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FISHERIES DEVELOPMENT

*Shrimp seed —
any to sell?
Come to Satkhira,
Bangladesh*



Shrimp seed any to sell? Come to Satkhira, Bangladesh

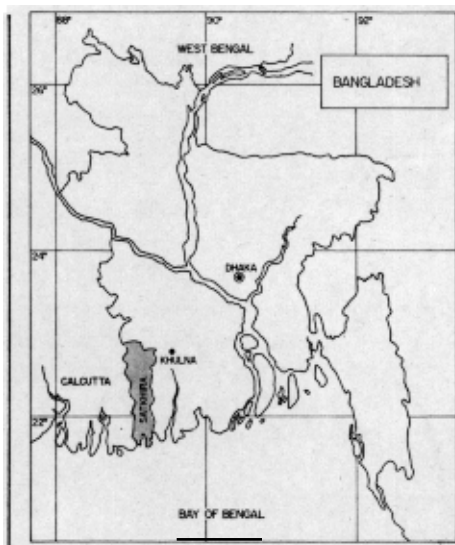
by P. Funegaard

Satkhira district in Bangladesh is a major shrimp culture region. The demand for shrimp seed is very high (of the order of 0.5 to 1.0 billion per annum) and far exceeds supply. Seed shortage is in fact the major constraint to shrimp culture expansion in Satkhira. There is also the danger of over-exploiting juvenile shrimp – something that could hit the country's profitable shrimp trawling industry. It is against this backdrop that this article takes a look at the collection, transportation and marketing of shrimp seed in Bangladesh and examines how far seed collectors have benefited from the expansion of shrimp culture.

During early 1986, a Swedish biologist, Mr. Kenneth Larsson from the National Swedish Board of Fisheries (NSBF), was sent out to Satkhira to assess the status of seed collection. Proposed by BOBP, the study was supervised by Mr. Peter Funegaard, BOBP Aquaculturist (Associate Professional Officer), who introduced Mr. Larsson to local fisheries officers and showed him the different seed collection centres in the survey area. The data for the study was collected mainly by interviewing groups of people partly or permanently occupied with collecting, transporting and marketing the seed. To conduct these interviews, it was necessary to travel on motorcycle on narrow roads and river embankments throughout the whole district.

This was a new and exciting experience for Mr. Larsson. The travels were peppered with several adventures such as, ferrying the motorcycle on small boats across rivers with strong tidal currents and transporting it on the back of a cycle rickshaw after a puncture. Mr. Mizanur Rahman, Fisheries Officer, Satkhira, who accompanied Mr. Larsson during his many field trips, served as translator during interviews with the local people.

The survey was conducted during a six-week period (from January 6 to February 18, 1986). This was not the peak season for seed collection a blessing in disguise, since most of the interviewees had time to answer questions, as they were not fully occupied with seed collection work. The seed collectors were quite willing to share the requested information and to discuss their future concerning seed collection. The report of the survey will



be published by the National Swedish Board of Fisheries. Hopefully this report will help future researchers.

What are the report's findings?

In recent years, the production of exportable shrimp from Satkhira district has increased because of the successful introduction of new culture techniques. The selective stocking of *P. monodon* has created a rapidly increasing demand for seed. These *P. monodon* seed are still supplied by local seed collectors. They will most likely continue to be the only source for seed supply in the near future since no hatchery projects have been started yet in the district.

The seed is collected from low saline areas in rivers and canals which are their nursery grounds. The methods used to collect seed have been adopted from West Bengal, in India, where selective stocking was introduced in the beginning of the '70s. Shrimp farmers in Bangladesh, living close to the Kalindi river (see map on

page 4), bordering India, brought used collection gears and demonstrated them to local population. Since the introduction of selective stocking in the beginning of 1980, the number of collectors has increased enormously because of the high prices paid for the seed. Today, nearly all the suitable sites for collection are utilized along the river embankments throughout the whole of Satkhira district. An estimated 20,000 to 25,000 collectors (calculated by extrapolating the average number of collectors observed per mile) operate during the peak season (February to March).

Main collection areas: (See map on page 4)

Collection gears

Three main types of gears were observed in use – one stationary, two mobile. The netting material used is high density polyethylene (HDPE) with 1 mm mesh size. This material is considered suitable because of its long durability and low cost. The netting material is bought in India and smuggled by boat to Bangladesh.

The netting material is sold at local markets at a low price, between Taka 8 and 13 per yard. The netting for stationary gear is made by local tailors for Taka 50. Depending on size and design, the total cost amounts to Taka 200-400. The small mobile gears are made by the collectors themselves for only Taka 20-30 for the netting material.

Methods of seed collection and seasonal variations

When abundant, seed is collected twice every 24 hours, and for four to
(Continued on page 4)

A Letter from the Publisher

Recently I had the opportunity to participate in the concluding seminar in Puri Orissa on the BOBP-supported credit scheme for artisanal fisherfolk. The scheme, which has been featured in earlier issues of Bay of Bengal News, comprises of 2,500 small loans totalling Rs. 7.4 million.

The loans have been issued by 29 branches of 9 regional commercial and rural banks in cooperation with the extension service of the Directorate of Fisheries in Orissa. The scheme is refinanced by NABARD, India's "mother bank" for rural credit. The disbursements started in 1983 and have just been finalized. The experience that stands out is the high rate of recovery — 95 per cent. How come the fisherfolk are repaying so well? Most other experiences, not only in Orissa and India, are that this type of credit doesn't work; large portions of the credit don't reach the intended target group and very low, even zero repayments, are reported. As a result, the enthusiasm for credit to small-scale fisherfolk among bankers and fishery officials is very low — to the detriment of fisherfolk. The positive experience of the Orissa scheme can perhaps lead to some new approaches.

The seminar in Puri, which was attended by bank managers of different levels, NABARD officials and fishery officers, discussed the reasons for the success and came up with the following :

- Loans are available for a variety of actual needs (20 different types of boats and nets).
- The investments have been *carefully* appraised, ensuring appropriate amounts (neither over-nor under-financing).
- Loans are available at short notice *at the appropriate* time by introduction of simplified procedures and delegated authority for sanctioning.
- Realistic repayment schedules including relaxation during lean fishing seasons.
- Careful selection of *beneficiaries* in cooperation with fishery extension officers with good knowledge of the communities and trained in principles of banking and credits.
- No political *interference*.
- Motivation and freedom of bank managers to issue loans according to needs and not to targets.

CREDIT

- Continuous close monitoring of disbursements and repayments and quick corrective action as required.
- Sharing of *experiences* in regular joint meetings between bankers and fishery officers — which also included a healthy competition by comparing performances.

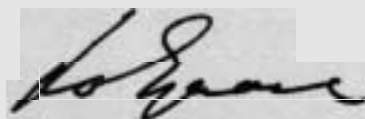
Many bank managers said that they had initially been very sceptical about the scheme but had got totally converted. Besides the quantitative achievements, they emphasized the confidence they had gained through the scheme in fisherfolk as good customers. One bank manager was prepared to issue loans without security for beachlanding craft costing about Rs. 120,000 to some fisherfolk he had got to know during the scheme. Bankers also commented on two important features of the Orissa credit scheme — the absence of subsidies and the absence of a multiplicity of agencies and committees.

A natural question is to what extent the credit scheme can be replicated elsewhere. The answer is that it can be applied anywhere else in India and other countries. — but not without an effort.

The main concern of the bankers would be the additional cost in terms of staff — but the substantially higher repayments would easily compensate for it. The main effort from the fishery administration would be to provide the services of trained extension officers.

But the costs and the effort of starting a new credit system should be seen as an initial investment and not necessarily as a long-term burden of recurring expenditure. Once the system works, and confidence between the bankers and the fisherfolk is established, the costs will come down. Proof of this is that a second phase of the Orissa scheme, is under preparation for implementation without BOBP assistance.

LARS O ENGVALL




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 (SIDA) 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 and monitor fishery resources.

Address : Bay of Bengal Programme, 91, St. Mary's Road, Abhiramapuram, Madras 600 018, India.
Cable : FOODAGRI Telex : MS-311-FISH Tel : 71294, 71296, 71788, 71587, 77760.

SHRIMP SEED — ANY TO SELL? COME TO SATKHIRA, BANGLADESH

(Continued from page 2)

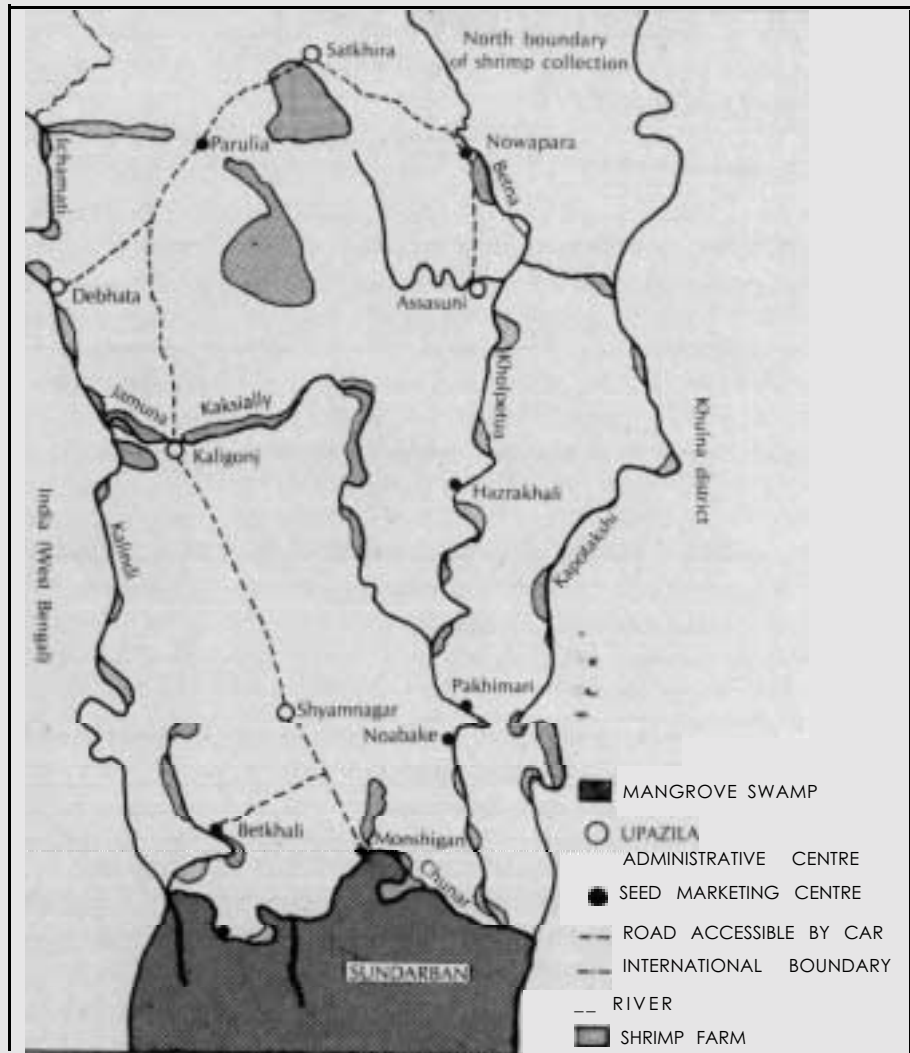
five hours each time due to the semi-diurnal pattern of the tide. The collection nets are best operated during the incoming high tide. The amount of seed is reported to vary considerably within a year — the peak season is February to March throughout the district, and most shrimp farmers also stock their ponds during this period. Seed collection is most intensive during the new and full moon periods because of the increasing tide; post-larvae are activated by the moon. The season is January-April in the northern part, but seed is collected all the year round in the southern part of the district because of higher salinity there.

Seed is collected from stationary nets by boat or by using a special device operated from the shore. Mobile gears are operated by collectors who push or drag these nets in the river.

Local people say that collectors who use mobile gears are sometimes attacked by sharks, resulting in deaths and severe wounds every year. To protect themselves, a few collectors have started using a bamboo stick to hold the nets without going into the water. In the southern part, where creeks run into the Sunderbans, young boys are said to have been attacked by tigers when they go collecting at night. Hence, most collectors collect seeds only on the eastern side of the river.

Segregation

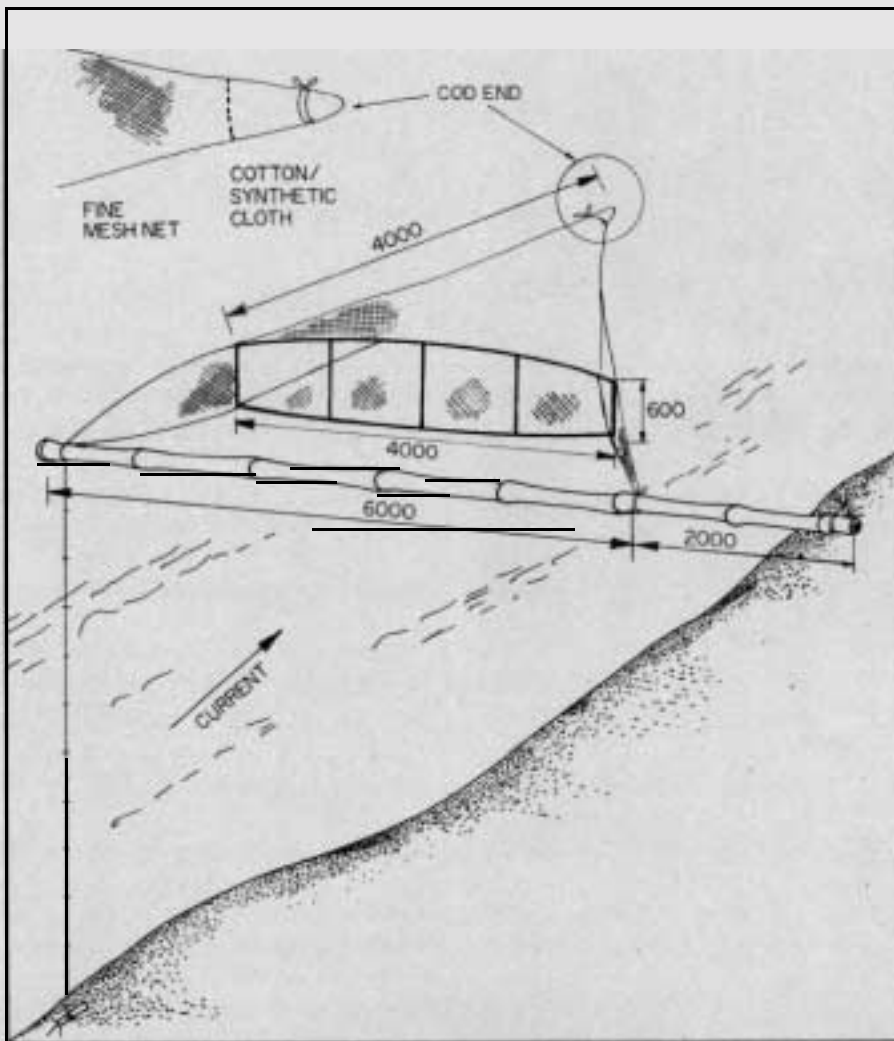
Segregation or sorting of seed takes place close to the river or at fixed places which the high tide cannot reach. The tide varies as much as 3m in this area. Every 20 to 30 minutes, seed collectors remove and separate out the catch by splashing water on the net. Seed and debris are then poured into jars made of aluminium or clay. The catch consists of many organisms — *P. monodon* usually comprises less than 1% of it. For segregation, a white dish and a mussel shell are used. Small portions of the catch are poured into this dish, where the *P. monodon* post-larvae of 10-20 mm length are easily distinguished because they are the only dark brown coloured shrimp of that size. The collectors sometimes dig a hole in the river bank, filled with water by the high tide, to be able to separate



Above : Map of the shrimp seed collection area in Sathira surveyed by Mr K Larsson and the author.

Below : Transport of shrimp seed by boat.





Above : Stationary net (Behundi Lal) for seed collection. The picture on the cover page shows how the net is operated.

Below : Transport of seed by bicycle. Such bicycles are referred to in Satkhira as "helicopters".



the seed which are strongly attached to the debris. The seed is readily collected after a short time when it gets detached from the debris. After the *P monodon* is taken out, what remains — the seed of finfish and other species of shrimp — are left to die. This large-scale destruction of juveniles might hit the adult stock of shrimp and finfish in the Bay of Bengal.

Transport

After being stored at the collection site, seed is transported to shrimp farmers by foot, bicycle, bus or boat or by a combination of these. When transported by foot, a split bamboo stick with two aluminium containers (12 to 16 litres) is used. Bicycles usually carry only one or two containers tied to the back of the cycle. These are locally called "helicopters" and are the most common way of transporting seed. The bicycle is specially suitable as a transport vehicle on river embankments.

The time for storing and transport of the seed to the shrimp farms varies from a few hours to 24 hours. Water in the containers is usually exchanged every four to five hours, depending on the number of seed stocked, water temperature and whether or not brackishwater is available. The mortality rate during the transportation was found to be surprisingly low — only 10 per cent during November to February and 20 per cent during the rest of the year. This mortality rate varies due to factors such as :

- number of seed transported
- time taken for transportation
- water exchange
- amount of dissolved oxygen in water
- type of container used
- the place where the seed is collected

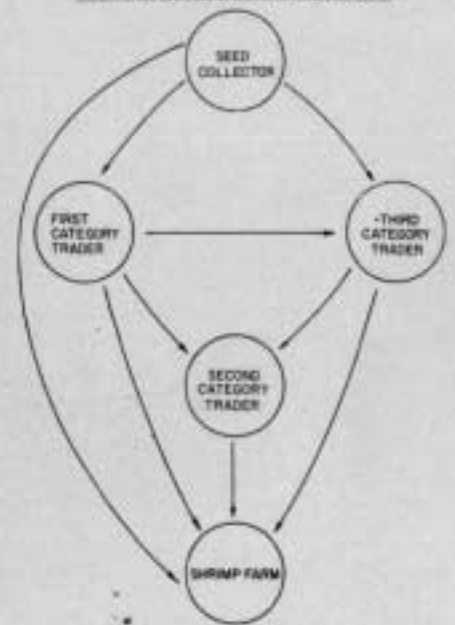
It was said that shrimp farmers prefer seed from the southern part of Satkhira district because high shrimp production has been achieved with seed from this area. It was observed that transport of seed in earthen jars means a higher survival rate than transport in aluminium jars. This is because post-larvae tend to cling to the surface of the containers; water doesn't get heated up so easily in earthen jars as in aluminium jars.

Trading

There is no fixed pattern to the manner in which seed is marketed. There can be up to three intermediaries involved



TRADING SYSTEM FOR SHRIMP SEED



Above : Mobile gears for shrimp seed collection : The pushnet (left) and dragnet (right). Below : Shrimp seed transported the hard way — on foot. Women and children are paid as much as men for shrimp seed.



Below : Buying and selling of shrimp seed.



1st, 2nd and 3rd category traders) between the collector and the shrimp farmer.

There are approximately 1,000 traders in Satkhira district. The price at the collection site may vary between Taka 100 and 400 per 1,000 seed. The price rises by Taka 100 (for 1,000 seed) before they reach the shrimp farms. But the prices at the marketing centres fluctuate a lot and depend on how many traders are present and how keen they are on purchasing the seed.

It was discovered during the survey that four years ago, seed collectors could catch 2,000 seed per net in a day in January and receive Taka 30 for 1,000 seed. In January this year, the catch was only one-tenth of what it was four years ago (200 seed per net in a day), but the price was 10 times as much (Taka 300 for 1,000 seeds). These days a collector earns Taka 30-50 per day, and traders earn Taka 1,000 to 10,000 per month.

In the final analysis, the most important finding of this study is perhaps that seed collectors as a target group have benefited a lot from expansion in shrimp culture because of the following reasons :

- The investment cost of collection gear is low.
- The rivers are owned by the Government and collectors have full access to them.
- The collectors are paid in cash; women and children are paid the same amount.
- Most of the collectors work for themselves or for their families.

Using micro-computers to compile, process and analyze fisheries data : findings from BOBP training course

A ten-day training course (August 27 to September 6, 1984) was held on the use of microcomputers for fisheries data compilation, processing, analysis and stock assessment. Two biologists each from Maldives, Sri Lanka, Bangladesh, Thailand, Malaysia and Indonesia participated in the course which was held under the auspices of the Bay of Bengal Programme's UNDP-funded project, "Marine Fisheries Resources Management in the Bay of Bengal".

Some 20 hours of the training programme were devoted to theoretical work and nearly 70 hours to hands-on experience with microcomputer systems. The biologists, all of them associated with fish stock assessment, worked on four Apple IIe computers, each team comprising three biologists.

The objectives of the course were to :

- (a) enable participants to operate the microcomputer provided;
- (b) learn the principles behind the data base and stock assessment programmes provided;
- (c) individually practise data entry, analyses and interpretation of results obtained and
- (d) enable participants to take care of the hardware and software, to dismantle and reassemble the main components of the system.

The course was in three parts, The first concerned understanding of the hardware components, and functions of these components. The second part included usage of the dBase II program for compilation and analyses of fisheries statistics and stock assessment programs — 'BOBFINS', ELEFAN, Beverton & Holt yield per recruit, Schaefer/Fox production models, Jones and Van Zalinge length composition analyses, 'Jones' length cohort analyses, Thompson and Bell's yield per recruit model etc. Copies of relevant manuals were provided. Dr. Daniel Pauly assisted in conducting this training course.

The final exercise was an analysis of length frequency data brought by the participants, and a presentation of their findings. The findings are also presented country&e, in the pages that follow. These helped identify problems of sampling, shortcomings in the data used and consequent effect on the results obtained. (The length-frequency data from Bangladesh and Indonesia did not yield reliable results. They have not, therefore, been presented here.)

The analyses performed at the training workshop threw up some interesting results. The recruitment to the mackerel fishery in Thailand and Malaysia were found to be similar. In both cases, there appeared to be two distinct peaks of recruitment, though these were more distinct for Thailand than for Malaysia. In the case of Sri Lanka, the data pertained to *Sardinella sirm* for two distinct years — 1980/81 and 1983/84. In both cases, two annual peaks of recruitment were observed though the unequal peaks of 1980/81 had become somewhat less unequal by 1983/84. One further conclusion that emerged from the Sri

Lanka analysis was that in 1983/84 the exploitation of *Sardinella* was much higher than in 1980/81. The data on the skipjack tuna (*Katsuwonus pelamis*) from Maldives did not represent the entire stock. As such, modal progression was not clearly evident.

At the end of the course, participants dismantled the hardware components, packed them and returned to their respective countries with one complete set of hardware and software for each country.

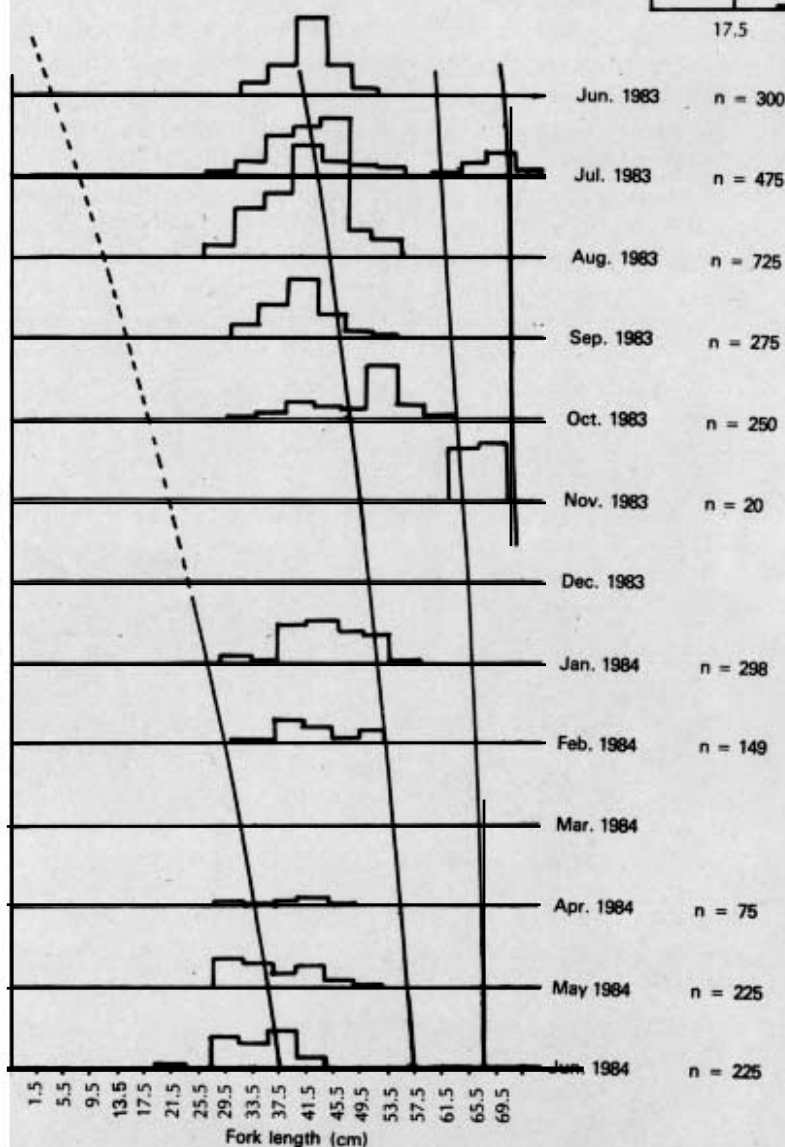
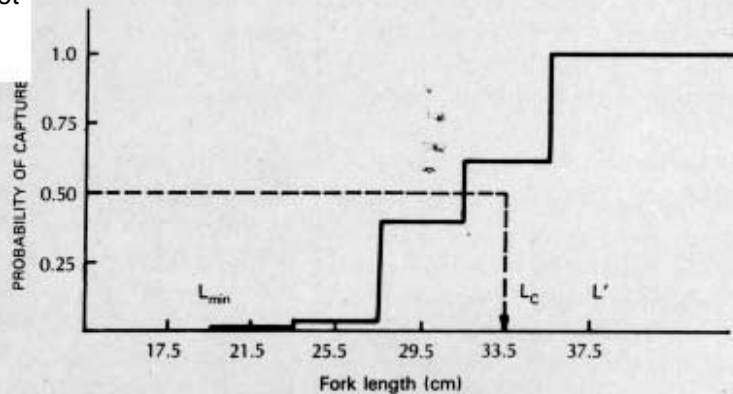
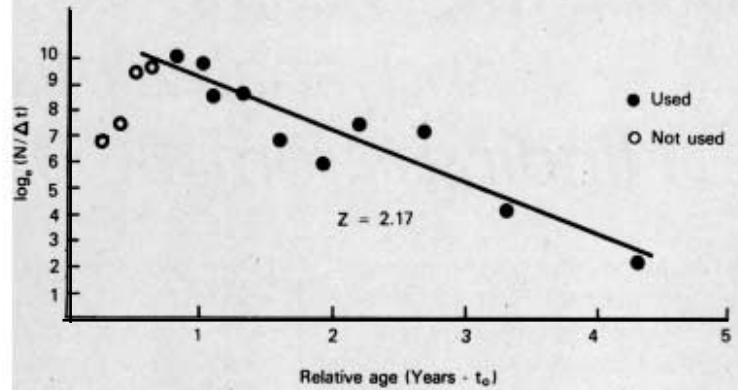
Though this training course was rather short, it was felt that the participants gained sufficient understanding, confidence and ability to use this tool for their work. It is expected that this training course and tools made available to the participants will have significant impact in the progress that will be made in the field of fishery resources assessment and management in the Bay of Bengal region. The project continues to monitor the progress being made on this aspect and provides assistance to strengthen the capabilities to use the hardware and software provided.

Scientists from NARA Sri Lanka, process fisheries data.



COUNTRY REPUBLIC OF MALDIVES**SPECIES** *Katsuwonus pelamis***AREA** Baa Atoll**AUTHOR** Ahamed Hafiz

SUMMARY Length frequency samples taken from the pole and line fishery in 1983/84. The parameters estimated, were $L=78\text{cm}$, $K=0.625$, $Z=2.08$, $M=0.99$, $F=1.09$. As the data do not represent the entire stock, the mortality values may be affected by this and E was not estimated for this reason. Modal progression also was not clearly evident.



Maldives

COUNTRY SRI LANKA

SPECIES *Sardinella sirm*

AREA Negombo

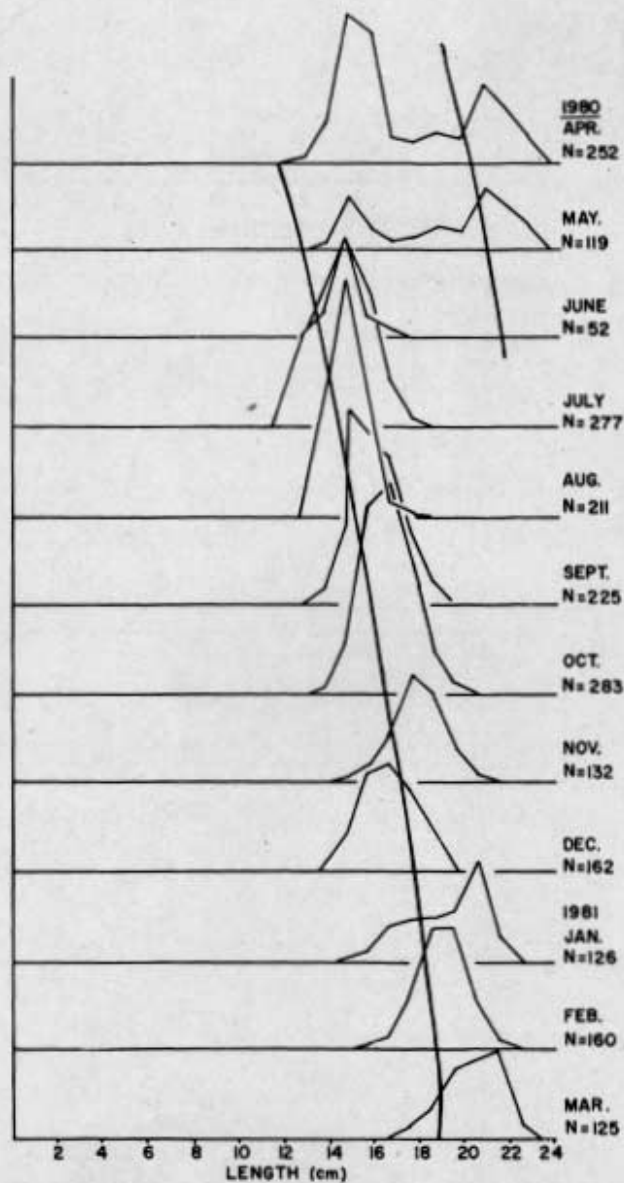
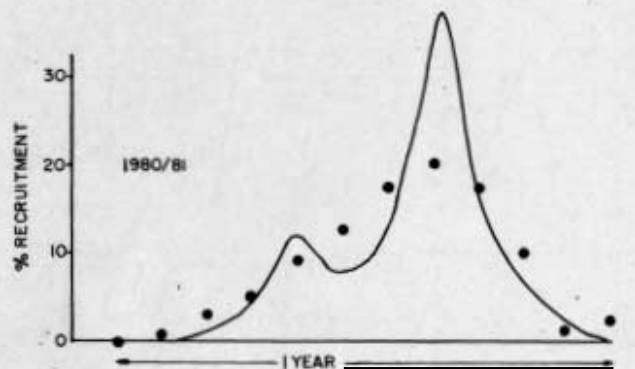
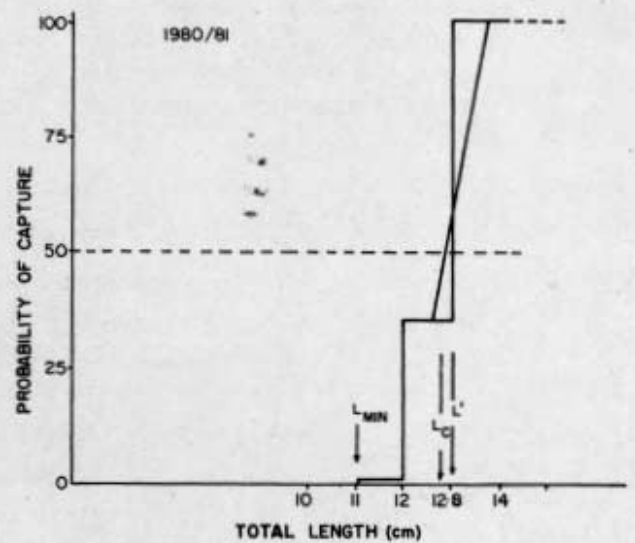
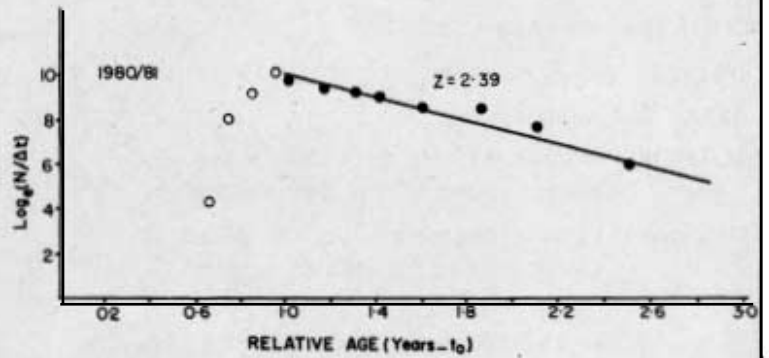
AUTHORS Siddeek M.S.M., L. Joseph, P.M.A.
Jayasuriya and W.P.N. Fernando

SUMMARY Length frequency data on gillnet catches in 1980/81.

Parameters estimated were:

$L=24.75\text{cm}$, $K=0.95$, $Z=2.39$,
 $M=1.43$, $F=0.96$ and $E=0.40$.

Annual recruitment may have occurred as two distinct events and the two pulses appear to be of unequal strength.



Sri Lanka

COUNTRY SRI LANKA

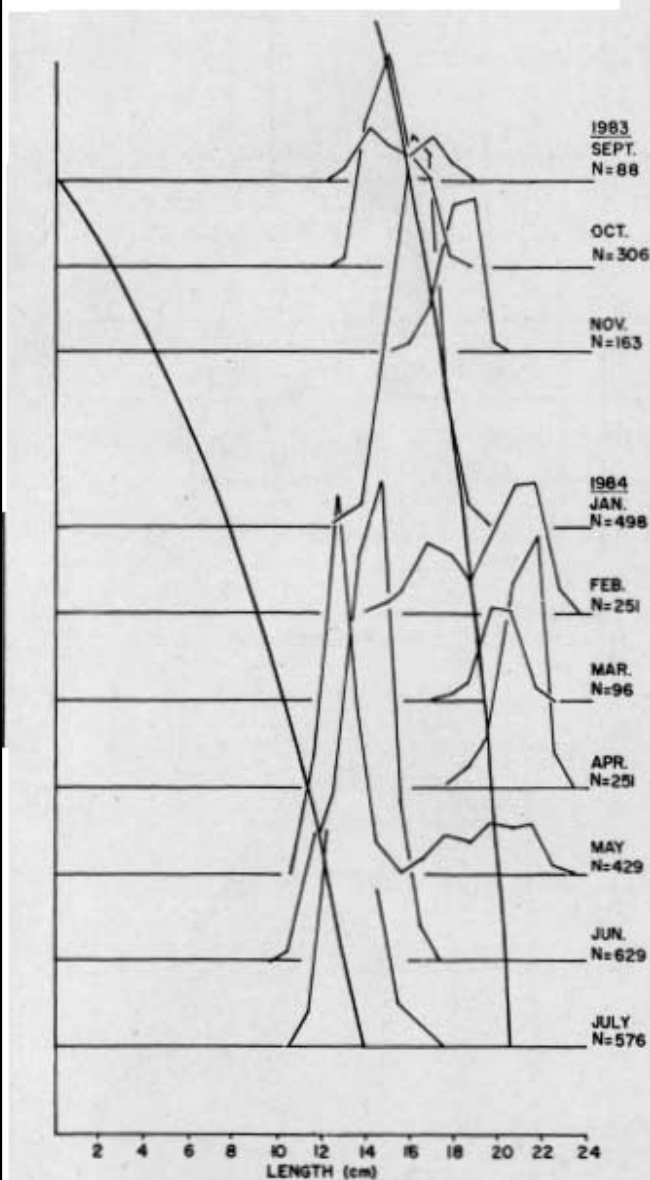
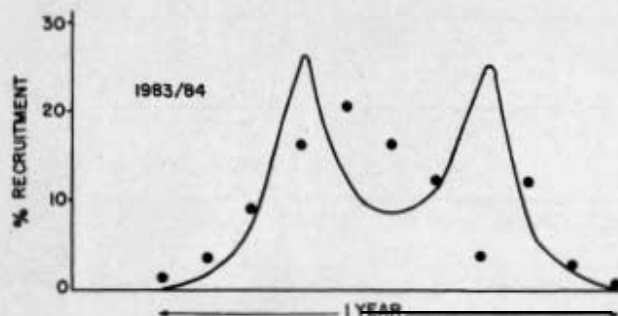
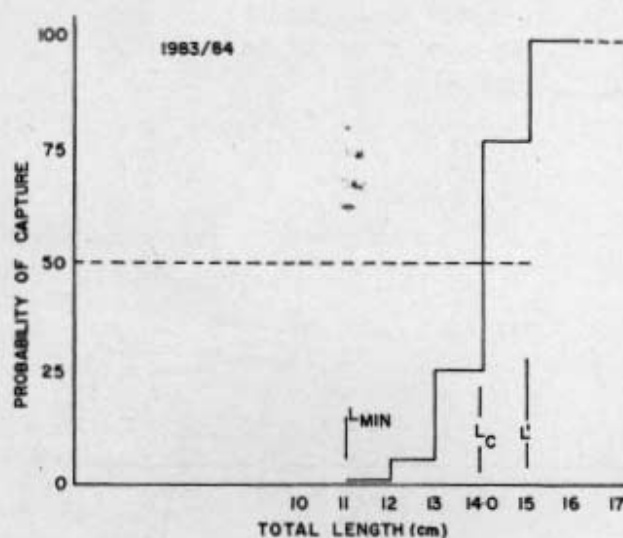
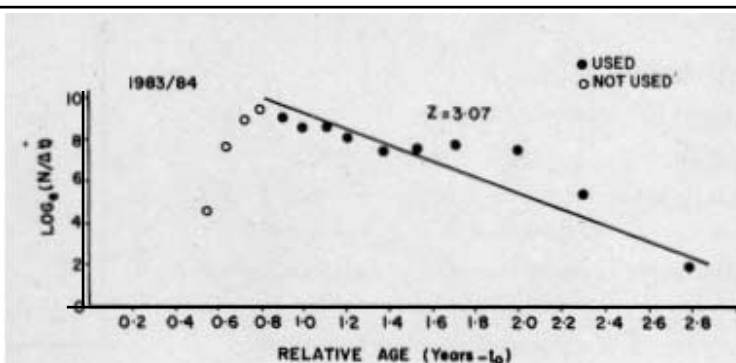
SPECIES *Sardine/la sirm*

AREA Negombo

AUTHORS Siddeek M.S.M., L. Joseph, P.M.A. Jayasuriya and W.P.N. Fernando.

SUMMARY Length frequency data on gillnet catches during 1983/84. Parameters estimated were:

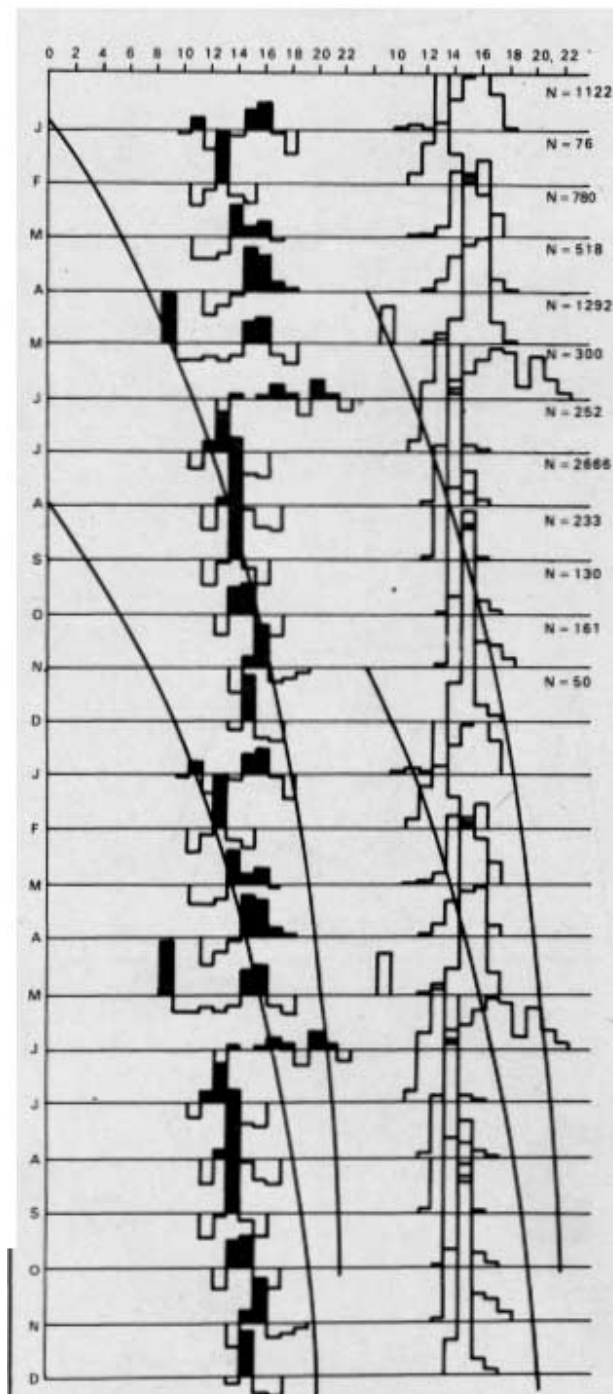
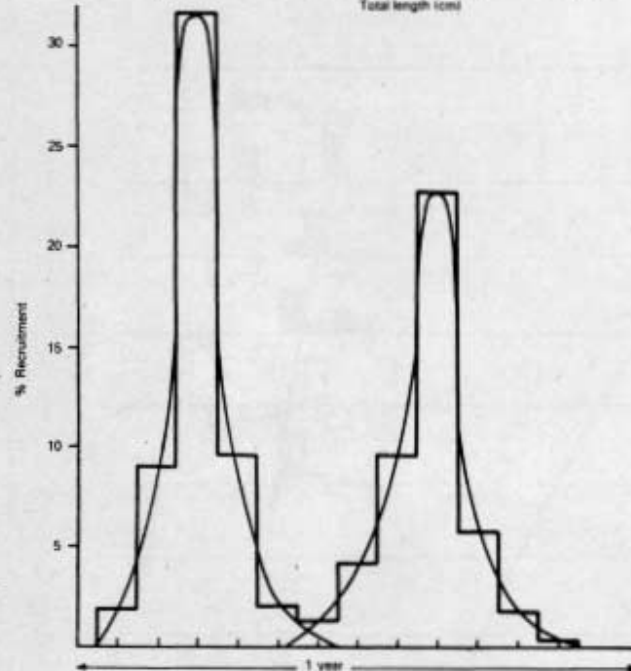
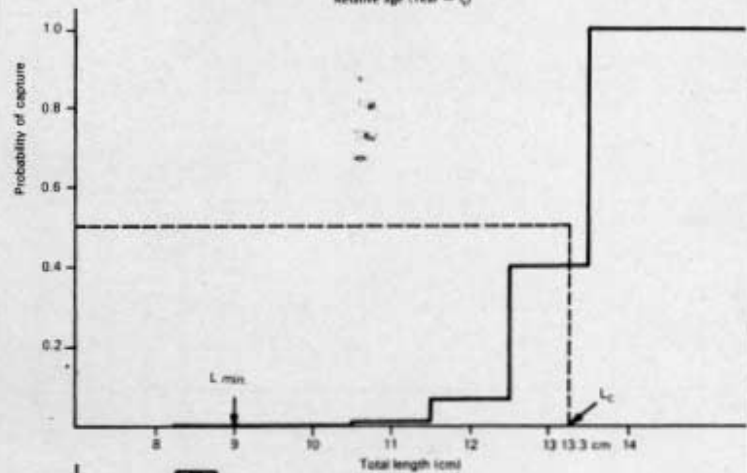
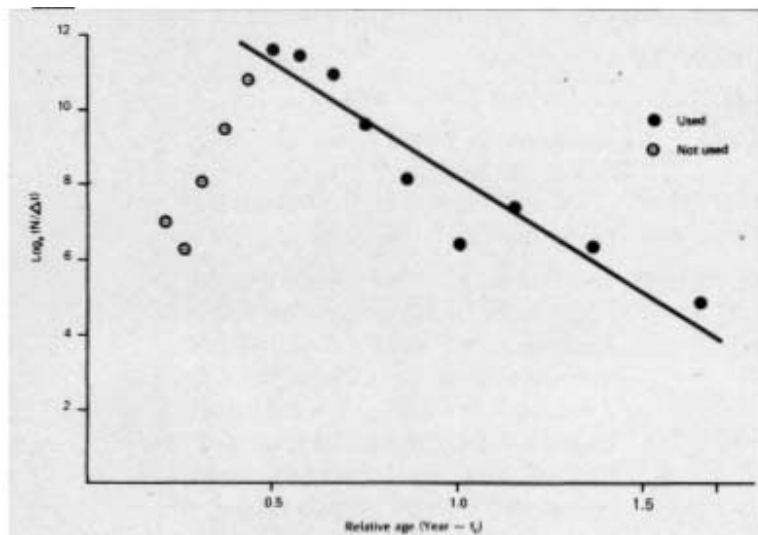
$L = 24.80$, $K = 0.95$, $Z = 3.07$, $M = 1.43$, $F = 1.64$ and $E = 0.53$. Indicates increase in exploitation rate over 1980/81. Annual recruitment seems to have occurred as two distinct events, but the pulses are less unequal, compared to the results of 1980/81.



Sri Lanka

COUNTRY THAILAND
SPECIES *Rastrelliger brachysoma*
AREA Phuket – Krabi (West Coast of Thailand)

AUTHORS Udom Bhatiya and Veera Boonraksa
SUMMARY Data collected from purse seine landings in 1983 by the Phuket Marine Fisheries Station. Parameters estimated were $L = 24\text{cm}$, $K = 14$, $F = 3.79$, $F = 0.62$. Annual recruitment appears to occur as two distinct events of almost equal strength.



Thailand

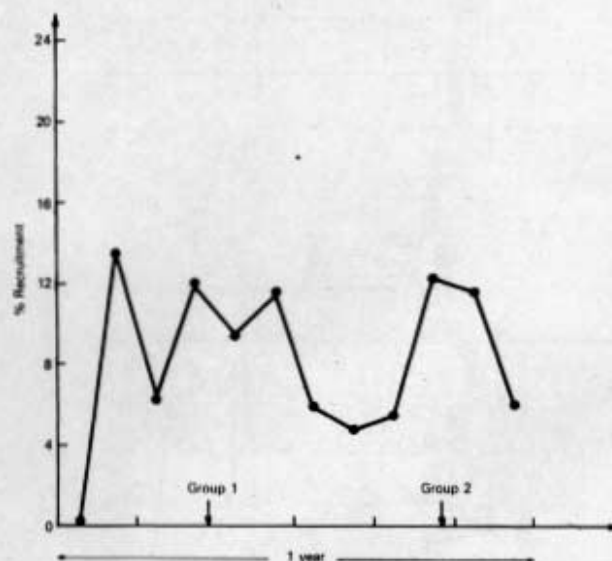
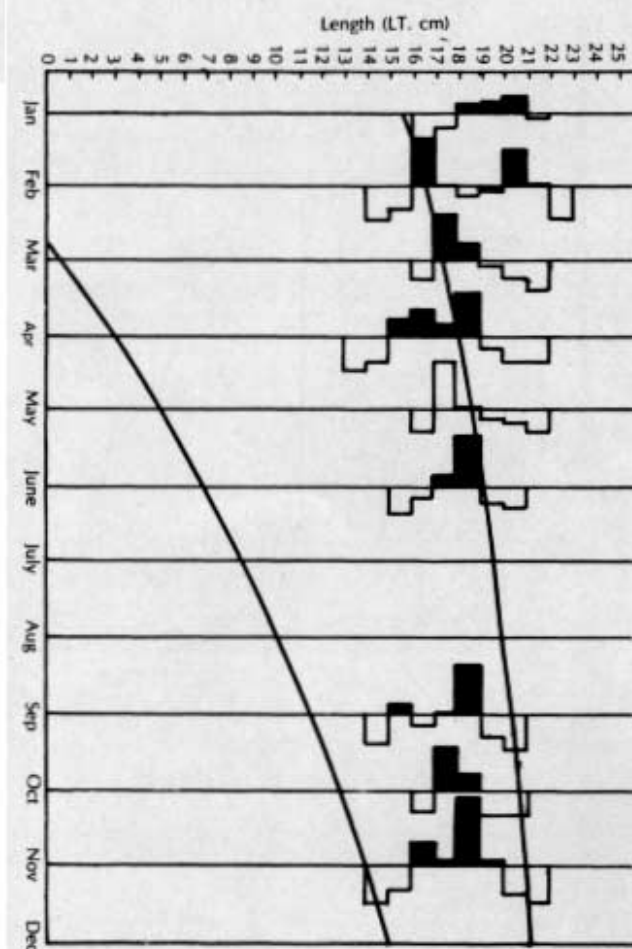
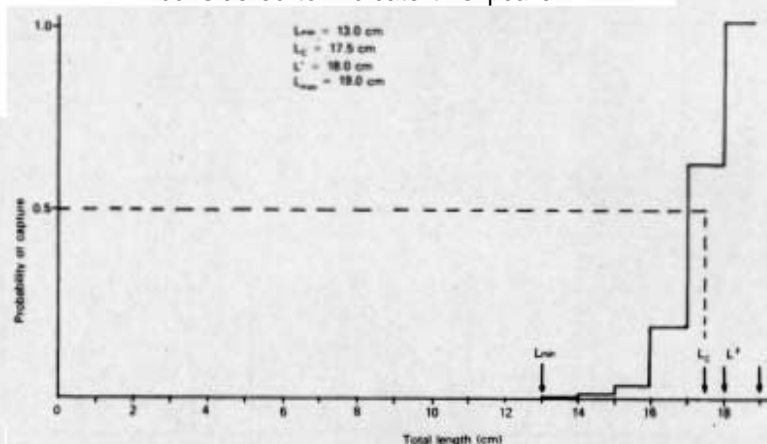
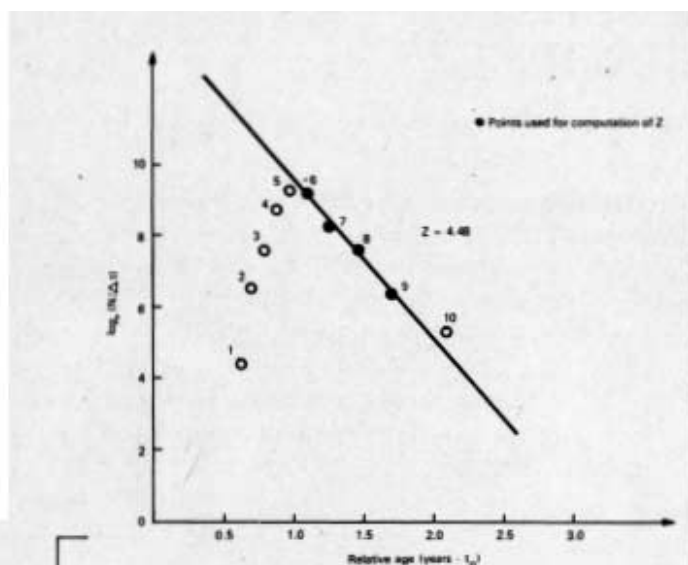
COUNTRY MALAYSIA

SPECIES *Rastrelliger brachysoma*

AREA Kuala Kedah (West Coast of Peninsular Malaysia)

AUTHORS Lui Yean Pong and Ahmad Adnan Bin Nuruddin

SUMMARY Length frequency samples collected from purse seine fishery by F.R.I. Penang, in 1.982. Parameters estimated were $L=23.5\text{cm}$, $K=1.3$, $Z=4.48$, $M=2.27$, $F=2.21$, and $F=0.49$. Annual recruitment pattern, though not well defined, was considered to indicate two peaks.



Malaysia

COUNTRY MALAYSIA

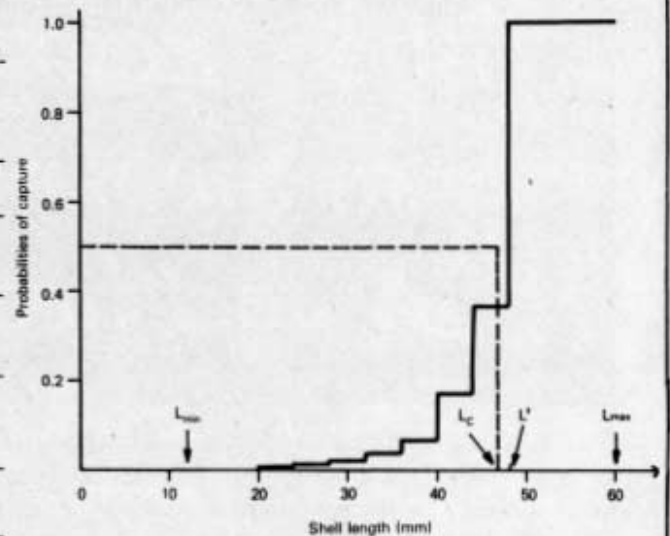
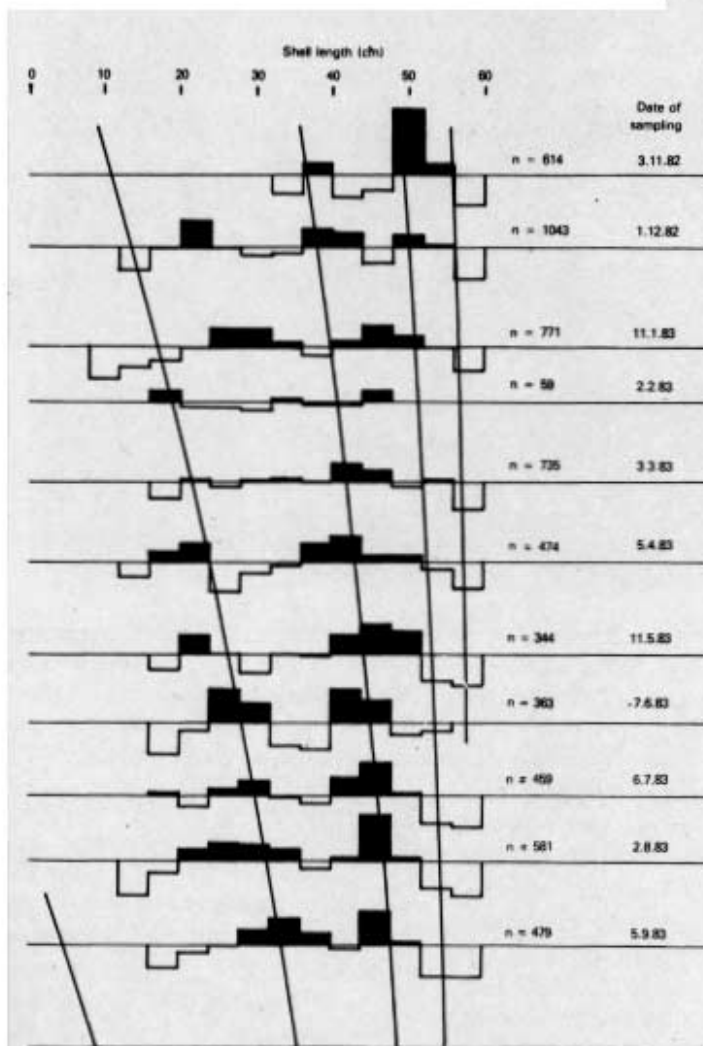
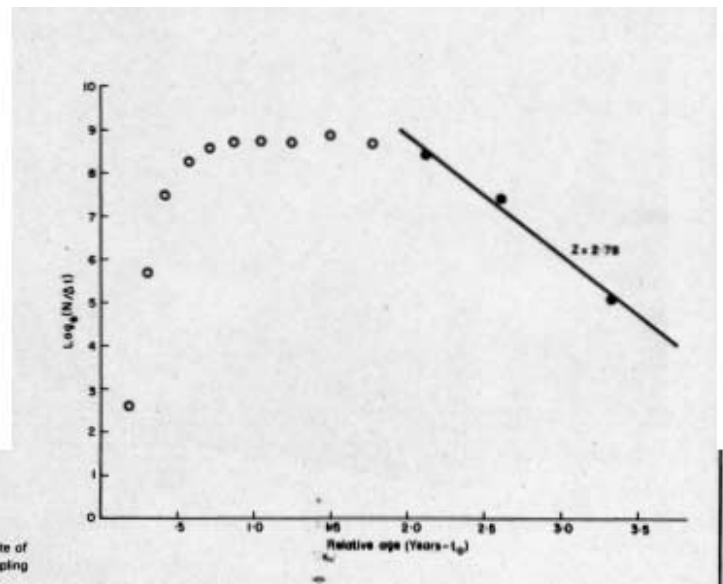
SPECIES *Paphia undulata*

AREA Kuala Penis (West Coast of Peninsular Malaysia).

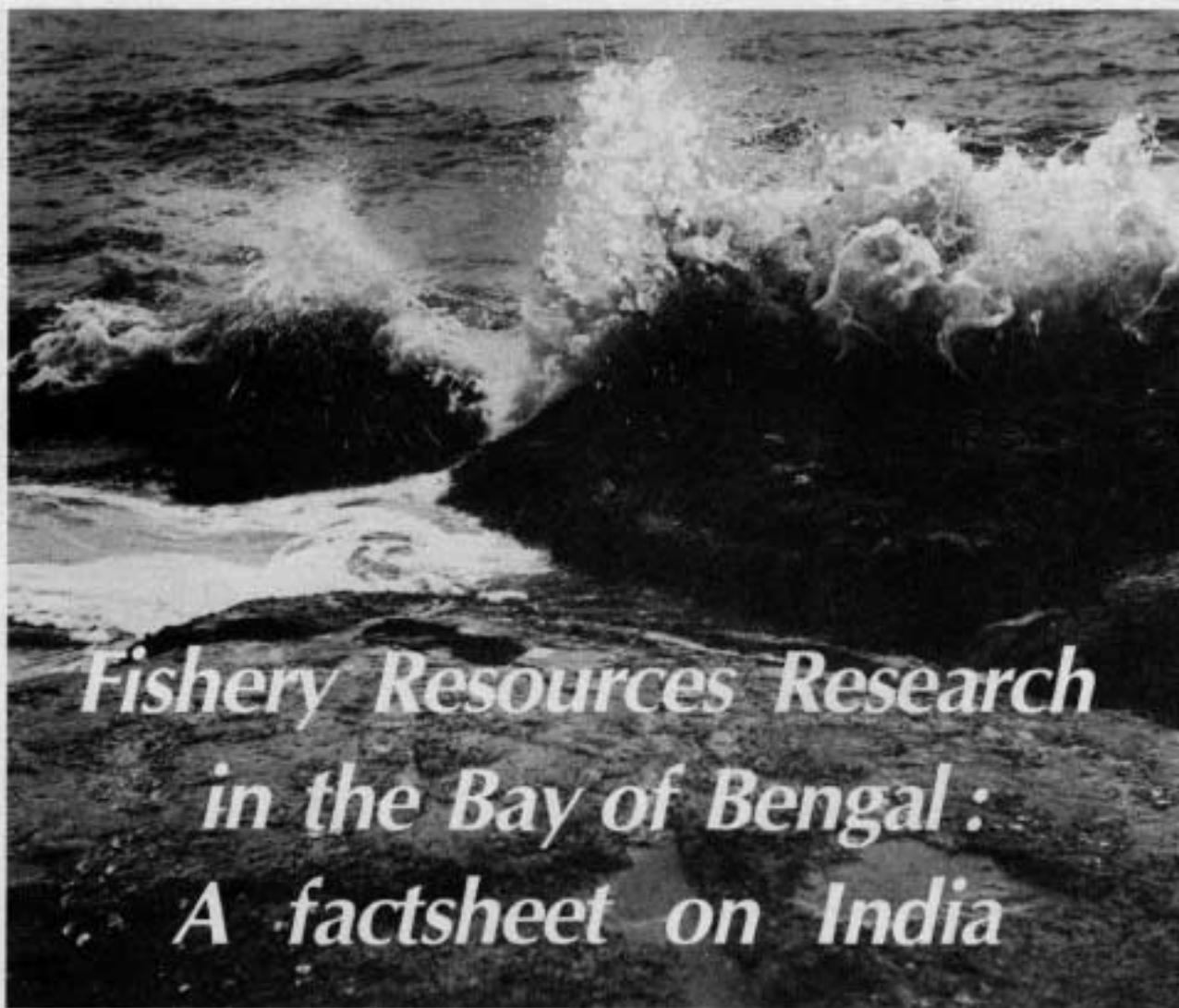
AUTHORS Ahmad Adnan Bin Nuruddin and Lui Yean Pong.

SUMMARY The data for this carpet clam were collected from the catches made with dredge, by F.R.I. Penang.

The parameters estimated were:
1982/83. — $L=62$ mm, $K=0.7$,
 $Z=2.78$. As M was not determined,
 F and F could not be estimated.



Malaysia



Fishery Resources Research in the Bay of Bengal : A factsheet on India

Exploratory surveys for marine fishery resources in the Bay of Bengal started in 1908 with the *S T Golden Crown*, followed by *S T Lady Goshen* in 1927-30. Since Independence in 1947, resources surveys have been a continuing activity of the Fishery Survey of India (FSI), first known as Deep Sea Fishing Station and later as Exploratory Fisheries Project. Till recently, the surveys were mainly confined to inshore areas up to 75m depth with 17.5m vessels. But since 1982, large vessels of over 30m length have been exploring areas up to 300m depth and sometimes even beyond. Trawling has been the main type of survey; recently longlines and purse seining have also been undertaken.

The UNDP/FAO Pelagic Fishery Project, which adopted the acoustic method, covered the Gulf of Mannar area during 1972-75 as part of its activity in the Arabian sea on the

south-west coast of India. In 1977, one survey was undertaken in the Bay of Bengal on the lower east coast of India.

The other important organization which is engaged in the area of fishery resources research is the Central Marine Fisheries Research Institute (CMFRI). Regular collection of catch statistics and conduct of quinquennial census of fisherfolk and their craft and gear on a national scale has been one of the major activities of CMFRI. About 200 field staff are engaged in sampling the fish landings on the east coast of India. The design is one of stratified, multi-stage random sampling, the stratification being over space and time. Statistically, the methodology is the best in the whole region and has been recommended for or adopted by other countries.

Provincial Governments in India also collect catch data and it is these figures that are adopted for official

records. Discrepancies between the two estimates occur very often. Efforts are being made to resolve and reconcile these discrepancies.

The organizations chiefly concerned with resources research and estimation are the CMFRI and the FSI. A wealth of data is available with both these agencies for the purpose of stock assessment. Perhaps due to various limitations such as computational facilities and skills and competent scientific inputs, the data remains either unprocessed, under-processed or processed, but not published. However, computer facilities have recently been either created or are being installed.

Biological and environmental studies are of a fairly commendable standard not only at CMFRI but also in the universities, especially those at Visakhapatnam, Madras and Annamalai.

Table 1: Bay of Bengal: Resources Surveys and Exploratory Fishing

COUNTRY	PERIOD	VESSELS	TYPE OF SURVEY	LIMITATIONS	REMARKS
India (East coast only)	Continuing (since 1947)	Seven vessels (FSI) at present	Bottom trawl/tuna long line/purse seine	Mainly off Calcutta, Paradeep, Visakhapatnam, Madras and Tuticorin	Most effort concentrated in shallow water; recent change to deeper waters by larger vessels; data published up to 1980.
	Continuing (since 1971-72)	GAVESHANI (NIO)	Hydrographic/ Planktonic	Occasional	Limited
	1972-75; 1977	RASTRELLIGER (UNDP/FAO PFP)	Acoustic, trawl	First phase; Gulf of Mannar covered especially for anchoviella resources; second phase, only one limited survey of the lower east coast	Average estimate of anchoviella during August to October was 700-800,000 tonnes. Between Palk strait and Krishna river delta, the estimated quantity of fish in the shelf area was 185,000 tonnes.
	Continuing (since 1982)	SKIPJACK (CMFRI)	Trawl	Three surveys of east coast	Data unpublished
	Continuing (since 1985)	SAGAR SAMPADA (DOD)	Trawl, acoustic	Four surveys on east coast	Operated by CMFRI; Data unpublished

PFP – Pelagic Fishery Project;

FSI – Fishery Survey of India; NIO – National Institute of Oceanography; CMFRI – Central Marine Fisheries Research Institute;

DOD – Department of Ocean Development

Table 2: Bay of Bengal: Statistics – Review of present systems for marine fisheries

Country	Institutes involved in data collection	System used	Collectors of basic data; Type, number	Processing place/method	Species	Effort data	Regular publications/ remarks
India	CMFRI; fisheries departments of some states; MPEDA	a) Frame survey; proportional sampling b) 5-year census c) Data collection from shrimp processors d) Export data	a) CMFRI staff (about 200 on east coast) b) State enumerators c) MPEDA officials	Locally by hand, central processing in Cochin, via punch cards. More sophisticated computer system is under acquisition	Groups to be expanded to 150 species groups	Unit of effort expressed as number of operations: data not published by CMFRI after 1982. Unpublished or unutilized data is probably available with the Dept. of Fisheries of provincial governments	a) CMFRI bulletins b) Marine Fisheries Information Service, Technical & Extension Services (CMFRI) c) 'Fish Tend' (CMFRI) d) States issue statistics on stencil e) Fisheries Div. of Dept. of Agr. Govt. India: 'Fisheries Statistics' (occasional stencil or print) f) Reports of industry & INFOFISH by MPEDA

Table 3: Bay of Bengal: Marine Fisheries Resources Research Facilities

Country	Institutes	Locations	Type of resources research	Staff Strength	Coverage of key areas	Research vessels	Remarks/ Publications
India (East coast)	Central Marine Fisheries Research Institute	(Headquarters Cochin) Regional centre at Mandapam Camp; Research centres at Tuticorin, Kakinada, Waltair	Statistics, biological sampling, detailed research on commercially important species and species groups, surveys in co-operation with other institutes	Dir. 1 it. Dir. 2 Scient. 280 Techn. 482 Admn. 175 Supp. 310 All India total 1250 (35% east coast)	— Inventory of fisheries (incomplete) — Resources surveys on east coast of India : limited — Sampling of commercially important species — Environmental studies — Stock assessment. limited — Detailed biological studies & experiments — Economic analysis limited	RN SKIP JACK (36m) 8 vessels of 13m of which one each at Waltair, Madras, Mandapam & Tuticorin (RN SAGAR SAMPADA, 70.5m operated by CMFRI)	— CMFRI Bulletins — CMFRI special publications — CMFRI newsletter (Occasional) — Krishi Vigyan Patrika — Extension pamphlets and brochures — Proc. of symposia — 'Fish Trend' — MFIS — hF — JMBAI
	Fishery Survey of India	(Headquarters: Bombay) Bases at Tuticorin, Madras, Visakhapatnam, Port Blair	Exploratory Fishing (Trawling, purse seining, tuna long-lining)	Dir. Gen. 1 Dy. Dir. 2 Gen. 6 Zonal Dir. 6 Other Scientific Staff 45 Technical Staff 104 Floating (vessels) 260 Admn. 122 Supp. 40 All India total 580 (40% east coast)	— Resources surveys — Stock assessment: limited	5-30 m & above; 2-17.5 m.	Survey reports (Occasional) Atlas (Occasional) Newsletter (Occasional) Annual Report (Annual)
	Central Institute of Fisheries Nautical & Engineering Training	(Headquarters : Cochin) Regional Stations at Madras & Visakhapatnam	Exploratory fishing (trawling)	Dir. 1 Dy. Dir. 2 Techn. 80 Teachers 60 Floating 140 Admn. 50 Supp. 30 All India total 363 (50% east coast)	— Resources surveys	3 — 28.3 m to 34.0 m 1 — 17.5 m	Newsletter (Quarterly) Special Publication (Occasional) Bulletin (Occasional) Annual Report (Annual)

hF — Indian Journal of Fisheries

MFIS — Marine Fisheries Information Service, Technical & Extension Services

JMBAI — Journal of the Marine Biological Association, India

RECENT BOBP TRAINING COURSES AND SEMINARS

Shrimp Culture Training Course in Satkhira, Bangladesh



BOBP's third and last training course in shrimp culture at the BOBP demonstration farm in Satkhira, Bangladesh, was held from 7-10 April 1986. (The two earlier courses were held in July and December 1985.) Sixteen officers and three private farmers attended this last course which covered practical feed preparation and farm management and also reviewed training imparted during earlier courses. The trainees also discussed backyard hatcheries in developing countries. Dr. A. N. Ghosh, Shrimp Culture Development Specialist, FAO/UNDP, acted as resource person during the course in cooperation with P Funegaard, BOBP's Associate Professional Officer in Aquaculture. Course participants received certificates from Mr. A. Q. Choudhury, Director of Fisheries.

Soon after the course, a study tour to Cox's Bazaar was arranged for the fisheries officers. The ADB (Asian Development Bank)-funded hatchery project, which will produce both *Penaeus monodon* and *Macrobrachium rosenbergii* post-larvae, was visited. Also visited was the ADB shrimp farm project at Chakaria Sunderbans, which can be reached only by boat (in two

hours). Although this project was started in the late 70s, *P. monodon* production has reached only 150 kg/ha/yr. There are several reasons for the low production; one is that the high land elevation at the site makes it

difficult to get sufficient water in the tide-fed ponds during the dry period.

Totally, 11.7 ha of the total project area of 100 ha has been brought under culture; and recently, after some changes in the objectives of the project, a 70 ha area was distributed in 10-acre plots to small-scale farmers in region.

The very successful private Ailahwela shrimp farm, with a reported production of 1000 kg/ha/yr of *P. monodon*, was studied. Culture techniques taught by Dr. A. N. Ghosh during a training course for private shrimp farmers in 1984 have been applied to good effect in this farm. The production is expected to increase considerably in 1986 when two crops (instead of the previous one crop per year) will be harvested. In future, it might be possible to get three crops per year if hatchery-produced seed can be obtained. On the last day of the study tour, the trainees visited the Marine Biological Research Station in Cox's Bazaar and obtained up-to-date information about marine resources in Bangladesh.

Training Course on Marine Fisheries Finance, Pune, India

A 2-week training course on marine fisheries finance for bankers was held with BOBP assistance at the College of Agricultural Banking of the Reserve Bank of India in Pune from 14 April, 1986. A newly developed syllabus and specially prepared learning materials and teaching aids were used for the course. Some 40 bankers and fisheries officers from Orissa attended.

As distinct from earlier training courses on fisheries for bankers, this course concentrated on marine fisheries finance. It discussed the latest developments in brackishwater fish and prawn culture, deep sea fishing, innovative technologies for the traditional sector, the latest techniques for preserving, processing and marketing fish-its economics and

financial requirements. Other areas covered were traditional and small-scale mechanized fishing craft and gear, marine resources potential, and the socio-economic characteristics of traditional fishing communities.

Special attention was paid to applying banking procedures to the special problems of fisheries finance-pre-investment and pre-sanction scrutiny, loan disbursement, and post-disbursement follow-up/loan recovery. Techniques of financial appraisal — such as discounted cash flow, internal rate of return, net present worth and sensitivity tests and their relevance to marine fisheries finance-were taught in the course and applied during field visits to Goa, Palghar and Panvel in

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“ ABSTRACTS OF BOBP PUBLICATIONS ”



BOBP/WP/24 : Traditional Marine Fishing Craft and Gear of Orissa. P Mohapatra, Madras, India, April 1986.

This working paper presents the results of a survey carried out in four districts of Orissa (Balasore, Cuttack, Puri and Ganjam) to obtain information on the state's traditional fishing craft and gear. The paper presents detailed data on basic features of the craft and gear.

BOBP/WP/38 : Credit for Fisherfolk The Experience in Adirampattinam. R S Anbarasan and Ossie Fernandez. Madras, India, March 1986.

This paper evaluates the impact of bank loans to fisherfolk in Adirampattinam, Tamil Nadu under the BOBP's Coastal Village Development Project initiated in 1981. The report concludes that despite some positive features, the loans to fishermen did not fulfil the immediate objective of increasing their income — only 25 per cent of the borrowers increased their catches and earnings. As for the loans to fisherwomen, it is uncertain whether the loans expanded their fish trade, but it helped them avoid high-interest loans from other sources.

BOBP/WP/42 : Fish Trap Trials in Sri Lanka, Madras, India, January 1986.

This paper describes the findings of BOBP's attempts at experimental fishing with various types of fish traps in Sri Lanka for a three-month period in 1982. The trials, which led to disappointing catch results, were part of a wider project to study the island's demersal resources and determine the best ways to tap them.

BOBP/WP/43 : Demonstration of Simple hatchery Technology for Prawns in Sri Lanka. Madras, India, June 1986.

A report on the facilities and operation of a "backyard" hatchery for Penaeid prawns set by BOBP for demonstration and training purposes in Pitipana, Sri Lanka. The hatchery is one of the components of BOBP-assisted project to develop a "a small-scale prawn culture region". The paper concludes that the demonstrated technology is viable and cost-effective.

BOBP/WP/44 : Pivoting Engine installation for Beachlanding Boats. Arild Overa and R Ravikumar. Madras, India, June 1986.

This paper describes BOBP's efforts at developing an appropriate engine installation for boats operating from open beaches in conditions of heavy surf. The paper details the different types of pivoting engine installation tried out with air-cooled and water-cooled engines at different makes. The problems faced, the improvements made and the conclusions derived are set out.

BOBP/REP/23 : Summary Report of BOBP Fishing Trials and Demersal Resources Studies in Sri Lanka. Madras, India, March 1986.

This report summarizes BOBP's varied activities concerning demersal fisheries in Sri Lanka, carried out from 1979 to 1985, and contains an overview of the present status of the island's demersal fishery resources. It also makes recommendations for further deve-

loping demersal fisheries on the basis of the identified resource potential.

BOBP/REP/24 : Fisherwomen's Activities in Bangladesh : A Participatory Approach to Development. Patchanee Natpracha, Madras, India, May 1986.

This paper describes a pilot project that used the participatory approach to development to improve the living standards of fisherwomen from two villages in Chittagong, Bangladesh. income-generating activities such as net making, fish culture, poultry and goat-rearing, were introduced among groups of fisherwomen. Activities to improve nutritional status, the disbursement of loans, launching a savings scheme — these were the project's other components. The paper discusses the project methodology, problems faced, achievements and failures, and lessons for the future.

BOBP/REP/25 : Attempts to Stimulate Development Activities in Fishing Communities of Adirampattinam. Madras, India, May 1986.

This paper describes the organization, conduct and outcome of a BOBP pilot project in Adirampattinam, Tamil Nadu, India, to help the development of coastal fishing communities. Executed between 1980 and 1982, the project tried to help fisherfolk avail of bank loans and existing Government credit schemes. It also organized leadership training courses to promote leadership and group action.

BOBP/REP/26 : Report of the Tenth Meeting of the Advisory Committee, Madras, India, April 1986.

This report records the deliberations and conclusions of the tenth Advisory Committee meeting of BOBP's small-scale fisheries project, held in Male, February 17-18, 1986. It includes an analysis of the progress made by the project in 1985, a discussion on the work programme for 1986 (the last year of the current project) and the future of the BOBP. It also describes the progress of the BOBP's UNDP-funded Marine Fishery Resources Management project.

BOBP/REP/27 : Activating Fisherwomen for Development through Trained Link Workers in Tamil Nadu. Edeltraud Drewes, Madras, India, May 1986.

This document reports on a BOBP-assisted pilot project implemented in Chingleput district of Tamil Nadu, India



Tamil Nadu fisherwomen link workers arriving at the Natesan Cooperative Training College in Madras. (BOBP/KEP/27)

to improve the socio-economic conditions of women from the State's fishing communities. The project's strategy was to initiate and encourage group action amongst fisherwomen by training "link workers" — village-level workers who serve as links between the village community and government. The link workers were trained to ensure that all available government and private welfare schemes were extended to their villages. The document contains a detailed study of project execution, problems and performance in a single village, Chemmencheri, and also a proposal for state-wide expansion of the link worker scheme.

BOBP/REP/28 : Small-scale Aquaculture Development Project in South Thailand : Results and Impact. Edeltraud Drewes. Madras, India, May 1986.

A critical analysis of the results and impact of a 6-year BOBP-assisted project for small-scale aquaculture development in south-west Thailand. Project work covered three main areas — aquaculture demonstration, community development and activities for women — and at the time of termination extended to six provinces. Aquaculture was the project's most successful component — especially finfish cage culture demonstration which resulted in a massive expansion of private cage farms. The paper is based on a review of project documents and reports, also on two weeks of interviews with

fisheries officers, small-scale fishfolk and large-scale fish farmers in eight villages during October 1985.

BOBP/REP/30 : Summary Report of Fishing Trials with large-Mesh Driftnets in Bangladesh. Madras, India, May 1986.

A report on one of BOBP's fishing gear improvement projects in Bangladesh. It analyses the findings of fishing trials to determine the catching efficiency of driftnets of different mesh sizes and materials and also to explore the suitability of polyethylene as a suitable netting material.

Traditional shrimp paste preparation by a fishetwoman in Thailand (BOBP/REP/28).



BOBP/NF/9 : Food and Nutrition Status of Small-Scale Fisherfolk in India's East Coast States. A Desk Review and Resource Investigation. V. Bhavani, Madras, India, April 1986.

This paper compiles available data from existing studies about the nutritional status of fishetfolk in India's east coast states. It also describes nutrition programmes and institutions in these states — none of which is meant exclusively for fisherfolk. The paper was sponsored by the Norway-funded project, "Nutrition and fishetfolk in the Bay of Bengal region", and was meant as a preparatory activity of the project.

BOBP/MAG/3 : Fishery Statistics on the Micro Computer — A BASK version of Hasselblad's NORMSE P Program. Madras, India, June 1986.

This paper grew out of a training course on the use of computers in fishery resources management, organized by the BOBP's Marine Fishery Resources Management project. The paper gives the programme listing of a mathematical method to analyze overlapping normal distributions — a method useful in fisheries biology. The method was originally developed by V Hasselblad : the new version presented in the paper has been written in Microsoft Basic, and can be implemented on a variety of microcomputers with a memory of about 12K.



Small-scale fisherfolk and the BOBP — fisherwomen net-makers in Bangladesh.

RECENT BOBP TRAINING COURSES AND SEMINARS

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Maharashtra, where project proposals were prepared by course participants.

Central and State Government agencies, like CIFE, MPEDA, NABARD and the Department of Fisheries, Orissa, actively cooperated in the preparation and conduct of the course. The learning and teaching materials used at the course—including videos, film strips and slide shows—are being disseminated to training institutes of nationalised banks of India.

Mr. R. A. Sugavanam, Principal of the College, appreciated the elaborate learning materials developed for the course and suggested that the college, which has imparted training to bankers from south Asia and south-east Asia for a number of years, could provide training on marine fisheries finance on a regional basis as well.

Swedish seminar scrutinizes BOBP project design

Is the BOBP mode of work fruitful in producing results beneficial to small-scale fisherfolk? Does the work reach the target groups and are the technical innovations of the right level for small-scale fishing communities? How and to what extent are results from BOBP activities applied on a large scale in the region? Such questions were discussed during a 3-day seminar organized by the National Swedish Board of Fisheries in Sweden in April. The seminar attracted more than 30 participants from the Nordic countries, all of them connected with development projects either as representatives of donor agencies, as scientists or as technical experts.

BOBP staff and consultants presented case studies on beachlanding craft, set bagnets and pen culture introduction, besides a general paper on the follow up of BOBP projects. Video films and slides helped illustrate the talks.

The discussions, held in Stenungson, a small beautiful island on the west coast of Sweden, focussed on how BOBP identifies specific problems facing small-scale fishing communities, and deals with these through pilot projects in which solutions (be they technological or methodological) are developed, tested in the long term and demonstrated.

Many critical questions were raised about the technology level of BOBP work, about people's participation in development, and about reaching the target groups. But the general conclusion of the discussions was that the mode of work adopted by BOBP was fruitful in producing solutions to problems which could then be integrated into government development plans for fishing communities. Thus, the seminar gave the participants ideas for their own work and provided a forum for discussion on the design of pilot projects.