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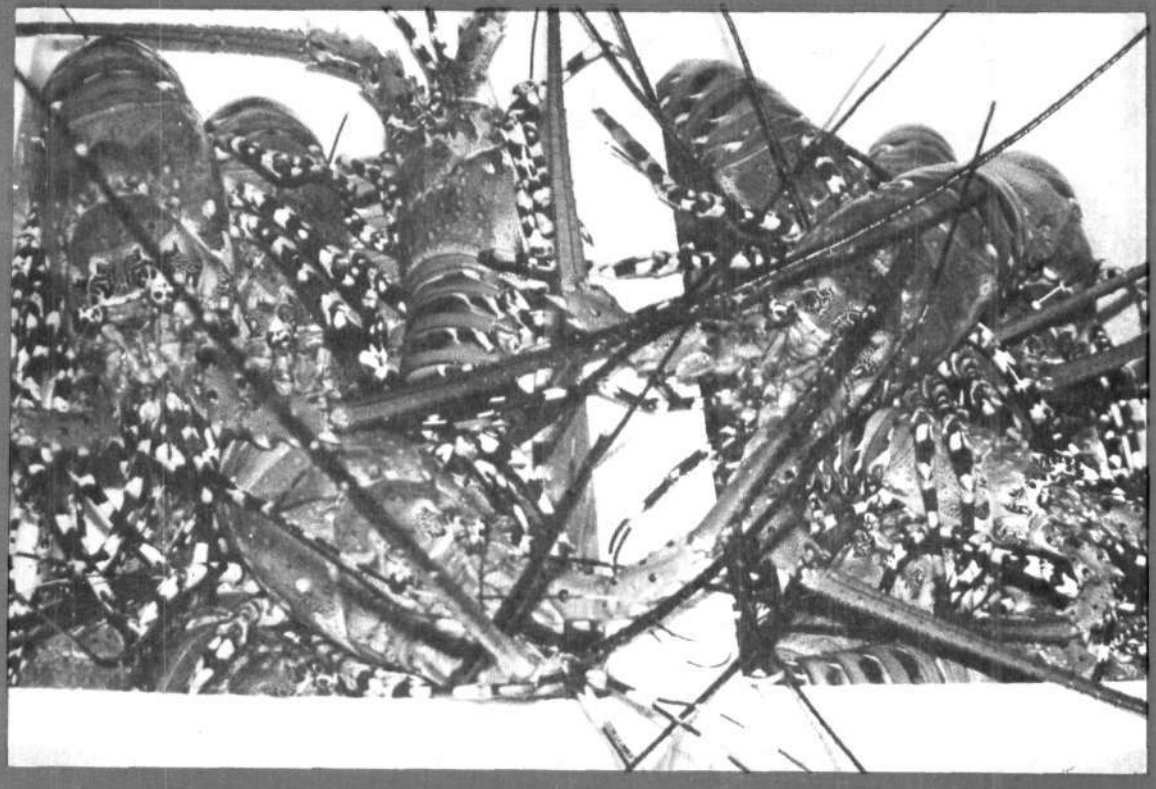

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SMALL—SCALE SHORE SEINE FISHERY AT TUTICORIN : 1987-'91

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Recent years have witnessed increased mechanisation of fishing methods all along the Indian coast. Particularly so along the Tuticorin coast in the Gulf of Mannar, where trawlers, motorised traditional crafts and out board engine fitted catamarans have eroded the use of traditional fishing methods. Important traditional fishing gears like *rampani* in Maharashtra and Karnataka, boat seines and shore seines in Tamil Nadu and Andhra Pradesh have become obsolete due to inroads made by mechanisation in the fishing industry. No doubt, this furious mechanisation has brought in good benefits to fishermen.

However, traditional methods of fishing also remain popular in small pockets all along the coasts. Modern trend in the traditional sector is to go for motorised fishing crafts. Shore seines are one of the shore based gears mainley operated from non-motorised plank built boats. Recently some shore seine boats are motorised to tow the boats with nets in order to save time of fishing operation. Small trawlers often fish so close to shore thereby reducing the catch of shore seine operations and hinder shoreward movement of shoals as well. Shore seines operated along the Tuticorin coast are fitted with bag like cod end and wings with large meshed coir netting that drive the fish into the cod end. A good illustration of shore seine is given by Rao 1973 (*Proc Sym. Living Resources of the seas around India Cochin*).

Large number of fish species like *Leiognathus* spp., *Stolephorus* spp., *Kowala coval*, *Hilsa toli*, *Thrissocles* spp., lesser sardines and carangids in addition to small quantities of other fish species, shrimps and crabs are caught by shore seines. The operation of shore seines support many families which depend on this fishery for sustenance and principal source of income for the boat owners.

Fishery

From 1987 to 1991 periodic observations were made at Tuticorin Harbour Point fishing centre where shore seines were operated. Number of shore seines operated varied from year to year depending on factors like favourable sea conditions and quantity of fish available in the catches. Annual average for five years from 1987 to 1991 came to 423 units of shore seines operated with lowest number of 197 units in 1991 and highest number of 571 units during 1990. Though on many days moderate to poor catches were reported, annual total catch by shore seines fluctuated between 161.2 tonnes during 1991 and 397 tonnes in 1990 (Table 1).

TABLE 1. *Effort (E), catch (C) in kg and catch/effort (C/E) in kg during 1987 - 1991*

Years	Effort	Catch	C/E
1987	395	204.0	516.4
1988	438	230.4	525.9
1989	516	297.4	576.3
1990	571	397.0	695.0
1991	197	161.2	818.2
Total	2117	1290.0	—
Annual average	423	258.0	609.0

Monthwise data on the fishery show that August, November and December were good months for shore seine operations (Table 2). Good quantities of *Stolephorus*, *Leiognathus* and *Kowala coval* were landed during August. Catches in November indicated good fishery for *Hilsa toli*, *Leiognathus*, *Kowala coval* and carangids. Good catches of *Kowala coval* and *Leiognathus* were recorded during December. Increased fishery for *Stolephorus* was reported during July.

Among the important groups leiognathids formed the major fishery in shore seines at Tuticorin (Table 3). Next in importance was *Stolephorus* supported mainly by *S. indicus* and in small measure by *S. devisi* and *S. bataviensis*. Bumper catch of *Stolephorus* was recorded during 1990 fishery season. White sardine *Kowala coval* was important during all years forming 14.9% in the total catch. *Hilsa toli* and *Thrissocles* formed good portion in catches. Small quantities of

TABLE 2. *Average month wise landings of important fish groups by shore seine at Tuticorin (in kg) during 1987-1991*

Fish groups	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total tonne	Rank
Kowala coval	892.2	391.6	1285.0	2992.6	3240.0	366.0	5285.0	5424.2	3372.2	1778.6	3380.4	10005.0	38.41	3
Lesser sardine	00	512.2	722.2	866.0	4602.0	198.0	220.0	71.6	123.0	1917.0	963.4	3794.0	13.98	6
Oil sardine	4158.0	00	00	00	00	00	00	00	00	00	1053.4	00	5.21	11
Stolephorus spp.	871.0	00	00	211.0	432.4	5218.0	13328.8	17905.2	4200.2	5263.4	1971.0	456.0	49.85	2
Hilsa toli	2273.2	1480.0	1724.4	741.0	3855.4	00	54.0	00	00	417.0	9576.0	1264.0	21.38	4
Thrissocles spp.	3032.6	1814.6	1302.0	1787.0	1777.6	716.0	1257.4	2880.6	239.0	1437.0	2012.0	1324.6	19.58	5
Sphyraena sp.	639.0	495.0	173.0	00	198.0	00	39.2	00	00	00	13.0	175.0	1.73	15
Carangids	554.4	544.0	318.8	379.8	545.0	180.6	547.0	1623.4	266.0	1788.8	3328.6	1602.0	11.67	7
Leiognathus spp.	3115.6	3034.0	1983.6	1999.8	2117.4	957.0	4617.8	8511.2	4308.2	8151.0	7262.0	8366.6	54.42	1
Sciaenids	308.0	336.0	210.0	00	160.0	00	00	185.4	28.8	72.0	1173.4	621.0	3.09	14
Mackerel	1842.0	92.0	128.0	00	902.0	58.2	00	00	00	435.0	2547.0	3309.0	9.31	9
Mullet	00	4.6	00	157.6	00	21.0	97.0	00	24.0	39.0	36.0	368.0	0.74	17
Otolithus sp.	1236.2	264.0	366.0	247.0	396.0	92.0	382.6	611.0	157.6	1179.0	1948.0	3652.0	10.53	8
Pellona sp.	458.0	560.0	186.0	40.0	00	115.0	120.0	424.2	76.8	112.4	635.4	1380.0	4.10	13
Pomfret	208.0	00	52.0	00	00	00	00	00	00	79.0	77.0	725.0	1.14	16
Prawns	264.0	48.0	246.2	10.2	17.8	48.0	31.2	52.4	59.2	4.8	56.2	110.6	0.94	18
Crabs	26.6	25.6	00	12.8	00	00	30.8	51.2	350.0	00	00	151.2	0.64	19
Other fish	102.2	129.6	252.2	241.6	263.8	88.0	880.2	1166.6	553.6	874.2	215.6	453.6	5.22	12
Miscellaneous	242.6	60.2	364.8	116.0	33.8	449.6	1013.4	1309.2	124.0	432.0	880.2	949.2	5.97	10
Total (in tonnes)	20.233	9.791	9.315	9.802	18.541	8.507	27.904	40.216	13.882	23.980	37.128	38.706	258.000	

shrimp species were recorded during all years with peak landings in January and March. By and large small and medium sized fishes were caught by shore seines. Large fishes were scanty and occurred in few numbers.

Seasonal fluctuations of different groups

Of the many groups of fishes normally occurring in shore seine fishery, seven groups were identified as predominant. They were *Leiognathus* spp., *Stolephorus* spp., *Kowala coval*,

TABLE 3. *Catch composition of important fish groups by shore seine at Tuticorin (in tonnes) during 1987 - 1991*

Fish groups	1987	1988	1989	1990	1991	Total	Average	Per cent	Rank
Kowala coval	50.6	46.0	11.8	35.8	47.9	192.1	38.4	14.9	3
Lesser sardine	4.1	3.6	36.9	20.7	4.6	69.9	14.0	5.4	6
Oil sardine	00	00	00	5.3	20.8	26.1	5.2	2.0	11
Stolephorus spp.	25.2	29.6	89.0	102.0	3.5	249.3	49.9	19.4	2
Hilsa toli	25.1	21.8	10.3	41.9	7.8	106.9	21.4	8.3	4
Thrissocles spp.	18.6	12.0	38.6	22.4	6.3	97.9	19.6	7.6	5
Sphyraena sp.	0.9	0.3	2.7	2.7	2.1	8.7	1.7	0.7	15
Carangids	3.7	15.1	16.6	15.9	7.1	58.4	11.7	4.5	7
Leiognathus spp.	39.5	58.8	57.9	83.4	32.6	272.2	54.5	21.1	1
Sciaenids	1.7	00	00	12.5	1.3	15.5	3.1	1.2	14
Mackerel	00	12.5	3.2	16.3	14.7	46.7	9.4	3.7	9
Mullet	0.5	00	0.6	2.1	0.5	3.7	0.7	0.3	17
Otolithus sp.	18.9	16.0	14.9	1.4	1.5	52.7	10.5	4.1	8
Pellona sp.	0.8	00	0.8	11.9	7.1	20.6	4.1	1.6	13
Pomfret	1.8	1.7	2.0	00	0.2	5.7	1.1	0.4	16
Prawns	0.3	1.3	1.39	0.8	0.4	4.7	0.9	0.3	18
Crabs	00	00	0.5	2.2	0.5	3.2	0.6	0.2	19
Other fish	5.5	1.6	3.5	14.1	1.1	25.8	5.2	2.0	12
Miscellaneous	6.8	10.1	6.2	5.6	1.2	29.9	6.0	2.3	10
Total	204.0	230.4	297.4	397.0	161.2	1290.0	258.0		

Fig. 1. Shore seine boat.

Hilsa toli, *Thrissocles* spp., lesser sardines and carangids. Their quantity varied during different months though, they were caught all round the year. Species of *Leiognathus* contributed over 21% in annual landings with *L. splendens* forming dominant role. August, October and December reported good fishery for *Leiognathus* spp. by shore seines. Low catches were recorded during March, April and June. Increased fishery for *Stolephorus* spp. was reported during 1989 and 1990 with heavy landings during July and August. Major portion of the fishery was supported by *S. indicus*. *Stolephorus* formed 19.4% in total fish catch of shore seines. Regular fishery for *Kowala coval* was noticed in shore seine catches forming 14.9% in total catch. Fairly good landings of *Kowala coval* was reported during 1987 and 1991 with fairly good catch during July, August and December. *Hilsa toli* supported the fishery with 8.3% mainly forming good fishery during November. Small and medium sized *Thrissocles* species contributed 7.6% in total landings with increased landings during January. Lesser sardines as a group contributed 5.4% and formed important landings during 1989 fishery. Mostly small sized *Sardinella dayi* and *S. gibbosa* were landed. Small and medium sized carangids formed 4.5% in total landings. *Caranx leptolepis* was one of the important species. November was important for carangid fishery.

Socio economic status

A survey was undertaken about the social and economic status of shore seine fishermen at Tuticorin Harbour Point. Most of the shore seine fishermen are poor because they totally depend on the fishery resources that come to the near shore for their livelihood. Good fishery bring cheer and good profit. If the fishery fails they borrow from boat owners who in turn borrow from fish traders and the poverty line seldom escapes. During good periods they work hard and get good returns for the money invested and pay back all borrowed money thereby able to continue shore seine operations. Bank loans are seldom resorted to for fear of default and penal action when fishery fails. Socio economic survey data is given below :-

1. Number of families : 73

2. Population :

	Male	Female	Total
adult	78	82	162
children	91	93	184

3. Main occupation : Fishing

4. Type and No. of house : Huts 107

5. Electricity : Not electrified

6. Education :

	Primary	Middle	Higher Secondary	College	Total
Male	12	5	none	none	17
Female	14	7	1	none	22

7. Income : Average monthly income of a family ranges from Rs. 400 to Rs. 700

8. Origin : Migrated from Vembar fishing village about fifty years back and have been operating shore seines at Harbour Point area

9. Catch share : No share in catch is given to fishermen, entire catch goes to the owner

10. Wages :

I daily wages;
a. For adult male Rs. 25 per day and 1 kg rice
b. For male boys Rs. 10 and 1/2 kg rice
c. For adult female Rs. 15 and 1/2 kg rice

II monthly wages : Rs. 600 to Rs. 700 per month without rice, whenever there is no fishing regular shore seine crew gets rice. Monthly wage earners are not eligible for this. For additional work like net mending, boat repairing Rs. 10 and 1 kg rice are given per day

11. Loan : State Bank of India has granted loan for three shore seine owners for procuring nets and accessories. Loans are repaid promptly

12. Marketing : 20 to 30% of catch comprising larger quality fish sold by auctioning on the spot. Remaining fish sent to fish traders who have given advances

13. a. Number of shore seines : 9

b. Number of motorised boats : 7

c. Cost of boat: Motorised : Rs. 60,000
Non-motorised : Rs. 40,000

d. Cost of net and accessories : Rs. 30,000

Fig. 2. Sorting the catch.

Fig. 3. Washing the net in progress.

Total cost of one shore seine unit of one motorised boat, one non-motorised boat, net and accessories Rs. 1,30,000.

Fig. 4. White pomfret - rare occurrence in Tuticorin.

Remarks

In the recent past innovations like motorised crafts and synthetic fibre nets have been introduced in the traditional fishery. Significant resurgence have not been made in the operation of shore seines. Many families depend on this gear for sustenance. It is as if living by archaic tradition is what makes the shore seine fishermen content though they earn hardly enough money to subsist. They do not go for costly investments, their only consolation is that they have contentment in the work and it pumps up their ego. present shore seine design is suitable for the substratum over which operated and no attempt has been made in improving designs to make them more efficient. With no alternative in sight shore seine operations will continue to dominate substantially to the socio economic well being of these people.