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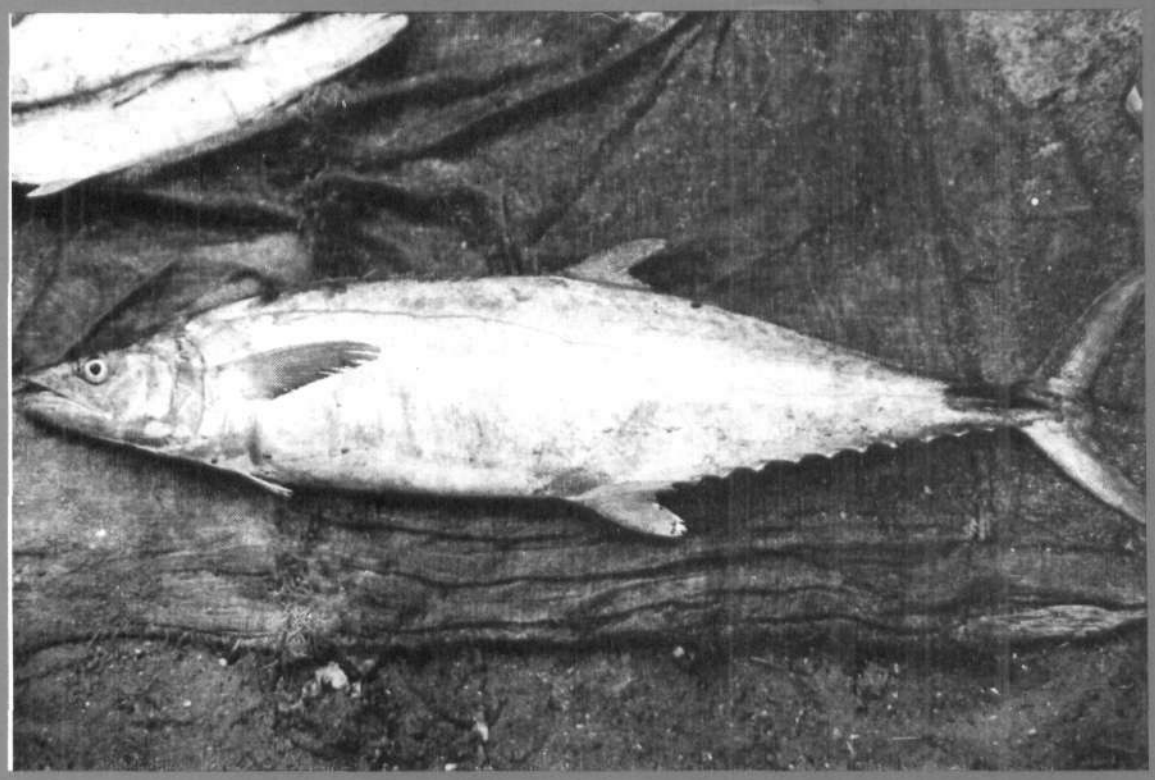

तकनीकी एवं विस्तार अंकावली
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INDIAN COUNCIL OF AGRICULTURAL RESEARCH

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 हस्तांतरित करना इस तकनीकी और विस्तार अंकावली 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. **115** : January, February, March - 1992

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Front cover photo : Barred Spanish mackerel (*Scomberomorus commerson*) from the gill-net catch at Rameswaram. (Photograph : Courtesy, Mr. A.A. Jayaprakash).

मुख आवरण फोटो : रामेश्वरम में गिलनेट से पकडी गई बार्ड स्पानिश मार्केरल(*स्कोम्ब्रोमोरस कम्मर्सन*)

Back cover photo : A view of the gill-net units at Rameswaram fish landing centre along the southeast coast of India. (Photograph : Courtesy, Mr. A.A. Jayaprakash).

पृष्ठ आवरण फोटो : दक्षिण पूर्व भारत के रामेश्वरम मछली स्थलन केंद्र के गिल-नेट एककों का एक दृश्य

COMMERCIAL TRAWL FISHERY OFF MADRAS COAST DURING 1980-'89 WITH A COMPARATIVE ACCOUNT OF THE CATCH TREND OF SHRIMP AND FISH TRAWLERS DURING 1989-'91

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Introduction

The fishery resources off the Madras coast have been traditionaly exploited by indigenous craft and gear. Introduction of commercial trawling two and half decades back and progressive expansion of the fishing fleet to exploit the ground fishes and prawns along the coast have resulted in considerable development of mechanised fisheries sector.

With the exception of a small number of seasonally operated Pablo-type drift gill netters, mechanised vessels operating along the Madras coast are trawlers which land their catches at Pudumanikuppam adjacent to the Madras Fisheries Harbour. The Fisheries Harbour constructed in 1983 at a cost of Rs. 12.6 crores with a jetty of 495 m length affords berthing facility to 50 trawlers. Due to socio-economic factors, at present all the trawlers engage catamarans for transporting their catch to Pudumanikuppam centre and the Fisheries Harbour is being utilised only for berthing the vessels.

Apart from the catch estimation of the mechanised vessels at Pudumanikuppam in the period 1981-'85 (*Mar. Fish., Infor. Serv., T & E Ser.*, No. 41 1982; 52 : 1983; 67 : 1986, *CMFRI Spl. Pub.* No. 34, 1987), no detailed information is available on the seasonal abundance of catches and related aspects of the fish landed at this centre. In the present study the composition of the commercial trawler landings at Pudumanikuppam, Madras during the period 1980-'89 has been studied with particular reference to the seasonal abundance of catch, catch per unit effort and seasonal fluctuations of major constituents of the catches. A comparative account of the catch trend of both shrimp and fish trawlers during the period 1989-'91 is presented indicating the seasonal variations in the landings with particular reference to the fluctuations of the major groups contributing to the fishery.

The various fishing areas covered by the trawlers are indicated in Fig. 1. Besides the daily trips made by the shrimp and fish trawlers which regularly conduct fishing operations off Madras coast, a small number of shrimp trawlers make long trips and fish off Sriharikota and Nellore.

The trawlers operated from Madras base comprise of four different overall length groups, 9.5-10 m, 11 m, 12 m and 13 - 14 m (the conventional 32', 36', 40' and 45') with the horsepower varying between 90 and 120 (Fig. 2 & 3). The vessels of the overall length 9.5 - 10 m and 11 m exclusively operate fish trawls northeast off Madras in slightly deep waters of 30 - 40 m depth range adjacent to the rocky patches locally termed *madai* whereas the 12 m and a few 11 m vessels conduct daily trip shrimp trawling in the coastal waters off Madras in the depth zones of 15 - 30 m. Most of the trawler units of the higher length range 13 - 14 m with 120 HP engine are engaged in long trip shrimp trawling off Sriharikota and Nellore at depths of 15 - 30 m for a duration of 3 - 4 days (Fig. 4).

Trawl production

During the period 1980-'89, an annual average of 9,500 t of all fishes was landed by trawlers at Pudumanikuppam centre for an effort of 34,090 unit operations. Fig. 5 indicates the fluctuations in the catch, effort and catch per unit effort. A steady increase in the landings with increased effort over the years is evident from the catch per unit indices. From 1,416 t in 1980 a steep rise in production to 16,342 t has occurred in 1987 and there has been a further increase to 23,953 t in 1989. The average annual all fish

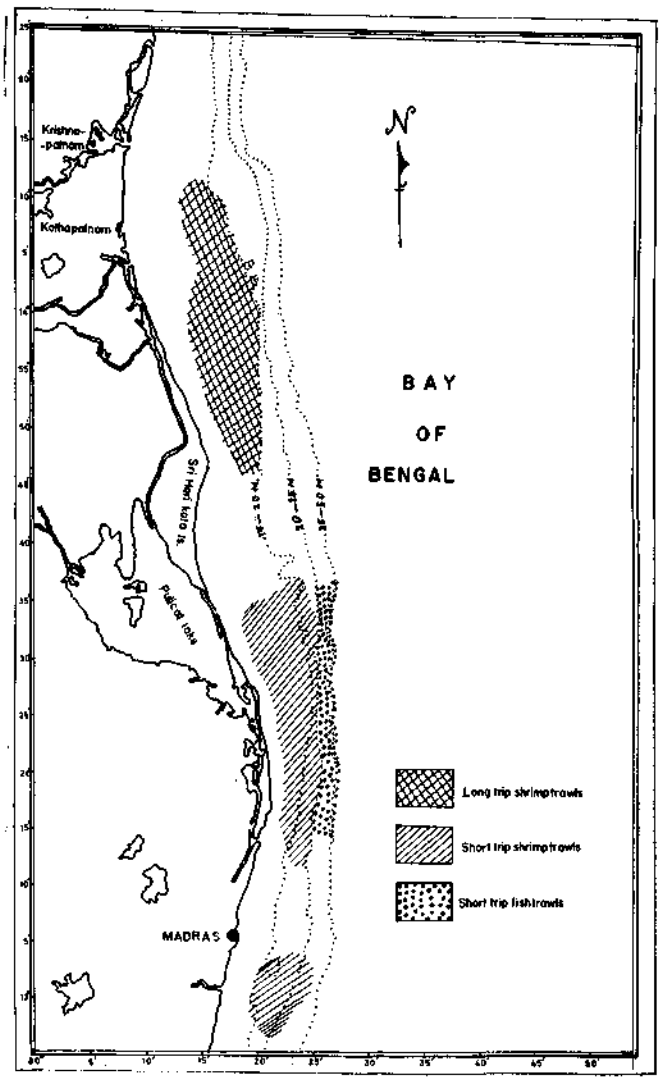

Fig. 1. Map showing the different areas where shrimp and fish trawlers based at Madras operated.

Fig. 3. A view of trawlers berthed at Madras Fisheries Harbour.

production during 1985-'89 was 14,162 t which is almost thrice that in the period 1980-'84 (4,796 t). The CPUE has doubled to 369 kg in 1987 compared to earlier years and has risen steadily with a maximum of 565 kg in 1989.

Analysis of pooled data on the quarterwise catch and effort during the period 1980-'89 with respective catch per unit effort (Fig. 6) reveals that in most quarters during the period increase in the unit operations yielded proportional increase of catch excepting the first quarter of 1987, when the effort was 36% of the year and the catch realised was 17%, with a decrease in the catch per unit effort. During the subsequent period viz., second quarter of 1987, with 6% reduction in unit operations than the previous quarter, 38% increase in the catch has been recorded. In the third and fourth quarters of 1989, when 35% and 29% of the total catch of the year was obtained maximum catch per unit effort of 767 kg and 627 kg respectively were recorded. The seasonal catch trend observed in

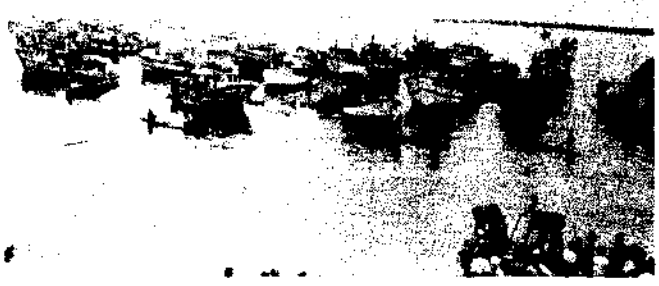

Fig. 2. Trawl catches being brought to Pudumanikuppam centre, Madras by catamarans from shrimp and fish trawlers.

Fig. 4. One of the long trip shrimp trawlers (overall length 14 m.) berthed at Pudumanikuppam.

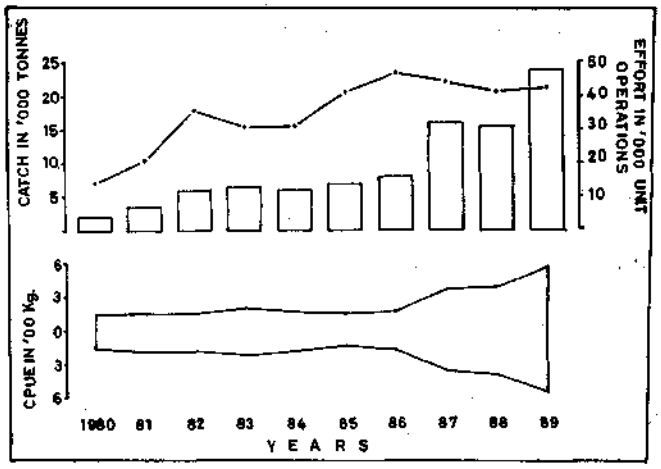

Fig. 5. All fish catch, effort and C.P.U.E. of the trawlers based at Madras during 1980-'89.

the various quarters of the period suggests that the third quarter is most productive followed by fourth quarter along the coast. This is further confirmed by the trend of the estimated combined quarterwise catch and effort for the periods, 1980-'84 and 1985-'89 (Table 1).

TABLE 1. *Percentage of combined quarterwise catch and unit operations during the periods 1980-'84 and 1985-'89*

Quarters	1980-'84		1985-'89		Total	
	Catch	Effort	Catch	Effort	Catch	Effort
I Quarter	22.1	25.0	19.4	27.2	20.1	26.3
II Quarter	21.7	22.0	22.2	21.9	22.1	22.0
III Quarter	31.7	27.3	33.1	25.2	32.7	26.0
IV Quarter	24.5	25.7	25.3	25.7	25.1	25.7

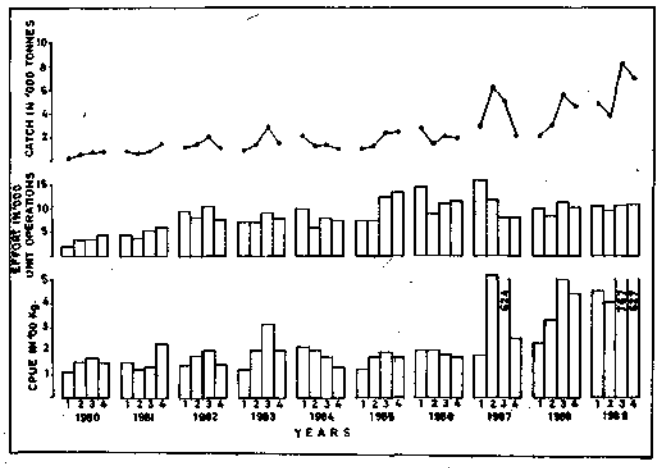

Fig. 6. Quarterwise all fish catch, effort and C.P.U.E. of trawlers during 1980-'89.

In order to get a detailed picture, pooled catch and effort in different months of the two five year periods 1980-'84 and 1985- '89 have been studied (Fig. 7). Monthly catch and effort trend has been more or less similar and highest effort and catch have been recorded during 1985-'89. The maximum landings were obtained in the third quarter during both the periods with peak landings in August.

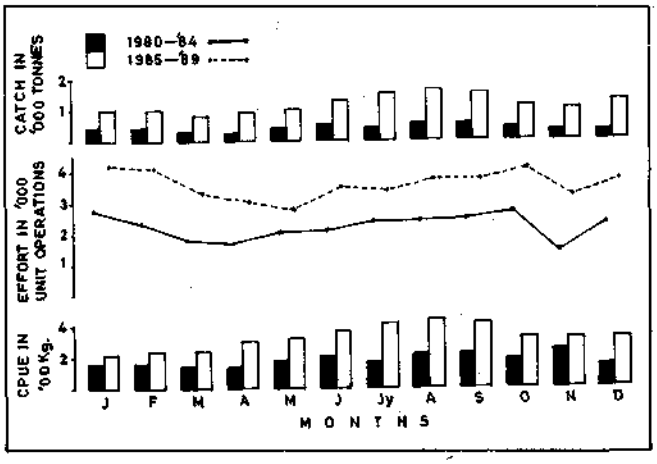

Fig. 7. Monthly fluctuations of catch, effort and C.P.U.E. of trawlers during 1980-'84 and 1985-'89.

Seasonal fluctuations of different groups

Of the various groups which contributed to the trawler fishery, fifteen major ones have been selected to study the seasonal fluctuations during the five year periods, 1980-'84 and 1985-'89. The percentage composition of the different groups in various seasons expressed as percentages in total landings are indicated in Fig. 8. The predominant groups (Fig. 9 & 10) comprised of the sharks, *Charchartus* spp., *Rhizoprionodon* sp., Skates, *Rhinobatus* spp., rays, *Dasyatis* spp., *Aetobatus* spp., *Rhinoptera* spp; threadfin breams, *Nemipterus* spp., silverbellies, *Leiognathius* spp., *Secutor* spp., ribbonfishes, *Trichiurus lepturus;* carangids, *Decapterus russelli, Selaroides leptolepis, Caranx* spp., goatfishes, *Upeneus* spp., lizard fishes, *Saurida* spp., croakers, *Johnius* spp., *Otolithus* spp., Silverbiddies, *Pentaprion* sp., barracudas, *Sphyraena* spp., white-baits, *Stolephorus* spp., penaeid prawns, *Penaeus indicus, P. semisulcatus, Metapenaeus dobsoni, Metapenaeopsis* sp. *Parapenaeopsis* sp., crabs, *Portunus* spp., cephalopods, *Sepia* spp. and *Loligo* sp. The groups termed 'others' includes mostly the incidental and seasonal landings of bullseye,

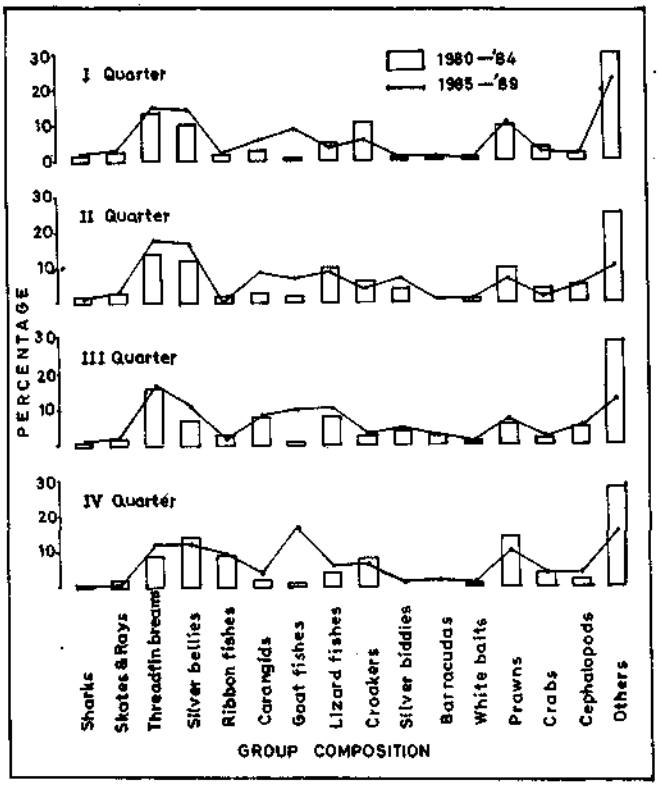

Fig. 8. Percentage contribution of different groups in trawl catches during 1980-'84 and 1985-'89.

Priacanthus hamrur; rainbow sardine, *Dussumieria* sp.; flatfishes, *Cynoglossus* spp. and *Psettodes erumei*; Indian whitings *Sillago sihama*, drift-fishes *Ariomma indicus* and the mojarras, *Gerres* spp. besides the miscellaneous trash fishes. The study revealed that some groups exhibit distinct seasonal trend during both the periods, 1980-'84 and 1985-'89.

Fig. 9. A part of fish trawl catch.

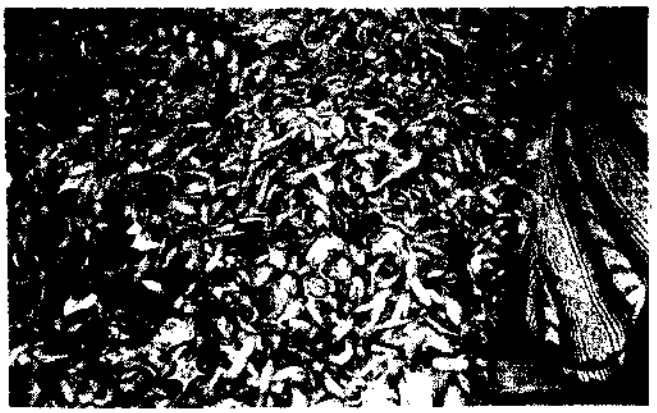

Fig. 10. A portion of the catch of a short trip shrimp trawl.

The threadfin bream catches are high in the first three quarters and lower in the fourth quarter. The best ribbonfish landings are obtained in the fourth quarter. Silverbellies were common in the first three quarters and less in the last quarter. The carangids exhibit high percentage indices during the second and third quarters. This was mainly due to the heavy landings of the scad, *Decapterus russelli* which formed nearly 70% of the carangids caught by fish trawls. Goatfishes were not prominent in trawl catches during 1980-'84 but in the subsequent five year period, they were caught in large quantities with a maximum of 17% in the fourth quarter. Lizardfish catches were maximum in second and third quarters. The percentage contribution of prawns is highest in fourth quarter followed by first and second quarters. Recent observations indicated that the bullseye (*Priacanthus hamrur*) and the drift-fish (*Ariomma indicus*) comprised nearly 13-19% and 4% respectively in the fish trawl catches.

Comparative catch trend of shrimp and fish trawls

The all fish catches of the daily trip fish and shrimp trawlers and long trip shrimp trawlers during the period October 1989 to June 1991 have been analysed and the seasonal trend of the catches of these different trawler units are given in Fig. 11. There have been no remarkable fluctuations in the effort over the quarters in the case of long trip shrimp trawlers during 1989-'90 but an increase in effort in 1991 has resulted in a higher catch as seen from the catch per unit effort. On an average 10 - 12 units landed per day. These trawlers have been estimated to have landed 23% of the total trawl production during the first half of 1991.

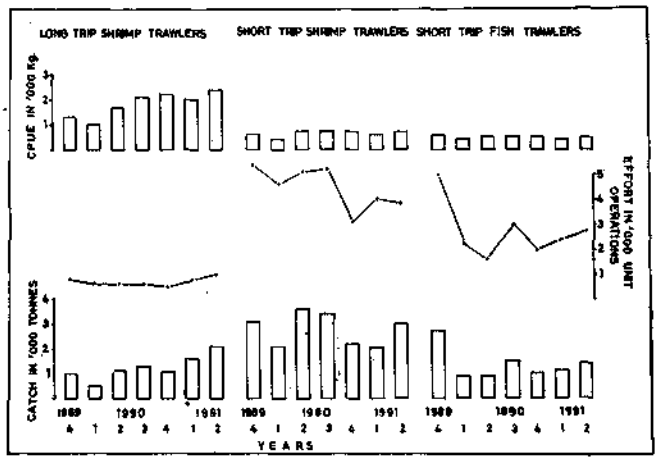

Fig. 11. All fish catch, effort and C.P.U.E. of long trip shrimp trawlers, short trip shrimp trawlers and short trip fish trawlers during 1989-'91.

With the operation of an average of 30 - 35 units per day and comprising 57% of the total trawlers, the short trip shrimp trawlers realised nearly 52% of the total landings during the period. Maximum catch and effort were recorded in the second and third quarters of 1990 followed by a steep decline in the fourth quarter without decrease in the catch per unit effort.

An average of 28 - 35 fish trawl units landed per day during the period and accounted for 25% of the total catch landed recording highest effort and catch in the fourth quarter of 1989. In spite of sharp fluctuations in effort noticed during some quarters, well defined changes were not observed in catch or catch per unit effort.

Groupwise landings in different type of trawls

Maximum catches of elasmobranchs including sharks, skates and rays (Fig. 12) were obtained in long trip shrimp trawls which accounted for 69% of trawl production during the period October 1989 - June 1991, followed by short trip shrimp trawls in which 30% were caught (Table 2). 53% of the threadfin bream production were fished in short trip shrimp trawls while fish trawls and long trip shrimp trawls netted 26% and 21% respectively. The bulk of silverbelly production (64%) was obtained in short trip shrimp trawls and only limited quantities in the other two types of trawls. Silverbellies are a predominant component of short trip shrimp trawls contributing 66% but are represented in much smaller proportion in the other two types of gears.

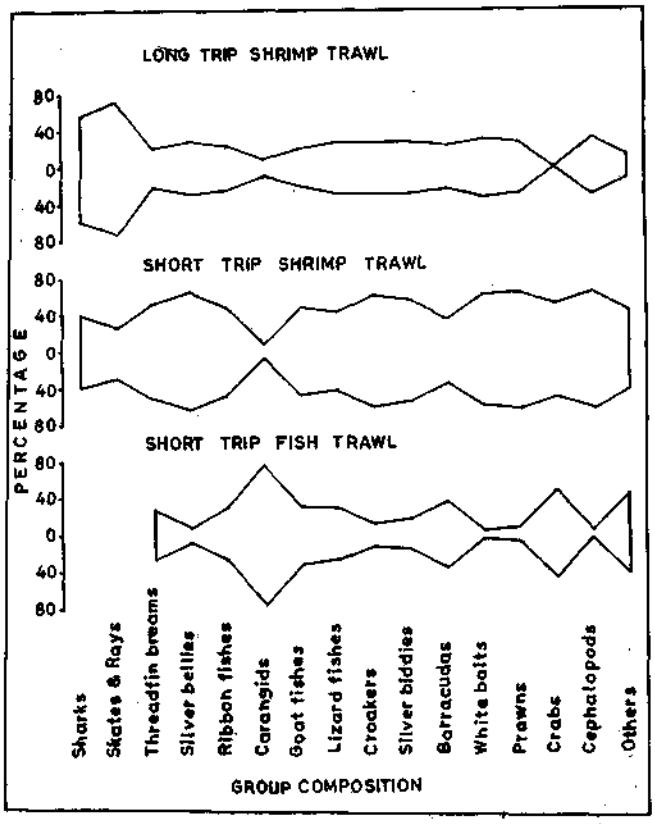

Fig. 12. Percentages of groupwise landings of three different types of trawlers during 1989-'91.

TABLE 2. *Groupwise production of different trawlers during October 1989 to June 1991 (In tonnes)*

Groups	Long trip shrimp trawlers	Short trip shrimp trawlers	Short trip fish trawlers	Total
Sharks	33	23	2	58
Skates & Rays	283	115	-	398
Threadfin breams	1,100	2,853	1,396	5,349
Silverbellies	1,611	4,058	436	6,105
Ribbonfishes	770	1,538	838	3,146
Carangids	221	236	1,606	2,063
Goatfishes	1,107	2,738	1,761	5,606
Lizardfishes	571	942	660	2,173
Croakers	458	986	182	1,626
Silverbiddies	391	729	218	1,338
Barracudas	181	264	280	725
Whitebaits	50	99	8	157
Prawns	589	1,364	230	2,183
Crabs	7	392	355	754
Cephalopods	857	1,719	89	2,665
Others	534	1,671	1,636	3,841
Total	8,763	19,727	9,697	38,187
Number of unit operations	4,475	31,409	19,185	55,069

The best catches of ribbonfishes were obtained in short trip shrimp trawls (49%) and the other two gears accounted for 24-27%. Goatfish and lizardfish catches show a similar trend. Carangids are a predominant group in short trip fish trawls in which they form as much as 78%. In the other two gears they form only 6-8%. 60% of croakers and white bait production is accounted for by short trip shrimp trawls. 64% of prawn production (Fig. 13) is obtained in short trip shrimp trawls and the long trip shrimp trawls are next in importance catching 28%. Only 8%

Fig. 13. Prawn catches landed by short trip shrimp trawlers.

of prawns are landed in the fish trawls. 52% of the crab catches are got by short trip shrimp trawls and 48% by fish trawls. Considerable quantities of crabs are caught in long trip shrimp trawls but they are not brought ashore due to lack of space in fish holds and the less price they fetch. 80% of the crabs caught in fish trawls consists of the swarming crab, *Charybdis (Goniohellenus) smithii* which appears in large quantities in some months. In the total trawl production, the catches of short trip shrimp trawls formed 52%, those of short trip fish trawls 25% and long trip shrimp trawls 23%. The short trip shrimp trawls are the main gear in which squids and cuttle fishes are obtained (64%) and the long trip shrimp trawls are second best gear for this group (34%) while fish trawls net only insignificant quantities (2%).

Remarks

The existence of trawling grounds off Madras coast has been indicated in the early period of the present century by exploratory trawling surveys conducted by the Department of Fisheries of the then Madras Presidency. However, commercial trawling was started in the Madras area only in the late 1960's and trawling became an active mode of exploitation from 1970s.

The all fish production of trawlers based at Madras amounted to 1,416 t in 1980. The 1980s are a period when the trawl fishery progressed remarkably attaining peak production of 23,953 t in 1989 and all fish production of trawlers based at Madras landed 17% of the total trawl production of Tamil Nadu. 75% of the total production of trawlers based at Madras during 1980-'89 was obtained in 1985-'89 with an effort of 62% in the period. The three fold rise in the annual all fish production observed in 1985-'89 as compared to the previous five year period is due to the starting of the long trip shrimp trawling operations off Sriharikota-Nellore coast which resulted in higher catches and catch rates.

The highest quantity of prawns (64%) is caught in short trip shrimp trawlers from depths of 15-30 m. The next best prawn catches are obtained in long trip shrimp trawl (28%) from same depth. The commercially important fishes like threadfin breams, ribbonfishes, goatfishes, barracudas, silverbellies and whitebaits are caught in maximum quantities in short trip shrimp trawls. These fishes are obtained in lesser quantities in the other trawls. Seasonal abundance of the resources show that the best catches were got in the third quarter followed by fourth quarter during the period 1980-'89.

The catch rate of long trip shrimp trawls operated off Sriharikota-Nellore coast are markedly higher than that of short trip shrimp trawl operated off Madras coast and adjacent areas. This is due to the greater effort expanded by the long trip shrimp trawlers which are of high horsepower and have 1 tonne capacity cold storage fish hold.

The results obtained in the present study indicate that there is good scope for stepping up production of demersal fish and shell fish resources off Madras and adjacent coasts by increasing the number of units operated from the present level. The rising trend of annual production in the period 1985-'89 and the steady catch per unit effort lend support to this view.

FIRSTLINE EXTENSION PROGRAMME AT KANDAKKADAVU, ERNAKULAM

Jancy Gupta and Krishna Srinath

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There are four transfer of technology (TOT) systems in India, each having its own approach and thrusts on freedom from hunger and poverty. They are (1) the first-line extension system of the Indian Council of Agricultural Research, (ii) National extension system of the Union-Ministry of Agriculture, (iii) Rural development programme of the Union Ministry of Agriculture and (iv) the extension efforts of the non-government organizations (NGOS) (voluntary organizations). The first-line extension system of the ICAR has basically an institutional extension role, a catalytic role, a supportive or complimentary role as well as pressure role to accelerate the process of transfer of technology. It serves as a window of educational and research institutions through which the extension agencies as well as the farmers can gaze the latest agricultural technologies (C. Prasad, *Agricultural Extension Services, 40 years of Agricultural Research and Education in India*, ICAR, New Delhi, 1989, 238-267).

In order to serve its first-line role effectively, CMFRI carried out an Extension project entitled 'Planned change in a coastal village—a model for first-line extension programme' under the leadership of the first author from 1987 to 1990. The second author and technical staff of KVK and Fishery Economic and Extension Division were associated in the project. This extension project as a model of first-line extension programme was directed towards, opening the avenues of fishery technologies to extension agencies as well as fishermen through the process of planned change. The planned change derives from a purposeful decision to effect improvements in a social system and is achieved with the help of professional guidance. Without motivating the people for a change, their participation in programme planning and execution will be limited.

Area of operation

After doing a preliminary survey of fishing villages in and around Ernakulam, Kandakkadavu, coming under Chellanam Panchayat, Palluruthy Block of Ernakulam district was selected as the suitable area for implementation of the project. It is about 20 kms away from Ernakulam in the southwest direction. The population is dominated by fishermen. Western side of this narrow sketch of land is the Arabian Sea and south-eastern side, vast stretch of backwater area where traditional prawn culture is being done.

Profile of the target population

Kandakkadavu village has 395 families. Because of practical difficulties only 165 families were contacted for the implementation of the project. The project work started with a benchmark survey of these families, to gather information on the resources available and to understand the socio-economic profile of the people and their felt needs. The human resource of the village was found consisting of a population predominated by youths.

It was observed that 46 per cent of the population had education upto primary class and 30 per cent upto higher secondary (Table 1). Land holding per household was found very low, 90 per cent having land less than 5 cents (Table 2). Area suitable for aquaculture worked out at about 100 acres which was usually leased out. While men were found engaged in fishing and related jobs, 95 per cent of the women were unemployed. In this area, duckery and poultry were predominant while cattle rearing was scarce.

TABLE 1. *Educational level*

Category	Number of persons	Percentage
Illiterate	5	0.56
Uneducated	54	6.01
Primary	411	45.73
Secondary	269	29.92
Higher secondary	129	14.35
Matriculate & above	20	2.22
Pre-degree & above	11	1.12
Total	899	100

TABLE 2. *Land holding in cents (1 cents = 40 sqm)*

Category	Number	Percentage
No land	2	1.21
3-5 cents	90	54.55
6-10 cents	71	43.03
above 10 cents	2	1.21
Total	165	100

About 100 fishing craft were owned by 65 families surveyed which included plank built boats and dugout canoes. The survey revealed that 27% of families operated dugout canoes and 57% plank built boats, collectively owned by a group of 20 or more fishermen. The most widely used fishing nets by the villagers was *Thanguvala* followed by *Neetuvala*, *Veesuvala* and *Chudavala*. Presently they aspire to own ringnets which they perceive most effective. The main problems identified were lack of marketing infrastructure, low price during peak season, lack of fish processing facilities, lack of employment facilities during lean season and lack of credit facilities for purchasing fishing equipments. The developmental potential for the selected families was worked out and presented in Table 5.

Field level extension programmes

The field extension programme was launched keeping in view three main objectives (i) optimum utilization of available resources (ii) extension education to bring awareness of appropriate technologies and development programmes and (iii) to show ways and means for generation of supplementary source of income utilising technologies developed by CMFRI. A village level meeting was called prior to starting of the field work. Details of the project were explained to them in the meeting which was followed by a discussion regarding the prevailing situation and where they ought to reach. They were made to identify their own felt and unfelt needs and the solution possible in the framework of the project. It was made clear to them that this was merely an educational programme and hence they would not expect any direct monetary benefits. The intention was that clients should never come forward to participate in the project for immediate monetary benefits but only for acquiring knowledge and skill. A fishermen forum was established in the village and office bearers were elected from them. This ensured peoples participation in the programme. Periodical meetings of fishermen forum were held to discuss ongoing programmes and future course of action. The office bearers and members of the Forum being community actnalizers were of great help for the smooth running of the project. Extension education programmes were launched to disseminate scientific prawn culture, prawn seed collection, fish processings and to improve the standard of life.

TABLE 3. *Developmental Potential*

	Response Categories	Frequency	Percentage
Persons attended any training programmes	Attended	10	6.06
	Not attended	155	93.94
Having interest to undertake scientific prawn culture	Interested	85	51.52
	Not interested	80	48.48
Willingness to take credit	Willing	120	72.73
	Not willing	45	27.27
Interest to send women for fisheries training	Interested	112	67.88
	Not interested	53	32.12

TABLE 4. *Extension programme in the village*

	Programme	Frequency	No. of participants
1.	Seminar	1	150
2.	Exhibition	1	500 (App.)
3.	Field day & mass contact programme	1	1000 (App.)
4.	Field trip	1	35
5.	Film show	3	-
6.	Group meetings	9	200
7.	**Training :**		
7. 1	Fish processing	2	40
7. 2	Prawn culture	2	42
7. 3	Prawn seed collection	2	34
8.	**Demonstration :**		
8. 1	Small scale prawn hatchery	1	250 (App.)
8. 2	Scientific prawn culture in homesteads	1	1000 (App.)
8. 3	Prawn seed collection	2	50 (App.)
9.	Linkage programme (linking developmental agencies with local people)	Throughout the project	100
10.	Fishery advisory programme for, prawn culture, fish culture, prawn nursery, fish capture, maintenance of craft and gear and conservation of fishery resources	,, ,,	

The various field level programmes implemented in the village are discussed below.

Diversified products from low cost fish

This programme was intended to convert low cost fishes into value added products and to help in utilizing the fish for getting better returns when any bumper catch occur. The training programmes were conducted in each quarter of the project for groups of selected members from the project area. It included lecture-cum-demonstration on preparation of fish pickles, cutlets, wafers and dried fish.

During peak season, fishermen were forced to sell fish at throw away price because of its perishable nature. It was felt that a group of people could be trained in the preparation of diversified fish products and whenever availability of fish is less this group could engage in other activities like prawn seed collection, prawn farming, horticulture etc. The trained people were also given guidelines on how to start the commercial production on cooperative basis.

Prawn seed collection

With the introduction of scientific prawn culture, there is a great demand for prawn seeds. As it cannot be met with the existing hatcheries, the seeds have to be collected either from surf or from shallow back water areas. Earlier work at CMFRI had already shown availability of prawn seeds in large quantity in the back waters of Chellanam. Taking this into consideration, training programmes including lecture-cum-demonstration of prawn seed collection were organised. Very good response was obtained for this training programme as people were till then totally unaware of the scientific method of prawn seed collection, which is a very profitable enterprise. The economics of prawn seed collection worked out by Dr. M. M. Thomas *et al.* has shown a net income of Rs. 1,945 per unit, comprising three persons, for the season mid-December to mid-February assuming 10,000 seeds to be collected per day for 24 days in the season.

Scientific prawn culture

Training and field trip

The fisherfolk under the project were trained in scientific prawn culture through lecutres, demonstrations and field trips. Classes

Fig. 1. Group discussion with fisherwomen in the village.

Fig. 2. A view of the village level meeting in connection with stocking of prawns.

Fig. 3. Demonstration of small-scale prawn hatchery.

Fig. 4. Training in collection of prawn seeds from surf.

Fig. 5. Stocking of prawns being done by the President, Chellanam Panchayat.

on prawn culture handled by the technical experts of Krishi Vigyan Kendra generated great interest and awareness among clients. A field trip arranged to show them the demonstration farms at Narakkal created further interest in adoption of the technology.

Demonstration of scientific prawn culture in homestead water canals

It was observed that water canals extending from the back water through homesteads are left

Fig. 6. Harvest of prawns in progress.

mostly unutilized. In order to make people realise that these water canals can be used for prawn culture and thus supplement their regular income, demonstration of scientific prawn culture was carried out in one of such canals in the village. In order to emphasise the possibility of prawn culture in off season ie. March to June, it was decided to carry out the demonstration during that period. A field day and mass contact programme were arranged in connection with the prawn culture. The demonstration probably brought desirable changes in farmers. It was more or less proved by the good strength of local people who came forward to adopt prawn culture in homesteads in the subsequent year.

Demonstration of small scale prawn hatchery

CMFRI has developed technologies for production of prawn seeds in small hatcheries which can be established within the limited financial means of local fishermen families. If a spawner is available such a hatchery can be set up at a very low cost. The project area having on one side sea and the other side being large prawn culture fields was felt having wide scope

Fig. 7. A view of the harvested prawns, from the water canal.

for transfer of this technology. The demonstration attracted large number of local people who expressed their eagerness to adopt the technology but before that they wanted to be trained in identification of spawners and its transportation which are the first steps for establishing their own hatcheries.

Linkage programme

This programme was envisaged to link the fisherfolk with various developmental agencies. The Manager of the lead bank, The Union Bank

Fig. 8. Training women in preparation of diversified products from low cost fish.

of India was invited to the village to participate in a group discussion on the credit schemes available to fishermen and how to make use of them. 75 fishermen participated in the discussion with great enthusiasm and it could help them in knowing about new schemes for fishermen and clear their doubts regarding eligibility to get loans and their terms and conditions. The discussion also pointed towards the need for fishermen to save a part of their income during good season so that it can be utilized in the lean season rather than depending on money lenders. Under the same programme the fishermen were also linked with the Agricultural Officer so that seeds and fertilizers were supplied to them under the existing schemes of the Department of Agriculture.

Seminar and exhibition

A seminar on "Research and Development Activities in Fisheries" was organised in the village to bring awareness of research & development in fisheries and the role played by CMFRI in development and dissemination of technologies. More than hundred people participated in the seminar which was inaugurated by Dr. P. S. B. R. James, Director of CMFRI. Representatives of various fisheries departments participated in the seminar. An exhibition highlighting the activities of CMFRI was also organised in connection with the seminar.

Impact of the programme

Fisherfolk being a localite group were initially reluctant to come forward and participate in the project. Hence good rapport was established with a number of personal visits which made them to shred their inhibition and participate in the programme. The data collected after the period of operation of the project showed that programmes channeled through the Fishermen Forum made them really feel the participation and made it a project of, by and for the people.

The level of knowledge in each subject area was measured before the initiation of the programme and immediately after the programme was over. The difference proved a significant level of increase in their level of knowledge. The gain in knowledge can be attributed to the success of this project. The impact of the demonstration on scientific prawn culture also was considerable having brought desirable changes in their level of

Fig. 9. Project leader, assessing knowledge gain of fisherwomen as a result of training programme.

knowledge, skill, understanding and attitude of the clientile and brought change in their total behaviour to the new practice and adoption of technology. This was also proved by the good strength of local people who came forward to adopt the technology in the subsequent years.

This pioneer work at Kandakkadavu helped beneficiaries to identify their needs and enabled them to realise how to supplement their income using local resources. It improved the social system by giving new technologies, providing knowledge and skill to adopt the technologies, linking with develpmental agencies and ushering in social change. It also helped to bring into notice the future need of such programmes and how fisherfolk gain out of it. Being purely an educational programme without subsidies and other monetary benefits and coming under the frame work of first-line extension programme, it served as a model to other extension agencies to start such programme and strengthen the dissemination of technologies to the grass-root level.

The authors are grateful to the Director of the Institute and to many of their colleagues in the Krishi Vigyan Kendra and the Fishery Economics and Extension Division of the Institute.

THE OIL SARDINE FISHERY ALONG NORTHERN TAMIL NADU COAST WITH A NOTE ON UNUSUALLY HEAVY LANDINGS AT CUDDALORE, PAZHAYAR AND KAVERIPATTINAM*

The Indian Oil sardine, *Sardinella longiceps* has become one of the important exploited fishery resources along the Tamil Nadu coast in recent years. With considerable annual fluctuations, the oil sardine production of Tamil Nadu including Pondicherry has increased from 4,270 t in 1985 to a record catch of 37,751 t in 1990 contributing 11.8% of the total marine fish production (Fig. 1). The trend of oil sardine catches indicates that maximum production was in the northern region of Tamil Nadu comprising Chengelpet to South Arcot districts including Pondicherry (Fig. 2) accounting for an average of 72.7% of the fishery during the period 1985-'89. In the oil sardine production during the period, South Arcot district predominated with a maximum of 43.4% of catches followed by 30.7% obtained along Pondicherry coast (Table 1). Earlier observations indicate that the occurrence of oil sardine along areas south of Madras especially between Pondicherry and Parangipettai was a regular phenomenon than incidental (*Mar. Fish. Infor. Serv., T & E Ser.*, **96**, 1989).

The oil sardine landings along Chengelpet, Madras and South Arcot districts of Tamil Nadu together contributed an average of 60% to the total oil sardine production of the state during the period 1985-'89 (Fig. 3). The study reveals that the best catches obtained along the districts were during the third and fourth quarters of the period and sizable quantities were also landed in the second quarter during some years.

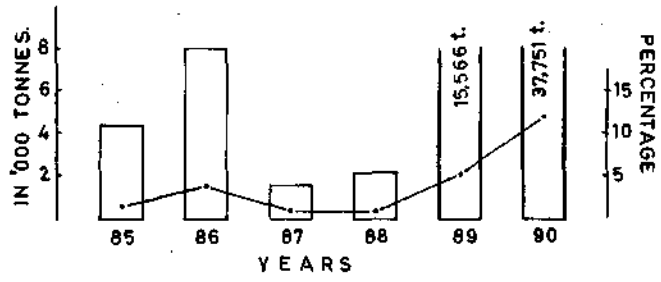

Fig. 1. Oil sardine landings along Tamil Nadu coast during 1985-'90 and its percentage composition in total marine fish production of the state.

TABLE 1. *Oil sardine landings (in tonnes) along the districts of Chengelpet, Madras and South Arcot of Tamil Nadu and Pondicherry during 1985-'89 (Percentages of total oil sardine catch obtained along the region in brackets)*

Years	Chengelpet	Madras	South Arcot	Pondicherry	Total	Percentage in total oil sardine catch of Tamil Nadu
1985	749 (21.50)	93 (2.67)	1,267 (36.38)	1,374 (9.45)	3,483	81.57
1986	2,010 (28.09)	12 (0.18)	3,316 (46.34)	1,817 (25.39)	7,155	90.46
1987	96 (10.28)	103 (11.03)	— —	735 (78.69)	934	57.98
1988	51 (3.09)	12 (0.73)	1,395 (84.60)	191 (11.58)	1,649	73.06
1989	2,258 (24.00)	479 (5.08)	3,834 (40.74)	2,840 (30.18)	9,411	60.46
Total	5,164 (22.82)	699 (3.09)	9,812 (43.35)	6,957 (30.74)	22,642	71.59

* Prepared by P. K. Mahadevan Pillai, Madras Research Centre of C.M.F.R.I. Madras; M. Radhakrishnan and M. Manivasagam, Field Centre of C.M.F.R.I., Cuddalore.

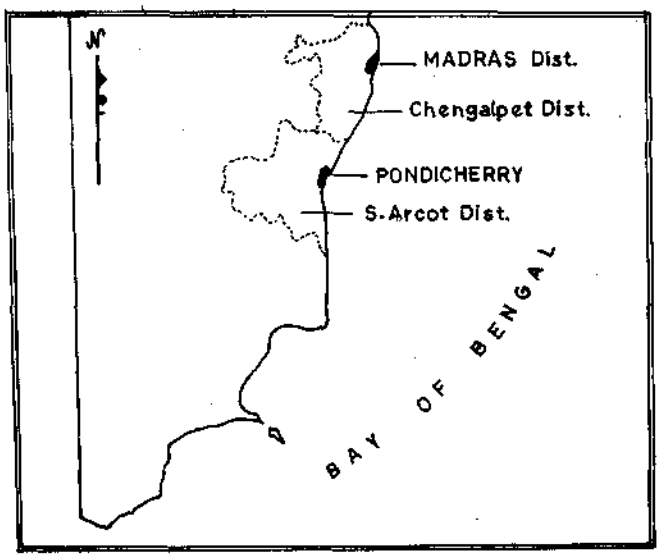

Fig. 2. Northern districts of Tamil Nadu including Pondicherry which recorded maximum oil sardine catch during 1985-'90.

The bulk of oil sardine were landed along the coast by the bag-net, *Eda valai* while lesser quantities were caught by the gill nets, *Kavala valai* and *Thattakavala valai*. The *Eda valai* is operated with the help of four catamaran units.

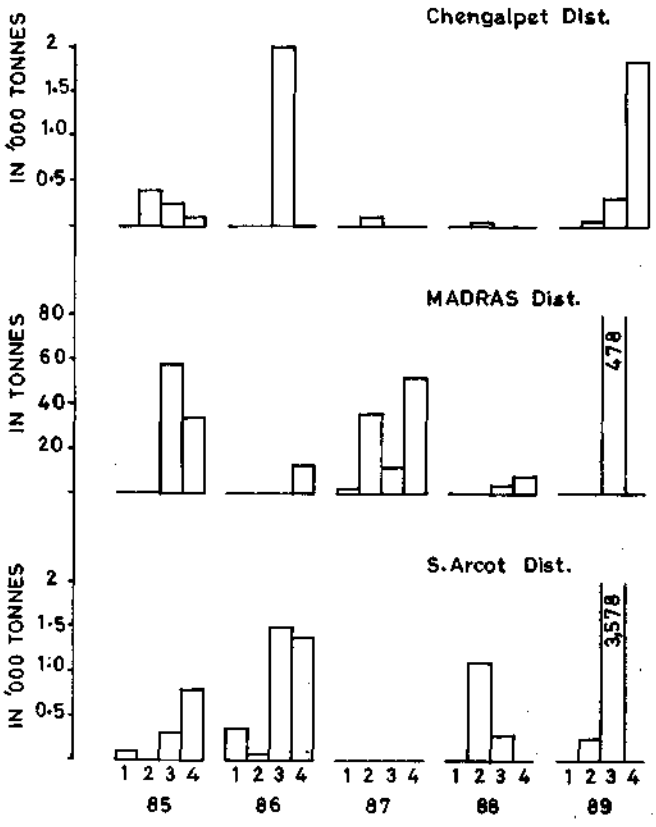

Fig. 3. Quarterwise landings of oil sardine along Chengelpet-South Arcot districts, Tamil Nadu during 1985-'89.

On sighting a shoal, the catamarans are towed to the fishing area by a mechanised vessel for timely approach near to shoal. The mechanised vessels are also used as carrier boats for fast transportation of the catch to the shore. At the time of heavy catches, more number of carrier boats are engaged.

Unusually heavy landings of oil sardine by the *Eda valai* units have been recorded at Cuddalore and Pazhayar fisheries harbours and Kaveripattinam during certain months of the period, 1989-'90 (Table 2). Large quantities were landed at Cuddalore Fisheries Harbour in 1990 while the landings were comparatively much less at Pazhayar and Kaveripattinam. Abundance of juvenile oil sardines of the size group 110 - 114

TABLE 2. *Incidental heavy landings of oil sardine (in tonnes) by the carrier boats of Eda valai at Cuddalore and Pazhayar fisheries harbours and at Kaveripattinam during 1989-'90 showing dominant size groups in the catches*

Year & Months	No of observation days	No. of carrier boats landed	Total catch (tonnes)	Dominant size groups (mm)
		Cuddalore Fisheries Harbour		
1990				
February	6	698	1,186	140-144
March	6	518	727	155-164
April	6	412	561	160-169
May	2	208	150	145-149
		Pazhayar Fisheries Harbour		
1989				
April	4	17	42	155-159
May	4	18	36	155-164
1990				
April	2	10	22	150-159
May	2	5	4	100-109
June	2	8	13	110-119
July	4	10	17	135-139, 165-169
		Kaveripattinam		
1989				
June	4	20	43	140-159
August	4	27	44	140-159
September	1	4	4	175-179
1990				
March	2	5	8	155-164
April	1	20	38	160-169
June	2	45	70	150-159
July	2	9	6	95-104
August	4	36	51	110-114, 155-159
September	2	15	18	165-169

mm was noticed during May - June, '90 at Pazhayar and in July at Kaveripattinam. Larger size groups of 175 - 179 mm predominated in September, '89 wheares in the same period of the succeeding year, 165 - 169 mm length groups supported the fishery. In most of the remaining months, the commercial size groups were of the length range 140 - 159 mm.

It was observed that the unprecedented heavy landings of the oil sardine in most of the centres did not benefit the fishermen monetarily to any significant extent. Larger size oil sardine were marketed at some centres outside Tamil Nadu and later that too was restricted. As local consumption of oil sardine along the coast was not much, almost the entire catch was sun dried on the beach and later sold to agents who supplied the same to some companies for the manufacture of poultry feed (Fig. 4).

Fig. 4. Dried oil sardine in gunny bags ready for despatch to fish meal plants.

Remarks

The oil sardine has come to support an important fishery along the Tamil Nadu coast since 1985 and an all time record catch of 37,751 t was obtained in 1990. The study has shown that the bag-net, *Eda valai* is the effective gear to tap the resource as indicated by its extensive use and the unusually heavy catches it made especially along the northern region of Tamil Nadu. Nearly 73% of the total oil sardine production of the state during the period, 1985-'89 were obtained along the northern coastal districts viz., Chengelpet, Madras and South Arcot including Pondicherry. The third and fourth quarters have been most productive except in 1988 during which the fishery was poor with maximum catches in the second quarter. The commercial catches of oil sardine from *Eda valai* along the coast consisted of fish of the size range 110 - 179 mm and the most comon size groups were 140 - 159 mm.

Due to lack of demand for fresh fish, the bulk of catches was sun dried. While other sardines find a good market, oil sardine is not being relished to that extent by the people in coastal Tamil Nadu. This attitude has to change and the consumption of oil sardine may be resorted to by the local people so that their protein intake is increased. This will also help to fetch good returns from the fishery.

It has been stated (*Mar. Fish. Infor. Serv., T & E Ser.*, **88**, 1988) that oil sardine catches are obtained along the east coast of India in areas close to harbours, backwaters and river mouths and this discontinuous distribution of fish appears to indicate its affinity, particularly juvenile phase, to areas where there is admixture of fresh and brackish water. In the present work also maximum quantities of oil sardine have been recorded along the northern Tamil Nadu coast where many rivers open into the Bay of Bengal and cause fluctuations in salinity in coastal waters.

ON THE OCCURRENCE OF 'WAHOO', *ACANTHOCYBIUM SOLANDRI* IN THE HOOKS AND LINE CATCHES OFF LAWSONS BAY, VISAKHAPATNAM*

The occurrence of *Acanthocybium solandri* (Cuvier and Valenciennes) in the hooks and line catches off Lawsons Bay was first noticed in February, 1988 (two specimens) and subsequently in March (one specimen) and December (two specimens) of the same year. Afterwards four more specimens landed by the hooks and line came under observation on 29th October, 1990, of which the smallest one was collected, photographed and the characteristics were noted.

The specimen examined had a fork length of 99.5 cm. (T. L. 104.5 cm, S. L. 91.8 cm and depth 7.06 cm) and weighed 5.6 kg (Fig. 1). The cleft of the mouth reached beyond the anterior end of the eye, almost to below the middle of the eye. The specimen was a female with the ovary in II stage, 31.5 cm long and weighing 32.5 g. The gut was half full (vol. 35 ml.) containing digested fish remains.

Fig. 1. *Acanthocybium solandri* (C & V) entire specimen. (Some of the parasitic copepods attached to the body, appearing like tick marks, are indicated by arrows).

The specimen was infested with the parasitic copepod of the genus *Lernaeenicus*, almost similar to *L. seeri* (Kirtisinghe, 1934). The copepod was found attached to the muscles all over, predominantly on the ventro-lateral side beyond the pectorals. However, a narrow space at the lower dorso-lateral region (excluding the caudal peduncle), the pre-dorsal, the head and the ventro-lateral region below the pectorals were the areas spared by the parasite. The same parasite was observed on the specimens examined by the authors earlier.

At Lawsons Bay, seer fishes from as much as 22.5% of the estimated annual average landings by all gears. *Scomberomorus guttatus* (15.8%), caught both by hooks and lines as well as bottom-set gill nets and *S. commerson* (6.7%), caught mainly by hooks and lines are the two important species. *S. koreanus* is rarely caught in hooks and line while *S. lineolatus* occurs very rarely in other gears. Some details on the fishery of seer fishes by hooks and line off Lawsons Bay, Visakhapatnam are given in Table 1.

According to an earlier report, the seasonal abundance in the landings of *S. guttatus* at Lawsons Bay and in other localities along the east coast is closely related to the circulation pattern of the water in the Bay of Bengal. *A. solandri* is stated to be wide spread in circum-tropical seas but nowhere abundant. Being an epipelagic oceanic species, frequently solitary or forming small loose aggregations rather than compact schools, *A. solandri* does not form a fishery as

* Reported by K. Vijayakumaran and S. Chandrasekhar, Visakhapatnam Research Centre of CMFRI, Visakhapatnam - 530 003.

TABLE 1. *Some details on the fishery of Seer fishes by hooks & line off Lawsons Bay, Visakhapatnam*

Species	*S. guttatus*	*S. commerson*	*S. koreanus*	*A. solandri*
Period of abundance or occurrence	Apr. - Jul. Nov. - Jan.	Jan. - Mar.	May - Jul.	Oct. - Mar.
Hooks & baits	No. 4 & 5 Sardines or Anchovies	No. 1 Ribbon fish	No. 4 & 5 Sardines or Anchovies	No. 1 Ribbon fish
Depth of operation of gear	20-50 m	20-50 m	20-50 m	36-50 m
General size range	30-75 cm	40-250 cm	40-100 cm	100-200 cm
Average price range per kg	Rs. 24-30	Rs. 28-32	Rs. 24-30	Rs. 28-32
% in the annual average hooks & line landings *	27.2	12.1	Not signi-ficant	Not signi-ficant
Local name	'Vanjaram'	'Konemu'	'Balla' 'Vanjaram'	'Pallapu' 'Konemu'

* Source : MFIS No. 6, p. 10 - 13.

such anywhere. From the published account it would appear that *A. solandri* is relatively denser in distribution in the equatorial Indo-Pacific waters.

The occurrence of *A. solandri* off the north coast of Andhra as reported now confines to the period October - March. This is the period when a strong surface current from the Malasian region enters the south-east corner of Bay of Bengal, bringing the equatorial Indo-Pacific waters. 'Wahoo' probably enters the Bay of Bengal along with this current and moves along with the prevaling currents on the east coast of India during October - March.

Fig. 2. Head portion of the above specimen showing the snout being as long as the rest of the head and posterior end of maxilla concealed under preorbital bone.

ON THE STRANDING OF SPERM WHALES AT NAGAPATTINAM, TAMIL NADU COAST*

In the Indian Ocean, the sperm whale *Physeter macrocephalus* Linnaeus are found concentrated more in the Arabian Sea upto 20°N and between 50° and 80°E especially in the Gulf of Aden and approaches a little east of Minicoy Island and off Sri Lanka. Most of the records on the whales along the Indian coasts are on their strandings only. The present report deals with the stranding of two sperm whales near Nagapattinam along the Tamil Nadu coast. On 18th December, 1988, the fishermen at Samnathanpettai near Nagapattinam noticed a whale in the sand silt surf region struggling to get back into the sea. The whale was in dying condition and had some injuries in the caudal peduncle region. Some fishermen tied the whale with ropes

* Reported by : P. Nammalwar, S. Krishna Pillai and M. Badrudeen, Mandapam Regional Centre of CMFRI, Mandapam Camp and V. Thanapathi, R. Somu and V. Sivasamy, Nagapattinam Field Centre of CMFRI, Nagapattinam.

TABLE 1. *Morphometric measurements (in cm) of the sperm whales stranded at Nagapattinam*

Body characters	Sperm whale I	Sperm whale II
Total length (tip of snout to tip of caudal fin)	371	970
Tip of snout to the notch of caudal fluke	310	880
Tip of snout to origin of dorsal fin	192	515
Length of dorsal fin base	32	165
Maximum height of dorsal fin (hump)	—	25
Origin of dorsal fin to caudal fluke	—	340
Tip of snout to anterior insertion of flipper	100	260
Length of flipper	28	67
Length of outer curvature of flipper	47	—
Maximum breadth of flipper	19	—
Tip of snout to bifurcation origin of lower jaw	65	—
Length between flipper and caudal fluke	—	510
Breadth of snout	38	115
Length of upper jaw	50	155
Length of lower jaw	40	150
Tip of snout to centre of blow-hole	49	130
Breadth of blow-hole	4	—
Tip of snout to centre of eye	71	186
Eye diameter	5	5
Tip of snout to centre of anus	227	620
Length between anus and notch of caudal fluke	128	270
Tip of snout to centre of genital slit	—	693
Length between genital slit and anus	26	73
Body depth at the origin of flipper	61	280
Body depth at caudal peduncle	28	—
Girth at origin of dorsal fin	52	310
Girth at origin of anus	—	210
Length of intestine	—	1450
Estimated weight (tonnes)	0.7	5.0
Sex	Female	Female

around the throat region and towed it to the shore where it died after five hours. Based on the morphometric characters (Table 1), the whale was identified as a baby female sperm whale, *Physeter macrocephalus* Linnaeus measuring 3.71 m and weighing about 700 kg. The length at birth of sperm whale is about 4 m. Therefore it may be inferred that the present sperm whale is a new born baby less than three months old (Fig. 1).

Fig. 1. The sperm whale stranded at Samnathanpettai near Nagapattinam.

Another sperm whale was found dead and washed ashore at Vizhunthamavadi near Nagapattinam on 18th January, 1991. The stranded sperm whale was an young female of 9.70 m weighing about 5 tonnes and estimated to be around five years old (Fig. 2). The stomach was cut open and found empty. The Tamil Nadu Fisheries Department made arrangements to bury the whale near the sandy shores at Vizhunthanavadi, to retrieve the skeleton. The head accounted for about one third of the animal's length and behind it the body tapered to the tail flukes. The lower jaw was very narrow

Fig. 2. The sperm whale stranded at Vizhunthamavadi near Nagapattinam.

and did not reach the end of the snout. On the lower jaw, there were two rows of budding teeth each row consisting of 22 teeth. The eyes were closed to the angle of mouth and behind it, the large rounded flipper. The colour of the whale was jet black with flippers lighter in shade.

It may be seen from the published information that strandings of sperm whales are more common along the east coast than the west coast. Another fact is that most of the strandings of the sperm whales have occurred during the months of November and December.

ON THE LANDING OF A YOUNG SPINNER DOLPHIN AT VISAKHAPATNAM, ALONG ANDHRA COAST*

A young female spinner dolphin *Stenella longirostris* Gray, measuring 70.5 cm in total length was entangled accidentally along with the other fishes in the early morning hours of 21st August, 1991 in a gill net operated off Visakhapatnam at about 40 m depth. It was brought to the Visakhapatnam Outer Harbour fish landing centre in dead condition on the same day.

The morphometric measurements of the spinner dolphin in cm are given below.

Total length (snout to notch of caudal flukes)	70.5
Length from tip of snout to blow hole	11.8
Length from tip of snout to centre of eye	13.1
Length from tip of snout to anterior insertion of flipper	18.6
Length from tip of snout to origin of dorsal fin	31.2
Length from tip of snout to centre of anus	47.5
Length from notch of flukes to posterior end of dorsal fin	27.2
Length from notch of flukes to centre of anus	19.3
Length of fluke on outer curvature	12.2
Length of fluke on inner curvature	7.3
Distance between extremities of flukes	11.9
Width at insertion of fluke	5.4
Length of dorsal fin base	8.5
Vertical height of dorsal fin	7.1
Length of flipper from anterior insertion to tip	14.5
Length of flipper along curve of lower border	9.5
Greatest width of flipper	4.5
Depth of body at anal region	6.2
Depth of body at origin of flipper	9.1
Depth of body at origin of dorsal fin	11.7
Depth of body in the region of eye	8.4
Length of upper jaw	10.7
Length of lower jaw	10.8
Width between 2 eyes	8.6
Distance between genital opening and anus	4.4
Teeth : Uniform and minute on both the jaws.	
Sex : Female.	
Total weight (Kg)	2.660

The colour of the specimen was dark-grey to black dorsally and white ventrally. A dark grey stripe from flipper to eye was present. Abrasions were noticed at the base of the caudal fluke and also on the dorsal fin, which might have been caused during its entanglement in the net and also due to rough handling. According to an earlier report the length at birth of this species is about 0.8 m. From the size of the specimen and the presence of minute teeth on the jaws it appears that it was a newly born calf. Although the occurrence of very young spinner dolphin has been reported from Veraval and Mandapam, the present specimen is the smallest ever reported from Indian waters.

* Reported by : C. V. Seshagiri Rao and K. Narayana Rao, Visakhapatnam Research Centre of CMFRI, Visakhapatnam.

ON THE STRANDING OF *BALAENOPTERA PHYSALUS* AT KOTA, DAKSHINA KANNADA*

On 14th April, 1991 at Kodi Kanyana (Kota) the carcass of a whale was stranded. The carcass was about 10 m long and about 3 m wide and the entire fleshy part of the body was putrified. The news about the stranding appeard in the local paper on 16th May, 1991 and immediately the reporters rushed to the area to examine the available part of the specimen. Due to the action of waves, the body parts were washed away and only the lower rostrum (jaw bone) and one vertebra (Fig. 1) could be observed. Based on the groove in the jaw and the spine on the vertebra the stranded whale has been identified as *Balaenoptera physalus*.

Since the jaw bone was partially damaged, its measurement could not be taken. The horizontal length of vertebra (tip to tip) measured 63.5 cm. On enquiry, it was understood that the local fishermen had not seen any such animal stranded in that area prior to theirs. They also informed us that the entrails spilt out on the day of stranding were more like huge pipes and the whole area was filled with stink.

Fig. 1. Part of jaw bone and vertical view of the vertebra.

* Reported by : C. Purandhara and C. H. Vaman Naik, Mangalore Research Centre of CMFRI, Mangalore.

ON THE LANDING OF HUMP-BACK DOLPHIN *SOUSA CHINENSIS* AT TUTICORIN*

Though dolphins do not form a regular fishery along the coasts of India, they are being caught accidentally by drift gill nets, trawlers and purse-seiners. When compared to the Eastern Pacific, destruction of dolphins along the Indian coasts is not very high. Reports on stranding and landing of dolphin along the Indian coasts are being made available as and when it is encountered by various workers.

On 24-01-1991, during one of our regular observations at Tuticorin north landing centre, a dolphin measuring 227 cm in total length and 85 kg in weight was landed. It was a female dolphin identified as *Sousa chinensis* (Osbeck) having 34 - 36 teeth on one side of upper and lower jaws (Fig. 1).

Fig. 1. The dorsal view of the hump-back dolphin.

This dolphin was accidentaly caught by drift gill net operated by Tuticorin type of motorised 'vallams' (Plank - built boat with inboard engine). Usually if a dolphin is caught or stranded the same will be thrown away by the fishermen. But in recent days the meat of dolphin is being used as bait for hooks & line fishery. Due to this fact, now-a-days, the accidental catches of dolphins are brought to the shore and disposed off by auction. The presently reported dolphin was sold for Rs. 68/-. Detailed morphometric measurements (in cm) are given below.

Total length	227.0
Fork length	220.0
Length from tip of lower beak to centre of eye	36.5
Length from tip of snout to blow hole	36.0
Length from tip of snout to origin of dorsal fin	101.0
Length from tip of snout to centre of anus	140.0
Length from snout to caudal pit	207.0
Length of dorsal fin base	42.0
Length from the dorsal fin to fluke fork	94.5
Length from dorsal fin to end of fluke	96.0
Length from dorsal fin to notch of caudal fluke	82.5
Length of flipper base	27.5
Depth of body at head region	79.0
Depth of body at flipper	93.0
Depth of body at dorsal	94.0
Depth of body at anus	75.0
Depth of body at notch of fluke	55.0
Length of upper Jaw	31.5
Length of lower jaw	32.0
Length of upper beak	14.5
Length of fluke	21.0
Length from anus to end of fluke	64.5
Distance between extremite of fluke	42.0
Diameter of eye	3.0
Breadth of eye	1.5
Total number of teeth on one side of upper jaw	34
Total number of teeth on one side of lower jaw	36
Sex	Female
Approximate weight	85 kg

Reported by: G. Arumugam, S. Rajapackiam and T. S. Balasubramanian, Tuticorin Research Centre of CMFRI, Tuticorin - 628 001.

मद्रास तट की वाणिज्यिक ट्रॉल मात्स्यिकी का तुलनात्मक अध्ययन

के. सत्यनारायण राव और पी. के. महादेवन पिल्लै सी एम एफ आर आइ का मद्रास अनुसंधान केन्द्र,
मद्रास - 600008

प्रस्तावना

मद्रास तट की मात्स्यिकी संपदाओं का विदोहन (Exploitation) परंपरागत रूप से देशज क्राफ्ट और गिअरों द्वारा किया जाता था। पर पिछले दो-तीन दश वर्षों में वाणिज्यिक ट्रालिंग के आगमन और नितलस्थ मछलियों और झींगों के विदोहन के विकास के फलस्वरूप इस तट की यंत्रीकृत मात्स्यिकी का काफी विकास हुआ है।

मौसमिक परिचालन के कुछ नावों को छोडकर अब मद्रास तट में परिचालित होनेवाले मुख्य यंत्रीकृत पोत ट्रालरें हैं, जो मद्रास मात्स्यिकी बंदरगाह के पास के पुतुमनिकुप्पम में अवतरण करते हैं। सामाजिक-आर्थिक घटकों के कारण वर्तमान में पकड को पुतुमनिकुप्पम केंद्र तक ले जाने के लिए सभी ट्रालर कटामरीनों का आश्रय लेते हैं और मात्स्यिकी बंदरगाह सिर्फ पोतों के लंगर डालने के लिए उपयुक्त करता है।

पुतुमनिकुप्पम से वर्ष 1981-85 की अवधि के दौरान प्राप्त यंत्रीकृत पोतों के पकड-आकलन के अलावा इस केंद्र में अवतरण की गई मछलियों की पकड की मौसमिक प्रचुरता और इससे संबंधित पहलुओं पर कोई भी विस्तृत सूचना न मिली है। वर्तमान अध्ययन में पुतुमनिकुप्पम के ट्रालर अवतरण का विश्लेषण और अध्ययन, यहाँ की पकड की मौसमिक प्रचुरता, प्रति एकक का पकड प्रयास और मौसमिक उतार-चढाव के संदर्भ में किया गया है।

मद्रास तट में परिचालन किए जाने वाले ट्रालर चार प्रकार के लंबाई वर्ग के होते हैं। ये 9.5-10 मी, 11 मी, 12 मी और 13-14 मी के हैं। 9.5-11 मी व 11 मी के पोत उत्तर-पूर्व तट के 30-40 मी के गहराई रेंच में मत्स्यन करते हैं और 12 मी और 11 मी के कुछ पोत 15-30 मी की गहराई के तटीय समुद्र में मत्स्यन करते हैं। 13-14 मी के बडे पोत श्रीहरिकोट्टा और नेल्लूर के 15-30 मी की गहराई के समुद्र में 3-4 दिन तक चिंगट का ट्रालिंग करते हैं।

महाजाल (ट्राल) से प्राप्त उत्पादन

वर्ष 1980-89 की अवधि में पुतुमणिकुप्पम केंद्र से ट्रालरों द्वारा 9,500 टन मछलियों का अवतरण हुआ। अधिक मत्स्यन प्रयास के साथ इस अवधि का अवतरण भी अधिक था। वर्ष 1980 के 1,416 टन उत्पादन की अपेक्षा वर्ष 1987 का उत्पादन 16,342 टन तक बढ़ गया और वर्ष 1989 में यह 23,953 टन तक बढ़ गया। वर्ष 1985-89 का मछली उत्पादन 1980-84 की अवधि से तिगुना अधिक दिखाया पडा। प्रति एकक के मत्स्यन प्रयास में भी वृद्धि दिखाई पडी।

वर्ष 1980-89 की प्रति एकक पकड, मत्स्यन प्रयास और तिमाहवार पकड के संयोजित आंकडे का विश्लेषण यह व्यक्त करता है कि अधिकांश तिमाहियों में एकक परिचालन के अनुसार पकड में भी वृद्धि दिखाई पडी। लेकिन प्रथम तिमाही में यह अनुपात कम था। वर्ष 1987 की दूसरी तिमाही में, पिछली तिमाही की अपेक्षा एकक परिचालन में 6% कमी के साथ पकड में 38% की वृद्धि अंकित की। वर्ष 1989 की तीसरी व चौथी तिमाहियों का अधिकतम पकड प्रयास यथाक्रम 767 कि ग्रा और 627 कि ग्रा थे। विभिन्न तिमाहियों की मौसमिक प्रवणता से यह दिखाई पडती है कि इस तट में, तीसरी तिमाही में सबसे अधिक उत्पादन हुआ जिसके बाद चौथी तिमाही का उत्पादन आता है।

इसका व्यक्त और विस्तृत चित्र मिलने के लिए दो-पांच वर्षों की अवधि के विभिन्न महीनों की संयोजित पकड और प्रयास का अध्ययन भी किया था। इसके अनुसार माहिक पकड एवं प्रयास बराबर ही देखा और वर्ष 1985-89 के

दौरान उच्चतम पकड और प्रयास हुए थे। तीसरी तिमाही में अधिकतम अवतरण हुआ और अगस्त महीना अवतरण का शृंग काल था।

विभिन्न वर्गों के मौसमिक उतार-चढाव

ट्रालर मात्स्यिकी में योगदान करने वाले विभिन्न वर्गों में से 15 वर्गों को वर्ष 1980-84 और 1985-89 अवधि के दौरान मौसमिक उतार-चाढ़ाव का अध्ययन करने के लिए चुन लिया। इनमें प्रमुख सुरा, *कर्केरिअस* जातियाँ, *राइजोप्रिओनोडोन* जाति, स्केट्स,*राइनोबाटस* जातियाँ, रे, *डैसिआटिस* जातियाँ, *ऐइटोबाटस* जातियाँ, राइनोप्टीरा जातियाँ, सूत्रपख ब्रीम, *नेमिट्टीरस* जातियाँ, मुल्लन, *लिओगनाथिअस* जातियाँ, *सेक्यूटर* जातियाँ, फीतामीन, *ट्राइक्यूरस लेप्ट्यूरस*, कैरंजिड्स, *डेकाप्टीरस रसेल्ली, सेलरोइड्स लेप्टोलेपिस, कैरांक्स* जातियाँ, गोटफिशस,*यूपेनिअस* जातियाँ, तुम्बिल, *सौरिडा* जातियाँ, क्रॅकिर्स, *जोनिअस* जातियाँ, ओटोलिथस जातियाँ, सिल्वर-बिड्डीस, *पेन्टाप्रिओन* जाति, बैराकुडा, *स्फिरीना* जातियाँ, वाइट बेट, *स्टोलिफोरस* जातियाँ, पेनिआइड झींगा, *पेनिअस इंडिकस, पी. सेमीसुल्कैटस, मेटापेनिअस डोबसोनी, मेटापेनिओप्सिस जाति और पैरापेनिओप्सिस जाति कर्कट, पेट्यूर्नस* जातियाँ, और शीर्षपाद, सीपिया जातियाँ और लोलिगो जाति हैं। अन्य वर्गों, में प्रियाकांतस हामरर, रेइनबो सारडीन, डसुमेरिया जाति, चपटी मछली, सिनोग्लोसस जातियाँ और *प्लेट्टोडस इरुमी*, इंडियन *वाइटिंग, सिल्लागो सिहामा, ड्रिफ्ट-फिशस, अरिओम्मा इंडिकस* और मोजारास, *जेरस* जातियाँ शामिल हैं।

प्रथम तीन तिमाहियों में सूत्रपख ब्रीम की पकड अधिक थी और चौथी तिमाही में कम भी। चौथी तिमाही में फीतामीन का अच्छा अवतरण पाया गया । इस प्रकार मुल्लन का अवतरण भी प्रथम तीन तिमाहियों में अधिक और चौथी तिमाही में कम था। कैरंजिड की पकड का प्रतिशत भी दूसरी और तीसरी तिमाहियों में बढ़ गया। तुम्बिलों की पकड दूसरी और तीसरी तिमाहियों में अधिक थी और झींगों का योगदान चौथी तिमाही में अधिकतम था। हाल के अध्ययनों से यह संकेत मिलता है कि ट्राल मात्स्यिकी में बुल्स आई *प्रियाकांतस* हामरर और ड्रिफ्टफिश अरिओम्मा इंडिकस का प्रतिशत यथाक्रम 13-19 और 4 है।

चिंगट एवं मछली ट्राल की तुलनात्मक पकड प्रवणता

अक्तूबर, 1989 से जून 1991 की अवधि के दौरान मछली और चिंगट ट्रालरों के प्रतिदिन की मछली पकड और चिंगट ट्रालरों के लंबे ट्रिप की मछली पकड का विश्लेषण किया गया। इससे यह व्यक्त हो गया कि वर्ष 1989-90के दौरान चिंगट ट्रालरों के मत्स्यन प्रयास में उल्लेखनीय उतार-चढ़ाव नहीं दिखाया पडा लेकिन वर्ष 1991 में उच्चतम पकड प्राप्त हुई और इन ट्रालरों की उत्पादन दर 23% थी।

प्रतिदिन औसत 30-35 एकको का परिचालन किया जाता है और इनमें से छोटे चिंगट ट्रालरों का अवतरण सबसे अधिक है, जो 52% है। वर्ष 1990 की दूसरी और तीसरी तिमाहियों में अधिकतम पकड और मत्स्यन प्रयास हुआ और चौथी तिमाही में इनमें घटती हुई।

वर्ष 1989 के दौरान मत्स्यन किए गए लगभग 28-35 एककों द्वारा चौथी तिमाही में कुल पकड के 25% का अवतरण हुआ। कुछ तिमाहियों में मत्स्यन प्रयास में हुए कुछ उतार-चढ़ाव के अतिरिक्त पकड और प्रयास में कहने लायक परिवर्तन नहीं हुआ।

विभिन्न प्रकार के ट्रालरों के वर्गवार अवतरण

अक्तूबर, 1989 से जून, 1991 के दौरान ट्रालरों द्वारा हुई उपास्थिमीनों की पकड कुल ट्राल उत्पादन का 69% था, जिसके बाद छोटे ट्रिप चिंगट ट्राल की पकड आई, जो 30% थी। छोटे ट्रिप चिंगट ट्रालों द्वारा हुआ सूत्रपख ब्रीम उत्पादन 53% था और मछली ट्राल और लंबे ट्रिप चिंगट ट्रालों द्वारा यह यथाक्रम 26% और 21% था। छोटे ट्रिप ट्रालों द्वारा मुल्लनों की भारी पकड हुई और ये छोटे ट्रिप ट्रालों द्वारा पकडी गई संपदाओं के प्रमुख वर्ग हैं।

छोटे ट्रिप चिंगट ट्रालों द्वारा फीतामीनों की अच्छी पकड हुई और अन्य दो प्रकार के गिअरों द्वारा इनकी कम पकड हुई। गोटफिश और तुम्बिल की पकड बराबर ही रह गई। छोटे ट्रिप मछली ट्रालों के अवतरण का प्रमुख वर्ग कैरंजिड है। छोटे ट्रिप चिंगट ट्रालों द्वारा हुआ झींगा उत्पादन 64% है और लंबे ट्रिप ट्राल द्वारा यह 28% है। छोटे ट्रिप चिंगट ट्रालों द्वारा 52% कर्कटों का उत्पादन हुआ। लंबे ट्रिप ट्राल भी बडी मात्रा में कर्कटों को पकड सके लेकिन इनका कम मूल्य और लाने की असुविधा के कारण इन्हें तट पर नहीं लाए गए। स्क्विड और कटल फिश के अवतरण का मुख्य गिअर है छोटे ट्रिप चिंगट ट्राल (64%) और लंबे ट्रिप चिंगट ट्राल इसके बाद आता है (34%) और मछली ट्राल से इनका कम (2%) अवतरण होता है।

अभ्युक्तियाँ

मद्रास के मात्स्यिकी विभाग द्वारा ट्रालिंग पर आयोजित अन्वेषणात्मक सर्वेक्षण से यह संकेत मिलता है कि मद्रास तट में ट्रालिंग के लिए अनुकूल धरातल वर्तमान सदी के आरंभ काल में विद्यमान था। फिर भी मद्रास क्षेत्र में इस शताब्दी के सातवाँ दशक के अंत में ही वाणिज्यिक ट्रालिंग शुरू हुआ और आठवाँ दशक से ट्रालिंग विदोहन का सक्रिय तरीका होने लगा।

नवीं दशक में मद्रास के सारे ट्रालरों द्वारा हुआ मछली उत्पादन 1,416 टन था। इस काल में मद्रास की ट्राल मात्स्यिकी की सबसे अधिक प्रगति हुई और तमिलनाडु के कुल मछली उत्पादन का 17% केवल मद्रास से ही प्राप्त हुआ। श्रीहरिकोटा-नेल्लूर तट में लंबे ट्रिप चिंगट ट्रालिंग परिचालन के शुरूआत के कारण वर्ष 1985-89 के दौरान का वार्षिक मछली उत्पादन पिछले वर्षों की अपेक्षा तिगुना अधिक था। अधिकांश झींगों को 15-30 मी की गहराई से छोटे ट्रिप चिंगट ट्रालरों द्वारा पकडा गया। लंबे ट्रिप चिंगट ट्राल द्वारा भी अच्छी झींगा पकड मिल गई। छोटे ट्रिप चिंगट ट्रालों द्वारा वाणिज्य प्रमुख मछलियों जैसे सूत्रपक्ष ब्रीम, फीतामीन, गोटफिश, बैराकुडा, मुल्लन और वाइट-बेट की बडे पैमाने की पकड हुई। अन्य ट्रालों द्वारा इन मछलियों की कम पकड हुई। तीसरी तिमाही में इन संपदाओं की अधिक पकड हुई।

श्रीहरिकोटा-नेल्लूर तट में परिचालित लंबे ट्रिप चिंगट ट्रालों की पकड दर मद्रास और निकटतम क्षेत्रों की अपेक्षा अधिक देखी गई। इसका कारण लंबे ट्रिप ट्रालों का अधिक प्रयास और मत्स्यन क्षमता है।

वर्तमान अध्ययन यह व्यक्त करते हैं कि मद्रास तथा निकटस्थ तटों की तलमज्जी और कवचप्राणी संपदाओं के उत्पादन बढ़ाने के लिए एकको का परिचालन और भी बढ़ाना आवश्यक है।

एर्नाकुलम के कन्डक्कडऊ में फस्ट लाइन एक्स्टनशन कार्यक्रम*

दरिद्रता निर्मार्जन को लक्ष्य करते हुये तकनोलजी का स्थानांतरण के ज़रिए देश में चार परियोजनाएं परिचालित की जा रही हैं। इन में प्रथम भारतीय कृषि अनुसंधान परिषद के अधीन आनेवाला फस्टलाइन एक्स्टनशन कार्यक्रम है। दूसरा व तीसरा संघ कृषि मंत्रालय का नाशनल एक्स्टनशन सिस्टम व रूरल डेवलपमेन्ट और चौथा गैर सरकारी संगठनों का विस्तार परियोजनाएं हैं। भारतीय कृषि अनुसंधान परिषद का फस्टलाइन एक्स्टन्शन कार्यक्रम तकनोलजी के स्थानांतरण को प्रवेगित करता है।

इस कार्यक्रम को प्रभावी रूप से कार्यान्वित करने को सी एम एफ आर आइ ने "एक तटीय ग्राम में योजनाबद्ध परिवर्तन-फस्ट लाइन एस्क्टनशन कार्यक्रम का एक नमूना" नामक एक विस्तार परियोजना आयोजित की। यह कार्य 1987 से 1990 तक सी एम एफ आर आइ की वैज्ञानिक श्रीमति जानसी गुप्ता के नेतृत्व में किया था। इस संस्थान की श्रीमति कृष्णा श्रीनाथ और के वी के व मात्स्यिकी अर्थशास्त्र व विस्तार प्रभाग के कर्मचारियों ने भी इस परियोजना में काम किये। विस्तार अभिकरणों और मछुओं को मात्स्यिकी तकनोलजी से लाभ उठवाने केलिए वृत्तिक मार्गदर्शन से सज्ज करना इस परियोजना का लक्ष्य था।

परियोजना कार्यान्वियन एर्नाकुलम जिला के कंडक्कडऊ पंचायत में किया था जहाँ की अबादी में मछुए प्रमुख थे। इनके समाज अर्थिक स्थितियों के सर्वेक्षण के बाद उपलब्ध संपदाओं का अनुकूलतम उपयोग उचित तकनोलजियों पर अवबोध लाने केलिए विस्तार शिक्षा, तकनोलजी के प्रयोग से आय कमाने की रीति आदि विषयों को आगे रखकर विस्तार कार्यक्रम चलाया गया। फील्ड वर्क शुरु करने से पहले ग्राम के निवासियों को मिलाकर एक बैठक आयोजित की और एक फिशरमेन फोरम की स्थापना की। इसके बाद फील्ड लेवल कार्यक्रम कार्यान्वित किये जो नीचे बताये गये हैं।

मछलियों से विविध उत्पादों का निर्माण

कम दामवाली मछलियों से अचार, कटलेट, वेफेर्स और शुष्क मछली तैयार करने के बारे में भाषण और निर्देशन दिया

गया। मत्स्यन कम होनेवाले महीनों पर झींगा बीज संकलन, झींगा खेती, उद्यान कृषि आदि करने केलिए प्रशिक्षण दिया। झींगा बीज संकलन पर दिया गया प्रशिक्षण लोगों के बीच बहुत रुचि पैदा की। झींगा संवर्धन पर आयोजित क्लास व नारक्कल के डेमोन्स्ट्रेशन फार्म दिखाने केलिये आयोजित फील्ड ट्रिप भी बहुत ही उपयोगी साबित की। पश्च जलों की जो छोटी नालियां अनुपयोगी पडी है। उन में झींगा संवर्धन करने केलिए दिया गया निर्देशन भी लोगों का उद्‌बोधन करने में पर्याप्त था। सी एम एफ आर आइ द्वारा विकसित लघु झींगा बीज स्फुटनशाला पर दिया गया निर्देशन सुनकर बहुत से लोग इस प्रकार की योजना के कार्यान्वियन केलिए आगे आये। विविध विकासात्मक अभिकरणों से मछुओं को मिलाने केलिए आयोजित कार्यक्रम और चर्चा में 75 मछुए सक्रिय रूप से भाग लिए। मात्स्यिकी अनुसंधान में होनेवाली विकास और तकनोलजी के स्थानांतरण केलिए सी एम एफ एफ आर आइ द्वारा किये जानेवाला कार्य समझाने केलिए एक सेमिनार आयोजित किया। आयोजित विस्तार कार्यक्रमों के असर समझाने केलिये किया गया अध्ययन ने व्यक्त किया कि मात्स्यिकी संबधी नई तकनोलजी समझाने में ये कार्यक्रम बहुत ही सफल हुये है और इसलिए ही इसे स्वीकार करने केलिए मछुओं को बडा तात्पर्य है।

*श्रीमती जान्सी गुप्ता और श्रीमती कृष्णा श्रीनाथ, वैज्ञानिक सी एम एफ आर आइ, कोची।

उत्तर तमिलनाडु के कूडल्लूर, पष्यार और कावेरिपट्टणम से तारली की भारी पकड*

हाल के वर्षों में तमिलनाडु के समुद्र से शोषित करनेवाली प्रमुख मात्स्यिकी संपदा है, *सारडिनेल्ला लोंगिसेप्स* जाति की भारतीय तारली। पिछले पाँच वर्षों के दौरान तारली की पकड में विचारणीय वृद्धि हुई है। वर्ष 1985 को यहाँ से मिली वार्षिक पकड 4,270 टन थी तो 1990 तक आते आते यह 37,751 टन हो गई। वर्ष 1990 के आँकडों के अनुसार कुल पकड का 11.8% तारली थी। पकड का अधिकांश भाग चेंगलपेट, साऊथ आरकोट जिला से प्राप्त हुआ था। रिपोर्टों के अनुसार तारली की पकड का प्रमुख भाग तमिलनाडु के उत्तरी जिलाओं से प्राप्त हुआ था। यह इस प्रांत के कुल तारली उत्पादन का 60% आंका गया है।

तारलियों को पकडने केलिए सब से अनुयोज्य जाल बैग-नेट (इडा-वलै) देखा गया था। इसके अतिरिक्त *कावाला वलै* और *तट्टकावाला वलै* का भी उपयोग यानों के ज़रिए किया था। कूडल्लूर और पष्यार के मात्स्यिकी बंदरगाहों में *इडा-वलै* के ज़रिए 1989-90 के दौरान भारी मात्रा में तारली की पकड हुई थी। मई-जून के दौरान 110-114 मि मी की तरुण तारली अधिक थी तो सितंबर में 165-169 मि मी की बडी तारली मिली थी। बाकी महीनों में मिली तारली 140-159 मि मी आकार की थी।

यद्यपि तारली अधिक मात्रा में यहाँ से पकडी गई तथापि मछुओं को इस से कम फायदा हुआ था क्योंकि तमिलनाडु में तारली पसंद की मीन न होने के कारण दाम बहुत कम मिला था। सिर्फ बडी तारलियों का विपणन बाहर के मार्केटों में किया था, बाकी फाक्टरीवालों को सुखाकर बेचा गया था।

*सी एम एफ आर आइ मद्रास अनुसंधान केन्द्र के पी. के. महादेवन पिल्लै सी एम एफ आर आइ कूडल्लूर क्षेत्र केन्द्र के एम. राघाकृष्णन और एम. मणिवासगम की रिपोर्ट

विशाखपट्टणम से हुक एंड लाइन द्वारा वैहू (Wahoo) *एकांतोसिबियम सोलंड्री* का प्राप्ति वृत्तान्त*

विशाखपट्टणम के लॉसन्स उपसागर से हुक एंड लाइन द्वारा एकांतोसिबियम सोलंड्री की पकड की पहली रिपोर्ट फरवरी, 1988 को मिली। इसके बाद और भी नमूनों को प्राप्त किया जिनमें से सबसे छोटे नमूने को लेकर इसकी विशेषता नोट कर ली गई है। इसकी लंबाई 99.5 से मी और भार 5.6 कि ग्रा था। इसके गणनीय और आकृतिमान लक्षण का निरीक्षण किया गया।

इस नमूने में लनीनिकस वंश के परजीव कॉपीपोड का उत्पीडन देखा गया। कॉपीपोड को प्रमुख रूप से अंसीय (Pectoral) भाग के पीछे अधरपार्श्व (Ventro lateral) भाग में देखा था। शरीर के अन्य भागों में भी इस परजीव का उत्पीडन था।

लॉसन्स उपसागर में सभी गिअरों द्वारा किए जानेवाले वार्षिक अवतरण का 22.5% सीर फिश है। इनमें *स्कोम्बेरोमारस गटेटस* और *एस. कमेर्सन* दो प्रमुख जातियाँ हैं। *एस. कोरिआनस* को हुक एंड लाइन द्वारा बहुत कम पकडा जाता है और एस. लिनिओलैटस अन्य गिअरों में विरल रूप से फंस जाता है। ए. सोलंड्री को परि-उष्णकटिबंधीय (Circum-tropical) समुद्र में प्रचुर मात्रा में दिखाई पडता है। राऊ ने 1960 में पसफिक महा समुद्र में वैहू का वितरण पाटर्न के बारे में उद्यतन विवरण प्रस्तुत किया था। अक्तूबर 1982 के दौरान कारवार तटों से भी इसकी उपस्थिति के बारे में दुलकड आदि ने रिपोर्ट की है। एक मध्य वेलापवर्ती महा समुद्रीय जाति होने पर भी ए. सोलंड्री को कहीं भी मात्स्यिकी में शामिल नहीं किया है। लेकिन कोल्लटे और नाअन (1983) ने रिपोर्ट की है कि पसफिक और अट्लान्टिक महासमुद्रों से वर्ष में 58-218 टन वैहू की पकड होती है। यह भी रिपोर्ट किया गया है कि लंबी डोर मात्स्यिकी में वैहू का अवतरण उप-पकड (by-catch) के रूप में होने पर भी पसफिक, अट्लांडिक और भारतीय महासमुद्र के उष्णकटिबंधीय और उपोष्ण जल में इसका वितरण अधिक रूप से दिखाया जाता है। अतः भूमध्यरेखीय इंडो-पसफिक समुद्र में यह जाति भारी रूप से फैली हुई है।

अक्तूबर-मार्च के दौरान आंध्रा के उत्तर तट, दक्षिण केरल और कर्नाटक तट में ए. सोलंड्री की उपस्थिति की रिपोर्ट की गई है। इस समय बंगाल उपसागर की ओर पृष्ठीय धारा (Surface current) अधिक है और इस धारा के साथ वैहू भी बंगाल उप सागर की ओर प्रवास करते हुए भारत के पूर्व और दक्षिण पश्चिम तटों में प्रवेश करता है।

*के. विजयकुमार और एस. चन्द्रशेखर, सी एम एफ आर आइ का विशाखपट्टणम अनुसंधान केंद्र

तमिलनाडु के नागपट्टिनम में धँसा गया स्पेर्म तिमि*

भारतीय महासमुद्र में स्पेर्म तिमि को अरेब्यन समुद्र के 20° N और 50° व 80° E के बीच केन्द्रीकृत देखा गया है। पर तिमि के सम्बंध में उपलब्ध रिपोर्ट उनकी उपस्थिति के बारे में नहीं बल्कि उनके धँस जाने के सम्बन्ध में है। हाल ही में तमिलनाडु के नागपट्टिनम से इस प्रकार की एक रिपोर्ट मिली है जिसके अनुसार 2 स्पेर्म तिमि यहाँ धँस गई हैं। दिसंबर 18 को नागपट्टिणम के मछुए एक अधमरा तिमि को तट पर घसीटकर लाए जिसकी 5 घंटे के बाद मृत्यु हुई।

बाह्य लक्षणों के अनुसार इसको बच्ची स्पेर्म तिमि पहचाना गया इसकी जाति थी फैसेटर *माक्रोसेफालस* लिन्सेस। लंबाई थी 3.71 मी और भार 700 कि ग्राम था। लंबाई के अनुसार इसकी आय 3 महीने अनुमानित की गई।

दूसरी तिमि को मरी स्थिति में 18 जनवरी को नागपट्टिनम के विषुतमवाडी से मिला। यह भी बच्ची स्पेर्म तिमि थी। लंबाई 9.7 मी और भार 5 टन था। इसकी अनुमानित आय थी 5 वर्ष। रिपोर्ट के अनुसार तिमियाँ धँसने का स्थान उत्तरी तट और समय नवंबर और दिसंबर के महीने हैं क्यों कि इस समय में उत्तर पूर्वी मन्सून और हवा के कारण समुद्र प्रक्षुब्ध रहता है।

*प्रतिवेदक : सी एम एफ आर आइ के मंडपम क्षेत्रीय केंद्र के पी. नम्मलवार, एस. कृष्णपिल्लै और एम. बदरुद्दीन, नागपट्टिनम फील्ड सेन्टर के श्री वी. तानापति, आर. सोमु और वी. शिवस्वामी।

आंध्रा तट के विशाखपट्टणम में धूसर रंग के किशोर स्पिन्नर डॉल्फिन *स्टेनेल्ला लौंगिरोस्ट्रिस* का अवतरण*

विशाखपट्टणम से 21 वीं अगस्त, 1991 को 40 मी की गहराई में गिलनेट का परिचालन करने पर अन्य मछलियों के साथ 70.5 से मी की कुल लंबाई वाले धूसर रंग की एक छोटी मादा स्पिन्नर डॉल्फिन *स्टेनेल्ला लौंगिरोस्ट्रिस* को फँसाया था।

यह नमूना काला धूसर रंग का था जिसका पृष्ठ (dorsal) भाग काले रंग का और अधर (ventral) भाग सफेद रंग का था। अरित्र (flipper) से आँख तक काले धूसर रंग की एक पट्टी भी थी। पहले रिपेर्ट के अनुसार इनके नवजात नमूनों की लंबाई लगभग 0.8 मी है। इस नमूने की लंबाई और छोटे दाँतें देखने पर ऐसे लगा कि यह नमूना नवजात है। यद्यपि वेरावल और मंडपम से छोटे स्पिन्नर डॉल्फिनों की उपस्थिति के बारे में रिपोर्ट मिली है तथापि भारतीय समुद्र से प्राप्त डाल्फिनों में यह सबसे छोटा है।

*सी एम एफ आर आइ विशाखपट्टणम अनुसंधान केंद्र के श्री सी. वी. शेषगिरि राव और के. नारायण राव द्वारा तैयार किया ब्योरा।

दक्षिण कन्नड के कोटा तट पर धँसा गया *बलिनोप्टीरा फैसालस**

तारीख 14.4.1991 को कोटा तट पर एक तिमिंगल का शव धँस गया। अखबार में वार्ता देखकर दो दिन के बाद जब लेखक इसको जाँच के लिए गया तब सारा मांस सडा हुआ देखा था। शव की लंबाई 35 फीट और चौडाई 10 फीट थी। हनु में देखा गया खँजा (groove) और कशेरूक में दिखाये गये कंटक (Spine) के आधार पर पहचान किया गया कि यह *बालियोप्टीरा फैसालस* है।

*सी. एम एफ आर आइ के मँगलूर अनुसंधान केंद्र के सी. पुरन्धरा और वामन नाइक द्वारा तैयार किया विवरण

टूटिकोरिन में हम्पबैक डॉल्फिन, *सूसा चैनेन्सिस* का अवतरण*

साधारण तौर पर भारत के तटों की नियमित मात्स्यिकी में डॉल्फिनों का अवतरण प्रमुख न होने पर भी ड्रिफ्ट गिल नेट, ट्रालर और कोष संपाशों द्वारा आकस्मिक रूप से इन्हें पकडा जाता है। पूर्व पसफिक क्षेत्र की तुलना में भारत के तटों में डॉल्फिनों का नाश कम दिखाया पडता है।

दिनांक 24-1-1991 को उत्तर टूटिकोरिन के एक अवतरण केंद्र में 227 से मी की कुल लंबाई और 85 कि ग्रा भार वाले एक डॉल्फिन का अवतरण हुआ। दोनों हनुओं (Jaws) के दाँतों की संख्या के आधार पर यह पहचान गया कि यह *सूसा चैनेन्सिस* जाति की मादा डॉल्फिन है।

इस डॉल्फिन को टूटिकोरिन में प्रचलित यंत्रीकृत वल्लम (आंतरिक इंजन लगाया गया बोट) द्वारा किए गए ड्रिफ्ट गिल नेट परिचालन से प्राप्त हुआ। हाल ही में डॉल्फिन का मांस कांटा-डोर (hook & line) मात्स्यिकी में चारा के रूप में उपयुक्त करने के कारण मछुए लोग इस डॉल्फिन को तट पर लाए और 68/- रु को नीलाम किया।

*सी एम एफ आर आइ के टूटिकोरिन अनुसंधान केंद्र के जी. अरुमुगम, एस. राजपाकियम और टि. एस. बालसुब्रमण्यन द्वारा तैयार की गई रिपोर्ट।

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