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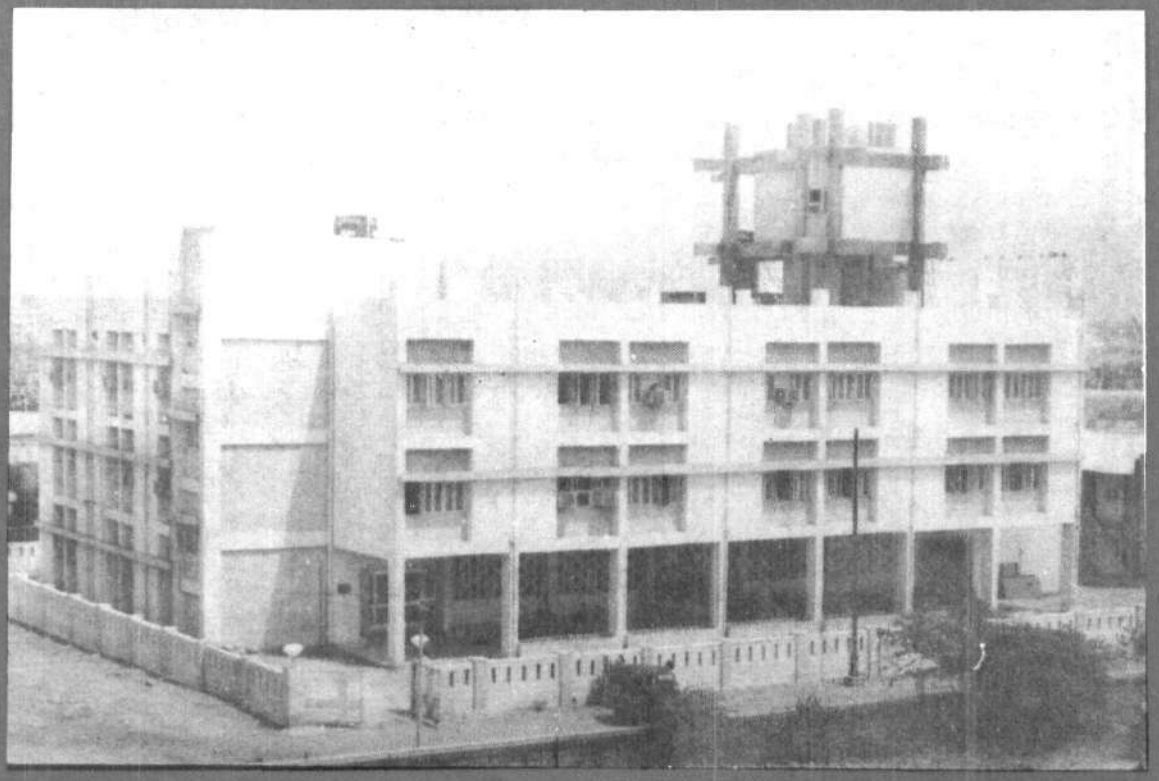

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केन्द्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान कोचिन, भारत
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भारतीय कृषि अनुसंधान परिषद
INDIAN COUNCIL OF AGRICULTURAL RESEARCH

समुद्री मात्स्यिकी सूचना सेवा : समुद्री मात्स्यिकी पर आधारित अनुसंधान परिणामों को आयोजकों, मत्स्य उद्योगों और मत्स्य पालकों के बीच प्रसार करना और तकनोलजी का प्रयोगशाला से श्रमशाला तक इस्तांतरित करना इस तकनीकी और विस्तार अंकमाली का लक्ष्य है।

THE MARINE FISHERIES INFORMATION SERVICE : Technical and Extension Series envisages dissemination of information on marine fishery resources based on research results to the planners, industry and fish farmers and transfer of technology from laboratory to field.

Abbreviation - *Mar. Fish. Infor. Serv., T & E Ser.*, No. **127** : February - March 1994

CONTENTS अंतर्वस्तु

Front cover photo : Laboratory and office building of the Veraval Research Centre of Central Marine Fisheries Research Institute and Central Institute of Fisheries Technology, Veraval — (photo : courtesy Mr. K. K. Philipose).

मुख आवरण फोटो : केन्द्रीय समुद्री मात्स्यिकी अनुसंधान संस्थान के वेरावल अनुसंधान केन्द्र और केन्द्रीय मात्स्यिकी प्रौधोगिकी संस्थान, वेरावल के प्रयोगशाला और कार्यालय का मकान।

Back cover photo : Bhidiya fish landing centre at Veraval (photo : courtesy Mr. K. K. Philipose).

पृष्ठ आवरण फोटो : वेरावल का भिडिया मत्स्य अवतरण केन्द्र।

PRESENT STATUS OF THE DRIFT NET FISHERY AT VELLAYIL, CALICUT

M. Sivadas

Minicoy Research Centre of C. M. F. R. I., Minicoy

Introduction

The drift net fishery at Calicut is commercially important in that the quality fishes like seerfish and tuna are almost fully landed by this gear. The introduction of outboard engines and the consequent fishing in more deeper waters have resulted in noticeable changes in the overall catch composition. In order to understand this, the recent status of the fishery is studied based on the data for the period 1988-'89 to 1991-'92 from Vellayil, Calicut.

Craft and gear

These have already been described by Yohannan and Balasubramanian (*Mar. Fish. Infor. Serv. T&E Ser.*, No. 95, 1989). But of late, fibre glass coated plywood boats have become the main craft instead of dugout canoes and flat bottom plank built boats. Instead of 3-4 persons, most of the units are now employing only 2 persons.

Effort

Fluctuation in the annual effort is shown in Fig. 1. The effort varied from 5114 to 7961 with an average of 7015. After a drastic decrease in 1989-'90, the effort showed a steady increase till 1991-'92.

The average monthly effort is given in Fig. 3. The effort varied from 46 in June to 965 in October. Maximum effort was expended from October to January.

Catch and cpue

Annual variation in catch is given in Fig. 1. On an average 604.6 tonnes of fishes were landed of which 47.2% was comprised by tuna and 35.7% by seerfishes. Thus these two together form around 83%. As could be seen from the figure, there was a sharp increase in the landing of tuna and total catch in 1988-'89 when compared with other years. The bulk of the landing in this year came from October as this month alone accounted for 69% of the tuna and 48% of the total drift net catch. This was quite unprecedental when compared with the same month of other years as shown below:-

Month & year : October	1988	1989	1990	1991
Tuna catch in tonnes :	371	57	71	61
Total catch " :	445	104	180	110

The landing in 1989-'90 showed a drastic reduction when compared with that of 1988-'89. Subsequently, it increased in 1990-'91 and then decreased.

Annual cpue is shown in Fig. 2. A drastic reduction in cpue from 1988-'89 to 1989-'90, and subsequently a gradual decrease till 1991-'92

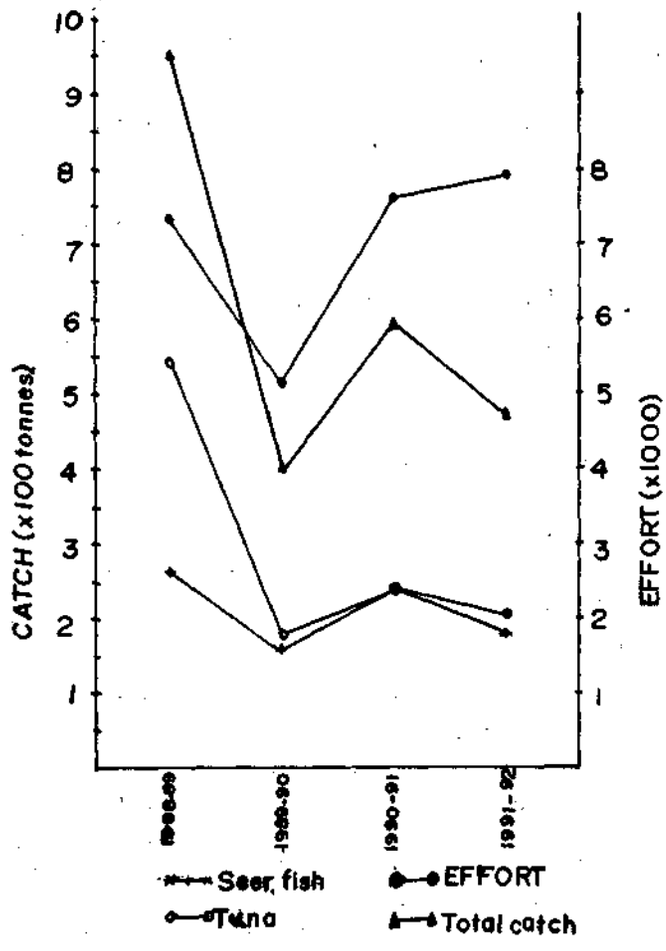

Fig. 1. Fluctuation in the total effort, total catch and seer fish and tuna catch at Calicut (1988-1992).

was observed in the case of total catch and tuna catch. But in the case of seerfish, a gradual decrease from 1988-'89 to 1991-'92 was observed.

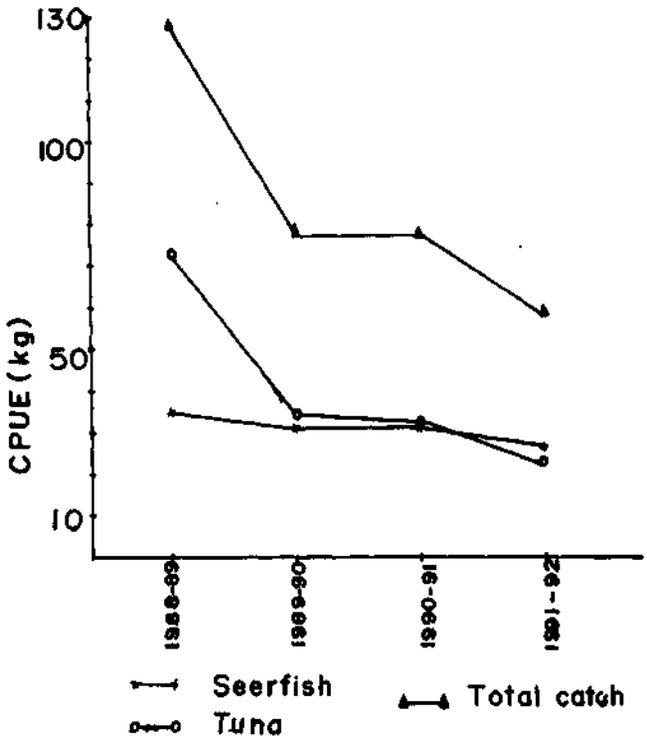

Fig. 2. Catch/unit effort (cpue-kg) in the total catch and seerfish and tuna catch at Calicut (1988-1992).

Seasonal variation in catch

Fig. 3 shows the average monthly landing of tuna, seerfish and total catch. The peak month of landing of total catch and tuna was October whereas November formed the peak month for seerfish. Moreover the drift net landing is dominated by tuna and seerfish. In general, tuna dominated the catch from April to October and in March, and Seerfsh from November to February.

Species composition

Seerfish was represented by *Scomberomorus commerson.*

Among tunas, 6 species occurred in the fishery and the overall composition is shown in Fig. 4. *Euthynnus affinis* dominated forming 66% followed by *Auxis thazard* (28%). The other species in the order of abundance were *Thunnus tonggol* and *T. obesus* 2% each, *S. orientalis* 1.1% and *A. rochei* 0.9%. Seasonal species composition of tuna is shown in Fig. 5. *E. affinis* and

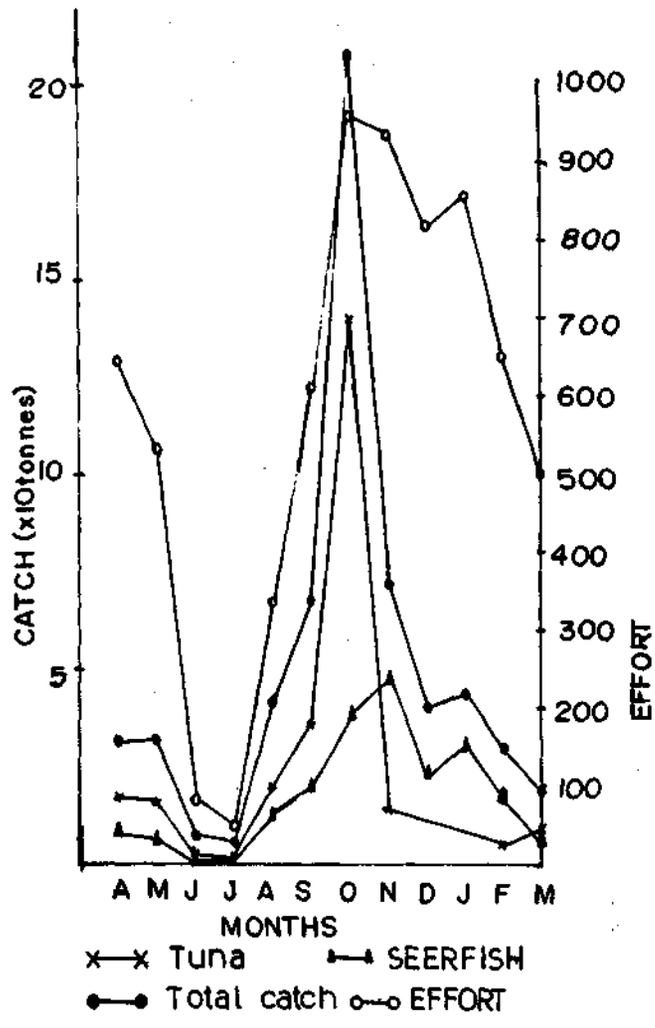

Fig. 3. Average monthly variation (1988-1992) in the effort, total catch and tuna and seerfish catch at Calicut.

A. thazard were occurring throughout the period. Others were quite seasonal. Two peaks were observed for *E. affinis* from April to June and November to March. July to October formed the peak season for *A. thazard.* December and January formed the main season for *T. tonggol* and September for *T. obesus* and *S. orientalis.*

Maximum Sustainable Yield (MSY) and Optimal effort (FMSY)

These were calculated using Schaefer model and is given in Fig.6. When the data for the period 1988-'89 to 1991-'92 were used, no correlation was found. But when the data of 1988-'89 was exculded, there was correlation. The failure in fitting the data of 1988-'89 may be due to the unusually heavy landing in that year. MSY and FMSY for seerfish were found to be 238.126 and 11835 tonnes respectively and for tuna they were 211.96 and 8268 tonnes. When

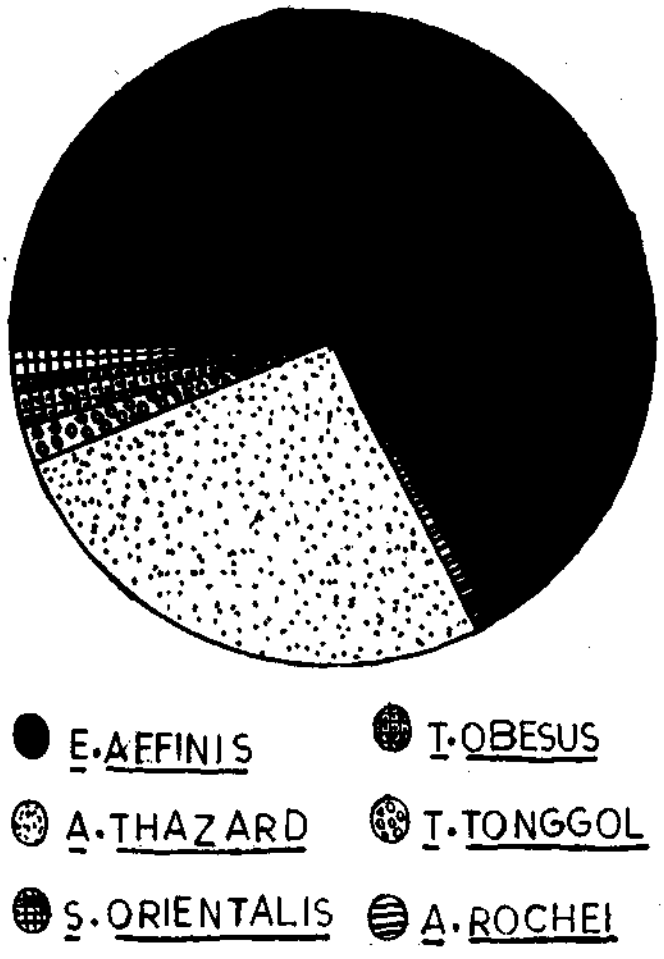

Fig. 4. Overall species composition of tunas in the drift gillnet fishery at Calicut (1988-1992).

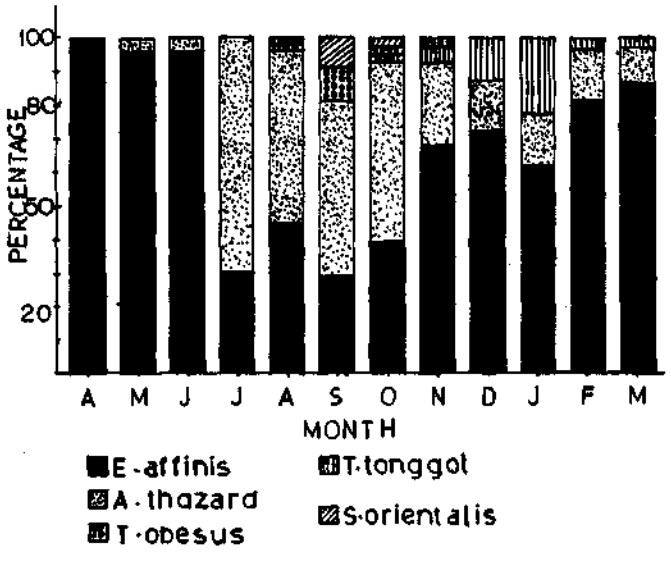

Fig. 5. Seasonal species composition of tunas in the drift gillnet fishery at Calicut (1988-1992).

the data of seerfish and tuna were pooled, the combined MSY was found to be 463.394 tonnes and the FMSY 10504 tonnes. It could be seen that at combined FMSY, though the tuna resource is slightly over fished, the seerfish are only nearing MSY.

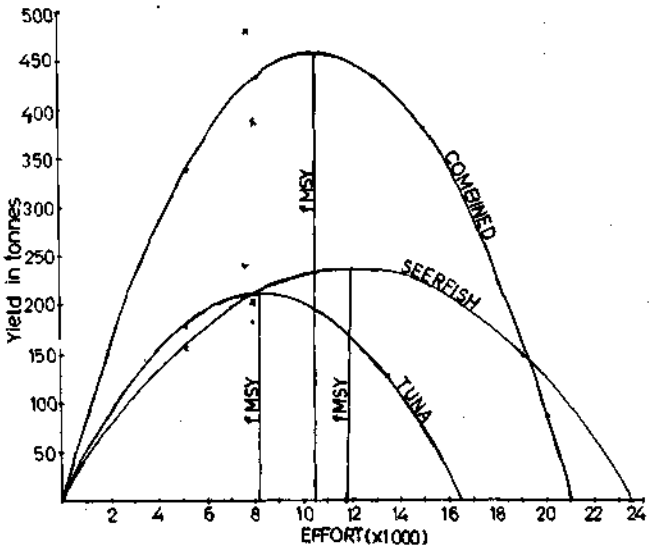

Fig. 6. Estimated Maximum Sustainable Yied (MSY) and Optimal Effort (f MSY) of tunas and seerfishes at Calicut in the drift gillnet fishery.

General remarks

The study shows that the drift net fishery at present fully depend on tuna and seerfish as they together constitute about 83% of the total drift net landings. Yohannan and Balasubramanian (*op. cit*) have found that they form around 55% only based on their study of the fishery of the period 1981-'88. Recently there is considerable increase in the landings of both tuna and seerfish when compared with the period 1981-'88. But the average total catch during the present period is less than that during 1981-'88 which indicate that the increase in the tuna and seerfish landings have simultaneously affected adversely the other fisheries like catfish, pomfret, shark etc. Among tuna and seerfish the former remains the dominant one. These infact are the notable developments after the motorisation of country craft.

As regards to the unusually heavy catch during 1988-'89, especially in October, it could be seen that the effort expended in October was higher than that of the same month in other years, and also was more than the preceding and succeeding months of the same year. A perusal

of the rainfall data shows the lowest rainfall in October 1988 when compared with the same month of other years. October being the peak month of tuna landing, the sudden calm condition following the turbulent monsoon would have become more conducive for intensive fishing as is evident from the increase in the effort used.

The drastic reduction in effort during 1989-90 was due to monsoon as during this year, the effect was felt intensely from April itself and continued till September. After 1989-'90, while the effort was showing a gradual increase, the cpue was showing a corresponding decrease. Neverthless, the catches did not decrease simultaneously except in 1991-'92. This may perhaps be due to yearly fluctuation.

It could be seen that the average catch of both tuna and seerfish for the period 1989-'90 to 1991-'92 was less than the MSY. This suggests that there is scope for further exploitation of the resources without affecting them adversely. The combined FMSY also indicate that there is scope for increasing the effort.

AN ECONOMIC EVALUATION OF PURSE SEINE FISHERY ALONG GOA COAST

K. K. P. Panikkar, D. B. S. Sehara and A. Kanakkan

Central Marine Fisheries Research Institute, Cochin - 682 014

Purse seining on an experimental basis was carried out first in Goa in 1957. However, it was successfully commercialised in 1964, with only two purse seiners under operation. By 1969 the number of purse seiners in Goa increased to 42 and recently the number has been considerably increased with the result that about 225 purse seiners are under operation along Goa coast.

The total marine fish landings of Goa in 1992 was estimated at about 96,000 tonnes, of which the purse seine contribution was about 70%. In this State traditional way of marine fishing has almost disappeared. About 96% of the total marine fish catch of the State was accounted for mechanised fishing comprising purse seiners and trawlers. About 3% of the catch was through motorised country craft and only 1% by non-motorised traditional sector. Hence, the marine fishing is becoming very much capital intensive. Fish is no more a gift of the sea. As in any other production process the fishing also involves a substantial production cost and with the increased tempo of mechanisation the unit cost of effort is continuously increasing. An economic evaluation is needed to find out whether this increase in fishing cost is compensated by increase in revenue either due to higher price or better catch.

Since the marine fishery of Goa is very much dominated by purse seine fishery and in view of its high catching efficiency and increasing tempo of its expansion the CMFRI has taken up a study on the economic performance of purse seiners along Goa coast.

Data base

The data on economics of operation of purse seiners and socio-economic aspects have been collected through special surveys organised by CMFRI during 1991 and 1992. Catch and effort and other relevant data utilised for this study have been obtained from the data centre of CMFRI.

Trend in marine fish landings viz-a-viz purse seine landings in the state

Marine fish landings in Goa during the period 1990-'92 showed an increasing trend with marginal yearly fluctuations. The catch varied between 24,500 tonnes in 1980 and 1,20,000 tonnes in 1989. From 1987 onwards the level of total landings of the State was maintained above 65,000 tonnes. The average annual landing during the period 1988-'92 was about 90,000 tonnes which indicates a 3 fold increase from the average catch of 33,800 during 1980-'84 period (Table1).

In 1980 the contribution of purse seiners in the total marine fish landings along Goa coast was only about 25%. The marine fish production of Goa recorded a continuous increase from 1980 except a few cases of slight fluctuations, reaching the level of about 96,000 tonnes in 1992. In between an all time record catch of 1.2 lakh tonnes was achieved in 1989 which was mainly

TABLE 1. *Catch, effort and total landings of purse seine units in Goa*

Year	Total catch in tonnes (all gears)	Purse seine catch in tonnes	Effort No. of unit days in operation for P.S.	Purse seine (CPUE kg)
1980	24490	6217	4184	1486 (25)
1981	34498	14113	12977	1088 (41)
1982	34041	7611	7333	1038 (22)
1983	37688	3568	5821	613 (09)
1984	38505	7322	7311	1002 (19)
1985	48850	13363	9721	1375 (27)
1986	54401	5950	8542	697 (11)
1987	65677	25192	28305	890 (38)
1988	91168	56335	24548	2295 (62)
1989	119866	98989	39859	2483 (83)
1990	66505	54305	36134	1503 (82)
1991	75623	55944	34699	1612 (74)
1992	96333	69614	35677	1950 (72)

Note :- Figures given in brackets are percentages to the total catch

due to the huge landings of oil sardine and mackerel throughout the west coast. The increase in marine fish landings of Goa was mainly due to the increase in purse seine landings which was estimated at about 6,000 tonnes in 1980, increased to 69,000 in 1992 and during this period its contribution to the total landings of Goa increased from 25 to 72%.

In 1980 the total effort by purse seiners was estimated at about 4000 unit days which increased to about 36,000 unit days in 1992.

The catch per unit per day of operation was 1.5 tonnes in 1980 and recorded about 2 tonnes in 1992 with wide fluctuations during this decade. In 1983 it was 0.6 tonnes, in 1986 about 0.7 tonnes and the highest at 2.5 tonnes was recorded in 1989, the year of all time record landings of the State. More than 95% of the purse-seine catch is contributed by clupeids, carangids, mackerel and tuna which used to be caught in traditional gears (Table 2).

Fishing cost

The average investment for a purse seine unit was estimated at about Rs. 7.5 lakhs. Eventhough the period of study was 1991-'92, the level of investment was calculated on the basis of average net asset value of a purse seine

TABLE 2. Specieswise marine fish landings along Goa coast by purse seiners

Catch	1991	1992
	(tonnes)	
Cat fish	495	—
Clupeids	30935	25891
Perches	—	8
Croakers	21	221
Ribon fish	—	7
Carangids	18348	31784
Pomfrets	94	122
Mackerel	2925	7673
Seerfish	73	128
Tunnies	1624	2721
Crustaceans	1081	534
Miscellaneous	348	525
Total	55944	69614

unit. Most of the craft are 46 footers and the engines are mostly with 125 HP.

For the purpose of analysing the fishing cost the costs incurred during 1991 and '92 have been separately calculated and the entire costs have been given under two classifications viz. the annual average operating cost and annual average fixed cost per unit under operation.

The annual average operating cost per unit worked out at about Rs. 5-6 lakhs of which the major components are expenditure on fuel and wages. Other cost items are repairing and maintenance, bata, food and ice. Unlike in other major purse seine operating states, in Goa, the carrier boat is not used for landing the fish. Wage system in Goa is also different from Karnataka and Kerala. In Goa, payment is made on monthly basis whereas in other states it is certain percentage of the total revenue after deducting the fuel expenditure for fishing and auction charges of the catch.

Interest, depreciation and insurance premium are included in fixed cost estimation. Interest is calculated at the rate of 18% and depreciation on the basis of the life span of the capital asset i.e. 10 years for craft and engine, 5 years for gear and one year for other accessories. The total fixed cost worked out at Rs. 2.68 lakhs. Hence, annual total cost of fishing operation of a purse seine unit has been

calculated at about Rs. 7.73 lakhs for 1991 and Rs. 8.71 lakhs for 1992 (Table 3).

TABLE 3. *Costs and earnings of a purse seine unit operating along Goa coast*

	1991 (Rs)	1992 (Rs)
A. Initial investment		
Craft	4,50,000	4,50,000
Net	2,80,000	2,80,000
Other accessories	20,000	20,000
Total	7,50,000	7,50,000
B. Catch (tonnes)	320	360
C. Revenue	8,48,000	9,90,000
D. Operating cost		
— Fuel	1,50,000	2,10,000
— Wages	1,40,000	1,68,000
— Bata	75,000	75,000
— Food	25,000	25,000
— Ice	40,000	50,000
— Repairing, maintenance and other miscellaneous	75,000	75,000
Total operating cost	5,05,000	6,03,000
E. Fixed costs		
— Interest @ 18%	1,35,000	1,35,000
Depreciation		
a) Craft	45,000	45,000
b) Gear	56,000	56,000
c) Other accessories	20,000	20,000
Total depreciation (a+b+c)	1,21,000	1,21,000
— Insurance	12,000	12,000
Total fixed cost	2,68,000	2,68,000
F. Total costs (D+E)	7,73,000	8,71,000
G. Gross profit (C-D)	3,43,000	3,87,000
H. Net profit (G-E)	75,000	1,19,000
I. Rate of return (%)	28	34

Fishing income

The average catch and fishing income per unit have been given for the years 1991 and 1992 in Table 3. Average annual catch per unit worked out at 320 tonnes in 1991 and 360 tonnes in 1992 with the average annual revenue of about Rs. 8.5 lakhs and 9.9 lakhs respectively. During 1991, the gross profit (income after deducting the operating cost) per unit worked out at Rs. 3.4 lakhs and the net profit at Rs. 75,000 (income after deducting the entire cost). During 1992, gross profit increased to Rs. 3.9 lakhs and net profit to Rs. 1.2 lakhs due to the increase in quantity landed per unit and also in price. The rate of return was 28% in 1991 which increased to 34% in 1992.

The total revenue through purse seine catch in Goa is estimated at about Rs. 210 million, which is earned by about 200 purse seiners. The total investment on purse-seine units came to about Rs. 150 million.

Value added income

Out of revenue of Rs. 210 million by purse seine landings an amount of about Rs. 42 million is incurred as fuel expenditure and the balance of Rs.168 million has come back to different people as remuneration for the services they contributed for the fish production. Hence, about 80% of the total income created through purse seine catch is the value added to the national income which indicates its high social benefit.

Cost and earnings per trip

Usually purse seiners in Goa go only one trip per day for fishing. Average fuel costs per day amounted to Rs. 750 during 1991 and Rs.1,050 during 1992. Average wages paid per day for all workers in a unit worked out at Rs. 750 in 1991 and Rs. 840 in 1992. Besides this an amount of Rs. 375 is paid as bata and Rs.125 as food expenditure, so that the total wage bill per day of operation per unit worked out at Rs. 1,200 in 1991 which increased to Rs. 1,340 in 1992.

The catch per unit per day of operation amounted to 1.6 tonnes in 1991 and 1.8 tonnes in 1992 (Table 4). The corresponding gross earnings worked out at Rs. 4,240 and Rs. 4,950 respectively. This amount is less as compared to purse seiners in Karnataka and Kerala. Hoewever, the annual income per unit is higher for purse seiners in Goa than those of Karnataka and Kerala. It is mainly because of more number of annual fishing days in Goa. Purse seiners in Goa operate about 200 days in a year as compared to 100-150 days in Karnataka and Kerala. So also annual net profit per unit in Goa is comparatively higher because of more number of fishing days as well as lesser cost as compared to other two states. Labour cost is fixed in Goa and wages are paid on monthly basis, where as in Karnataka and Kerala, it is based on percentage (mostly

TABLE 4. *Costs and earnings of a purse seine unit per day of operation along Goa coast*

	1991 (Rs)	1992 (Rs)
A. Catch (tonnes)	1.6	1.8
B. value	4240	4950
Price realised per kg of fish	2.65	2.75
Average number of days fished per year	200	200
C. Operating cost		
— Fuel	750	1,050
— Wages	700	840
— Bata	375	375
— Food	125	125
— Ice	200	250
— Repairing and maintenance	375	375
Total operating cost	2,525	3,015
D. Fixed costs		
— Interest @ 18%	675	675
Depreciation		
a) Craft	225	225
b) Gear	280	280
c) Other accessories	100	100
Total depreciation (a+b+c)	605	605
— Insurance	60	60
Total fixed cost	1,340	1,340
E. Total cost (C+D)	3,865	4,355
F. Gross profit (B—C)	1,715	1,935
G. Net profit (F—D)	375	595

25%) of the gross revenue after deducting the fuel cost and auction charges. Hence workers of purse seiners in Kerala and Karnataka get better wages than those of Goa.

Seasonality

About 80% of the Goa marine fish is landed in the first and the last quarter of the year. More than 80% of the purse seine catch is landed in the last quarter and about 85% of the trawl catch is in the first and the second quarter. Hence for any owner it is more economic to use the vessel for purse seining during September to December and for trawling during January to May. This will be more remunerative for the boat owner without affecting the total landings of the States (Tables 5 & 6).

TABLE 5. *Month wise marine fish catch (in tonnes) and effort (unit days) in Goa during 1991 by purse seiners and trawlers and quarterly total landings*

Month	Purse seiner		Trawler		Total catch (tonnes) (Quarterwise)
	Catch	Effort	Catch	Effort	
January	2274	3875	2099	6030	
February	997	2205	3188	6825	12583 (I)
March	413	1000	2631	8022	
April	1237	1613	1565	5588	
May	300	1085	1935	6805	5697 (II)
June	—	—	40	1050	
July	36	277	43	1080	
August	2344	3860	283	3752	8062 (III)
September	3107	2880	798	4140	
October	8606	5853	310	1872	
November	29186	7767	318	2700	49281 (IV)
December	7444	4284	606	2747	
Total	55944	34699	13816	50611	75623

TABLE 6. *Month wise marine fish catch (in tonnes) and effort (unit days) in Goa during 1992 by purse seiners and trawlers and quarterly total landings*

Month	Purse seiner		Trawler		Total catch (tonnes) (Quarterwise)
	Catch	Effort	Catch	Effort	
January	1951	1674	3042	2821	
February	1451	1717	2925	3834	11220 (I)
March	101	391	1270	3323	
April	142	915	3688	6345	
May	3	223	2007	7136	6184 (II)
June	—	—	117	2026	
July	8	517	99	1681	
August	5481	5851	1410	6572	12952 (III)
September	4418	2340	385	4770	
October	7685	3798	245	1302	
November	37311	12375	225	1080	65977 (IV)
December	11063	5876	1105	4768	
Total	69614	35677	16518	45658	96333

Optimum level of operation

On the basis of the existing operational level i. e. 200 units operating for about 200 days, assuming a reasonable level of profit and with expected level of average fish price of Rs. 3 per kg, each unit should get 1.5 tonnes per day of

operation. Hence, the total purse seine catch should be about 60,000 tonnes. The present level of operation can be increased without effecting economic viability only if there is either an increase in catch or price. Even if there is a reduction in catch, it will be compensated by an increase in price, so that the present level of effort can be maintained.

Impact of purse seine operation on traditional fishery

'Rampani', 'Yendi' (shore seine) and gillnet were the prominent traditional gears operated in Goa. These gears put together contributed about 60% of the marine fish landings of Goa in 1975, which reduced to about 10% in 1984. During 1992, 96% of the total landings was contributed by motorised units and the rest by the traditional gears without any type of mechanisation. This indicates the almost total disappearance of the traditional fishing units like 'Rampani', 'Yendi' etc. from Goa shore due to the large scale introduction of purse seining which is highly competitive to the traditional units. However, because of the continuous increase in purse seine effort the total catch also has been increased which coupled with the increasing trend in fish prices resulted in not only higher fishing income, but also helped to establish a number of fishery allied activities. Thus, the loss in the employment potential in traditional sector due to the onslaught of purse seining has been compensated by such newly created employment opportunities. But, as in the case of Karnataka State, these new opportunities have mainly helped the urban fishing centres and not the fishermen of remote rural centres. Besides this, the huge investment requirement of purse seiner has deprived the traditional fishermen in owning the means of production and most of them especially younger generation have become fishing workers in purse seine units. The recent introduction of motorisation of country craft may help the traditional fishermen revive the village based fishing operation. In Karnataka, motorisation has started reducing the dominance of purse-seining by introducing small mini purse seines, such as *ranivala*, *mattubala* and ring seine operating with motorised country craft. This can be introduced in Goa also so that the village based fishing activities can be revived without affecting the level of exploitation.

Conclusion

During 1991-'92 about 75% of the marine fish landings was by purse seiners. The average profit per unit during 1992 worked out at Rs.1.19 lakhs and the rate of return was 34%. At present about 200 purse seiners are under operation in the State. At the present level of exploitation, the effort is almost at the optimum level. Since there is every possibility of considerable increase in fishing cost along with the increase in price of fish, unless there is a substantial increasing trend in fish landing during the coming years, it is better to have the effort to be stablised at the present level of near about 40,000 boat days with 200 existing number of units under operation.

It is more profitable to any boat owner in Goa to operate purse seines during September-December and trawl nets from January-May with the same craft.

As in Karnataka and Kerala the introduction of ring seine operation in Goa can help revive the village based fishing activities as a joint venture.

OBSERVATION ON THE CULTURE OF GREEN MUSSEL IN PILLAIMADAM SALT WATER LAGOON, NEAR MANDAPAM*

Introduction

The Pillaimadam salt water lagoon (09°17'N and 79°06'E), located near Mandapam, in Ramnad district is bound by the Palk Bay on the north and the Rameswaram-Ramnad rail road on the south (Fig. 1). It extends to a length of about 5.2 km, covering an area of about 450 ha. The lagoon is connected to the Palk Bay by a bar mouth, through which it receives the tidal water. During the north-east monsoon (November and December) the lagoon gets rain water mainly through the Pillaimadam creek. Although the suitablity of the lagoon for finfish culture, particularly the milkfish (*Chanos chanos*) has been discussed by Tampi (1959) and Lal Mohan (1983a,b) no attempt has been made to utilize this ecosystem

*Prepared by : A. P. Lipton, S. Krishna Pillai and P. Thillairajan, Mandapam Regional Centre of CMFRI, Mandapam - 623 520.
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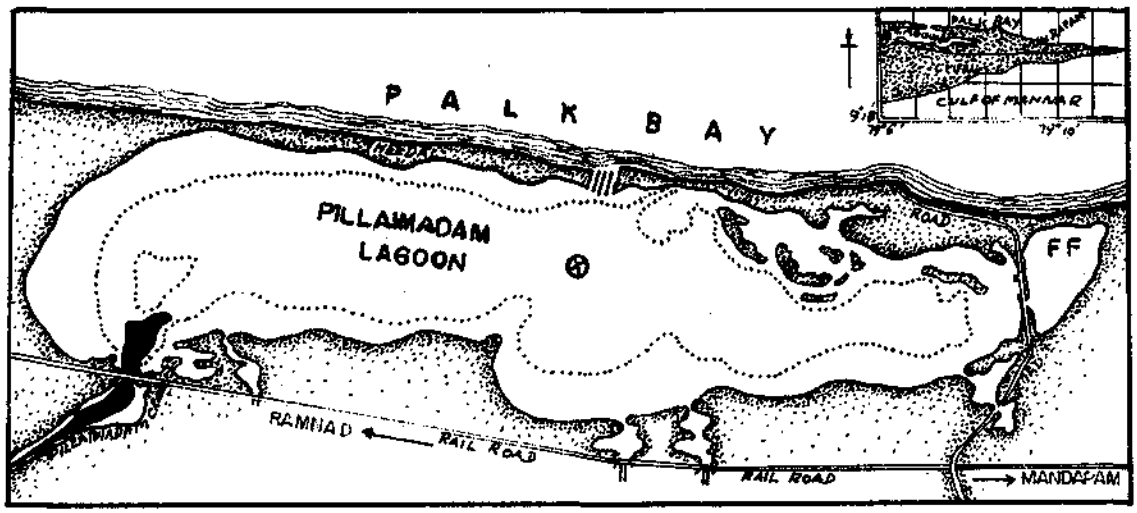

Fig. 1. Skech map of Pillaimadam Lagoon (The inset shows the general location)

for the culture of shellfishes. In this report, the results of the experiments carried out during January to April 1989 on the culture of the green mussel, *Perna viridis* are presented.

Hydrological conditions

The site selected in the lagoon was opposite to the bar mouth, where the water depth was considerably greater. The hydrological conditions of the lagoon are found to be greatly influenced by the freshwater precipitation during the NE monsoon and the tidal water. Subsequent to the rainfall, the maximum water level of 170 cm was recorded in December 1988 and in January 1989, this water level came down to 140 cm. In the summer month of May, the minimum water level of 30 cm was observed. In January 1989, water temperature, pH, surface and bottom water salinity of the culture site were 28.2°C, 7.5, 29.0 ppt and 29.5 ppt respectively (Table 1). However, during the summer month of April, while the values of water temperature and pH were steady, there was slight increase in salinity to 32.83 and 33.7 ppt in surface and bottom waters respec-

TABLE 1. *Rainfall, hydrological and nutrient conditions observed in Pillaimadam lagoon*

Month/parameter	Jan. 1989	Feb. 1989	Mar. 1989	Apr. 1989
Rainfall (mm)	25.00	1.00	9.00	98.00
Water depth (cm)	140.00	60.00	51.70	32.00
Atm. temp. (°C)	29.00	28.00	29.33	30.75
Water temp. (°C)	28.2	29.0	28.5	28.5
Surface salinity (ppt)	29.00	32.00	32.82	34.50
Bottom salinity (ppt)	29.50	33.60	33.70	36.75
Surface DO (ml/l)	4.47	4.42	4.40	4.56
Bottom DO (m1/l)	4.30	3.86	3.86	2.85
pH	7.50	7.20	7.65	7.75
phosphate (µg at/l)	0.15	0.10	0.05	0.01
Silicate (µg at/l)	24.0	34.0	33.0	10.0
Nitrate (µg at/l)	1.50	3.00	1.00	2.00
Nitrite (µg at/l)	0.07	0.25	0.20	0.10

tively. The dissolved oxygen level varied from 4.4 to 4.56 ml/l (surface) and 2.85 to 4.3 ml/l (bottom). Among the nutrients, phosphates fluctuated between 0.01 and 0.15/µg at/l. Silicates from 10.0 to 34.0/µg at/l; nitrates value from 1.0 to 3.0/µg at/l and nitrite values from 0.07 to 0.75/µg at/l (Table1).

Experiments on the culture of green mussel

The green mussel was cultured by suspended bag method. As natural mussel populations are not available along the Ramnad coast, the spat was collected from the Ennore estauary, Madras during January 1989 and transported by train to Mandapam in wet gunny bags, kept inside plastic troughs. The mortality during transportation was below 5.0%

The spat were stocked in bags made of nylon net material of 35 X 100 cm size with 10 mm mesh, cut and stitched on sides. Nylon rope of 3.0 mm dia. was inserted in the upper portion of the bag through the webbing after leaving a gap of about 10.0 cm. The rope was tied tightly, which apart from closing the bag, also facilitated the hanging from the poles. Each bag was stocked with 2.5 kg of green mussel after measuring the initial length, breadth and weight. The bags were suspended from the abandoned laboratory cum-watchout hut erected inside the lagoon (Fig 2). The bags containing the mussels were kept submerged under water.

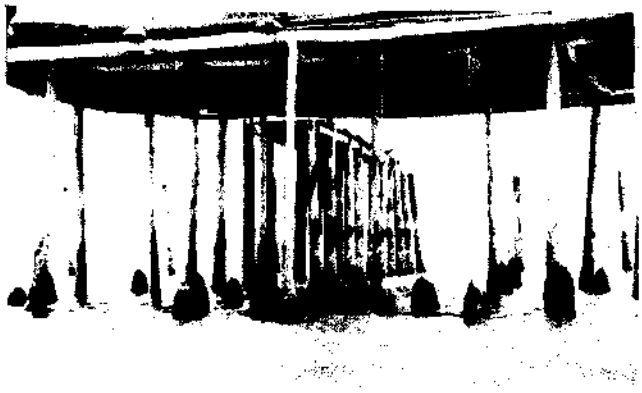

Fig. 2. Culture site in Pillaimadam lagoon.

Results

During the culture period of 80 days, the mussels have grown from an initial length of 31.89 + 5.93 mm to 42.33 + 3.21 mm size.

The average monthly increase in length was 3.9 mm (Table 2). This growth rate is less when compared to the average monthly growth of 12.8 to 13.0 mm in the rope culture method in Kovalam Bay, Madras (Rangarajan and Narasimham, 1980) and 7.3 mm per month in the onion bag culture method in the open sea in Thailand (Chaitanawisuti and Menesveta, 1987).

In the estuarine ecosystem, the green mussels have been reported to attain an average growth of 8.0 mm per month in the Ennore estuary (Rangarajan and Narasimham, 1980). In the saltwater lagoon of Muthukadu, in the suspended bag method of culture of green mussels, Sreenivasan *et al.*, (1988), observed the growth at 8mm per month. Compared to these results, the growth of green mussel in the Pillaimadam lagoon system was poor.

The weight attained by the mussels in the present report was 5.0 g from an initial value of 2.29 ± 1.47 g. The weight increase was faster during the first 40 days of rearing. The gross increase in the weight of bag during the first 40 days of growth was 1.60 kg/bag (Table 2). However, during the second phase of 40 days, a marginal increase of 0.15 kg was recorded. Sudden mortality of mussels from the 80th day onwards was observed. The reasons for the sudden mortality of mussels from the 80th day onwards are not understood.

Associated organisms

Rhodophycean members such as *Acanthospora spicifera* and *Hypnea musciformis* were found to attach heavily on bags (Fig. 3). Barnacles were found to attach on the shells of green mussels and also on the nylon bags. In addition, *Cerethium* sp. was found on the mussels inside the bag.

TABLE 2. *Results on the growth of mussel in the bag culture method in Pillaimadam lagoon*

Parameter	Initial	After 40 days	After 80 days
Length (mm)	31.89 ± 5.93	37.0 ± 5.01	42.33 ± 3.21
Breadth (mm)	16.49 ± 3.02	18.54 ± 2.48	21.27 ± 1.79
Weight (g)	2.29 ± 1.47	4.40	5.00
Gross weight of mussel (kg/bag)	2.50	3.75	3.90

Fig. 3. Fouling of culture bags by algae.

Conclusions

It is inferred that the growth of green mussels was slow and survival was poor in the Pillaimadam saltwater lagoon during January to April. The production was poor and therefore the Pillaimadam lagoon does not appear to be suitable for green mussel culture.

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OBSERVATIONS ON THE GRAZING PHENOMENON OF THE CULTURED SEAWEED, *GRACILARIA EDULIS* BY FISH IN MINICOY LAGOON (LAKSHADWEEP)

The seaweed *Gracilaria edulis* is a fast growing agarophyte and its distribution is confined to Tamil Nadu, Andaman-Nicobar islands, Lakshadweep group of islands and Chilka lake along the Indian Coast. In Lakshadweep, it has been reported growing abundantly in the islands of Agatti, Kavaratti, Kalpeni and Kadamath while in Minicoy it was totally absent till recently. In 1990 this seaweed was transported from Mandapam (Gulf of Mannar) and Kavaratti islands (Lakshadweep) to study the feasibility of its establishment and colonizing in the lagoon in Minicoy. As is well known this seaweed is much sought after as an industrial raw material for the exraction of the phyto-chemical, agar-agar which is of wide industrial use.

The initial culture experiments by net and rope methods had shown encouraging results and as time passed by, a certain amount of grazing by fish was observed in the culture nets and ropes causing considerable damage to the seed material or growing fragments or some times to the fully grown seaweed. But during one of the field trials in 1992, a record production of 31 fold incerease over the initial seed material was noticed in one of the ropes which had escaped grazing by fish, while most of the ropes introduced along with that were grazed down completely except for one more rope which had grown to harvestable size in November 1992 yielding an 18.65 fold enhancement over the seed material introduced initially.

These experiments were continued in 1993 also with a view to confirm the above trend consistently in the subsequent years. But these culture operations had a set back because of heavy grazing of the seed material within a few hours of introduction by different types of fishes.

So as to get a convincing proof that these fishes were actually feeding on the seaweed; cast net and set gill net operations were carried out

Prepared by : V. S. K. Chennubhotla, A. K. V. Nasser, V. A. Kunhikoya, A. Anasukoya, Research Centre of CMFRI, Minicoy (Lakshadweep) and M. S. Rajagopal, CMFRI, Cochin - 682 014.

in the seaweed culture sites to capture the fishes that hover around the culture sites. The gut contents of these fishes were analysed for qualitative analysis of food items and the details are given in table.

TABLE 1. *Fishes caught from the seaweed culture sites in the Minicoy lagoon by cast net and get gill net and their gut contents*

	Fish species	No. of fish Examined	Length range (cm)	Gut contents
1	2	3	4	5
1.	*Abudefduf septemfasciatus*	6	9.5-14.2	*Chaetomorpha* sp., *Enteromorpha* sp., *Polysyphonia* sp., *Centroceras* sp., *Gracilaria edulis*, zooplankton, calcareous algae
2.	*Acanthurus* sp.	2	9.3-11.3	Filamentous algae, zooplankton, plant material
3.	*A. triostegus*	7	7.3-11.2	*Enteromorpha* sp., *Centroceras* sp., *Sarconema* sp., *Gracilaria edulis*, *Dictyota* sp., filamentous algae, other brown algae
4.	*A. lineatus*	2	14.5-16.5	*Dictyota* sp., *Gracilaria edulis*
5.	*Caranx* sp.	3	9.9-13.8	Fish remains, filamentous plant material
6.	*Chaetodon auriga*	6	12.2-14.5	Worms, calcareous pieces, zooplankton
7.	*Epinephelus tauvina*	1		Zooplankton, fish remains
8.	*Gerres lucidus*	11	11.2-16.5	*Chaetomorpha* sp., *Cladophora* sp., *Gracilaria edulis*, *Enteromorpha* sp., fish remains, zooplankton
9.	*Hyporhamphus* sp.	1		Fish remains, filamentous plant material
10.	*Kyphosus vaigiensis*	2	19.6-31.3	Seagrasses, *Gracilaria edulis*, *Dictyota* sp., *Enteromorpha* sp., other algae
11.	*Leptoscarus vaigiensis*	5	14.3-15.5	Seagrasses
12.	*Lethrinus harak*	21	11.0-16.4	Fish remains, shrimps, crabs, filamentous green algae, brown and red algae
13.	*L. mahsena*	2	9.5-14.5	*Chaetomorpha* sp., *Gracilaria edulis*, green and brown algae, seagrasses, zooplankton
14.	*Liza* sp.	1		Sand particles
15.	*Lutianus gibbus*	1		Zooplankton
16.	*L. kasmira*	8	7.2-14.1	Shrimps, *Cladophora* sp. crabs, polychaete worms, fish remains
17.	*Myripristis murdjan*	1		Semidigested matter
18.	Other parrot fishes	13	11.2-16.8	Seagrasses, fish remains, crab
19.	*Paraupeneus indicus*	2	11.6-13.7	Crabs, gammarids, copepods, fish remains
20.	*Polynemus sexfilis*	8	12.9-16.5	Fish remains, seagrasses *Gracilaria edulis*, shrimps, zooplankton
21.	*Stethojulis trilineata*	1		Semidigested matter
22.	*Therapon jarbua*	1		Crabs, *Enteromorpha* sp.

SKIN OF RAYS — A NEW COMMODITY FOR EXPORT MARKET*

During recent years, there is an unprecedented spurt in the export market for unconventional marine species like gorgonids, sea horses and products obtained from them. Latest among this expanding list of items is the skin of rays (elasmobranch).

The ray skin export is a newly established endeavour for the fisherfolk of Ramanathapuram coast of Tamil Nadu. The skin is cut meticulosuly so as to avoid damage and wastage and dried under the sun, after which it is removed and stacked for marketing. Keelakarai is the centre for collection of skin of rays. Figure 1 shows the dorsal and ventral views of the skin of 'Manal thirukkai' (in Tamil), *Himantura bleekeri* (Blyth) collected from a Keelakarai merchant dealing with the export.

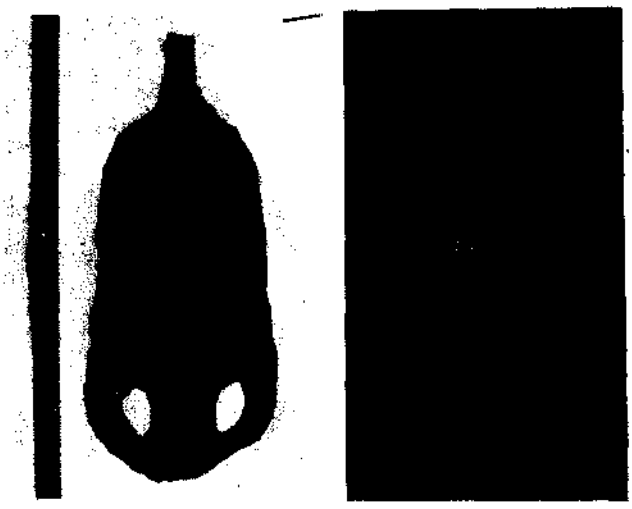

Fig. 1. Dorsal and ventral view of ray skin made for export.

Nepal is the main market for the ray skin. From the information collected, various products such as chappals, wallets, belts and Hi-fashion products like ladies bags are made using the skin of rays.

The cost of the skin of a ray ranges from Rs. 4/- to Rs. 20/- depending on the size. When it is sold to another merchant or prospective buyer, the percentage profit ranges from 50 to 100. Although at present the exact quantity of ray skin being exported from India is not known, it is presumed that in the near future this commodity will assume importance.

* Prepared by A. P. Lipton and J. R. Ramalingam, Mandapam Regional Centre of CMFRI, Mandapam - 623 520.

ON THE LANDING OF LARGE SIZED HAMMER HEAD SHARK *SPHYRNA LEWINI* AT TUTICORIN*

A large sized female hammer head shark *Sphyrna lewini* (Cuvier, Griffith and Smith, 1834) locally called 'Kombu sorrah' measuring 4 m in total length and weighing 520 kg was caught by hooks and line (No. 7 'disco thoondil') off Tuticorin from a depth of 100 m on 30.3.'93 (Fig. 1). The important morphometric measurements taken are presented in Table 1.

TABLE 1. *Morphometric characters of Hammer head shark* Sphyrna lewini

	Measurements (mm)
Total length (snout to tip of upper lobe)	4010
Standard length (snout to caudal fork)	3100
Snout to first dorsal	1220
First dorsal fin	
Height	770
Breadth	390
Outer curve length	715
Inner curve length	73
Distance between first dorsal & second dorsal fin	882
Second dorsal fin	
Height	250
Breadth	160
Outer curve length	370
Inner curve length	195
Snout to pectoral fin	882
Pectoral fin	
Height	620
Breadth	240

*Reported by : S. Rajapackiam, T. S. Balasubramanian, K. M. S. Ameer Hamsa and H. Mohamad Kasim, Tuticorin Research Centre of CMFRI, Tuticorin - 628 001.

Curve	580
Distance between pectoral and pelvic	883
Pelvic fin	
Height	370
Breadth	320
Curve	400
Distance between pelvic and anus	286
Anal fin	
Height	250
Breadth	230
Caudal fin	
Upper lobe	1092
Lower lobe	490
Snout to•mouth	210
Width of mouth	400
Mouth curve length	490
Snout to first gill opening	702
Snout to eye	470
Eye diameter (horizontanl)	44
Eye diameter (vertical)	31
Snout to spiracle	400
Body height at first dorsal	896
Body height at pectoral	533
Body height at pelvic	814
Body height at anal	530
Body height at caudal notch	300

Fig. 1. Dorsal view of the Hammer head shark *Sphyrna lewini* landed at Tuticorin.

ON A JUVENILE WHALE SHARK *RHINCODON TYPUS* CAUGHT OFF KAYALPATNAM (GULF OF MANNAR)*

Stray individuals of the Whale shark *Rhincodon typus* (Smith) are caught occasionally along the Gulf of Mannar coast. On 15th April 1993 a male whale shark measuring 3.8 m and weighing approximately 650 kg got entangled in 'Paruvalai' (Nylon drift gill net, mesh size : 115 - 170 mm) operated at a depth of 40 m off Kayalpatnam during the early hours of the day. The shark was towed ashore with the help of neighbouring crew. Locally this sahrk is known as 'Ammuni uluvai'. Since the meat is unpalatable and the fins does not fetch any fair price, it was auctioned for a very low price of Rs. 300/-. Necessary morphometric measurements taken are presented in Table 1.

TABLE 1. *Morphometric measurements (mm) of whale shark* Rhincodon typus *(Smith).* Measurements in mm

Total length	3870
Standard length	3300
Snout to first dorsal	1660
Snout to second dorsal	2440
Snout to pectoral	1010
Snout to eye	410
Snout to nostril	520
Snout to anal	2080
First dorsal fin	
Height	420
Breadth	350
Curvature	300
Inner curvature	170
Second dorsal	
Height	220
Base	190
Curvature	160
Inner curvature	150
Pectoral	
Length of pectoral	640
Base	330
Curvature	330

*Reported by : S. Rajapackiam, K. M. S. Ameer Hamsa, T. S. Balasubramanian and H. Mohamad Kasim, Tuticorin Research Centre of CMFRI, Tuticorin - 628 001.

Inner curvature	190
Caudal length	960
Snout to first gill opening	730
Snout to second gill opening	800
Snout to third gill opening	860
Snout to fourth gill opening	960
Snout to fifth gill opening	1010
Eye diameter (vertical)	35
Eye diameter (horizontal)	40

Inter orbital distance	810
Inter nostril distance	880
Mouth length	510
Mouth width	320
Girth at I dorsal	2640
Girth at 2nd dorsal	1080
Girth at caudal	420

ON TWO LARGE SPECIMENS OF DEVIL RAY *MANTA BIROSTRIS* (WALBAUM) LANDED AT TUTICORIN*

Two female specimens of devil ray locally known as 'Kombu thirukkai' measuring 3020 and 3050 mm in total length and 5670 and 5700 mm in breadth respectively were landed at Tuticorin North fish landing centre on 29.03.'93 (Fig. 1). The approximate weight of the two rays was 1375 and 1425 kg. The specimens were auctioned for Rs.550/- and Rs.600/- respectively at the fish landing centre.

Plank built boats locally called 'Vallam' were engaged for fishing with a crew of 5 to 7 fishermen. The gears used were a stationary bottom set net locally know as 'Thirukkai Valai'. The length of the net is approximately 6-7 m. The nets were made out of nylon thread with a mesh size of 45 cm and operated at a depth of 50 m.

The occurrence of this speices has been reported by D.B. James, CMFRI, Madras (*I.J.F.*, **32**, (4) : 492-494 (1985), at Karwar' by K.Y.Telang and T.B. Harikantra (MFIS, 85) and by S. Rajapackiam *et al.* (MFIS, 106). But the size of the present specimens sets the maximum recorded so far.

The following observations were made on the morphometry of the devil rays.

Particulars	Specimen No.1 in mm	Specimen No.2 in mm
Total length of the body	3020	3050
Standard length of the body	2340	2420
Width of the body	5670	5700
Inter orbital distance	1370	1375
Inter cephalic horn distance	780	785
Length of cephalic horn	680	700
Width of cephalic horn	270	300
Diameter of eye	90	95
Length of eye	70	75
Diameter of eye ball	30	32
Length of mouth	790	800
Length of tail	1290	1310
Total length of gill slits	590	600
Width of first gill slit	510	520
Width of second gill slit	530	525
Width of third gill slit	510	515
Width of fourth gill slit	460	475
Width of fifth gill slit	370	380

Fig. 1. Devil ray landed at Tuticorin.

*Reported by R. Gurusamy and T. S. Balasubramanian, Tuticorin Research Centre of CMFRI, Tuticorin - 628 001.

ON THE LANDING OF BOTTLENOSE DOLPHIN *TURSIOPS TRUNCATUS* AT KAKINADA*

On 28-04-1993, a dolphin measuring 225 cm in total length and weighing 160 kg was landed at Kakinada Fisheries Harbour, about 30 km north east of Kakinada. It was a female dolphin identified as *Tursiops truncatus* (Bottlenose dolphin) having 25-27 teeth on one side of upper and lower jaws. This dolphin was caught in Bottom set gill net ('Panduvala') operated by motorised 'Nava' (in-board engine) about 20 m depth. The presently reported dolphin was sold for Rs. 500/-. The meat of dolphin is being regularly used as bait for hooks and line fishery which is resulting in good landings of sharks and tuna. The detailed measurements (in cm) are given below.

Date of capture	:	28-04-1993
Total length	:	225
Standard length	:	197
Head length	:	64
Snout to dorsal fin	:	19
Length of caudal fluke along upper margin	:	36
Length of flipper from angle of inner base to tip	:	37
Lenth of flipper from angle of inner base to tip	:	27
Total number of teeth on one side of upper jaw	:	25 concial teeth
Total number of teeth on one side of lower jaw	:	27 conical teeth
Sex	:	Female
Weight	:	160 kg

Reported by T. Nageswara Rao, P. Venkata Ramana, Kakinada Research Centre of CMFRI, Kakinada - 533 004.

INSTANCES OF FINLESS BLACK PORPOISE, *NEOPHOCAENA PHOCAENOIDES* CAUGHT IN MANDAPAM REGION ALONG THE PALK BAY COAST IN TAMIL NADU*

The finless black porpoise, *Neophocaena phocaenoides* G. Cuvier is widely distributed in the Indo-Pacific ranging from Cape of Good Hope to Japan and China and often known to ascend the estuaries of larger rivers. In India, this species is fairly common along the coasts of Bombay, Madras and Trivandrum. Since, porpoises are considered as endangered marine mammals, strict regulations have been imposed by the Government authorities for their conservation and management. Incidental catch of porpoises reported in the west coast is more than in the east coast of India as may be seen from the published information. It appears that propoise, *Neophocaena phocaenoides* frequents the coastal waters and gets captured on many occasions. More recently, incidental catch of porpoises are on the increase in Mandapam region.

In the present report, details on the incidental landings of porpoises, *Neophocaena phocaenoides* from fish landing centres in Mandapam region along the Palk Bay coast are given. As there was no bidder for the porpoises due to lack of demand, they were buried in the beach.

A female porpoise of 77 cm in total length was caught in a gillnet ('Choodai Valai') on 08.07.1988 off Mandapam at a depth of 8 m (Fig. 1) The second porpoise measuring 132 cm in total length was a female caught in a gillnet at a depth of 6 m on 11.08.1990 off Pillaimadam. The third porpoise measuring 126 cm in total length was a female caught in gillnet at a depth of 12 m off Verkodu near Rameswaram on 16.11.1990. The fourth porpoise was a male measuring 132 cm in total length was stranded and washed ashore in decomposed condition at Agnitheertham near Rameswaram on 25.10.1992.

Morphometric measurements (in cm) of all the four porpoises are presented in Table 1.

Dawson (1959) reported four embryos in

*Reported by : P. Nammalwar, A. P. Lipton, S. Krishna Pillai, G. Maheswarudu, C. Kasinathan, M. Bose, N. Ramamoorthy and P. Thillairajan, Mandapam Regional Centre of CMFRI, Mandapam Camp - 623 520, Tamil Nadu.

TABLE 1. *Morphometric measurements (in cm) of Finless black porpoise* Neophocaena phocaenoides

Date of catch Place of catch/stranding	08.07.'88 Mandapam	11.08.'90 Pillaimadam	16.11.'90 Verkodu (Rameswaram)	25.10.'92 Agnitheertham (Rameswaram)
Sex/ Body characters	Female	Female	Female	Male
Total length (tip of upper jaw to deepest part of caudal fluke notch)	77.0	132.0	126.0	132.0
Tip of upper jaw to anterior insertion of flipper (right)	20.1	29.0	-	27.5
Tip of upper jaw to centre of eye	9.6	16.0	12.0	11.0
Width of eye	-	-	-	2.5
Tip of upper jaw to centre of blow-hole	-	16.0	-	18.0
Length of flipper (anterior insertion - right)	17.0	30.0	-	23.0
Length of flipper (anterior insertion - left)	16.6	30.0	-	-
Length of eye	1.1	1.4	1.2	4.0
Girth at eye	18.4	44.0	-	-
Length of blow-hole	1.7	2.5	2.1	2.5
Width of blow-hole	0.8	1.1	1.0	2.0
Tip of upper jaw to the centre of anus	52.9	96.0	-	88.0
Length of anal slit	0.8	1.4	-	2.5
Girth at anus	14.5	50.0	-	58.0
Tip of upper jaw to the centre of genital slit	44.1	79.0	-	72.0
Length of genital slit	8.7	9.0	-	-
Length of penis	-	-	-	9.5
Tip of upper jaw to the centre of umbilicus	36.4	62.4	-	-
Length of throat-grooves	-	23.0	-	-
Caudal fluke span	22.4	40.0	34.0	23.0
Notch of caudal flukes to centre of anus	22.5	41.0	-	-
Notch of caudal flukes to centre of genital aperture	31.0	60.0	-	-
Teeth counts (in numbers)				
Upper (right)	-	16	-	17
Upper (left)	-	14	-	-
Lower (right)	-	17	-	17
Lower (left)	-	16	-	-
Weight (in kg)	-	30.0	22.0	45.0

the size range 9.3-15.5 cms among seventeen porpoises of the species *Neophocaena phocaenoides* landed at Malpe, South Kanara coast. Balan (1978) reported a juvenile specimen measuring 66.9 cm in total length and weighing 4.52 kg caught in gillnet off Calicut, Kerala coast. Recently, Ganapathy (1992) reported one adult of *N. phocaenoides* measuring 120cm stranded at Mullimunai (Thondi) along the Palk Bay coast in Tamil Nadu. According to the present reports, porpoises are caught more recently from east coast of India.

ON THE LANDING OF SPINNER DOLPHINS *STENELLA LONGIROSTRIS* AT LAWSON'S BAY, VISAKHAPATNAM*

Three adult spinner dolphins were caught by mechanised, fibre-glass, beach landing craft and landed at Lawson's Bay on 19-4-'93 (Fig. 1). They were caught off Rushikonda10 km from Visakhapatnam at a depth of 15 metres.

The dolphins were accidently caught in the drift net, which is locally called 'Pandu vala'. The mesh size is 150 mm. This gear is mainly used to catch seer fish. The dolphins were caught during early hours and were brought to the landing centre in the afternoon.

Fig. 1. The spinner dolpins landed at Lawson's Bay, Visakhapatnam.

All the three dolphins were adult females measuring 2.44 m, 2.39 m and 2.16 m in total length and weighing about 250 kg, 200 kg and150 kg approximately. The morphometric measurements are given in the table.

The dolphins were dead on landing. Dolphin meat is used as baits for hooks and line to catch sharks, but as the month is not a season for sharks, the dolphins were thrown back into the sea.

TABLE 1. *The morphometric measurements (cm) of a female* Stenella logirostris

1. Tip of upper jaw	to the tip of caudal fluke	244
"	to the fork of caudal fluke	224
"	to the dorsal fin	101
Cleft of mouth		29
Eye diameter		4
Number of teeth present on one side of the Jaw		48 Nos.
2. Tip of upper jaw	to the tip of caudal fluke	239
"	to the fork of caudal fluke	218
"	to the dorsal fin	101
3. Tip of upper jaw	to the tip of caudal fluke	216
"	to the fork of caudal fluke	202
"	to the dorsal fin	94

*Reported by S. Satya Rao and S. Chandrashekar, Visakhapatnam Research Centre of CMFRI, Visakhapatnam - 530 003.

ERRATA

MFIS No. 122, August, September, 1993.

Page 1, col. 1, line 10 : Insert the following after the word 'operated' : 'throughout the Indian coasts, whereas 'dol' nets are operated'
Page 2, col. 1, line 12 : Read '23' as '32'
Page 3, col. 4, line 12 : Insert hyphen after 'Oct.'
Page 3, col. 4, line 14 : Insert hyphen after 'Aug.'
Page 3, col. 7, line 11 : Insert 'Oct.' in place of 'Dec.'
Page 4, col. 7, line 6 : Insert 'Nov.' after 'Sep'.
Page 5, col. 4, line 10 : Transfer '& Sep. - Oct.' to line 8 in col. 5
Page 5 : Insert the following under Sl. No. 39 after 'VIZHINJAM Centre' :

'39 Drift/Gillnet and Hooks & line	*S. tumbil, S. undosquamis,* *S. longiceps, Sardinella* spp., *R. kanagurtta, S. devest,* *S. bataviensis, S. buccanneri,* mullets, *Sphyraena* spp., *Caranx* spp., *D. russelli*'	May - Oct.	May, Sep.-Oct.	.. ..

Page 5, col. 3, line 37 : Put '(2)' in line 38 after *S. fimbriata*
Page 5, col. 6, line 20 : Insert 'May' after 'Apr.'
Page 6, col. 2 : Insert 'MANDAPAM Centre' between Sl. No. 49 & 50
Page 6, col. 6 : lines 8 & 9 : Read as 'Mar., May - June & Nov.'
Page 7, col. 5, line 12 : Insert 'May' after 'Mar'.
Page 7, col. 6 : Delet line 11.

कालिकट के वेल्लयिल में ड्रिफ्ट जाल मात्स्यिकी की वर्तमान स्थिति

एम. शिवदास

सी एम एफ आर आइ का मिनिकोय अनुसंधान केन्द्र, मिनिकोय

आमुख

कालिकट में सीर फिश, ट्यूना आदि गुणतायुक्त मछलियों का अवतरण ड्रिफ्ट जाल से होता है। इसलिए वाणिज्यिक दृष्टि में इस गिअर का महत्वपूर्ण स्थान है। बाहरी इंजन की प्रस्तुति ने गहरे समुद्र से मछली पकडने की सहायता प्रदान की है जिस से पकड में सराहनीय वृद्धि हुई है।

आनायक और संभार

पुराने डगआउट कानोस के स्थान में फाइबर ग्लास से आवृत प्लाइवुड पोतों का परिचालन होता है। कर्मशक्ति भी कम कर दिया है, 3-4 लोगों के बदले दो व्यक्तियों से काम चलाता है।

प्रयास: मत्स्यन प्रयास में उतार-चढाव देखा गया। 1989-90 की भारी घटती के बाद 1991-92 में नियमित बढती देखी गयी। अक्तूबर से जनवरी तक की अवधि में प्रयास अधिक था।

पकड और पकड प्रति एकक प्रयास

औसत 604.6 टन मछलियों का अवतरण हुआ जिसमें 47.2% ट्यूना और 35.7% सीर मछली थी। 1988-89 में ट्यूना अवतरण और कुल पकड अन्य सालों की तुलना में ज्यादा था। 1989-90 में अवतरण कम हो गया और 1990-91 में बढकर फिर घट गया।

पकड का प्रति एकक प्रयास वर्ष 1988-89 से 1991-92 तक कम था।

पकड में वातावरणीय उतार-चढाव

कुल पकड और ट्यूना पकड का ऋंगकाल अक्तूबर था तो सीर मछली का ऋंगकाल नवंबर था। ड्रिफ्ट जाल की प्रमुख पकड ट्यूना और सीर मछली थी। नवंबर से फरवरी तक सीर मछली पकड में प्रमुख थी।

जाति मिश्रण: सीर मछली में *स्कोम्बेरोमोरस कर्मेसन* का प्रतिनिधित्व था। ट्यूना मात्स्यिकी में छ: जीतियाँ उपस्थित थी। इन में *यूथिनस अफिनिस* (66%) प्रमुख था। अन्य मछलियों का प्रतिशत *ऑक्सिस थासार्ड* (28%) *थुन्नस टोंगोल* (2%) *टी. ओबीसस* (2%) *एस. ओरियन्टालिस* (1.1%) और *ए. रोचेइ* (0.9%) *ई. अफिनिस* और *ए. थासार्ड* हमेशा उपलब्ध थे। *ई. अफिनिस* का ऋंगकाल अप्रैल से जून और नवंबर से मार्च तक का समय था। जुलाई से अक्तूबर तक की अवधि *ए. थासार्ड* का ऋंगकाल था। दिसंबर से जनवरी तक की अवधि *टी. टोंगोल* केलिए और सितंबर *टी. ओबीस* और *एस. ओरियन्टालिस* केलिए उचित समय था।

अधिकतम वहनीय उत्पाद और इष्टतम प्रयास

सीर मछली का एम एस वाइ और एफ एम एस वाइ क्रमश: 238.126 टन और 11835 टन और 8262 देखा गया।

अभ्युक्तियाँ

अध्ययन से व्यक्त होता है कि ड्रिफ्टजाल मात्स्यिकी पूर्णतया ट्यूना और मछली पर निर्भर है। वर्ष 1988-89 की अवधि के अक्तूबर में पकड अधिक था जिसकेलिए प्रयुक्त प्रयास भी अन्य सालों के इसी महीने में प्रयुक्त प्रयास की तुलना में अधिक था। इसके अतिरिक्त 1988 अक्तूबर में बारिश अन्य सालों में इस महीने में प्राप्त बारिश की तूलना में कम थी। अक्तूबर में मानसून के बाद की शान्त अवस्था तीव्र प्रयास केलिए सहायक बन गया होगा।

वर्ष 1989-90 में प्रयास में देखी गयी कमी का कारण मानसून था। 1989-90 में प्रयास बढा था लेकिन पकड प्रति एकक प्रयास कम हो गया। लेकिन पकड में कमी नहीं दीख पडी।

यह देखा गया कि ट्यूना और सीर मछली का औसत पकड 1989-90 से 1991-92 तक अधिकतम वहनीय उत्पाद से कम थी। इससे व्यक्त होता है कि संपदा का विदोहन और भी किया जा सकता है।

मण्डपम के निकट पिल्लैमडम में हरित शंबु का संवर्धन *

आमुख

मण्डपम के निकट रामनाडु जिले में स्थित पिल्लैमडम लैगूण का उत्तर भाग पाक खाडी और दक्षिण भाग रामेश्वरम-रामनाड रेल है। लगभग 450 हेक्टार क्षेत्र नें इसकी लंबाई 5.2 कि मी है। एक बार-माउथ के जरिए यह लैगूण पाक खाडी से संयोजित है, जिससे लैगूण मे ज्वारीय पानी उपलब्ध होता है। उत्तर-पूर्वी मानसून में पिल्लैमडम क्रीक से लैगूण में बारिश मिलती है। यहाँ कवच प्राणियों का संवर्धन अभी तक नहीं किया है। यह रिपोर्ट जनवरी-अप्रैल 1989 के दौरान हरित शंबु, पेर्ना विरिडिस के संवर्धन केलिए किए गए परीक्षणों का परिणाम के बारे में है।

जलवैज्ञानिक स्थितियाँ

लैगूण केलिए चुने गए स्थल बार माउथ के सामने है, जहाँ गहराई ज्यादा अधिक है। लैगूण की जलवैज्ञानिक स्थितियाँ उत्तर-पूर्वी मानसून से और ज्वारीय जल से अत्यधिक प्रभावित है। बारिश के बाद जल तल दिसंबर 1988 में 170 से मी रिकार्ड किया गया और जनवरी, 1980 में यह कम होकर 140 से मी हो गया। मई महीने में जलतल 30 से मी देखा गया। जनवरी, 1989 मे संवर्धन स्थल के जल का तापमान, पी एच, उपरितल और तटीय जल लवणता क्रमश: 28.2°C, 7.5, 29.0 पी पी टी और 29.5 पी पी टी थे। अप्रैल में लवणता में थोडी सी वृद्धि हुई। विलीन आक्सिजन स्तर 4.4 से 4.56 ml/l (उपरितल) और 2.85 से 4.3 ml/l (तलीय) विविधता दिखाई। पोषकों में फोसफेट्स, सिलिकेट्स, नाइट्रेट्स आदि ने उतार चढाव दिखाया।

हरित शंबु संवर्धन पर परीक्षण

रामनाडु तट में प्राकृतिक शंबुओं की संख्या कम होने के कारण स्पाटों को एन्नूर ज्वारनदमुखी और मद्रास से गन्नी थैलियों में संग्रहित करके मंडपम तक ले जाते है। इस तरह परिवहन से मृत्यु संख्या 5.0% से कम देखी गई है।

इन स्पाटों को नाइलोन थैलियों में संग्रहित करके इनके ऊपरी भाग में नाइलोन की रस्सियाँ अच्छी तरह बांधना है और रस्सी का दूसरा अग्र किसी दृढ़ वस्तु में बांधना है। इस प्रकार की एक थैली में संवर्धन केलिए आवश्यक आकार एवं भार वाले 2.5 कि. ग्रा. हरिन शंबु भरा जाना है। शंबूवाली थैलियाँ पानी में निमग्न होना चाहिए।

परिणाम

80 दिनों के संवर्धन काल में शंबुओं के आकार में 31.89+5.93 मि मी से 42.33+3.21 मि मी की बढती हुई। महीने मे लंबाई की बढती दर 3.915 मि मी है। यह बढती दर सामान्य माहिक वृद्धि दर की अपेक्षा कम है।

ज्वारनदमुखि पारिस्थितिक तंत्र में हरित शंबुओं की बढती दर 8.0 मि मी आकलित किया गया है। मुत्तूकाडू के लवण जल लैगूण में बैग तरीके से संवर्धित हरित शंबुओं की बढती दर 8.0 मि मी आंका गया है। इन दो तरीकों की तुलना से पिल्लैमडम लैगूण के हरित शंबुओं की बढती दर कम देखी गई है।

प्रथम रिपोर्ट के अनुसार शंबुओं का भार 2.29 ± 1.47 ग्रा प्रारंभिक भार की अपेक्षा 5.0 ग्रा देखा गया है। पालन के प्रथम 40 दिनो में बढती दर द्रत गति में थी। अगले 40 दिनों में बढती दर 0.15 कि ग्रा थी। 80 वां दिन से लेकर अचानक मृत्यु दर बढ गयी। इसका कारण अनजान है।

सहवर्ती जीव

हरित शंबुओं की थैलियों में *अकांतोस्पोरा स्पिनीसफेरा* और *हैप्निआ मसिफोर्मिस* जैसे रोडोफइसिया जाति के जीव अधिक मात्रा मे दिखाए पडे। इसके अतिरिक्त थैली के अंदर के शंबुओं में *सेरेथियम* जाति भी देखी गई।

समाप्ति

यह एक ध्यान देने योग्य बात है कि पिल्लैमडम लवण जल लैगूण में जनवरी- अप्रैल अवधि में हरित शंबुओं की बढती दर मंद गति में थी। उत्पादन भी कम था। इससे पता चला कि पिल्लैमडम लैगूण हरित शंबु संवर्धन केलिए उचित नहीं है।

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* सी एम एफ आर आइ के मंडपम क्षेत्रीय केंद्र, मंडपम के ए. पी. लिप्टन, एस कृष्णपिल्लै और पी. तिल्लैराजन द्वारा तैयार की गई रिपोर्ट।

गोआ तट पर कोष संपाश मात्स्यिकी का आर्थिक मूल्यांकन

के.के.पी. पणिक्कर, डी.बी.एस.सेहरा और ए. कनक्कन

कोष संपाश का प्रचालन सबसे पहले एक परीक्षणात्मक दृष्टि से गोआ में वर्ष 1957 में किया था। केवल दो कोष संपाशों से 1964 में प्रचालन की अच्छी फायदा हुई थी। 1969 होते होते कोष संपाशों की संख्या 42 हो गयी और अब गोआ तट में लगभग 225 कोष संपाशों का प्रचालन होता है।

गोआ से 1992 में प्राप्त कुल समुद्री मछली 76 हज़ार टन है जिसका 70% कोष संपाशों का योगदान था। इस राज्य से समुद्री मत्स्यन की परंपरागत रीति प्राय: अप्रत्यक्ष हुई है। यहाँ के कुल मछली पकड का लगभग 96% कोष संपाशों और ट्रालरों के यंत्रीकृत मत्स्यन के ज़रिए होता है। पकड का 3% देशी आनायकों से और 1% अयंत्रीकृत परंपरागत रीति से प्राप्त होती है। अत: समुद्री मत्स्यन आजकल पूंजी निवेश से जुडा हो जा रहा है। कोई भी अन्य उत्पादन कार्य के समान मत्स्य का भी उत्पादन लागत होता है और यंत्रीकरण की वृद्धि के अनुसार प्रयास का एकक लागत भी लगातार बढती जाती है। इस प्रकार बढती जानेवाली मत्स्यन लागत उच्च मूल्य या अच्छी पकड से क्षतिपूर्ति करती है या नहीं, यह जानने केलिए एक आर्थिक मूल्यांकन की आवश्यकता है।

गोआ तट पर कोष संपाश मात्स्यिकी की आधिपत्य इतना ऊँचा है कि, सी एम एफ आर आइ ने गोआ तट पर कोष संपाशों की आर्थिक निष्पादन पर एक अध्ययन चलाया।

सामग्री और रीतियाँ

सी एम एफ आर आइ द्वारा 1991 और 1992 में चलाये गए विशेष सर्वेक्षण से कोष संपाशों के आर्थिक और सामाजिक - आर्थिक पहलुओं की डाटा का संग्रहण किया गया है। पकड एवं प्रयास की संबंधित डाटा सी एम एफ आर आइ डाटा केन्द्र से प्राप्त किया गया।

राज्य में कोष संपाश अवतरण का झुकाव

गोआ में समुद्री मत्स्य अवतरण 1990-92 के दौरान बढती दिखाई। पकड 1980 में 24,500 और 1989 में 12,0000 टन के बीच विविधता दिखाई। 1988-92 के दौरान औसत वार्षिक अवतरण 90,000 टन था। यह 1980-84 अवधि के अवतरण की तीन गुणी थी। 1989 में पश्चिम तट से तारली और बाँगडे की भारी पकड प्राप्त हुई थी। गोआ तट में हुई समुद्री मत्स्यन अवतरण की वृद्धि का मुख्य कारण कोष संपाशों की वृद्धि है। वर्ष 1980 में कोष संपाशों द्वारा कुल प्रयास प्रतिदिन 4,000 एकक आकलित किया था। वर्ष 1992 में यह प्रति दिन 36,000 एकक तक बढ गया।

प्रतिदिन प्रचालन से प्रतिदिन पकड 1980 में 1.5 टन था और वर्ष 1992 में 2 टन रिकार्ड की गयी। उच्च पकड 2.5 टन 1989 में रिकार्ड की गयी। कोष संपाश पकड के 95% से अधिक क्लूपिड्स, करैंजिड्स, बॉगडे और ट्यून का योगदान है जिन्हें परंपरागत संभारों के ज़रिए पकडे जाते थे।

मत्स्यन लागत

एक कोष संपाश केलिए औसत निवेश लगभग 7.5 लाख रु. आकिलत किया गया था।

मत्स्यन लागत के विश्लेषण केलिए 1991 और 92 के दौरान किये गए व्यय का अलग आकलन किया गया और सारे लागतों को वार्षिक औसत प्रचालन व्यय और वार्षिक औसत नियत लागत नामक दो वर्गों में वर्गीकृत किया गया।

प्रति एकक का वार्षिक औसत प्रचालन व्यय 5-6 लाख रु. आकलित किया गया जिसमें ईंधन और मज़दूरी का व्यय मुख्य है। कोष सेपाशों का प्रचालन करनेवाले अन्य राज्यों के समान मछली अवतरण केलिए गोआ में वाहक पोतों का उपयोग नहीं करता है। गोआ में भुगतान माहिक है जबकि अन्य राज्यों में यह ईंधन व्यय और पकड के नीलाम व्यय को छोडकर बाकी राजस्व का कुछ प्रतिशत है।

ब्याज, मूल्यह्रास और बीमा नियत लागत आकलन में शामिल है। ब्याज की दर 18% में और मूल्यह्रास आनायक और इंजिन केलिए 10 साल, संभार केलिए 5 साल और अन्य सहायक उपकरणों केलिए एक साल के आधार पर है। कुल नियत लागत 2.68 लाख रु आकलित किया गया। अत: एक कोष संपाश प्रचालन का वार्षिक नियत लागत 1991 केलिए 7.73 लाख रु और 1992 केलिए 8.71 लाख रु. आकलित किया गया।

मत्स्यन आय

प्रति एकक का औसत वार्षिक पकड 1991 में 320 टन और 1992 में 360 टन और औसत वार्षिक राजस्व क्रमश: 8.5 लाख और 9.9 लाख रु. आकलित किया गया। 1991 के दौरान कुल लाभ प्रचालन लागत कम करके 3.4 लाख रु और निवल लाभ पूरी लागत कम करके 75 हज़ार रु आकलित किया गया। 1992 के दौरान कुल लाभ 3.9 लाख और निवल लाभ 1.2 लाख रु. था।

गोआ में लगभग 200 कोष संपाश पकड के ज़रिए कुल राजस्व 210 करोड रु. और कोष संपाशों पर कुल निवेश लगभग 150 करोड रु. आकलित किया गया है।

कोष संपाश अवतरण से प्राप्त 210 करोड रु. में 42 करोड रु ईंधन व्यय और शेष 168 करोड विविध व्यक्तियों के वेतन के रूप में जाते है। अत: कुल आय का 80% राष्ट्रीय आय में लीन हो जाता है।

प्रतिट्रिप लागत और अर्जन

साधारणतया गोआ में कोष संपाश मत्स्य केलिए प्रति दिन एक ही बार जाता है। प्रतिदिन औसत ईंधन लागत 1991 में 750 रु. और 1992 में 1,050 रु था। एक दिन का मज़दूरी बिल 1991 में 1,200 रु. और 1992 में 1,340 रु था।

प्रतिदिन प्रति एकक प्रचालन से प्राप्त पकड 1991 में 6 टन और 1992 में 1.8 टन था और कुल अर्जन क्रमश : 4,240 और 4,950 रु था। कर्नाटक और केरल के कोष संपाशों की तुलना में यह रकम कम है। यद्यपि गोआ में वार्षिक मत्स्यन दिवस की अधिकता होगी।

मौसमीपन

गोआ में कोष संपाश प्रचालन केलिए सितंबर-दिसंबर तक की अवधि और ट्रालिंग केलिए जनवरी- मई का समय सबसे उचित है।

प्रचालन का इष्टतम स्तर

वर्तमान इष्टतम स्तर के आधार पर 200 एकक 200 प्रचालन दिनों से और प्रति कि. ग्रा औसत 3 रु पर हर एकक को प्रति दिन प्रचालन से 1.5 टन मछली प्राप्त करनी है। अत: कुल कोष संपाश पकड लगभग 60,000 टन मछली होनी चाहिए। यदि पकड या मूल्य में वृद्धि है तो अर्थक्षमता को प्रभावित किए बिना वर्तमान प्रचालन स्तर बढाया जा सकता है।

परंपरागत मात्स्यिकी पर कोष संपाश प्रचालन का प्रभाव

गोआ के परंपरागत संभार राम्पेनी, येन्डी (तट संपाश) और गिल जाल है। इन गिअरों के ज़रिए 1975 में 60% अवतरण हुआ था। लेकिन 1984 में यह कम होकर 10% हो गया। कोष संपाशों और ट्रालरों जैसे यंत्रीकृत एककों के ज़रिए 1992 में 96% अवतरण हुआ। कोष संपाशों की लगातार बढती से मछली की कुल पकड और मूल्य बढ गई और मात्स्यिकी से संबंधित कई कार्यकलापों की स्थापना हुई जिससे परंपरागत मात्स्यिकी करनेवालों को रोज़गार भी मिल गया। लेकिन कर्नाटक राज्य के समान यहाँ भी नया विकासों से शहरी लोगों का ही भलाई हुई है। यह भी नहीं, कोष संपाश अपनाने केलिए भारी निवेश की आवश्यकता पडती है। इसलिए ये लोग कोष संपाशों के मालिक बनने के बदले कोष संपाशों में मज़दूर बन जाते है। कर्नाटक में देशी यानों का छोटे कोष संपाशों की प्रस्तुति ने कोष संपाशों का प्रभाव कम किया है। गोआ में भी इसकी प्रस्तुति किया जाए तो गाँव पर आधारित मत्स्यन क्रियाकलापों का उद्धार हो सकता है।

मिनिकोय लैगून (लक्षद्वीप) में समुद्री शैवाल ग्रैसिलेरिया इडुलिस का संवर्धन परीक्षणों में मछलियों की चराई के कारण गत्यवरोध

समुद्री शैवाल ग्रैसिलेरिया इडुलिस शीध बढनेवाला एगारोद्भिद है और इसका वितरण तमिलनाडु, आन्डमान-निकोबार द्वीप समूह, लक्षद्वीप समूह और चिल्का झील तक सीमित है। लक्षद्वीप में अगति, कवरत्ती, कोल्पेनी और कडमात द्वीपों में इसकी भारी बढती रिपोर्ट की गई है जबकि मिनिकोय में अभी हाल तक यह बिलकुल अनुपस्थित था। मिनिकोय लैगून में समुद्री शैवाल की बसती की शक्यता के अध्ययन केलिए मण्डपम मान्नार खाडी और कवरत्ती से समुद्री शैवाल लाया गया था। फाइटो-केमिकल, अगर-अगर आदि आद्योगिक असंस्कृत पदार्थों केलिए यह समुद्री शैवाल अत्यन्त उपयोगी है। जाल और रस्सी रीति से किये गए प्रारंभिक संवर्धन परीक्षण का परिणाम प्रोत्साहजनक था। लेकिन धीरे धीरे मछलियों द्वारा समुद्री शैवाल बीजों या पूरी तरह बढी गई शैवालों का भारी नाश होने पर 1992 में चलाये गए एक परीक्षण में एक रस्सी में 31 गुणी वृद्धि दिखाई पडी जिसकी चराई भी नही हुई थी जबकि इसके साथ लगायी गई अधिकांश रस्सियों के शैवालों का पूरा का पूरा नाश हुआ था। इसके अलावा एक रस्सी ने नवंबर 1992 में उपर्युक्त बीज के 18.65 गुणी वृद्धि प्राप्त करके पूर्णाकार प्राप्त किया था।

उपर्युक्त प्रवणता की पुष्टि केलिए 1993 में भी ये परीक्षण जारी रखी थी। लेकिन बीजों की चराई के कारण ये परीक्षण सफल नही निकला।

डा वी. एस. के. चुन्नुबोतला, ए. के. वी. नाज़र, वी. ए. कुंजिकोया, ए. अनासुकोया और एम. एस. राजगोपाल; सी एम एफ आर आइ का मिनिकोय अनुसंधान केन्द्र, मिनिकोय द्वारा की गई रिपोर्ट।

शंकुशों की चमडा-निर्यात विपणन केलिए नया माल*

गोरगोनिड्स, समुद्री घोडा आदि अप्रचलित समुद्री जातियों और उनके उत्पादों के निर्यात-विपणन सें आज अभूतपूर्व उत्साह देखा जाता है। उपर्युक्त चीजों की सूची में नये माल के रूप में शंकुशों की चमडा को भी जोडा जा सकता है।

तमिलनाडु के रामनाथपुरम तट के धीवरों के लिए शंकुश की चमडा का निर्यात एक नया उद्यम है। चमडा के कोई क्षति नही पहूँचाकर अत्यन्त ध्यान से मांस से निकालते है और सूर्य तपित करके विपणन केलिए ले जाते है। प्रमुख संग्रहण केन्द्र कीलकरै है।

नेपाल शंकुश चमडा का मुख्य बाज़ार है। चप्पल्स, वालेट्स, बेल्टस आदि कई चीज़ें शंकुश चर्म से बनाती है।

आयाम के आधार पर एक शंकुश चमडा को 4 रु. से 20 रु तक मूल्य होता है। आज भारत से निर्यात करने वाले चमडों की वास्तविक गुणता के बारे में कोई जानकारी नहीं है, लेकिन भविष्य सें यह माल प्रमुखता प्राप्त किया जायेगा।

* ए. पी. लिप्टन और जे. आर. रामलिंगम, सी एम एफ आर आइ का मंडपम क्षेत्रीय केन्द्र, मंडपम।

टूटिकोरिन में एक भीमाकार हामर हेड सुरा *स्फिरना लिविनी* (कुविर, ग्रिफिन्त और स्मिथ 1834) का अवतरण*

टूटिकोरिन से 30-3-93 को 100 मी की गहराई से "कोम्बु सोरा" नाम से जानने वाली एक मादा हामर हेड सुरा *स्फिरना लिविनी* (कुविर, ग्रिफिन्त और स्मिथ, 1834) को काँटा डोर के ज़रिए पकडा था। इसकी कुल लंबाई 4 मी और भार 520 कि. ग्रा. था।

एस. राजपाकियम, टी. एस. बालसुब्रमणियन, के.एम.एस. अमीर हंस्सा और एच. मौहम्मद कासिम, सी एम एफ आर आइ का टूटिकोरिन अनुसंधान केन्द्र,टूटिकोरिन द्वारा की गई रिपोर्ट

कायलपट्टनम (मान्नार खाडी) से पकडे गए किशोर तिमिंगिल सुरा *रिंकोडोन टाइपस* स्मिथ पर टिप्पणी

मान्नार खाडी तट से कभी कभी तिमिंगिल सुरा रिंकोडोन टाइपस को पकडा जाता है। कायलपट्टनम में 15 अप्रैल, 1993 को 40 मी गहराई में प्रचालित परुवलै में 3.8 मी लंबाई और 650 कि.ग्रा भार के एक नर तिमिंगल सुरा फंस गया। इसका स्थानीय नाम ''अम्मुनि उलुवाय'' है। इसके मांस और पंख की अधिक माँग नहीं होने के कारण कम मूल्य 300 रु पर इसका नीलाम हुआ।

एस. राजपाकियम, के.एम.एस. अमीर हंसा, टी.एस. बालसुब्रमणियन और एच. मोहम्मद कासिम सी एम एफ आर आइ का टूटिकोरिन अनुसंधान केन्द्र, टूटिकोरिन द्वारा तैयार की गई रिपोर्ट।

टूटिकोरिन में अवतरित डेविल रे *मान्टा बाइरोस्ट्रिस* (वालबम)

टूटिकोरिन के उत्तर अवतरण केन्द्र में 29-3-93 को क्रमश: 3020 और 3050 मि मी कुल लंबाई और 5670 और 5700 मि मी चौडाई के दो मादा डेविल रे अवतरित हुए थे। इनको क्रमश: 550 रु और 600 रु पर नीलाम किया गया।

इसकी पकड केलिए ''वल्लम'' नाम से जाननेवाले प्लवक निमिर्त पोतों का उपयोग किए थे। इसमें प्रयुक्त संभार का स्थानीय नाम 'तिर्क्काय वलै' था।

इस जाति की उपस्थिति पहले ही रिपोर्ट की गई है। लेकिन पकडे गये ये नमूने सबसे बडे थे।

आर. गुरुसामी और टी.एस. बालसुब्रमणियन, सी एम एफ आर आइ का टूटिकोरिन अनुसंधान केन्द्र टूटिकोरिन द्वारा की गई रिपोर्ट

काकिनाडा में बोटल नोस डोलफिन *टरसियोप्सिस ट्रंकाटस* का अवतरण

काकिनाडा में 28-4-1993 को 225 से मी कुल लंबाई और 160 कि. ग्रा भार के एक डोलफिन *टरसियोप्स ट्रंकाटस* का अवतरण हुआ । यह मादा डोलफिन थी । ऊर्ध्व हनु और अधो हनु के एक भाग में 25-27 दॉत थे। इसकी पक्ड बोटम सेट गिल जाल पाण्डुवला से हुई । इसे 500 रु. पर बेच दिया गया । ट्यूना और सुरा के जीवित चारा के रूप में डोलफिन मांस का उपयोग करते है ।

टी. नागेश्वर राव, पी. वेंकट रमणा, सी एम एफ आर आइ का काकिनाडा अनुसंधान केन्द्र द्वारा तैयार की गई रिपोर्ट

तमिलनाडु के मंडपम क्षेत्र में अपख काला शिंशुक *निओफोसिना फोसिनोइड्स जी. कुविर* की पकड

अपख काला शिंशुक *निओफोसिना फोसिनोइड्स जी. कुविर* इन्डो पसफिक में केप ओफ गुड होप से जापान और चीन तक पाया जाता है। भारत में बंबई, मद्रास और तिरुवनन्तपुरम में यह देखा जाता है। इसकी जीवसंख्या कम होते जाने के कारण सरकार ने इसके अनुरक्षण और प्रबन्धन केलिए नियम लाया था । भारत के पुर्वी तट में पश्चिम तट की अपेक्षा इसकी पकड अधिक देखी जाती है । आजकल मंडपम क्षेत्र में इसकी पकड बढ गयी है।

मंडपम में 8-7-1988 को 77 मी कुल लंबाई की एक मादा शिंशुक गिल जाल के ज़रिए पकडी गयी थी । 11-8-90 को पल्लिमडम से 16-11-90 को रामेश्वरम के निकट वेरकोडु से क्रमश: 132 से मी, 126 से मी कुल लंबाई की मादा शिंशुकों की पकड हुई और 25-10-1992 को रामेश्वरम के निकट अग्नितीर्थम में 132 से मी के एक नर शिंशुक घस गया था ।

केरल तट में कालिकट से गिल नेट के ज़रिए 66.9 से मी लंबाई और 4.52 कि. ग्रा भार के किशोर नमूने के बारे में रिपोर्ट की गयी है । हाल ही में तमिलनाडु के मल्लिमुने तोण्डि से 120 से मी के प्रैढ *एन. फोसिनोइड्स* के धस जाने की रिपोर्ट भी रिकोर्ड की गयी है।

पी. नम्मलवार, ए. पी. लिप्टन, एस. कृष्णपिल्लै, जी. महेश्वरडु, सी. काशिनाथन एम. बोस, एन. राममूर्ति और पी. तिल्लैराजन, सी एम एफ आर आइ का मंडपम क्षेत्रीय केन्द्र, मण्डपम कैम्प - 623520 तमिलनाडु ।

स्पिन्नर डोलफन्स *स्टेनेल्ला लोंगिरोस्ट्रिस* का अवतरण

एस. सत्य राव और एस. चन्द्रशेखर

विशाखपट्टनम से 10 कि मी दूर रुषिकोण्डा से 15 मी गहराई में प्रचालित फाइबर ग्लास के बीच लैन्डिंग आनायक द्वारा 19-4-93 को तीन प्रौढ स्पिन्नर डोलफिनों को पकडा गया ।

पाण्डुवला नाम से जाननेवाले ड्रिफ्ट जाल में यादृश्चिक रूप में इन्हें पकडे गये । यह संभार का प्रचालन साधारणतया सीर मछली के मत्स्यन केलिए होता है।

ये तीन नमूने मादा जाति की थी और कुल लंबाई 2.44 मी, 2.39 मी और 2.16 मी और भार 250 कि.ग्रा, 200 कि.ग्रा और 150 कि.ग्रा थे ।

अवतरण के समय ये मरे हुए थे । सुराओं को पकडने केलिए चारा के रुप में डोलफिन मांस का उपयोग करता है। लेकिन सुरा पकडने का उचित समय नहीं होने के कारण इन डोलफिनों को समुद्र में फेंक दिया गया।

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