sri Lanka	
Mr. M. G. Amarasinghe	Marine Engineering Assistant Ministry of Fisheries Colombo
Mr. D. K. Fernando	District Fisheries Extension Officer Ministry of Fisheries Colom bo
Mr. H. H. C. Jayawardene	Project Manager Sri Lanka Fisheries Project Galle
Mr. A. A. Kulatunge	District Fisheries Extension Officer Trincomalee
Mr. L. A. Munasinghe	Divisional Fisheries Inspector Negombo
Mr. E. A. Nanayakkara	Dy. Director of Fisheries Regulation and Extension Ministry of Fisheries Colombo

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Ms. S. de Silva	District Fisheries Extension Officer Ministry of Fisheries Colombo

Thailand

Mr. Anuwat Ratnachote	Chief, Brackish Water Fisheries Section Phuket Fisheries **Station** Phuket
Mr. Paitoon Skulpone	Chief, Extension and Training Section Department of Fisheries Bangkok

FAO Fisheries Department

Mr. E. R. Kvaran	Senior Project Operations Officer
Mr. J. Johnson	Fishery Industry Officer (Education and Training)
Mr. R. Willman (RAS/77/044)	Economist (Associate Expert)

Secretariat (RAS/040/SWE)

Mr. L. O. Engvall	Project Manager
Mr. V. L. C. Pietersz	Development Adviser
Mr. B. W. Perera	Project Officer (Sri Lanka)
Mr. S. R. Madhu	Information Officer
Ms. M. Pieris	Administrative Assistant
Ms. M. Paul	Secretary
Ms. Gwynette de Zilva	Secretary
Mr. E. Thevaraja (Host Government)	Secretary
Ms. G. W. Sylvia (Host Government)	Secretary

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Appendix 2

WORKSHOP ON EXTENSION SERVICE REQUIREMENTS IN SMALL-SCALE FISHERIES

Agenda

Monday, 0% October	
09.00	Inauguration Keynote address : Small-scale fisheries development and the role of extension services.
	Report on extension services in participating countries.
14.30	Continuation of country presentations
19.00 - 20.30	Reception
Tuesday, 09 October	
09.00	Sequential discussion of each of the following topics :
	1. Strengths and limitations of extension work. Choosing a style to match the objectives.
	2. Community participation in the extension service process.
	3. Training and the role of specialists in extension.
	4. Monitoring, evaluation, and revision of tactics and strategy. Coordinating the approach.
14.00	Ruatha: working groups planning an extension service on the basis of case study information.
Wednesday, 10 October	
09.00	Case study exercise (continued)
13.00 - 19.00	Field trip to Negombo
Thursday, 11 October	
09.00	Case study : presentation of extension service plans by working groups.
14.00 - 14.30	Discussion I on interaction of Bay of Bengal Programme with fisheries extension services of the region.
14.30	Preparation of proposals by country working groups.
19.00	Dinner by host Government.

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Friday, 72 October

09.00 **Country working groups (continuation)**

14.00 - 17.00 **Presentation of country working group proposals.**

17.30 - 20.00 **Discussion II on interaction of Bay of Bengal Programme with fisheries extension services of the region.**

— **Evaluation of the Workshop**

— **Closure.**

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PUBLICATIONS OF THE BAY OF BENGAL PROGRAMME (BOBP)

Development of Small-Scale Fisheries (GCP/RAS/040/SWE)

Reports **(BOBP/REP/. . . .)**

1. Report of the First Meeting of the Advisory Committee, Colombo, Sri Lanka, 28-29 October 1976. (Published as Appendix 1 of IOFC/DEV/78/44.1, FAO, Rome, 1978)
2. Report of the Second Meeting of the Advisory Committee, Madras, India, 29-30 June 1977. (Published as Appendix 2 of IOFC/DEV/78/44.1, FAO, Rome, 1978)
3. Report of the Third Meeting of the Advisory Committee, Chittagong, Bangladesh, 7-10 November 1978. Colombo, Sri Lanka, 1978.
4. Role of Women in Small-Scale Fisheries in Countries Bordering the Bay of Bengal. (Final report in preparation)
5. Report of the Workshop on Social Feasibility in Small-Scale Fisheries Development, Madras, India, 3-8 September 1979. Madras, April 1980.
6. Report of the Workshop on Extension Service Requirements in Small-Scale Fisheries, Colombo, Sri Lanka, 8-l 2 October 1979, Madras, June 1980.
7. Report of the Fourth Meeting of the Advisory Committee, Phuket, Thailand, 27-30 November 1979. Madras, February 1980.
8. Pre-feasibility Study of a Floating Fish Receiving and Distribution Unit for Dubla Char, Bangladesh. Madras, April 1980.

Working Papers **(BOBP/WP/. . . .)**

1. Investment Reduction and Increase in Service Life of Kattumaram Logs. Balan, R. Madras, February 1980.
2. Inventory of Kattumarams and Their Fishing Gear in Andhra Pradesh and Tamil Nadu, India. (In preparation)
3. Improvement of Large-Mesh Driftnets for Small-Scale Fisheries in Sri Lanka. Madras, June 1980.

Published by the Bay of Bengal Programme, FAO, 91, St. Mary's Road, Abhiramapuram, [illegible] 600 018, India. Printed at Amra Press, Madras 600 041.

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