BAY OF BENGAL NEWS

JUNE 1984
ISSUE NO.14

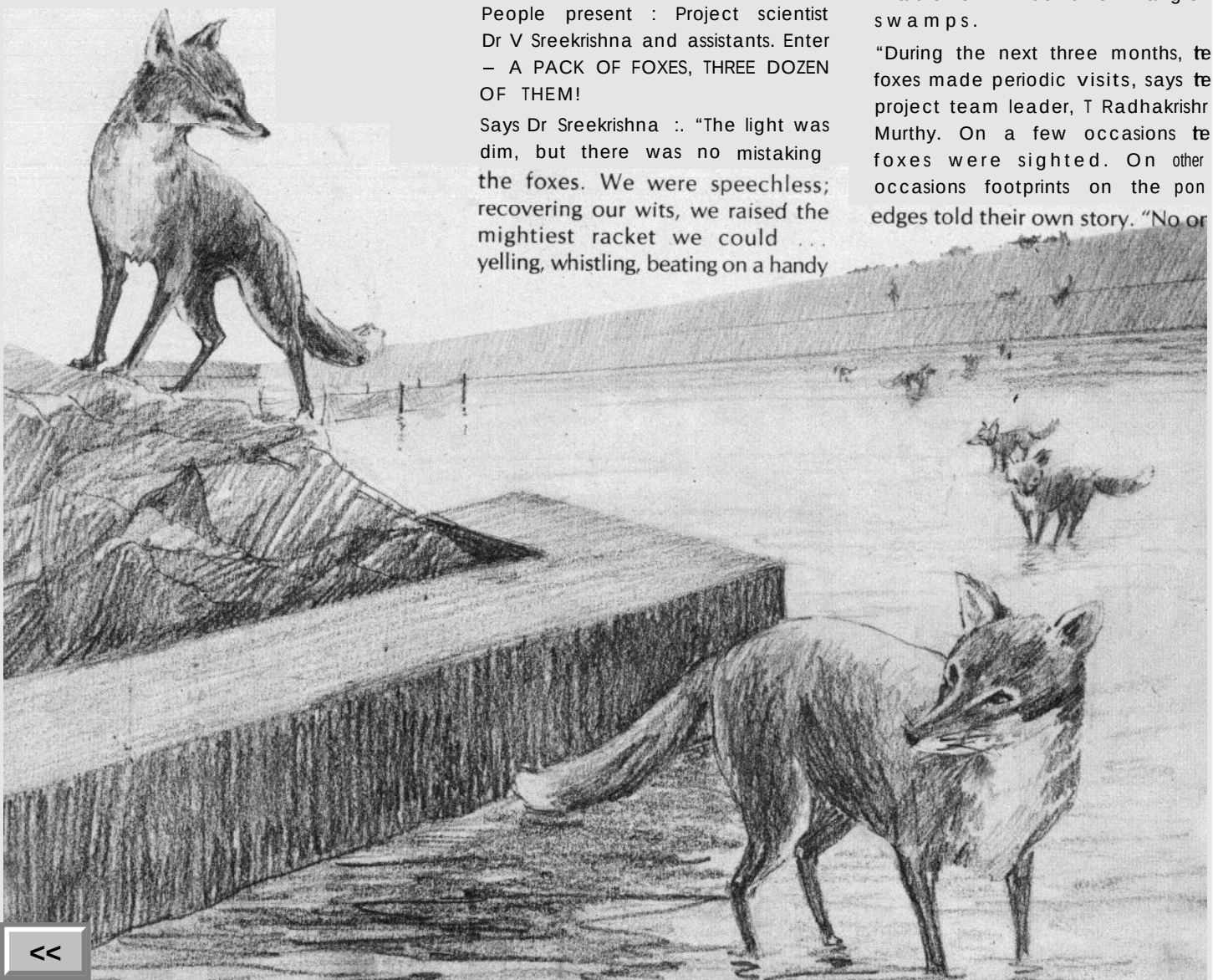
A PUBLICATION OF THE
BAY OF BENGAL PROGRAMME FC
FISHERIES DEVELOPMENT

WHEN FOXES ENTEREC A SHRIMP POND...

Period : December 1983. Place : Polekurru island 'near Kakinada (Andhra Pradesh, India). Venue : Shrimp culture project. Time : 7 p.m. People present : Project scientist Dr V Sreekrishna and assistants. Enter – A PACK OF FOXES, THREE DOZEN OF THEM!

Says Dr Sreekrishna :. "The light was dim, but there was no mistaking the foxes. We were speechless; recovering our wits, we raised the mightiest racket we could ... yelling, whistling, beating on a handy drum lying nearby. The fox stomped across the five ponds, or after the other, then turned ar made off into the mangro swamps.

"During the next three months, the foxes made periodic visits, says the project team leader, T Radhakrishr Murthy. On a few occasions the foxes were sighted. On other occasions footprints on the pon edges told their own story. "No or



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caught a fox red-handed with shrimp", says Dr M Karim, BOBP aquaculturist, "But we assume the foxes were hot just paying a nostalgic visit to their former haunt". (Before the project came up, the island used to be a jungle habitat.)

So the project staff bought drums and crackers and took turns keeping up a continuous din at night; they even engaged a gunman with a.l9th century rifle, to shoot down the predators. One night a machan-type structure was erected and a chicken was held out as bait, but the gunman waited all night in vain; Early morning he shot down a wandering bird in sheer disgust.

Text and photographs by S.R.Madhu

Otters and storks were other predators that paid courtesy calls. The otters live in creeks nearby and keep out of sight during the day; at night they move in. They take a circumlocutioUs route, but once an otter enters a pond, not merely does he gorge himself without restraint, he stays till he has devoured all the shrimp. Yet another predator was the white stork that's a common sight in Polekurru. It's particularly active in the morning and at dusk. One moment a picture Of grace then a fell swoop, flailing wings and skyward ascent with a shrimp in the beak.

Despite these predators of earth and sky' – which, now seem to have beaten a retreat – the shrimp under culture are faring well, thanks to the conscientious aquaculturists of the project. Harvests so far have been encouraging.

Despite the foxes, *other' predators such as otters, and the formidable problems of a remote location, the BOBP-assisted pond culture demonstration project for shrimp in Polekurru island near' Kakinada, Andhra Pradesh, India, has made good progress.*

Polekurru island is a half hour away from Kakinada by car, and 7 km from Tallarevu, a small town that's known for its boat-building. yards. It is remote by any standards – and un-inhabited. To reach it you have to drive, walk and row: drive past Pedavalasala fishing village, walk on a narrow 200-metre long walkway (that straddles slushy earth, puddles and private shrimp farms), then row across the Vadalanali creek for just about a minute.

The Polekurru project is executed by the Andhra Pradesh Department of Fisheries with funding and technical assistance from BOBP. The 15-hectare complex consists of six rectangular ponds of different design, each about (125 m X 60 m) in area, a "hut" that serves as a godown, a five-metre wide supply-cum-drainage canal, a separate drainage canal and 11 sluices. A layout of the pond complex is shown in the diagram.

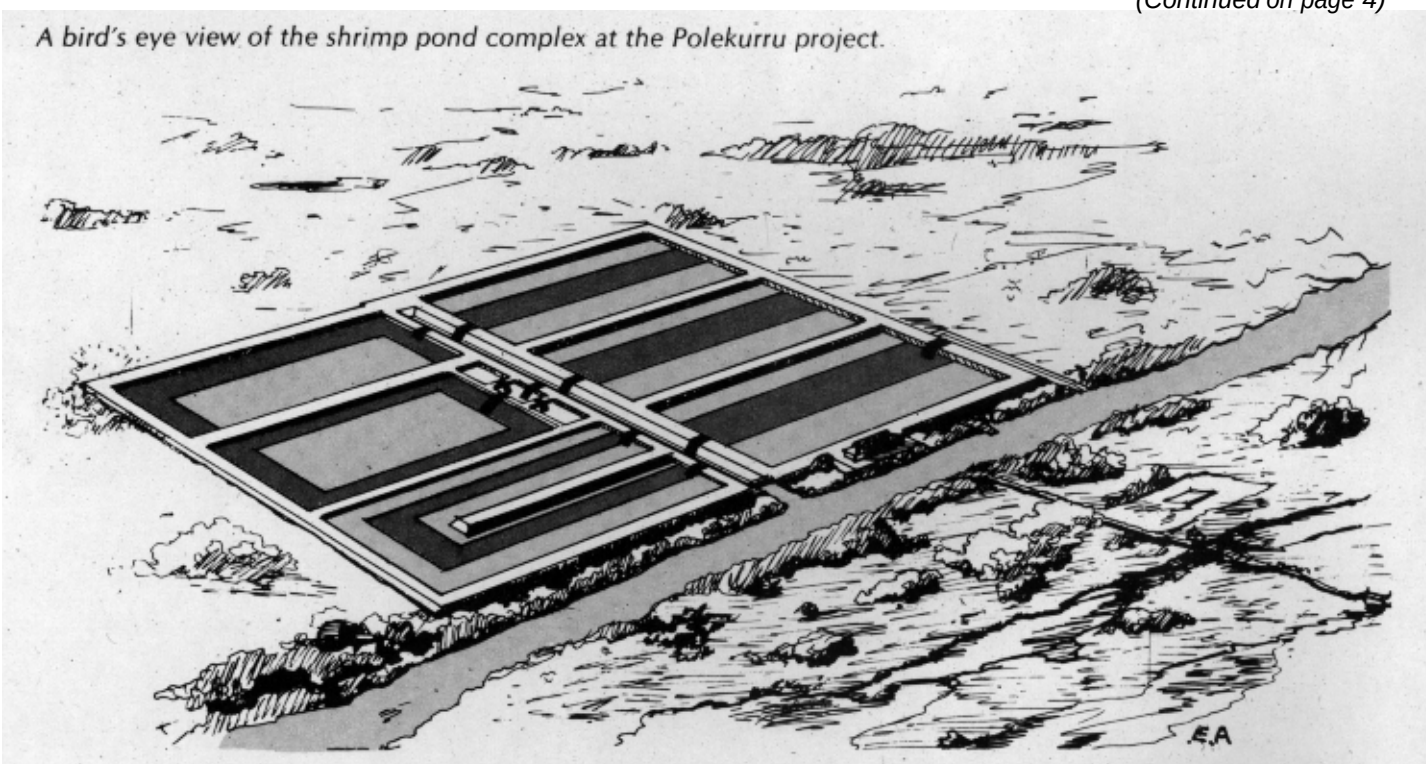
The project also houses a multi-purpose building, just completed, that will be used for laboratory work, for night halts by staff, for meetings, for shrimp sorting and grading, for storing materials. A few guard huts are alsb part of the complex. The project 2ffice is presently in Tallarevu.

The Polekurru team consists of three officers (Radhakrishamurthy, Raghavulu and Sreekrishna), two secretarial assistants, two watchmen, an office assistant and a driver, four contract helpers.

"The tidal amplitude in Andhra Pradesh is not ideal for pond culture," says aquaculturist Karim, "it is low". However, other factors – seed, salinity, pH, etc – are quite suitable. "An appropriate pond design is vital — one that's easy and to construct, yet effective for shrimp production. We are therefore trying out six pond designs, so that the

(Continued on page 4)

A bird's eye view of the shrimp pond complex at the Polekurru project.



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A Letter from the Publisher

SOCIAL FEASIBILITY

Technical and economic feasibility are day-to-day terminology used in development projects. Everyone has a fairly definite notion of what they mean although interpretations may vary.

Small-scale projects in rural areas (as opposed to industrial investments) often fail despite apparent technical and economic feasibility. The distribution ofbenefits (ownership and income) often turns out to be quite different from what was intended. Projects also sometimes fail completely because of deficiencies in organisation and management, producing little or no benefits. It appears that a third feasibility measure i.e. the social one, needs to be used more frequently and systematically. It would be difficult to establish absolute criteria for social feasibility but in general it would determine to what degree the benefits of a project reach the intended beneficiaries

Before embarking on a development project funding agencies usually undertake elaborate Investigations to establish its technical and economic feasibility

But very little isdone about the social feasibility aspects. Project formulators and authorities prescribe, for instance, how a particular number of fishing craft or fish ponds should be distributed and how the necessary operational services should be organised. Although the prescriptions might be noble and logical they too often do not lead to the desirable result. The traditional habits, the power structure and the market forces in local communities are ignored or under-estimated.

In BOBP's work we have encountered social feasibility problems in introducing new technologies. One example is the Killai pen culture project described on pages 22-23 and 32 of this issue. Nearly two years of experimental farming of shrimp in pen enclosures has shown that it is technically feasible; the economic data gathered indicate that it would also be highly profitable. How can this technology be best utilised?

An entrepreneur (fish merchant or a shrimp processor) would probably be able to achieve commercial success through his management, organisation and finance and by hiring local labourers. But this is not a socially feasible alternative since the main benefits would not accrue to the small-scale fisherfolk.

The socially most feasible alternative would be to engage the first group (the Veddars) as owner-operators of small but viable pen areas. The investigation made rules out this possibility since it is likely to meet with strong opposition by the other group.

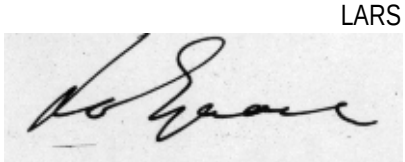
A third alternative would be to establish the already better-off small-scale fisherfolk as owners of the pens who would engage the Veddars as labourers. The benefits would accrue within the community but their distribution would not be the most desirable one.

A more fair distribution could be achieved by agreed minimum incomes, or even better, by protit sharing as in capture fisheries. But is this a realistic proposition in the particular social context?

Even if satisfactory arrangements could be worked out within the framework of the third alternative there is uncertainty about its social feasibility. Individually, small-scale farmers will be weak and vulnerable and there is the risk of a middleman stepping in and taking the cream off the cake. For commercial success the small farmers will probably have to collaborate in some operational matters of culture – finance, pen erection, seed collection and, most likely, feed supply and marketing. Will the farmers themselves, or with the assistance of banks or other- agencies, be able to establish the necessary cooperation?

The BOBP experience has been that it might not be possible to attain as high a degree of social feasibility as one would wish in introducing new technologies. But it is perhaps better to initiate something in the right direction even if it's modest – rather than attempt something over-ambitious and fail completely.

LARS O. ENGVALL



BAY OF BENGAL NEWS

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

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

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

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When foxes entered a shrimp pond

(Continued rrorn page 2)

best one can be recommended for future development..

Some project landmarks: The team leader joined May 1982, excavation of ponds began December 1982 and ended April 1983; construction of sluices and gates began June 1983 and ended in August. The first stocking was done in August, 1983. The first harvest of ponds 2, 3 and 4 in December yielded 648 kg of *Penaeus monodon,* an average production of 316 kg/ha. "Unwanted" species, not considered in this figure, included about 128 kg of small-sized metapenaeid shrimp and 31 kg of fish. The harvest was sold for Rs. 23,000 — money that is being re-invested in the project. "For a first crop the, harvest can be considered good", says Karim.

The Team Leader's Story

The Polekurru project has come a long way since May 1982 when desolate emptiness wa.s all that one saw. But the team is quite proud about those early days of struggle. Looking back, Radhakrishnamurthy says: "In 1980; I helped organize a survey of brackishwater areas of Andhra Pradesh for a visiting mission from Indonesia. One of them was Polekurru island. When I was asked to advise a site for a BOBP-assisted shrimp culture project, I picked on Polekurru.

"Our first task was to arrange a tidal gauge in Vadalanali creek to collect hydro-biological data, plus hourly readings for tidal inundation. We needed a boat to cross the creek every day. We allayed the suspicions of the fishermen and arranged for a boat on hire on a daily basis, but the boat was sometimes not available. We then built our own boat in Tallarevu — Raghavulu didn't give the carpenter a moment's peace till the boat got done! It took him about a month. It was a great day when we could use our own boat to cross the creek

"The next step was a site survey, and finalization of the pond layout in accordance with BOBP designs. Equipment had to be carried from Tallarevu to the project site — first by bicycle in the hot sun, then by boat We often ran out of drinking water by the time we reached the site!

"To ensure prawn seed stock for the ponds, we started groping around creeks near the project site.' This was a new experience, an unforgettable one : we hadn't done this before ourselves. Crab bites and catfish stings were part of the day's game! And shoals of mosquitoes, which normally feasted themselves on cattle, attacked us without let. Taking the walkway from the creek back to the main road, we stepped

1. One of the fishing villages near Polekurru, where the pond culture project has aroused much interest.

2. Pond constiuction (December 1982 — April 1983) posed many problems because of the remote location of the project site.

3. To reach the project site you have to use this walkway froIII the main road, then a boat. On either side of the walkway you have puddles, slush or private ponds — and project staff often use it in the dark of night under a moon less sky.

4. The project's feeder-cum-drainage canal. At the background are the laboratory-cum-office and a hut-cum-godown.

S. Does the screen reach the bottom, ensuring that predators cannot enter? A check near one of the pond sluices.

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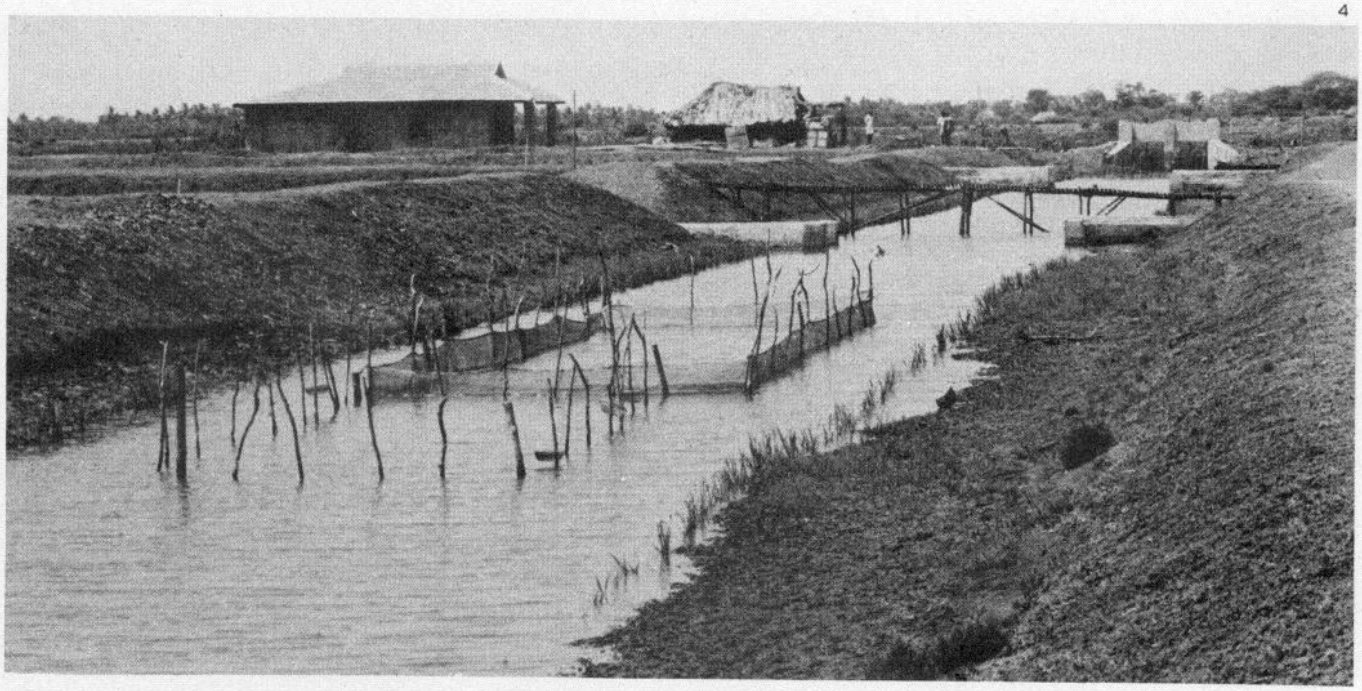

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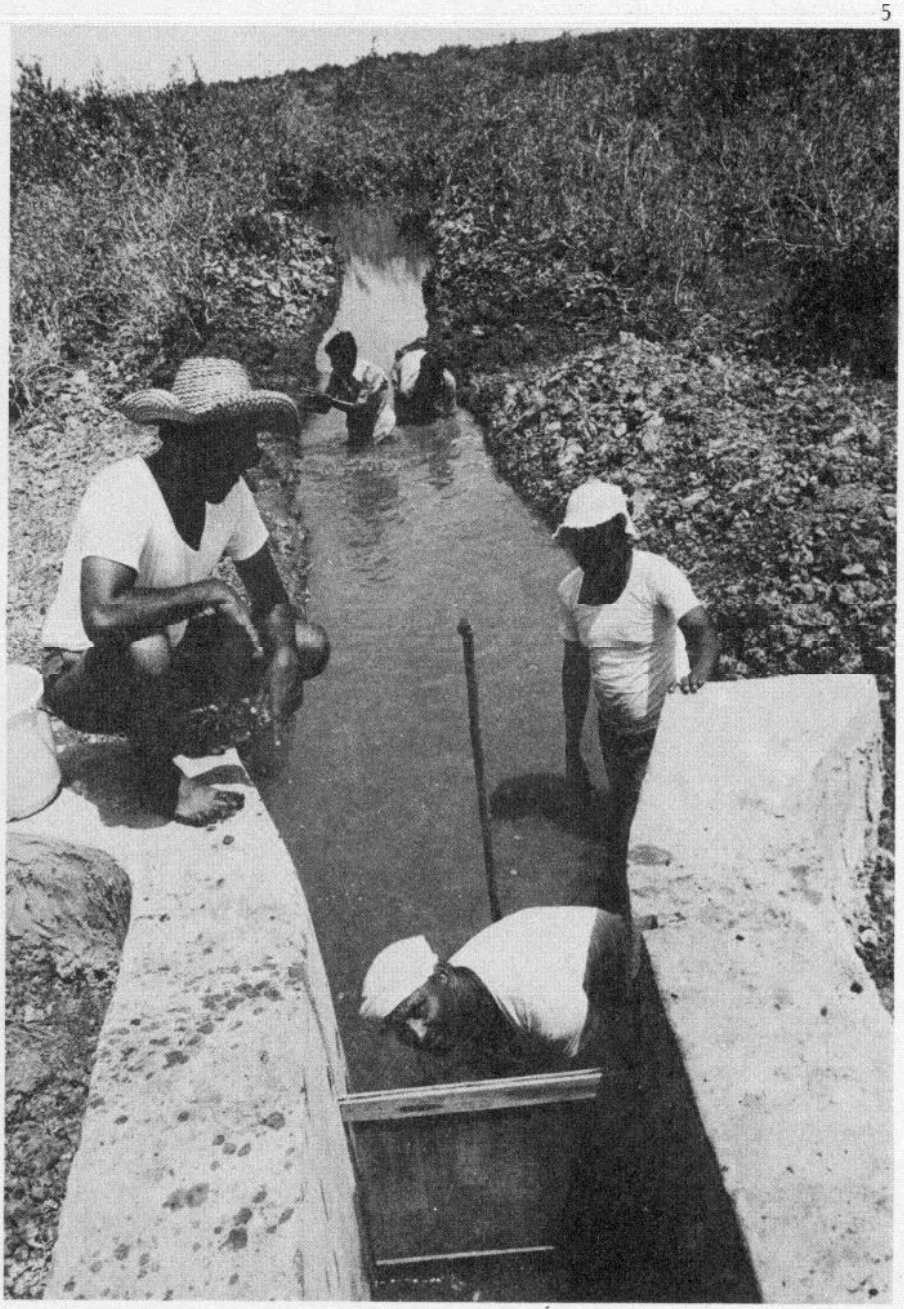

on thorns, or fell on marshy land. And on reaching the main road, we would sometimes find our bicycle tyres punctured by village urchins. You may well imagine how we felt!"

"Pond excavation began in December 1982. Mr Nageswara Rao, an engineer from the Andhra Pradesh Fisheries Department, Hyderabad, was assigned to help execute the work. We got in touch with the Upparulu tribe that normally does all earth excavation jobs. We arranged for 250 Upparulu labourers from Tuni taluk, 80 km away, to excavate the ponds. Seventy temporary huts were constructed for them on the approach road to Polekurru.

"The excavation work started on December 13, 1982 and ended on April 2, 1983 (nearly four months). More than 22,000 cubic metres of earth were excavated.

"The next construction job, that of main sluice gates and pond sluices, was taken up only in June; the engineer was needed for other jobs. But the skies opened up in June, and we were awash with problems; the main one being disgruntled labourers. Walking on slushy ground and working in rainy weather in a desolate place that lacked fresh water, tea, cigarettes or pan wasn't the workers' idea of a cushy job. We had to fetch water from the freshwater tank of a neighbouring village. The villagers there objected to the depletion of their tank, their only source of drinking water; we met the village elders, and convinced them that our project was meant to help poor fihserfolk. They then relented.

"The hardships resulted in several drop-outs among the workers and numerous 'holidays'. Somehow we managed to complete construction work by the third week of August."

When sluice construction work was under way, Dr Karim suggested that *Penaeus monodon* post larvae could be stored separately for stocking in the project ponds. An idle pond of the DRDA (District Rural Development Authority), a km from the project site, was used; a nursery cage and a pen were constructed inside the pond. Some 34,000 seed of different sizes were collected in 20 days, stored in the nursery cage, and several screens fixed to prevent entry of predators.

Additional substrata were provided, feed was put in, water was exchanged, pest-checking was done. Thus the project staff gained valuable practical experience in shrimp culture even before formal culture 'experiments began.

Culture practices in Polekurru are the same as in any other pond culture project — screening of predators, seed collection and selective stocking, nursery management, regular water exchange, feeding (feed consists of minced trash fish or a mixture of rice bran and wheat cake), constant monitoring of environmental parameters, shrimp sampling

The scientists have been carrying out these practices themselves — wading into the pond in nothing but shorts, getting hands dirty and feet wet. .. Practical experience is the best teacher.

Discussing the culture results vis-a-vis the pond design, Dr Karim says that pond 2 has a central ridge; fresh tidal water is let into one end of a U-shaped channel, forcing out old water through the other end.

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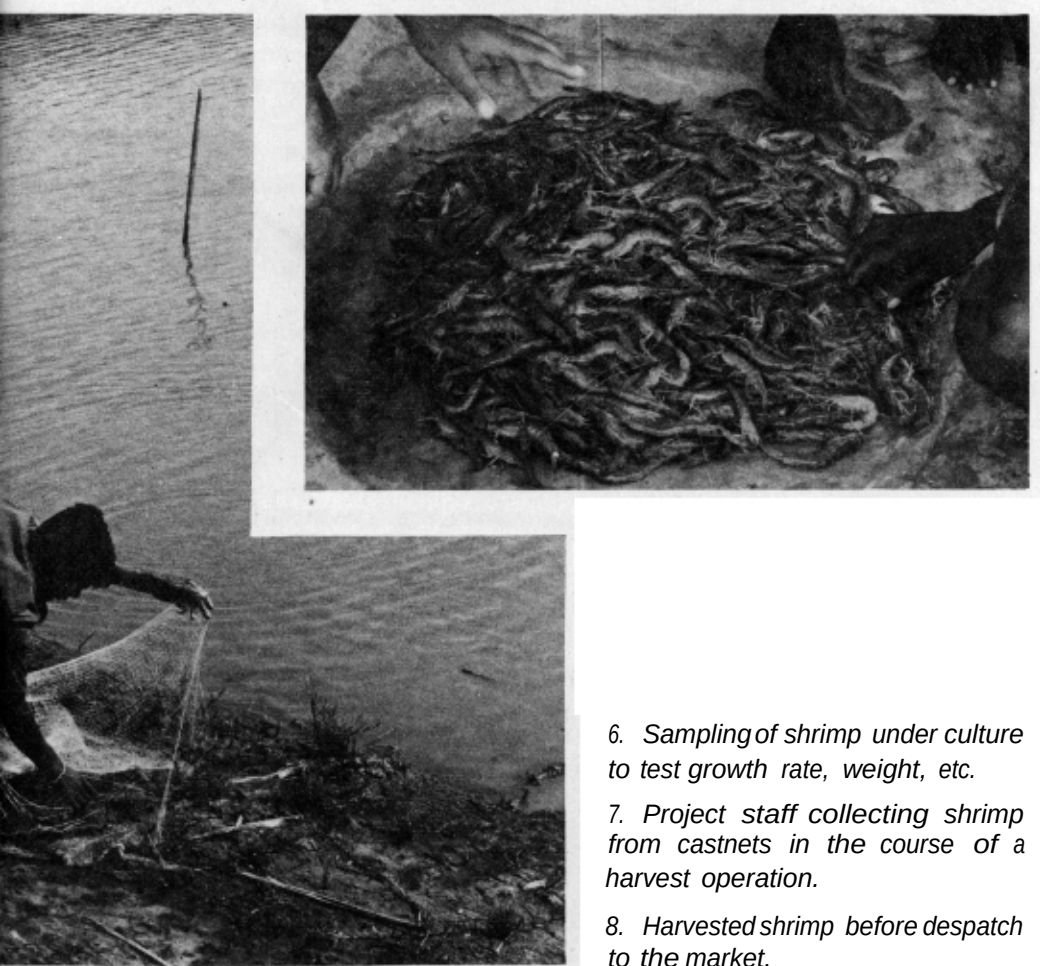

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6. Sampling of shrimp under culture to test growth rate, weight, etc.

7. Project staff collecting shrimp from castnets in the course of a harvest operation.

8. Harvested shrimp before despatch to the market.

This ensures satisfactory water exchange. The highest first crop harvest of 378 kg/hectare was recorded from this pond.

Ponds 1, 3 and 5 have more or less the same configuration – a central canal and two shallow platforms on two sides. Ponds 1 and 3 are tide-fed; as for pond 5, the canal can be filled in by tide but the platforms depend on a pump.

Ponds 3 and 5 have one sluice each for both taking in water and draining out, while Pond 1 has been designed with separate inlet and outlet located at opposite sides. However, the outlet in this pond has some construction defects, so it does not fonction; this will be remodelled soon.

In 1 and the pump-fed pond 5 very little water exchange could be carried out. Water salinity has been quite high, around 30 ppt. Shrimp, particularly tiger shrimp, have not been growing satisfactorily in these ponds.

Says Karim : "January - March represent the leanest tide period. Since tides regulate many important physico-chemical parameters, this period is also the most critical one for pond culture. The tide conditions are 'now (late April) improving – this means more water exchange will be possible, so things are likely to improve

Summing up the Polekurru experience, Kar.+m says : "The culture experiments are continuing, and lessons are being learnt. If we achieve a regular productivity of 1 ton per hectare per annum, establish a suitable pond design for this area, and leave behind a corps of well trained people with actual field experience, this pilot project would have made a useful contribution."

Polekurru will soon begin functioning as a training-cum-demonstration centre on a wider scale. Selected Andhra Pradesh fisheries officials and scientists will be deputed here for short periods. Meanwhile, allotment of land in Polekurru to private individuals for shrimp pond culture has already begun. If the enthusiasm of the Polekurru team catches on, the future for shrimp production through culture can only be bright.

glimpses into BOBP projects

Good news for stock assessment: Computers are coming

A micro-computer has been set up at the BOBP's Marine Fishery Resource Management Project in Colombo. Funded by the UNDP, the' project seeks to. improve fishery resource assessment practices in seven member countries — Bangladesh, India, Sri Lanka, Malaysia, Thailand, Maldives and Indonesia — and to create a mechanism for collecting, processing and analysing data at the regional and sub-regional levels.

Besides the one at Colombo, BOBP will acquire six micro-computers. These will be set up in the project's other member countries in institutions concerned with the project's activities.

Computers as a tool for resource assessment are' well-known in temperate fisheries but are new and not common in stock assessment of tropical fisheries. A package of stock assessment programmes is being designed for the computer with the cooperation of ICLARM, Manila and the Dansh Marine Fisheries Institute. These programmes will be distributed among member countries along with guidance on using them with the computers.

Says BOBP's Senior Fishery Biologist Dr K Sivasubramaniam: "We are introducing a standardised approach to sampling programmes concerned with investigation of fish stocks.. The use of micro-computers will not only facilitate exchange of data but also ensure compatibility of data and lead to common analytical approaches for comparison of results and joint assessment."

BOBP work figures in film on world food

American film-maker Andre Waksman spent eight days in and around Madras, Tuticorin and Killai from March 25 filming the BOBP's activities in craft, gear, aquaculture and extension.

Subjects filmed included high-opening bottom trawling in Tuticorin; pen culture for shrimp in Killai, near Chidambaram; traditional fisheries in Royapuram; beachcraft development at Reddikuppam south of Madras; women's extension and training activities at Pattipulam (also south of Madras), Sastrinagar and Annanagar.

The BOBP film sequence will serve to illustrate how an international agency is helping develop appropriate technologies in fisheries. It is to be integrated into a 90-minute film on world food titled *Bon Appetit* (Good appetite). It has been shot in 10 countries (Philippines, Kenya, Senegal, Brazil, USA, France, Holland, Scotland, Spain, India) for a total period of 75 days. The $ 250,000 film is funded jointly by several agencies : EEC, UNDP, UNICEF, FAQ, French and Dutch television, and Terre des Hommes, a voluntary Dutch agency.

The film focuses on a whole range of food issues — its production, storage and distribution; north-south problems; and projects to develop alternative strategies. It is likely to be shown at the World Fisheries Conference in Rome in June-July. It will also be viewed widely on television on the occasion of World Food Day. October 16.

During the course of the film, Waksman interviewed French wheat

Shooting BOBP work and small-scale fisheries in the Bay of Bengal for the film Bon Appetit. *Left : Cameraman E.N. Balakrishnan and film-maker Andre Waksman. Right : The cameraman goes into action as a traditional Tuticorin vallam sails by. The film has been shot in 10 countries for a total of 75 days.*

farmers and Dutch dairy farmers; he filmed experiments with amaranth, compost and fish farming in a 100-acre farm owned by the Rodale publishing group in Pennsylvania, United States. Other subjects included the green revolution (International Rice Research Institute, Manila); problems in marketing pyrethrum, a non-toxic organic pesticide very useful for food storage (Kenya); making bread with 15% millet content (Senegal).

"I hope the film gives an idea of the work each country is doing to become self-sufficient," Waksman says. He adds : "Food, like war and peace, is not a problem that will vanish during our lifetime. But it's important to keep the issue alive, to talk about what's being done, so that the work gets more support. If my film promotes such an awareness, I will be happy."

Fishing boats at Male harbour in the Maldives.

Where every fish landed is counted Maldives

A country of 26 atolls with about 1,300 islands of which 200 are inhabited with some 160,000 people — that is the Maldives. Fishing is done from all the inhabited islands.

Fishing is the primary industry, and makes the largest contribution (15.9%) to the gross domestic product. Since it is the backbone of the country's economy the entire population relates directly or indirectly to the fishing industry.

Tourism continues to have its impact on the fishing industry through diversion of fishing craft, particularly mechanised craft, from fishing to tourism and the entry of more and more young men into tourist trades.

Fishing is mainly for tunas in near-shore waters up to about 25 miles from the shore, but minor fisheries on reef fishes are limited to the reef waters and the intra-atoll basins. Pole and line (live bait) fishing and trolling are the tuna-fishing methods while handlining is directed on'reef fishes. The fishing craft are 'Dhonis', 28'-49' in length. They may be powered with sail, engine or a combination 'of both. The pole and line craft is known as 'Masdhoni' and the trolling craft is known as 'Vadudhoni'. These craft have hardly deviated from the traditional design. Fishing goes on round the year.

This country has evolved its own fisheries statistical system, and the chief of each island has been recording the number of craft fishing and the number of fish landed by species on his island, every day. This total enumeration system has provided them with reasonably good estimates of the number of fish caught, seasonally and annually, on every one of the inhabited islands. Monthly summary records prepared by the atoll chiefs are compiled by the Ministry of Fisheries in Male. A little over a decade ago the Ministry began to convert the annual catch by number into annual catch by weight, using conversion factors based on the mean weight of individuals of each species landed.

Over the last decade, fish production in the Maldives has fluctuated between 27,000 and 35,000 tonne per annum (61% skipjack tuna, 14% yellowfin tuna, 4% little tuna, 9% frigate tuna, and 12% other marine fish.) Though the number of non-mechanised craft have declined between 1974 and 1982, this has been compensated by the increase in number of mechanised craft and as a result, the total number of 'Dhonis' has been more or less around the average level of 5,500 units, since 1974.

With the development of the fishing industry, the Ministry of Fisheries decided to improve the statistical system, particularly to obtain more detailed and accurate information on the fisheries and also to assess the resources available for further expansion. With the assistance of FAO, a training course on fisheries statistics and biology (TCP/MDV/2202) was conducted under the auspices of the BOBP. Some young men and women in the staff of the Ministry of Fisheries were trained to collect statistical information, carry out analyses for estimating production, costs and earnings in fisheries, sustainable/potential yield levels and other biological parameters.

Applying the knowledge gained from the training course, the trainees attempted an analysis of the historical data and obtained some interesting and valuable results. The proportions of the different species in the catches were found to vary from area to area around the country. The percentage of skipjack tuna in the production showed higher values both on the eastern and western

(Continued on page 12)

MANAGING THE MACKEREL RESOURCE IN THE MALACCA STRAITS

by K. Sivasubramaniam

Fishery scientists from Indonesia, Malaysia and Thailand met recently in Penang to discuss current knowledge of the mackerel resource in the area and ways to improve it. This article by BOBP's Senior Fishery Biologist examines the outcome of the meeting.

Exploitation of mackerels is one of the major fisheries in the Malacca Straits. The rapid development of this fishery and recent trends in the fisheries of that area have drawn the attentiOn of fishery scientists and administrators to the need for managing the mackerel resource in the Malacca Straits.

The three nations bordering the Straits – Indonesia, Malaysia and Thailand – decided to worktogether towards this end, and held their first working group meeting 12-16 December1983, at the Marine Fishery Research Institute in ,Penang, Malaysia. The meeting was held under the auspices of the FAO/ UNDP Marine Fishery Resources Management Project, one of the components of .the BOBP. The objective of the meeting was to evaluate the status of the mackerel fishery in the Malacca Straits, compile available information and knowledge on the mackerel resource in the area, identify gaps and limitations and prepare a common workplan to obtain the data needed to improve resource assessments.

Fishery scientists from Indonesia, Malaysia and Thailand pooled their knowledge, discussed the results and prepared a workplan for a collective approach to the study of the mackerel resource in the Malacca Straits, which they share.'

The four species of mackerels contributing significantly to the fishery are: *Rastrelliger Kanagurta* (Indian mackerel), *R. brachysoma* (Indo-Pacific mackerel), *Decapterus maruadsi* (Round scad) and *D. macrosoma* (Layang scad/scad mackerel). These species are widely spread and fished by the three nations bordering the Straits.

The production trends in the EEZs of the three countries within the Malacca Straits are illustrated by Figures 1 and 2. The production of Indian and Indo-Pacific Mackerels by Malaysia has increased by leaps and bounds since 1977, it is about five times Indonesia's production. Purse seining with lures (coconut palm leaves, petromax lamps or electric lights) and without lures, is the primary method of fishing for mackerels. The highest catch rates (catch/trip) have been realised by the Thaijand purse seiners, though their armual production from this area is lower than those of Malaysia or Indonesia. The trawl fishery in

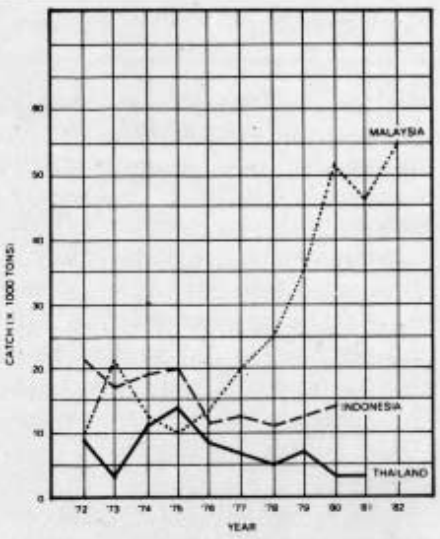

Figure 1a : Annual variations in the production of Rastrelliger spp.

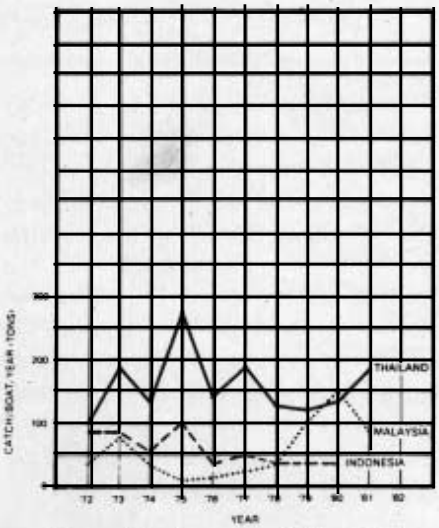

Figure 1b : Annual variations in the catch rates of Rastrelliger spp.

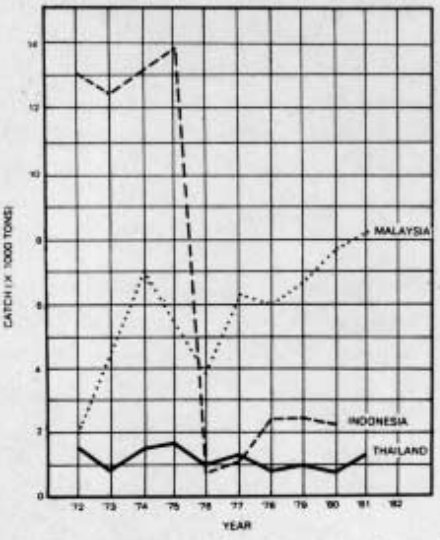

Figure 2a : Annual variations in the production of Decapterus spp.

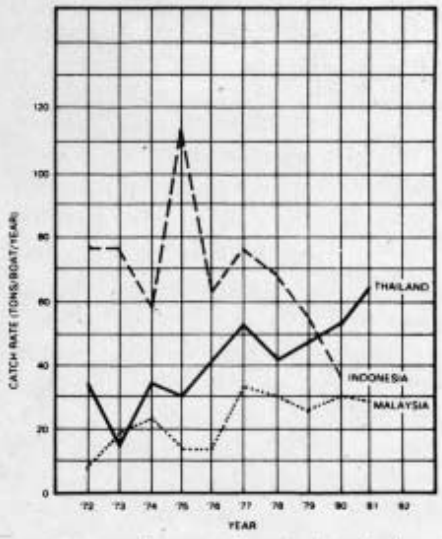

Figure 2b : Annual variations in the catch rates of Decapterus spp.

Table 1: Production levels for the two groups of mackerels in the Malacca Straits

Country	Rastrelliger species (1979)	Decapterus species (1980)
Thailand	7,392 MT	895
Malaysia	34,154 ,,	6,599
Indonesia	12,073 ,,	2,593
Total	53,619 ,,	10,611

Malaysia is evidently contributing more and more to the annual increase in mackerel production. In fact mackerels are turning out to be the target species for the trawl fishery in the west coast of Malaysia. A noteworthy observation : 1975, the peak year for Rastrelliger species production by Thailand and Indonesia, was alsO the year of least production of this variety by Malaysia.

The production figures available are from the estimates made' by the statistical divisions of the respective ministries in the three countries. They do not generally provide species-wise breakdown, except in the case of Thailand. The effort estimates applied are rather indices based on the number of fishing gear units, and not estimates of efforts based on fishing operations.

The maximum sustainable yields (MSY) were estimated with the catch and effort values (Table 2). The results indicated that West Malaysia's production of the Rastrelliger species exceeded the MSY in 1978, but the production seenis to continue to increase up to recent years! Indonesia's production of these species exceeded the MSY in 1972 but it has subsequently been fluctuating around the MSY. Thailand exceeded its MSY in 1973, but its production since then has been nearly half or much less than half the MSY. It is understood that Thailand is gradually shifting its effort from mackerels to tunas and hardtail scads. The total production of these species from the entire Malacca Straits seems to have exceeded the total MSY only in 1973. Production of the Decapterus species by Thailand and Indonesia does not appear to have exceeded their MSYs but it has done so in the

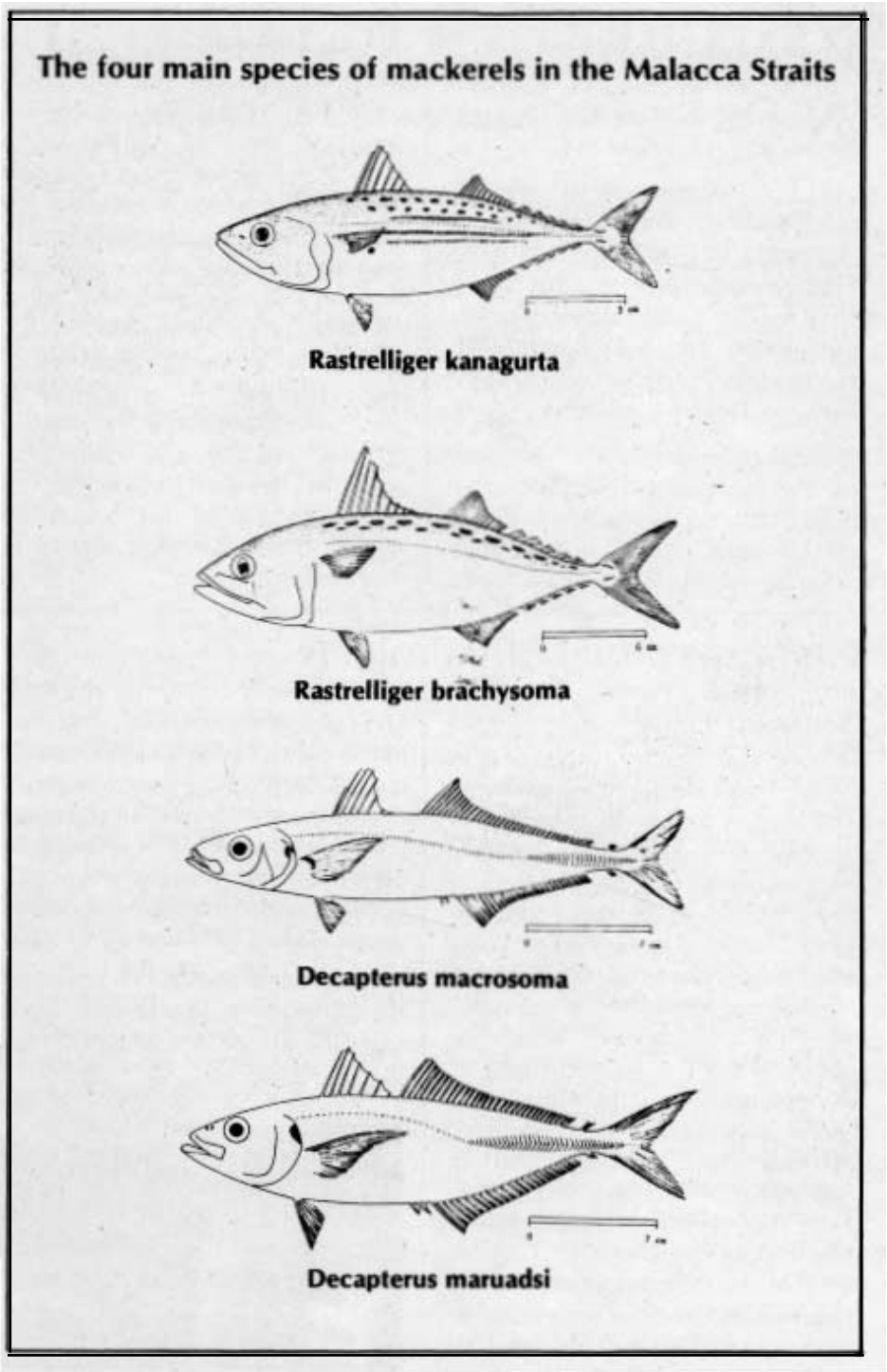

Table 2: MSYs for each EEZ area in the Malacca Straits and overall MSY.

Area	Rastrelliger MSY	Decapterus MSY	Percentage of EEZ area fished	Yield/Unit area fished*
Thailand	20,074 MT	2,700 MT	.39%	0.3 Ton/Km^2
Malaysia	21,000 ..	5,800 ..	89%	0.8
Indonesia	17,691 ..	2,700 ..	55%	0.3
Total	58,765 ..	11,200 ..	57%	
Overall Estimate for Malacca Straits	54,841 ..	9,121		

* Based on the production in the year with the highest catch rate for the respective countries.

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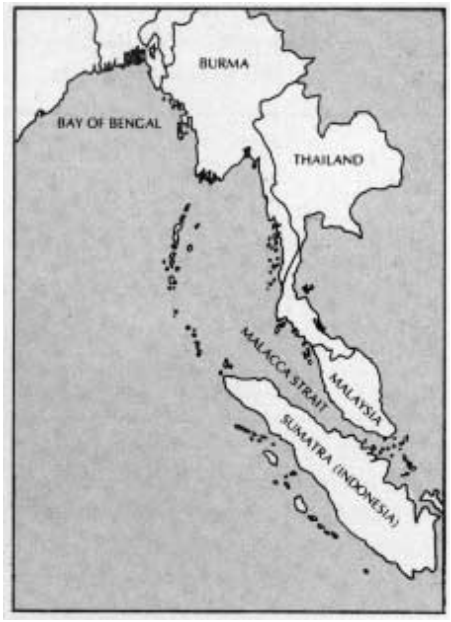
case of Malaysia, since 1977. Overall, the production of the Decapterus species from the Malacca Straits does not present evidence of having exceeded the overall MSY.

Very little information is available at present on the biology of the mackerels in the Malacca Straits. Tagging experiments conducted by Thailand have qualitatively shown movement of the Rastrelliger brachysoma, across the EEZ boundary between Thailand and Malaysia.

Work plans for standardised sampling for the study of mackerels by the three countries were discussed and agreed upon. With the anticipated progress along these lines, it is expected that better and more reliable estimates of catches of individual species and the effort applied will become available for determining species distribution pattern and for improved estimates of MSYs. The standardised approach will ensure compatibility of data from the three countries for collective analyses and joint assessment of the stocks in the entire Malacca Straits. Systematic biological sampling of these species will also make it possible to apply a length-structured approach to the assessment programme, besides enhancing th,e understanding of the spawning season, the recruitment areas and migration trends.



Glimpses into BOBP Projects

(Continued from page 9)

side of the southern part of the country and declined northwards. The reverse trend was observed in the case of yellowfin tuna. Further, the percentage of yellowfin tuna in the catches was greater along the West Coast than along the East Coast and the opposite trend was indicated for skipjack tuna. The highest catch rates for skipjack tuna were also observed off the southern part of the country. Though there is year-round production, there are very distinct peak seasons, such as September to February and May to July, and the catch rates between seasons were very poor and almost nil at times. Differences in seasonal variations in the different areas were obliterated when catches from all areas were combined. The effort distribution indicated that it is low in areas of high skipjack catch rates and high in areas of moderate catch rate. In other words, the distribution of effort does not appear to correspond with catch rates.

Analysis also indicated that the efficiency of non-mechdnised pole and line craft may be only 23% and 30% the efficiency of the mechanised pole and line craft for skipjack and yellowfin tunas respectively.

Though the total number of pole and line craft has been roughly constant over the years, there is an annual increase in the number of mechanised craft in the total fleet. This not only increases its proportion in the fleet of pole and line vessels but also multiplies their efficiency over the non-mechanised craft by a factor of about 4. The analysis of catch and effort data showed a decline in the overall catch rate of skipjack after 1979 and up to 1982.

A rough assessment indicates that a significant increase in production from the presently exploited range may be difficult to achieve and that spreading into areas beyond the present limit may be necessary.

It is expected that the training provided will be effectively applied to improve fisheries statistics in the Maldives and alsp lead to a more reliable assessment of the resources around ,that country for future development and management of the resources available within its EEZ.

Boatbuilding in Male.

What Happened in Adirampattinam?

by Patchanee Natpracha and V.L.C. Pietersz

This article presents the findings of two candid studies of what was right and what went wrong with a BOBP project of 1980-81 to promote self-reliance' among fishing communities in a small town of southern Tamil Nadu.

What is the best strategy one can adopt to promoterural development? Community organization is an essential primary step. An approach often used for this purpose' has been to organize small groups of people towards solving a specific need or problem. By working together, the members learn many things which stretch beyond the specific problem — how to interact with each other, what skills they need to identify other needs, what is behind the problems they face in daily life, how they may plan actions to overcomethem, how to form and operate a cooperative society. Group action thus sets in train a participatory process which ultimately leads to self-reliance.

This target group approach was tried out in a village development project in Adirampattinam in the Thanjavu,r district of Tamil Nadu. The project was described in an earlier issue of *Bay of Bengal News* (March 1982).

As stated therein, field workshops conducted with the fisherfolk of the four fishing communities of Karaiyur Street, Sunambukara Street, Arumuga Kittangi and Tharagar Streets (or villages) showed that the foremost need was small loans. For women, to set up fish marketing; for men, to buy fishing equipment for themselves. For this purpose some 400 women were organized in small groups of 8 to 10 and 100 ,men in eight groups of 8 to 12.

The women groups were organized with the help of the Working Women's Forum, Madras; the men groups were organized with the assistance of a social worker based in Adirampattinam. The credit scheme being used was the government's Differential Rate of Interest (DRI) scheme under which a rate of interest of 4% is charged for loans to low income groups (annual income less than Rs. 2,400). Loans of Rs. 100 - Rs. 200 were being sought for women; loans of Rs, 1,000 for the men. The latter also carried a subsidy of 30% granted under the government's Integrated Rural Development Programme (IRDP). The loans in both cases were administered by the Canara Bank.

How effective were these loan schemes? In 1983 two separate studies were made of the working of the two group schemes to find out how far their objectives had been achieved, and to document the experience for the benefit of future extension work.

The immediate aim of the fisherwomen groups was to increase the profitability of petty marketing operations, generate investment capital of their own through savings and, ultimately, step up the volume of marketing through increased investment — by replacing their normal high interest loans (10% per mensem) from private sources with low interest bank loans (4% per annum).

The study elicited facts regarding the daily marketing operations of the fisherwomen.

- It showed that the targeted credit levels were appropriate : the women in the target groups were engaged in both fresh and dried

The fishing communities of Adirampattinam live near the seashore a short distance from the town.

A few fishermen sell catch them selves at the nearest market.

fish marketing, with a larger number being engaged in the latter.

- The majority took their fish by bus or train .to various markets situated at distances varying from 5 to 60 km from their village, while a minority walked with headloads of fish to neighbouring villages 1/2 to 8 km away.
- For a single, operation, the investment level was in the order of Rs 50 - 250 for fish purchases. The operational cost.s for the majority (for train/bus fare, market fee, cart hire) ranged from Rs 2.75 - 7.00, depending on the distance, and the profit was in the order of Rs 10 for every Rs 100 invested; the majority incurred a loss on the operation about once in a mOnth.

All borrowers asserted that they found the loans advantageous since they did not have to pay exorbitant interest, and although the repayments were not made in uniform instalments, or within the stipulated period of six months, the record of recoveries was high, with 87% of the loans having been repaid at the time of the study.

It was not possible to conclude from the study whether the process of capital formation aimed at had been achieved – it was in any case unlikely to have occurred with a single loan. It was found, however, that 14% of the women interviewed had used the loans for purposes other than fish marketing.

There was also no indication that the loan groups had had any catalytic impact stretching beyond the immediate credit objective. It was in fact found that the groups never met for purposes of discussion and that once the loans had been obtained, the members met one another only on the days that the instalments were due.

The immediate purpose of the fishermen's groups was to increase the members' incomes by improving the productivity of their fishing operations. This was sought to be achieved by means of cheap credit, utilizing the low DRI rate of interest (4%) and the IRDP subsidy (30%).

The study on the working of the fishermen's groups included an analysis of the members' pattern of indebtedness. It showed that around 67% of the debts normally incurred by them are for the purchase of nets, and therefore confirmed the appropriateness of credit for this purpose for the formation of the target groups.

The credit provided did not however lead to the achievement of the immediate objectives; only 25% of the borrowers admitted to an increase in catch/earnings due to the new nets. 55% admitted a negligible increase, while 25% claimed that there was no increase at all. Several factors were responsible. The majority of the borrowers (80%) had decided to purchase a particular type of net ('koi' net of 1" mesh). Delayed supply of the net by net factories resulted in the nets arriving only after the peak season for the nets had ended. This was compounded by the fact that the peak season for the nets was a lean one. Further, the material of the nets was inferior and the mesh size became smaller due to shrinkage.

The number of new nets that could be purchased with the loan was too few. The fishermen's normal practice is to purchase good second-hand nets – they could have purchased double the quantity of these – but the bank insisted on their purchasing new nets, with a view to ensuring that th. loan was not diverted to other purposes. All this was no doubt an unfortunate concatenation of adverse circumstances; however, it perhaps also derived from certain unsatisfactory features of the target groups themselves.

The study showed that the objective behind forming groups was not well understood by the members – or sometimes even bythe group leaders. Of the 100 members, as many as 17 did not know the objective 'at all. 57 members believed that the purpose was only to get loans orto ensure repayment of loans. Only 22 members had any concept of a larger purpose, such as helping fishermen to work together or improve their living conditions.

In the BOBP project of 1980-81, women received loans for fish marketing...

When the social worker started working.in Adirampattinam, he was regularly assisted by a few young fishermen in the work of collecting data on the village, conducting the field workshops, identifying those in need of fishing gear, etc. He depended on the same persons for identifying beneficiaries for credit and for initiating the process of group formatiOn. When the groups were formed, the members selected these same persons as the group leaders – outof gratitudefor having informed them about the credit scheme rather than out of respect or any belief regarding their capabilities. When interviewed during the study, 25 of the group members said they did not know what the role of the leaders was. In fact, the leaders themselves had no real understanding of their role, beyond the initial function of getting the groups organized. Due to these factors, the groups met only a few times before loans were sanctioned. At these meetings, the discussions were mainly about the type of nets to be purchased. These were hardly any meetings after the nets were acquired.

In spite of so many adverse factors, however, the target group approach does appear to have had a positive influence on the repayment of loans. After 16 months of the stipulated 24-month repayment period (at the time of the study) 48% of the repayments falling due had been made. The repayment period allowed to the groups was shorter than the five years allowed under the DRI scheme. On the basis of the normal repayment period, the amount repaid so far would be equivalent to about 72% – a figure that compares very favourably with the national average of 29.6% recoveries under the DRI credit scheme – particularly when the misfortune attending the purchase of nets in considered.

By and large, the experience of the working of the target groups at Adirampattinam has not been encouraging. Is this then an indication that the target group approach is invalid so far as the fisherfolk are concerned? Such a conclusion would be too drastic.

While the studies revealed many blurs in retrospect, they also highlighted some bright spots. The immediate purposes for which the groups were formed are seen to be very appropriate. The usefulness of the loans was clearly evident as far as the women's groups were concerned; what vitiated their usefulness for the men groups were largely some extraneous factors – defective nets and late delivery. The repayment record was satisfactory.

Men received loans for the purchase of fishing equipment.

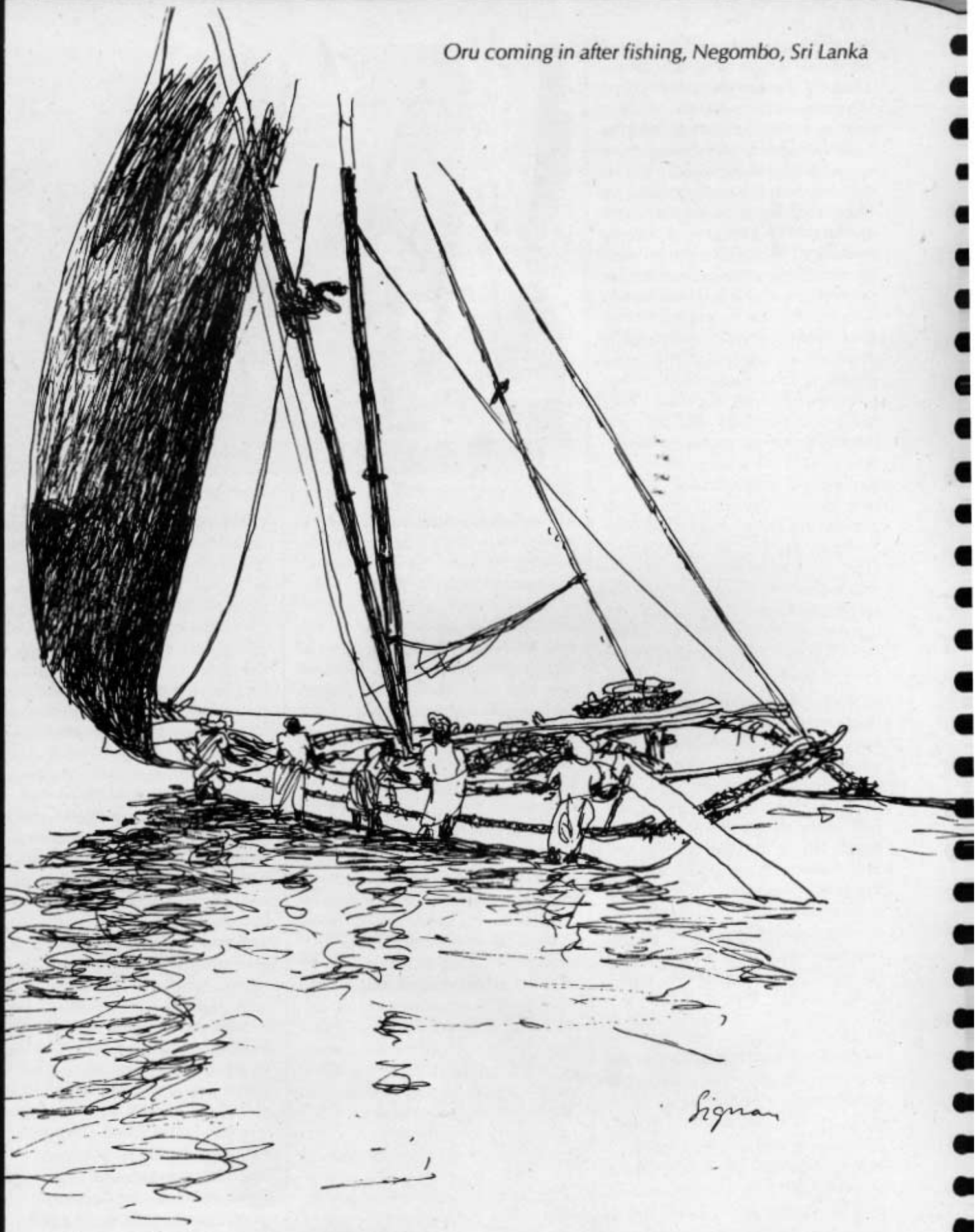
The blurs are seen to have been due largely to defects in implementation. The deeper purpose, of the groups was more or less ignored in the rush to achieve the immediate objective of obtaining the credit.

Insufficient attention was paid to the need to ensure that members understood the purpose and implications of the groups. Perhaps the numbers involved were too large to permit the frequent meetings and the leisurely discussions that are necessary at the village level.

This also contributed to the wrong approach adopted for selection of group leaders – an error which was compounded by the fact that the selected leaders, being young men, the social and economic equals of the group members, were of a different type from the respected elders who traditionally play that role in a village. The lack of understanding and the limited discussions also meant that there was no move to select other leaders when those initially selected proved unsatisfactory.

The use of rural credit as the component of a development programme obviously involves a great deal of guidance and close supervision, particularly during the initial stages of target group formation. In retrospect, it can be seen that in the case of the women groups, greater attention could have been paid to discussing and implementing ways and means of better budgeting, to effecting savings to increase the investment capital, to identifying better methods of drying fish or transporting it. The loans should then have been repeated until self-reliance had been reached. In the case of the men groups, frequent meetings and discussions could have been used, for instance, to obtain agreement by the bank to the purchase of a larger quantity of second-hand nets in time for the peak season. The effect of such actions would have constituted a practical demonstration of the value of group action to the fisherfolk, thus fulfilling the immediate objectives as Well as contributing towards the ultimate objective of the target group approach.

The Adirampattinam experience therefore does not invalidate the target group approach. Rather, it pinpoints the importance of a prolonged and patient process of supervision and guidance of the groups by extension workers if the approach is to achieve any measure of success.



Oru coming in after fishing, Negombo, Sri Lanka

The author is a well-known Swedish artist who evinces a keen interest in sails and sailing vessels. He recently visited India and Sri Lanka, and was a delegate to the sail consultation held in Madras during October 1983.

"No one believed that sails would be necessary....."

Text and sketches by Signar N Bengtson

The title of this article is actually a remark by one of the experts who took part in the October 1983 sail consultation in Madras.

He shares this view with most of us. Who could imagine that small freighters in Europe and America would start equipping their hulls with sails to reduce fuel costs?

Who could, 20 years ago, believe that a sailmaker in southern Sweden would be seriously requested by trawl fishermen about the possibilities of reducing fuel costs between the harbour and the fishing areas by the use of sails?

Since the October 1973 oil crisis, things are'nt as they used to be. In retrospect, one could be wise and say, in talking about small-scale fisheries, that engines should have been introduced more selectively.

One could have developed rigs with good hulls and sailing performance, but who could believe that the cost of fuel would multiply? With the cost structure that prevailed pre-1973, the sail was not a serious alternative to the engine. Anyone who, 20 years back, recommended sail as a supplement to the engine, or as the source of primary propulsion, was regarded as a Judgement Day Prophet. We know better now.

It was not believed, either, that the material for traditional fishing boats would become expensive and, in certain areas, impossible to obtain. Nowadays, it has become difficult to build boats from traditional material; it seems that hull lay-out has to be changed and that the hull has to be constructed from materials other than those used from time immemorial.

Literature dating back to 70 B.C. contain references to boats in Ceylon that were similar at both ends and therefore able to sail in both directions. The Sri Lankan oru was, apparently developed and well-known 2000 years ago, and there is no reason to believe that other types of boats around the Bay of Bengal are any younger.

Sea-going boats have sailed for a long time in the Indian Ocean. Faced with the knowledge that traditional boatbuilding materials are getting very scarce, one starts to wonder how to manage to design the new boats. Are we competent enough, are we talented enough, to replace boat designs which represent perfect solutions of adaptation and function?

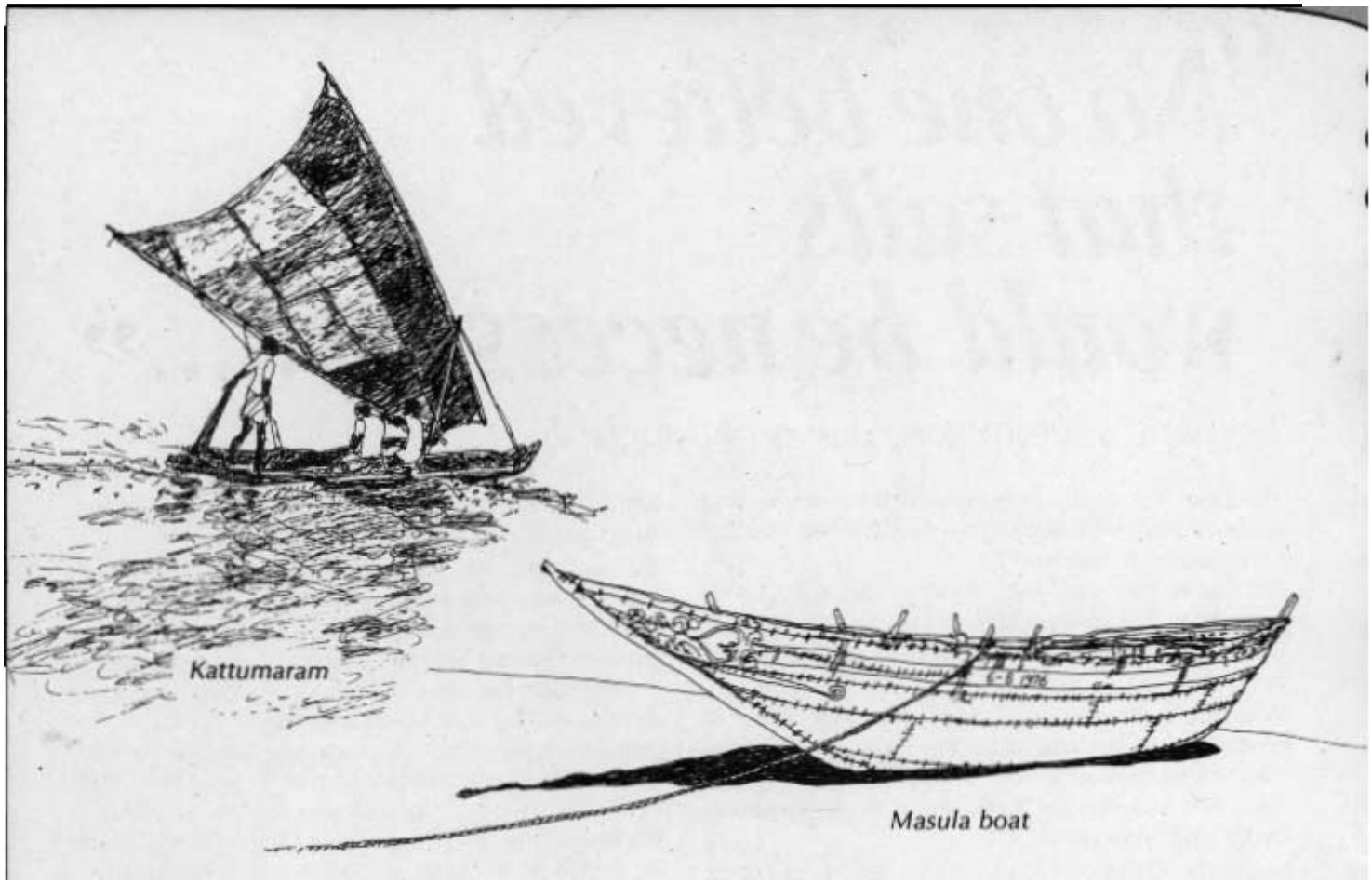
To succeed, we must go back humbly to our predecessors and their way of thinking. The Madras Sail Consultation showed clearly that the sail is not a museum piece but must regarded as a powerful and inexpensive means of that should be developed. Even at low speed, most of the tested rigs gave the trial boats a speed close to the hull speed : what more can one wish for? The Consultation demonstrated also the possibilities of improving the tacking ability of the traditional craft by means of effective leeboards and centreboards. It is really surprising that in the past, so little has been done to make existing hulls and rigs more efficient.

A fishing boat usually has many crew members and therefore many hands to handle sails, centerboards and rudder. It is quite possible for traditional boats to use large sail areas – why not investigate the possibilities by simplifying sail handling to carry even larger sails, to increase the speed and capability in light winds, and (by means of better leeboard and steering systems) create optimal windward sailing abilities?

The sail must be given the opportunity to demonstrate its ability in all aspects to become an acceptable alternative to the engine. One must be able to stay close to the wind in windward sailing and have a rig that permits quick tacking.

We know that fishermen of yesteryear used outriggers and balancing boards to manage their large sails; they used leeboards, often several of them, to be able to sail windward. Let us develop these possibilities! The will to sail and to sail fast still exists; that is obvious to everyone who has seen the kattumaram fishermen of Madras or the Oru fishermen of Sri Lanka.

We need to replace a very large number of beachcraft and coastal fishing boats within a short time, and with new materials. This is vitally important, both to give the fisherfolk a meaningful occupation and to ensure consumers with a supply of protein-rich food. If suitable wood for boat construction were available in sufficient quantities improvements within the framework of traditional boatbuilding could be envisaged.



This is possible wherever the material and the skills exist – which is the case in some countries in the Bay of Bengal area. Others – India and Sri Lanka for example – have experienced rising timber prices, and some of the important timber varieties are being conserved and are not available for boatbuilding. What to do then?

To a westerner, the quick answer would be to adopt a combination of western-style boat designs including engine and perhaps sail. That solution, even if it leads to a good boat, has the disadvantage of being rooted in a foreign environment and culture. Why should an effective platform for fishing with an easily propelled and stable hull have a western appearance?

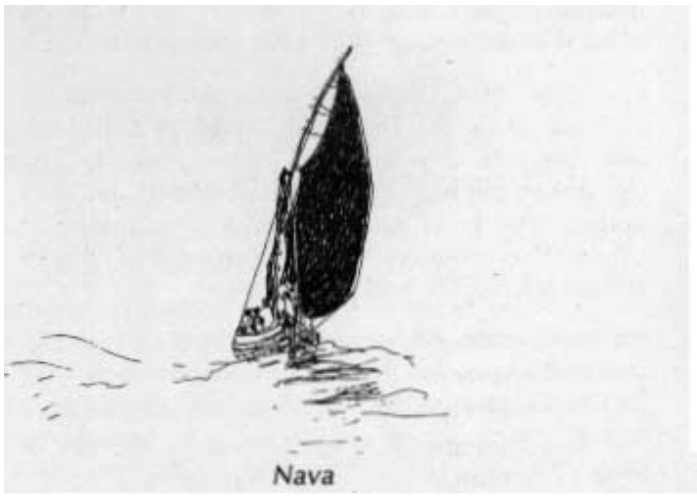
To attain a solution that is adapted to local conditions and that offers a logical extension of traditional boat culture, one has to start with an open mind, with local boat traditions, and perhaps in cooperation with the fishermen on the shore create something that has not yet been seen on the seas.

The replacement of traditional kattumarams with new hull materials at costs acceptable to the fishermen calls for an unconventional solution: perhaps a kattumaram hull of GRP with water ballast adapted for'rriast, stays, centerboard, rudder and oar locks. The formula to solve this kind of problem is latent. in the construction and design of traditional boats. Can we translate that formula into modern materials?

We are now reaching an important point for our future discussions : Will the sail or the engine be the primary propulsion power in small-scale fisheries? We have to select one of the two, because the source of propulsion affects the form of the hull, cargo capacity and crew accommodation.

To those who have spent large chunks of their lives designing fishing boats, such a choice can be very difficult. One has been brought up to regard engines as the only source of power, as devices that guarantee a steady speed (as long as they, run).

The function of the sail depends sometimes on unreliable winds (but if there is wind, the sail will always propel the boat.) Do we dare to try the sail as



BOBP boat IND-20 and Nava outside Madras, October 1983

primary propulsion device in future for small and medium sized coastal fishing boats?

Personally, I believe that the answer would be easier to give if our designers and boatbuilders got opportunities to develop a "sailing machine" based on the Sri Lankan oru and the Indian kattumaram.

For centuries, the sail has been used effectively on all the oceans. Heavy freighters have slowly crossed river systems and open seas. Log rafts with cargo loads have been able to sail to windward in open seas by using leeboards.

Speedy outrigger canoes have performed planned trips over enormous distances. Along many coasts there are still cargo ships which use sails only : both India and Indonesia have a large number of such vessels. One of these types, the Pinisi, from Sulawesi (Indonesia) is such an efficient sailing vessel, that according to investigations, it is not possible to make it more economic with an engine. Some of these ships have recently been fitted with a small engine for use when there is no wind, as also for use in harbours.

What I wish to say is that we can easily misjudge the possibilities of a sail; we have too limited knowledge to evaluate the subject fairly from all angles.

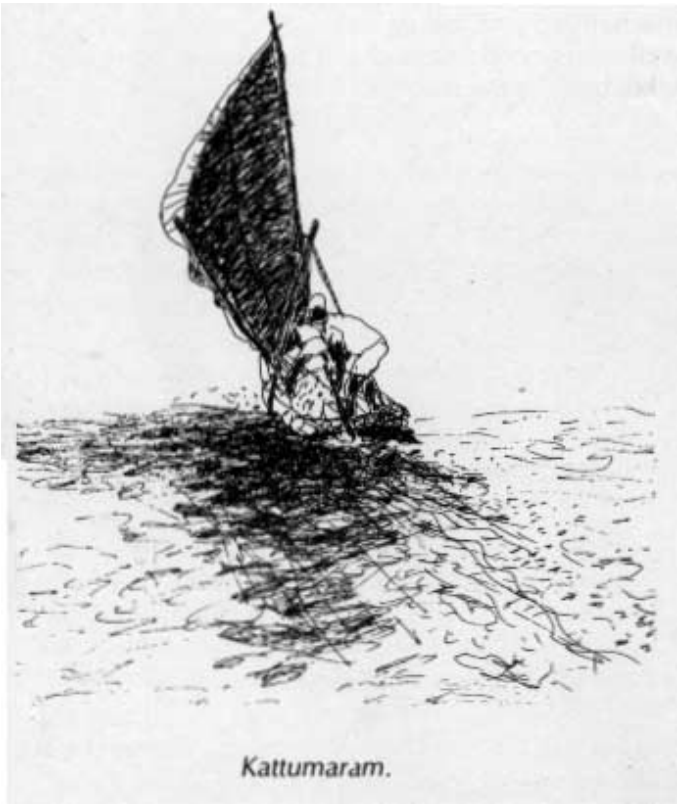
And perhaps we under-estimate the sail's possibilities and advantages because of our "motorized" upbringing.

I have deliberately left another factor to the very end. It is more difficult to penetrate: it concerns what we could label as the romantic aspect of the issue.

Around the Indian Ocean – or wherever a living, rowing and sailing tradition exists – one can clearly notice the difference in maintenance and trim between mechanized and sailing boats; the sailing craft are well maintained, painted and decorated. The crew takes pride in the craft and its function under sail.

Kattumaram sailing in the harbour.

Net repair, Madras.



Kattumaram.

It seems that it easy for a man to cooperate with a sailing boat, and that his knowledge in handling hull and sail in different situations is a source of happiness and satisfaction. In a sailing boat, every member of the crew can influence the speed and behaviour of the boat.

How can one evaluate the importance of personal responsibility and skill, which a sailing boat demands? It is difficult, but this seems to be the basis of all traditional boat cultures.

I have encountered this phenomenon among the whalers from Bequia who still row their boats to carry the harpooners within reach of the prey. The whaling boats have the same layout as seen during the mid-i 9th century when Melville wrote about the white whale; they are still working well!

There is no doubt that oru and kattumaram fishermen enjoy the speed capabilities of their boats — they frequently race to and from the fishing grounds. If one studies the sailing boats of the Maldives, one will come across willing teachers in the art of building and sailing a 'dhoni'.

During a night sailing trip some years ago, I was taught the art of sailing a dhoni in darkness, to control rolling, detect directions of the current, and to 'see' reefs and islands in a moonless night.

If one chooses to develop the sail as primary propulsion power, a professional sailing tradition is available in the area as a base for development work.

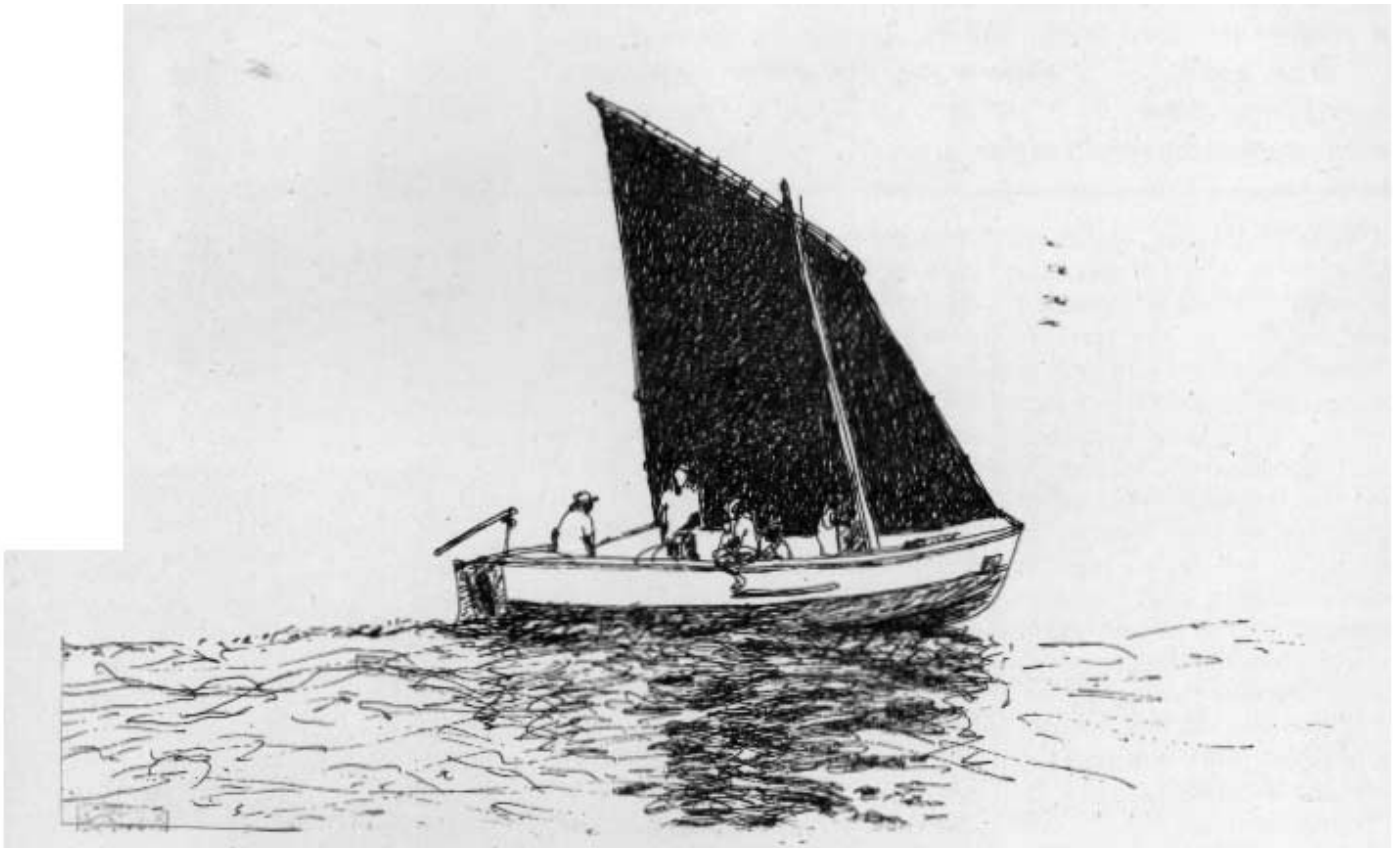
I won't say any more about traditional sailing boats and their crews, lest I be dubbed a sail romanticist.

This article is an outcome of my participation in the BOBP "Sail Consultation". My conclusion, based on impressions from the shore at Madras, is that the sail has had and will in future achieve a greater importance in the coastal fisheries.

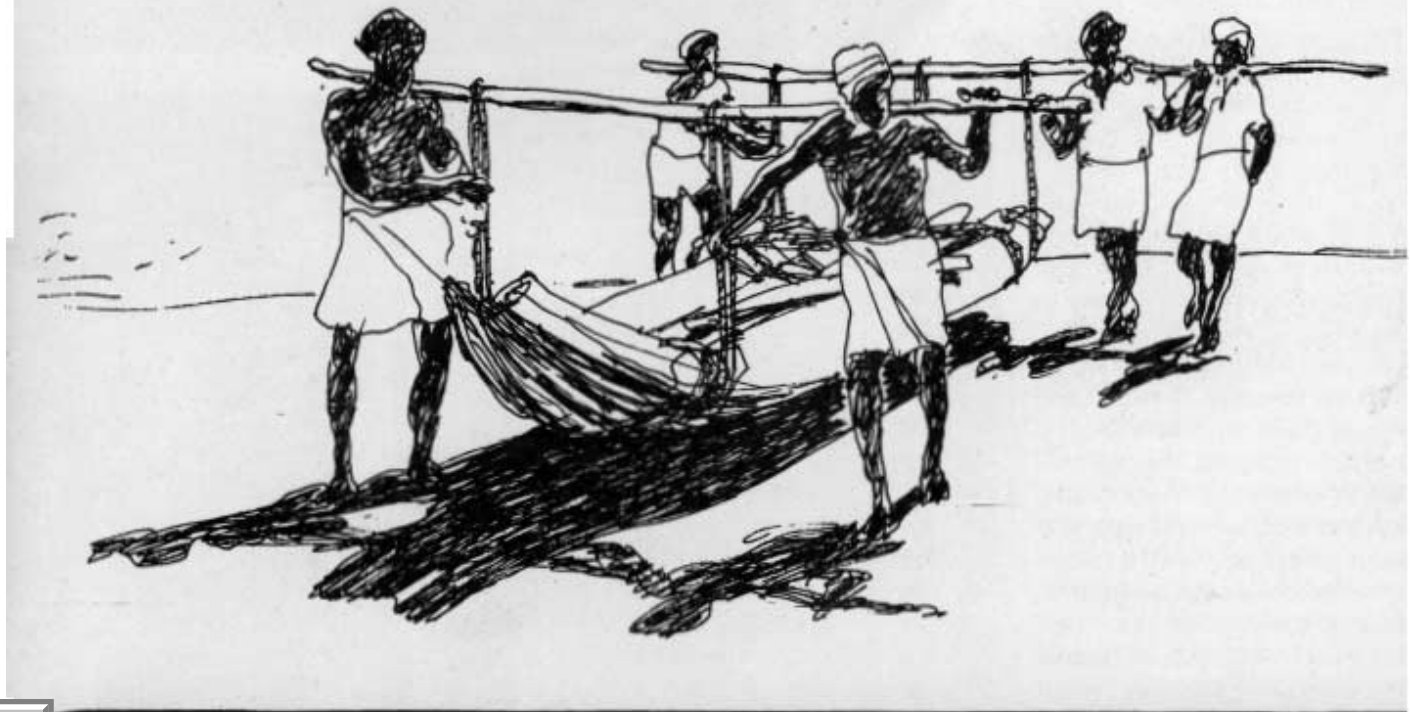
The fisherman is an important factor in the supply of food and should be given the 'tools' that suit his aim – the tools that help him and his family achieve a good economic return and personal satisfaction.

Existing craft developed by generations of fishermen will soon have to be replaced, not in function, but in the matter of material. The fisherman should not be left alone to do this.

With his and our joint experiences and knowledge, we ought to be able to give the fisherman beats which even in the future will assure him of gainful occupation.



Above: IND-20 sailing with Dipping Lug rig. Below: Kattumaram being carried ashore.



Pen culture of shrimp in Killai: Passing on the technology to fisherfolk

by Rathindranth Roy

The technology for pen culture of shrimp at the BOBP-assisted Ku/al project in Tamil Nadu has proved successful. How best should it be applied on a wider scale? The author conducted a socio-economic survey for BOBP at Killai to find out the answers. He analyses here the results of the survey.

Tamil Nadu, in the south east coast of India, faces a rather peculiar predicament. There is an increased demand for fish in the state to supplement local diets with protein and to earn valuable foreign exchange through export. However, escalating fuel costs constrain any substantial expansion of fuel-dependent capture fisheries. Further, the fisheries of Tamil Nadu are dominated in numbers and size by small fishermen and the state is faced with an urgent need to help their lot by increasing and expanding their earning options.

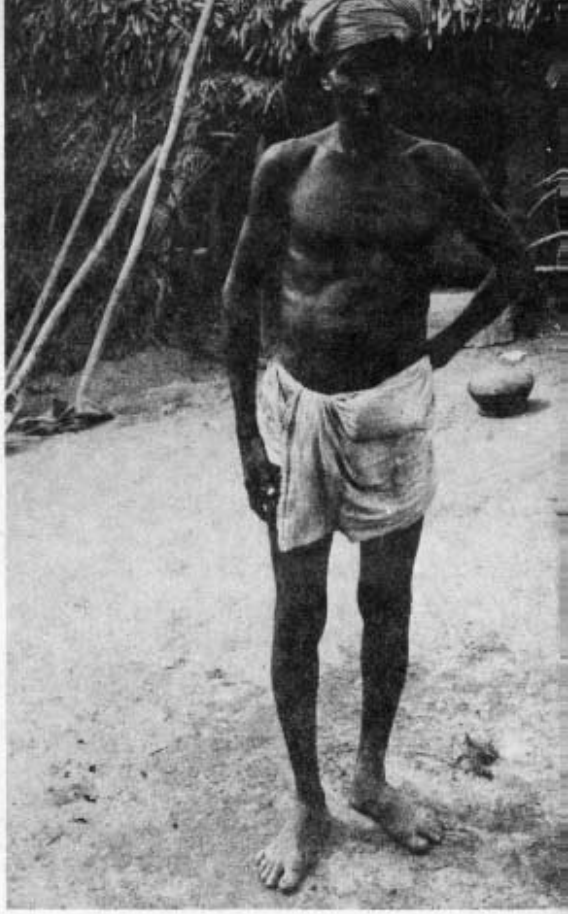
In trying to overcome this complex nexus of needs and constraints the government chose to fall back on two resource bases which are presently under-utilized : large stretches of coastal fallows and shallow backwaters and the small fishermen who fish them.

The Tamil Nadu Government made a specific request to the BOBP for help in this matter and the BOBP undertook several studies. Out of these evolved a project 'to test the technical feasibility of the one technology which showed promise as an answer to the needs and constraints : shrimp pen culture in backwaters. A project at Killai, 250 km from Madras, appeared to be both technically feasible and technologically appropriate. The technology exploits the natural environmental phenomena of coastal fallows and shallow backwaters; it makes it possible for the small fishermen who fish the backwaters to dramatically increase their productivity by shifting from capture to culture at reasonably low cost; it does not need large investments and uses skills which are easily acquired by fishermen. The technology will also generate a surplus which could be a very useful input and stimulant to the local economy.

Naturally, the Government of Tamil Nadu and the BOBP were eager to extend the technology and make it available to the small fisherfolk. The question was how to encourage the Killai fisherfolk accept the technology, how to let it enter their mainstream.

A techno-economic and social feasibility study was undertaken and this article will dwell on some of the findings and recommendations of the study. Questions such as seed and feed availability for large-scale extension remain to be answered, but the study did indicate the technical viability. The economic analysis was based on the assumption that the ideal shrimp farm would be a 1 ha pen operated by a family with outside help for pen construction, seed and feed supply. Furthermore it was based on a production of about 460 kg of P. monodon and P. indicus and about 330 kg of 'pests' per cycle, and on the assumption that feed costs do not rise above Rs. 1.60 per kg., that seeds are naturally available for three crops per year and that a market price of Rs. 45 per kg can be realized for the harvest (P. monodon, P. indicus).

The socio-economic feasibility was another story. And while the study identified several constraints to technology transfer, it also helped the evolution of a new approach to solving the prQblem.



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The Killai community is scattered among several hamlets and consists of two very different and distinct groups of people. The majority belong to one Hindu caste, the Parathavars, who are a relatively well developed group and the dominant group of the region. The minority are a tribal, semi-nomadic group who are in all probability an off-shoot of the wandering Irula tribes of South India. While the Parathavars have dugout plank canoes and various types of nets, the Veddars, as the tribals are locally known, fish the backwaters with their bare hands and basket nets. These two groups are at very different levels of development and have very different needs. The Parathavars would like to improve their producti-' vity and even enter new fields other than fishing, but lack the skills, investment and organization to do it. The Veddars, on the other hand, are talking about survival and immediately need employment to assure themselves of the basic needs of life. The extension scheme would have to cater to these widely different needs.

Every technology finally succeeds because the community is able to evolve social and commercial organizations to 'carry' and 'nurture' the technology. The communities in Killai are organized around the family for social as well as commercial purposes. Extra-familial organizations such as fishing teams are transient and unstable, while cooperatives are perceived as structures which enable exploitative access to government funds and services. The only real cooperation was found around religions and social-cultural activities and rituals. So, while developmental activities can and should work towards cooperative and other forms of joint activity in Killai we would have to begin with the family orthe individual as the carrier.

Life in Killai revolves around the backwaters which is the major resource, in spite of the fact that the government has legal hold over it. In a resource-scarce economy, allocating a piece of water area for exclusive culture to one is seen by the others as a reduction of their

(Continued on page 32)

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How Can Traditional Fisherwomen Supplement Incomes?

The Story of Three Fishing Villages near Chittagong

Juldia-Shamipur, north Juldia and Diyang are traditional fishing villages near Chittagong. They are beautiful even amidst want : trees, wild flora and greenery are as much a part of the landscape as the huts.

To reach Juldia, you drive 20 km south of Chittagong to the bank of the Karnaphuli river, and row across it on a *sampan.* Shamipur adjoins juldia, north juldia lies about a kilometre ahead by straight road, Diyang is located in a hilly area, a few kilometres away.

A pilot project is on at the three villages, which have a combined population of more than a thousand. Its aim is to help fishing families here, particularly the women, help themselves, and improve their lot.

How does the project manifest itself? In group meetings of the women. And in a number of productive home-based economic activities. Net-making, pond culture of carp, animal husbandry — the rearing of goats, ducks, chicken. These activities have had a collective i'mpact on the villages, both direct and intangible.

Direct impact — in the form of cash. The women are supplied with twine, they make nets and earn a wage; ..they get loans for fish marketmg; they get loans to buy goats, Th.jcks or chicken. And, very soon, i'hey will earn income from fish pond culture.

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More activities are mooted for the future. A community centre; loans for widows or the poorest families for fish drying during winter; a ration shop to sell basic essentials such as rice and tea; a revolving fund to provide capital to start new income-earning activities; launching of similar income-earning activities for the men through group action. Apart from the tangible impact of all these activities, the intangible impact has been substantial – it has injected new hope for the future.

Says BOBP sociologist Patchanee Natpracha: "We want the women to supplement their incomes by applying skills which they already know or can be easily taught. We stress participation by all. We encourage them to feel that they are capable. We help them to see new alternatives and execute them".

The project is executed jointly by the BOBP and the Ministry of Fisheries and Livestock, Bangladesh, with some initial assistance in the logistics of group organisation by Ghashful, a voluntary agency. Three officials from the Bangladesh Ministry of Fisheries – Mr Shamsul Huda, Mr Basheruddin Tapadar and Mr Kazi Huq – offer technical support to the women's activities as necessary. Two social workers engaged by BOBP – Gouri Dutta and Mursheda Begum – regularly visit the village, attend women's meetings and maintain accounts.

What makes the income-earning activities possible is group action at the village level. Participants are a dozen groups of village women, each group having about 10 women each. There are six "link workers" – Ratna, Rangbala, Marijana, Rajmala, Sumanta, Maria – who coordinate the activities of the groups. Each link worker looks after two groups.

Says Mr Huda: "The link worker has many responsibilities. She holds regular group meetings, distributes twine obtained from BOBP through field supervisors Gauri and Mursheda to "net-makers" in her group, picks up the completed webbing from them, collects wages for the work and distributes them. She keeps track of other project activities as well.

For example she tells the field supervisors about day-to-day problems if any in carp culture, about how the ducks and goats given to group members are faring". For her labours, she is paid Taka 100 to 150 per month.'

Photographs by F. Amalore

"The link worker moti.vates and inspires her group", says Patchanee. "The abilities of the link workers vary, but most of them have helped motivate, the village women and make the project's efforts meaningful".

How did the whole project begin? Since 1979 the BOBP has been active in trying to improve traditional fishing gears in the Chittagong area. Technologist C' Pajot wanted to encourage fishermen to use thin twine for making large-mesh drift-nets. The idea was mooted of getting fisherwomen to use such twine to make net webbings. Other components of the project – such as savings, fish ponds, animal husbandry – followed.

* * *

A few weeks ago this reporter went on a walking tour of Juldia – Shamipur and north Juldia villages, accompanied by officials Huda and Huq and field supervisors Cauri and Mursheda.

Village coordinator Ratna (above), talks to her group (left).

The first major activity we see in juldia is a fish pond, got on lease on a nominal rent (Taka 1,500 for a whole year). Three varieties of Indian carp – *katla katla, ruhi* and *mrigal* – are cultured here. Stocking of fry, bought by fisheries officials from the Chittagong fresh water fisheries station, was done in june 1983. The women have been trained to provide supplementary feed (oil cake and rice bran), to put sticks into the pond to discourage poachers, and to keep an eye on the ponds, while the Department officials monitor progress. Says Huda "We stocked 1,250 fry into this pond. We expect 65% survival. After havest, we will deduct what we have spent on the culture operations and distribute the proceeds among the women."

The project also runs a second fish pond in Juldia – the site was donated 'by an industrialist. This pond was also stocked in June 1983. The sites for two more ponds are the subject of negotiation. Thus four fish, ponds will soon be available in the area, a lucrative source of supplementary income for the fishing families.

Net-making is the project's major success. Till May 1984, the women had earned nearly taka 65,000 as wages for the nets they had made.

"During the latest fishing season we sold 187 large-mesh driftnets, and

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Net-maker at work. Women from north Juldia, Juldia-Shamipur and Diyang villages have so far earned about 65,000 taka as wages from net-making. Facing page (clockwise) : BOBP field worker with' village coordinators; rearing of chicken; and carp culture in ponds: Three varieties of carp are being cultured.

24 boatowners bought them", says Patchanee. BOBP fishing technologist C Pajot – who had earlier visited' boats out at sea to inspect nets made by the Juldia women – said that the quality of the work done by the women was quite satisfactory. However, the nets should have been stretched before being sold, he said. Huda and Huq made note of his point.

During our tour, we see only sporadic net-making activity by the women. Why? Since the market for thin-twine driftnets is limited (only some Chittagong fishermen use them), only a limited quantity of twine was distributed to the women. But the project recently distributed tyre cord (the material most fishermen use for their nets) on an experimental basis to 20 women. If this experiment succeeds, net-making by'women may rapidly gain momentum, even without assistance from outsiders.

From the wages women earn for net-making, 15 per cent is deducted as savings, and field supervisors Gauri and Mursheda carefully maintain savings accounts for each group member. Says Patchanee "We discovered during a socio-economic survey that when the fisherfolk have no money during the lean season, or when emergencies occur, they borrow and run up big debts. The savings are meant to prevent such debts." (Till May 1984, the women had saved up nearly Taka 12,000.)

The BOBP also plans to engage a voluntary agency, the Village Education Resource Centre (VERC), to give the women training in budgeting and to suggest a savings plan after studying the fisherfolk's presentstatus, incomes and savings.

Besides organizing savings, the project provides loans to the women on a trial basis. So far, 38 loans of 100 - 200 taka have been given to the women for fish marketing, and five' loans of 300 to 500 taka for fish drying. The women repay in small instalments, whenever they can. The proceeds from the sale of nets madeby the women go into a "revok'ing fund". The fund will help finance a community hall in Juldia. Eventually the revolving fund will be used to buy twine or tyre cord to keep the women gainfully occupied, and the proceeds of their work will again swell the revolving fund. Thus the fund will be a self-generating mechanism for improving the lot of the fisherfolk.

* * *

We stop at the house of village coordinator "Photo" – it's part of a cluster of huts facing a row of palm trees. She isn't around but her mother Monibala, also a group member, is. She says, "This net-making has helped us. We make some money.

That is why we want more twine". Monibala has five daughters including Photo, none of them married, and two sons. The two main earning members are herself and husband Bholaram, 65, a contract labourer on fishing boats and an occasional fish ttader. "We have no fixed income", says Bholaram wistfully. "So I am glad our women are able to earn some money by making nets ... It makes a second daily meal possible."

In north Juldia, we talk to coordinator Ratna, a resourceful young girl who runs her family and also keeps her group going with tact, humour and, patience. In a spacious courtyard outside her home, cow dung is spread out to dry, and ducks reared under the project are cackling about. As we chat in the shade, we are offered coconut juice and a jaggery snack.

Ratna belongs to a 14-member family — 3 brothers, 7 sisters, a baby daughter, husband and mother live together. Her husband works on contractwith the BFDC in Chittagong.

Talking about her problems Ratna says that she has to walk about a mile to the "field office" (at the Kalidaha fishing project) to collect twine for all her group members, and it's not easy during the rainy season. She is also expected to inspect the net webbing made by her group members — but this irritates them. And after collecting their finished work, the net webbing, she is sometimes unable to pay them because the money hasn't arrived yet.— and that angers the group too.

Greenery is abundant in the three villages, and it's natural that the project considered the potential of fruit rearing in a soil where apparently anything grows. But the few trees planted disappeared quickly — either. cattle ate them up or some one took them away. The project has had better luck with the rearing of ducks, chicken and goats — distributed on loan to group members. Their number is steadily growing, and in course of time animal husbandry may be fairly widespread as a supplementary occupation.

"This project helps us a lot but we need more such help," a link worker told this reporter. That in fact is what most women feel. The menfolk, who see the new flurry of activity around women, are keen on similar activities for the men, particularly during the lean-March-june season.

An important question the BOBP is now giving thought to : How far is the Juldia Shamipur project a model? How far can the experience of raising fishing family incomes through net-making and other activities be widely applied? Self-reliance at Juldia-Shamipur is not in sight yet. Can it be achieved quicker by any other means? The BOBP still seeks answers. — **S.R.M.**

A day in Phuket harbour

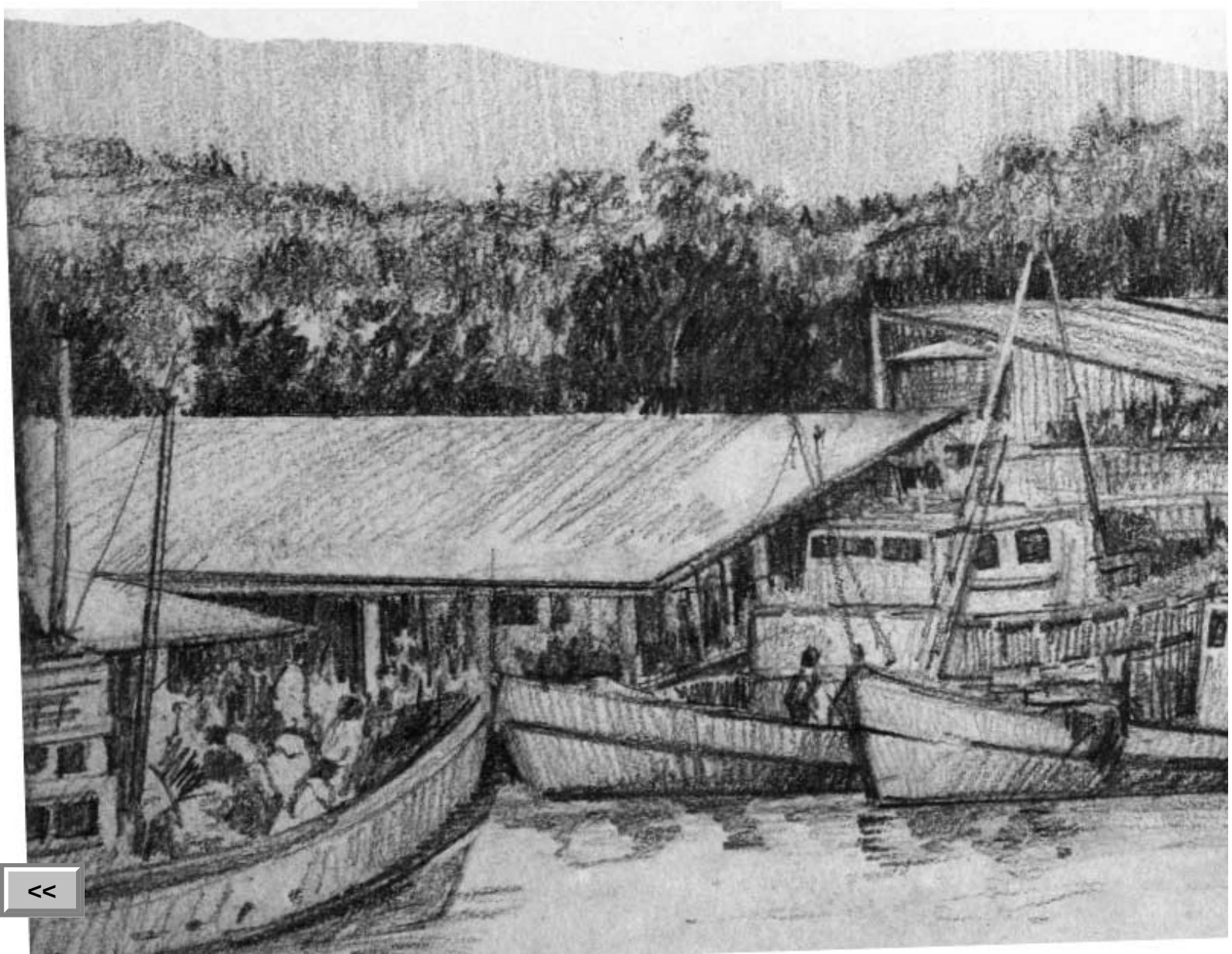
The scene at Phuket harbour, about 10 km from the heart of the town, should enchant the artist – as the sketch below shows – as much as it delights the fisherman or the entrepreneur. The hills stretch away at a distance; trawlers and purse-seiners dominate the waterfront; the jetty is host to scores of enterprises.

Prominent at the jetty are two giant machines that hiss and growl as they swing into action. The Convenger, a 35' long snake-like electrically operated device, can transport 12,000 kg of fish by a rubber'conveYOr belt in 50 minutes. Giraffe, a tall mechanical contrivance, crushes ice and sends it cascading into trawlers.

Men are as busy as t,he machines – mending 1,500 rn-long purse-seine nets, loading trucks with fish, or carrying palm-leaf branches into the purse-seiners for use as lures. Vessels are being recharged and reinforced by the crew (with fuel, food, gear) for the next hunt.

The sun is blazing away, but we hear thunder – or rather, a series of explosions. It's just a trawler's pre-launch ritual. Fishermen in India crack coconuts to propitiate the unknown, in Thailand they fire crackers.

We explore one of the many purse-seiners, and the crew are quite hospitable. This one is about 20 m long, powered by a 180 hp engine, and fitted with a radar, sonar, echo sounder and radio, as also with "glare lights" to lure fish. "We engage in one-day operations, but sometimes we go out late in the evening and return in the morning," says a crew member. "We do not need to go far – we go after shoals and find them a few mites from the shore. We usually catch sardines, mackerels, scads and trevallies." How much of it? Several thousand kg. The catch sells foi'about 3.5 baht/kg (scad or sardine) or 16-17 baht per kg (Indian mackerel). (Some 25 baht make one US dollar.)



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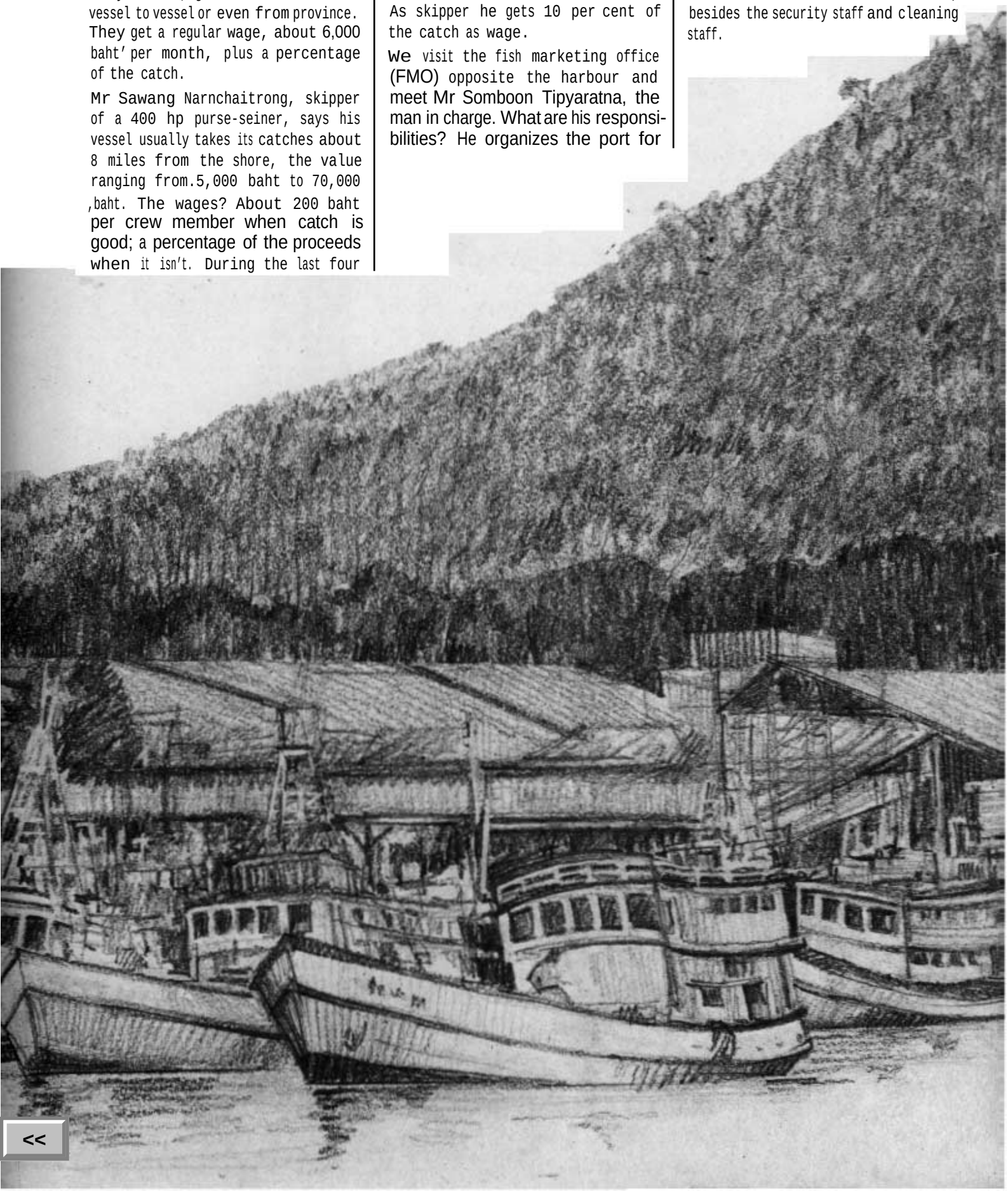
Phuket town, south of Bangkok, is a major marine fisheries center of Thailand. This photo feature describes the sights and sounds at Phuket fishing harbour – where the highest landing on a single day was 187,000 kg of fish on September 8, 1983.

The purse-seiner has about 25 crew. They switch, jobs with ease from vessel to vessel or even from province. They get a regular wage, about 6,000 baht' per month, plus a percentage of the catch.

Mr Sawang Narnchaitrong, skipper of a 400 hp purse-seiner, says his vessel usually takes its catches about 8 miles from the shore, the value ranging from.5,000 baht to 70,000 ,baht. The wages? About 200 baht per crew member when catch is good; a percentage of the proceeds when it isn't. During the last four months, says Sawang, "each crew member has made some 17,000 baht.." As skipper he gets 10 per cent of the catch as wage.

We visit the fish marketing office (FMO) opposite the harbour and meet Mr Somboon Tipyaratna, the man in charge. What are his responsibilities? He organizes the port for landing operations. Under him serve 11 data collectors'or enumerators, besides the security staff and cleaning staff.



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Photographs by Peyton Johnson & S.R. Madhu

Mr Somboon tells us that the highest landing for a single day at the harbour was recorded on September 8, 1983 — 186,930 kg. The main species were pelagics — about 100,000kg of round scads, 50,000kg of mackerels and 30,000 kg of trevallies. 1983 has been the best year so far.

The Phuket harbour is six years old. Before this harbour came up, trawler owners used their own landing centres. These are still active — thus fish that lands at.the harbour represents only a part of the total catch. During the November-january monsoon season, traditional boats using gillnets for shrimp and finfish are active along with big trawlers. But there is no conflict between the two types of vessels.

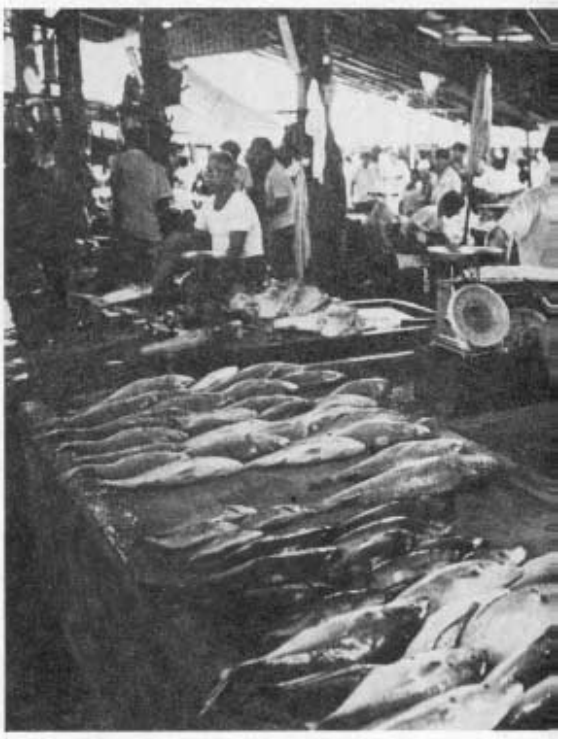
From the harbour, fish for the town goes by refrigerated trucks to. the local fish market. Most of the other fish is preserved in the cold storage plant near the FMO's office. We peep tentatively into the cold storage room — and back out. "That blast of cold air can knock down a buffalo," we are told, "unless the buffalo wears protective gear like we' do." Every day some 50 trucks leave from here, for Bangkok, Songkhla, Kuala Lumpur and Singapore. Fish processing for export.is not done in Phuket, but by processing plants in Bangkok.

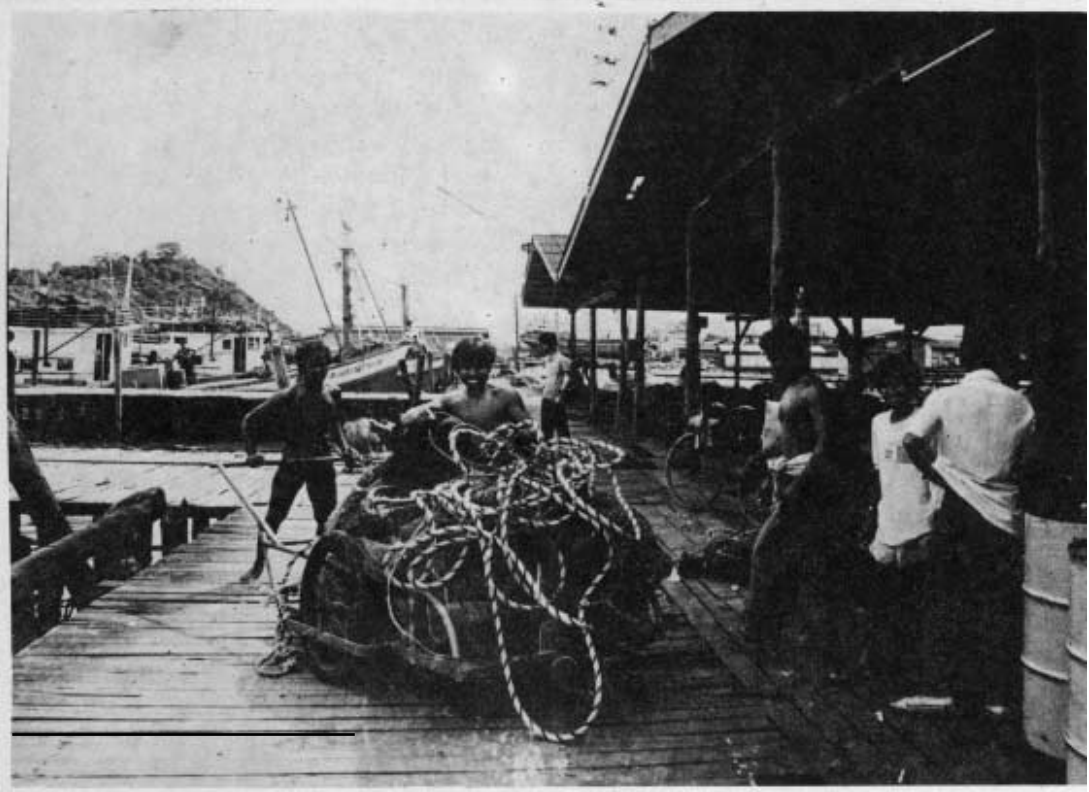
There is also an ice-making plant near the storage plant. The manufactured ice is stored in aluminium containers which in turn are stocked underground in blocks. This plant — and five private plants — supply some 750 tons of ice every day to the fishing harbour, and during the peak month of December, nearly 900 tons per day.

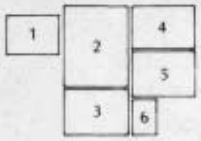
A landmark of Phuket is the fish market where you can buy, besides fish : meat, vegetables, fruits, flowers, snacks and provisions for daily use. Incredibly, the fragrance of roses mingles with the odours of meat and fish and the aroma of fresh vegetables — beans, tomatoes, potatoes, onions, spinach, cucumber.

Merchants at the fish market get their supply either from a single regular source, or from several sources. On the day of our visit, mackerel costs about 20 baht per kg, round scads 10-12 baht per kg. *Penaeus monodon* caught from gillnets costs about 160 baht per kg, while other varieties of prawn sell for 120 baht per kg. Smaller shrimp caught from trawlers are being sold for 60-80 per kg, depending on the size.

Visitors to the market include tourists and natives, office-goers, home-managers, fun-seekers, teenagers and old folk. "I love Phuket," says one of the town's old-timers. "Bangkok is fine to visit but this is where I want to live . . . You don't get fish in Bangkok like you do here.







1. *Purse-seiners and trawlers dominate the. waterfront at the Phuket harbour.*

2. *Fish handling at the harbour.*

3. *Fish for local consumption goes from the harbour to the Phuket market.*

4. *Palm leaf branches being taken aboard purse-seiners for use as fish lures.*

5. *A purse-seine net is transported on wheels at one of the private landing centres near the harbour.*

6. *A traditional fishing boa't at a canal neat the harbour.*

Pen culture of'shrimp in Killai

(Continued from page 23).

rights. And this can raise conflicts, often violent conflicts., The vast majority of the people of Kil!ai felt that should the government insist on allocating rights the only equitable and just procedure acceptable to them would be to ensure that everyone benefited or none at all. Any form of allocation which benefited less than all was suspect in terms of the criteria for the selection of lucky few. Unfortunately, there is not enough of water area of the right kind to satisfy all; therefore the activity, to begin with, would have to be small enough not to raise a conflict, while testing whether there is a sizeable benefit to all.

The people of Killai use very simple technology to fish the backwaters.

The Killai study showed the need for a development service to advise and support the small shrimp farmers

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Agents and middlemen buy their catch and sell it elsewhere at considerable profit. For the people of Killai to successfully undertake the enterprise of shrimp pen culture would require them to have not just finance and technical knowhow but a whole range of managerial, marketing and entrepreneural abilities and attitudes. Most small and tiny enterprises fail not because of credit and technology problems but because of management, attitudes and a socio-economic cultural context which often tends to distort processes away from their planned goals. So while nationalized banks are prepared to help with credit and the government's fisheries department and the BOBP are confident of giving the people technical know-how and training them in the specific skills, the study showed the need for a development service to advise and support the small shrimp farmers in establishing the shrimp pens and in managing them to ensure successful technology transfer to small-scale farmers.

A Small Fish Farmers Development Service (SFFDS) will answer the many extension needs of Killai pen culture

- by motivating the community to undertake the enterprise of shrimp pen culture for their own benefit;
- by making the technical know-how available and by training the entrepreneurs ,in technical and managerial skills;
- byliaisingwith banksand government agencies to enable the small farmers to avail of finance, know-how and other services;
- by participating in and helping 'in the management of all aspects of the shrimp pens;
- by motivating the individual farmers into group activity and cooperative activity over time;
- by motivating the investment of surpluses into other local enterprises.

The study went a step ahead and suggested that the SFFDS charge the fishermen for services rendered. Why charge at all? For two reasons: First, it would vastly improve the credibility of the SFFDS, for most folks have a healthy suspicion of the motive of someone giving away something for nothing. Business relationships are clearly understood and socially acceptable. Secondly, should it be possible at some stage to generate enough revenue for the SFFDS, we could even contemplate a viable, self-reliant service which would then enter the mainstream of activity – as management consultants and other professionals did at one time.

If successful the SFFDS would be a valuable ally and aid to not only fishermen but to development agencies and banks whose work it is to work with the poor, but who are often unable to do so because of their very structure. The success of the'SFFDS would be based on its ability to perform the necessary tasks which as depend on earning the respect and credibility of financial organisations on the one hand and fishermen on the other. And further, the fisherman can hold the service accountable as he is paying for the services rendered.

In conclusion you may well ask where has the study and all this theorizing taken us? We are happy to say that even as you are reading this article the BOBPwill be initiating activity to put the first SFFDS into the field in the Killai region to enable the community to accept shrimp pen culture and in time to better their lot.

Published by Lars O. Engvall for the Bay of Bengal P.rogramme, Post Bag 1054, Madras 600 018, India. Phototypeset at Mesvag Process, Madras 600 041, processed at Color Crafiks, Madras 600 028, and printed at Nagaraj & Co., Madras 600041. Editor: S: R. Madhu. Layout Artist: E. Amalore.

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