A PRELIMINARY ACCOUNT OF THE GILLNET FISHERY OFF VERAVAL DURING 1979-82

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ABSTRACT

In spite of an increase in the fishing effort, the total catch was almost same. The important components of the fishery were Elasmobranchs (26% in the total catch), Clupeids (25.8%), Pomfrets (11.1%), *Chirocentrus* spp. (8.8%), seer fish (7.6%), catfish (5.6%), tuna (3.2%), ribbonfish (3%) and Carangids (%). However, increasing trend was observed in the abundance of *Hilsa toli, Parastromateus niger, Chirocentrus dorab, Scomberomorus guttatus* and Carangids. Generally, the fishery was good in the beginning and at the end of every fishing season, i.e., September-October and May-June, respectively.

INTRODUCTION

The conventional gillnetting off Veraval had been with non-mechanised craft (Srivatsa 1954, Gokhale et al 1961) till 1953-54, when the mechanisation of the fishing craft was initiated. Except for the exploratory gillnet operations by M. L. Sagarvihari and M. L. Sagarkranti, (CMFRI, Annual Reports 1961-64), the information on the gillnet fishery off Saurashtra coast was very limited. Therefore, a study was initiated in 1979 to collect information, particularly on the catch and effort, on this important fishery of the region.

MATERIAL AND METHODS

Weekly observations were made, and, on each abservation day, data on effort, catch and species composition were collected from a minimum of 10% of the boats. The data were then raised to obtain the sampling day's effort, catch and species composition, and which were weighted to get the monthly figures. (The fishing holidays prevalent in the region such as 11th moon, newmoon and other festival days were excluded.) The fishing effort was standardised and the catch per unit effort was expressed as catch per standard unit of net.

CRAFT AND GEAR

Mainly two types of boats, dugout canoes and plank-built boats, were in use, Dugout canoes were mechanised with outboard engines of hp ranging from 6 to 9. Plank-built boats were fitted with inboard engines of 45 to 85 hp.

The canoes were manned by 3 persons: owner, tandel and a kalasi, and the plank-built boat by 7 men: owner, tandel and 5 kalasis. On an average, 140 boats were involved in active fishing, though there was migration of some boats to neighbouring ports every fishing season.

Commonly three types of gill nets with varying mesh size were in use *Kandari,* mainly a surface driftnet, with mesh size of 85-86 mm was used mainly for *Hilsa* spp and *Scomberomorus* spp., *Pakku jal,* with mesh size 140-155 mm, was the most common gear for pomfret and operated as surface or bottom drift gill net by addition or deletion of sinkers and floats. *Jada jal,* with mesh size 180-215 mm, was operated in summer months exclusively for sharks. The *Kandari* and *Pakku jal* were mainly made of nylon twines and the *Jada jal* of monofilament twines. The operations of *Kandari* and *Pakku jal* varied depending on the abundance of the species to be caught, and sometimes these two nets were used in combination. Of late, there was a tendency growingly to increase the height of these nets, and presently there were 50 meshes vertically.

The length of the head-rope of *Kandari* was about 18-20 m and height was approximately 3 m. The head-rope length of *Pakku jal* was 20 to 25 m and the height was about 5. The dugout canoes carried, on an average, 30 nets and the plank-built boats 6 nets. These nets, in an agreed-upon proportion, belonged to the defferent persons associated with the fishing, based on their functionary status. The boat owners had 20 and 40 nets in canoe and plank-built boat, respectively. Each tandel and Kalasi had 6 and 4 nets, respectively, irrespective of the kind of boat. The catch obtained in the net of each person belonged to himself and no wages were offered by the boat owner to anyone for operating nets, which was done though by the combined effort of all the crew. And the crew members did not contribute anything towards the maintenance and operation of the boats. The fishing season usually began in the first week of September, after the monsoon, and continued up to the first fortnight of June. However, fishing was carried out even during monsoon period if the sea was relatively calm. Mostly daily fishing was conducted.

FISHERY

The out-board-engined (OBM) gillnetters operated usually in a depth range of 20 to 30 m and the in-board-engined (IBM) gillnetters in 30 to 45 m. The average annual landings of these two fleets combined was 2976.4 t, in which the OBM fleet's contribution was 994.3 t and the IBM fleet's 1982.1 t. The annual catch per unit effort of OBM and IBM indicates that the pelagic resources were better in 30-45 m depth range (Table 1). There was a progressive increase in the effort and catch of OBM units. The effort by the IBM units increased only in the second season and, subsequently, in the third season, it had declined; but the catch progressively declined over the entire period. The

pelagic resource was good during the first season, but declined in the second season, and remained almost same in the third season (Table 1). The data on the monthwise effort, catch and CPUE for OBM and IBM fleets are shown in Fig. 1. In addition to displaying the general trend in the effort, catch and CPUE in each season, the figures show the proportionate variation in the effort input in accordance with the change in the CPUE. For instance, higher effort input by OBM units was recorded in February and May, 1981, and in May, 1982, when the CPUE was also good. Typically, the trend in effort input by IBM

TABLE 1. *Estimated annual and average effort (unit of net), catch (in tonnes), catch per unit effort (in kg.) of OBM and IBM gillnetters and estimated standard effort, total catch and standard C.P.U.E. of these units operated off Veraval during* 1979-82.

	OBM			IBM			STANDARD		
	Effort	Catch	CPUE	Effort	Catch	CPUE	Effort	Catch	CPUE
1979-80	226440	643.1	2.8	717750	2382.4	3.3	909881	3025.5	3.3
1980-81	396390	956.2	2.4	722832	1878.9	2.6	1088731	2835.1	2.6
1981-82	549540	1383.6	2.5	643632	1684.9	2.6	1172036	3058.5	2.6
Average	390790	994.3	2.54	694738	1982.1	2.85	1043203	2976.4	2.85

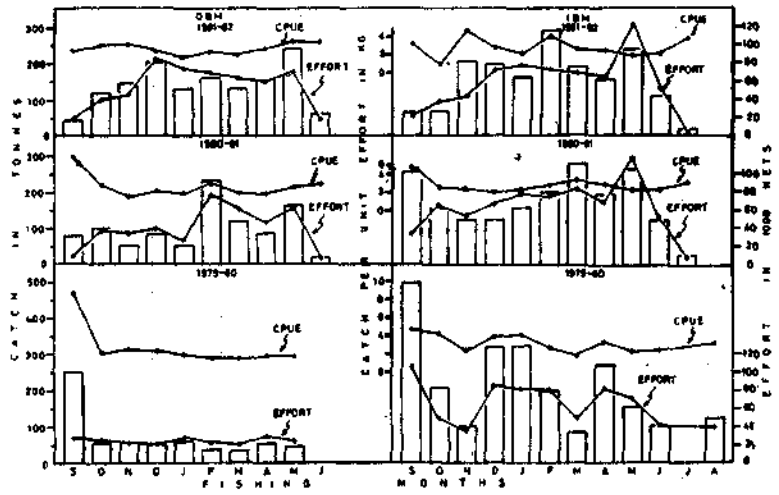

FIG. 1. Monthwise catch, effort and CPUE of OBM and IBM units during 1979-82.

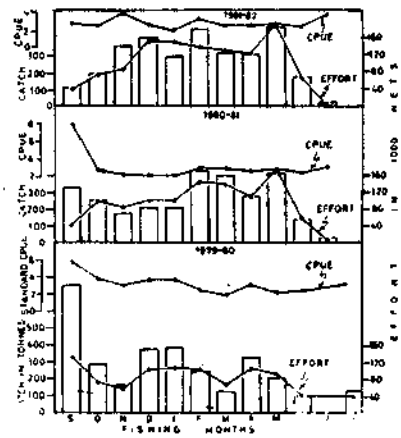

FIG. 2. Monthwise total catch, standard effort and standard catch per unit effort of gillnetters (OBM & IBM) during 1979-82.

units during 1979-80 was directly proportionate to the CPUE except in August, whereas the effort input by IBM units in May, 1981 and 1982, was negatively proportionate to the CPUE. The data on the total catch, standard effort and standard CPUE are given in Fig. 2. In general, the abundance of the pelagic resource was always good in the beginning (i.e., September-October) and end (i.e., May-June) of the fishing seasons.

Catch Composition

The percentages of the important items composing the gillnet catches are shown in Fig. 3, which shows that the elasmobranchs (26%), clupeids (25.8%), pomfret (11.1%), *Chirocentrus* spp (8.8%), seer fish (7.6%), catfish (5.6%), ribbonfish (3%) and carangids (3%) were dominant, particularly in 20-30 m depth range. Better landings by OBM were recorded generally in September, December, February and May, whereas the

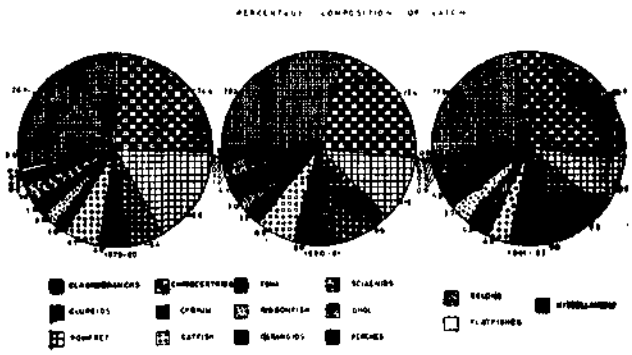

FIG. 3. Percentage composition of gillnet catch during 1978-82.

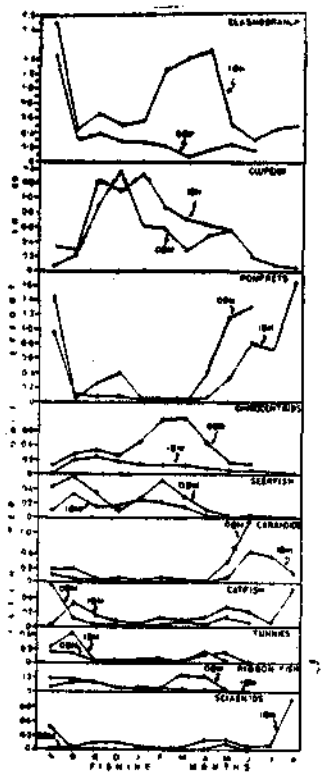

FIG. 4. Monthwise abundance of important groups, separately for OBM and IBM, during 1979-82.

landings by IBM units were better in September and Dcember to May. The elasmobranchs were more abundant in 30-45 m depth range in all the months, whereas the abundance of chirocentrids was better in shallow waters.

Elasmobranchs: The elasmobranchs comprised sharks *Scoliodon laticaudus, Rhizoprionodon acutus, Carcharhinus melanopetera, Sphyrna blochii, S. tudes, S. lewini,* rays *Nobula diabolus Aetobatus narinari, Trygon* spp and *Rhinoptera javanica* and skates *Rhynchobatus djeddensis*. Among sharks, the first two species occurred in all months but the bigger sharks only in the summer months. The peak period of abundance of sharks was in September and February to April (Fig. 4). On an average, 456 t of sharks, 235 t of rays and 83 t of skates were landed annually. Good abundance of rays was observed during September-December.

Clupeids: Annually, on an average, 748.5 t of clupeids were landed. *Hilsa toli* formed about 71%, *H. ilisha* 7% and *Ilisha filigera* 22% of the catch. Other clupeids landed were *Sardinella fimbriata, Dussumieri acuta* and *Engraulis* spp. Generally, a good abundance of clupeids was observed from November to May. (Fig. 4).

Pomfret: The catch of this choice item declined steadily from 482 t in 1979-80 to 284 t in 1981-82 mainly because of the decline in abundance of *Pampus argenteus*. However, there was an improvement in the landings of black pomfret, *Parastromateus niger*, owing to better abundance in subsequent seasons. A third species, *Pampus chinensis*, was observed to occur only occasionally. September, December, April-August were the months of abundance for pomfrets (Fig. 4).

Chirocentrids: Of the two species of chirocentrids, *Chirocentrus dorab* was the most common and *C. nudus* rare. The landings improved from 187 t in 1979-80 to 289 t in 1981-82. The chirocentrid catches were better from 20-30 m depth. Though this species was occurring throughout the fishing season, they were more available in October, November, January-April (Fig. 4).

Catfish: This group was constituted by several species such as *Tachysurus dussumieri, T. thalassinus, T. tenuispinis, T. caelatus, T. malabaricus. T. sona, Osteogeneiosus militaris* and *Plotosus anguillaris*. Among these, *T. dussumieri* contributed to about 73%. The catfish landings improved from 177 t in 1979-80 to 203 t in 1980-81 and, later, declined to 121 t. Catfishes were caught in abundance in September, October and May-August (Fig. 4).

Seer fish: The spotted seer, *Scomberomorus guttatus*, king seer, *S. commerson*, streaked seer, *S. lineolatus*, and *Acanthocybium solandri* constituted the group. The first species occurred in almost all the months, whereas king seer and streaked seer were highly seasonal. *A. solandri* was found to occur only rarely. The peak abundance of seer fish was observed in September-November and January-March (Fig. 4). The landing of seer fish improved from 143 t in 1979-80 to 268 t in 1981-82.

Tunnies: The tunas were: *Euthynnus affinis, Kishionella tonggol* and *Auxis thazard*. All the three species were highly seasonal. They used to appear in September, and, from November onwards, became sporadic till April-May (Fig. 4), when they showed a revival. The tuna landings were on the increase from 53 t in the first season to 132 t in the third season.

Carangids: The carangids were on the increase from 48 t in the first season to 167 t in the third season. Among the different species, *Megalaspis cordyla, Chorinemus lysan* and *Atropus atropus* were observed to be dominant in the catches. September-October and May-July appeared to be the peak period of their fishery (Fig. 4).

Ribbonfish: Ribbonfish, one of the important resources off Veraval (Sudhakara Rao and Kasim, 1985), was represented in the gillnet landings mainly by *Trichiurus lepturus, Lepturacanthus savala* and *Eupleurogrammus muticus* The ribbonfish landings declined from 78 t in 1979-80 to 58 t in 1980-81 and subsequently increased to 113 t in 1981-82. Better abundance of the group was noticed in September-November and March-April (Fig. 4).

Sciaenid: The sciaenids mainly comprised ghol, *Pseudosciaena diacanthus*, koth, *Otolithoides brunneus*, *Otolithus ruber*, *Nibea semiluctuosa*, and a few other species. The bigger sciaenids like ghol and koth were landed in fair quantity from 30-45 m depth by IBM units. On an average 10 t and 82 t of sciaenids were landed from 20-30 m and 30-45 m depth areas, respectively.

Perches: The common perches were: *Lutianus* spp, *Pomadasys hasta*, *Epinephelus* spp, *Serranus* spp, *Diagramma grisseum*, *Nemipterus japonicus*, *Argyrops spinifer* and *Therapon* spp. Mostly IBM gillnetters landed the perches, about 12 t, mainly from deeper waters, whereas the negligible perch landings by OBM gillnetters were from shallow waters.

Belonids: Annually 5.7 and 7.5 t of belonids were landed at Veraval by OBM and IBM gillnetters, respectively, and the common belone was *Belon melanostigama*.

The rest of the species such as *Lactarius lactarius*, *Psettodes erumei*, soles *Remora* spp. and *Rastrelliger kanagurta* are pooled under miscellaneous, which formed about 50 tonnes annually.

General Remarks

The catch composition shows that the drift gillnet fishery at Veraval is a multispecies fishery, mainly composed of *Hilsa toli*, *Ilisha filigera*, *Pampus argenteus*, *Parastromateus niger*, *Scomberomorus guttatus*, *Chirocentrus dorab*, *Scoliodon laticaudus*, *Rhizoprionodon acutus*, *Trichiurus lepturus* etc., The resource was good in 1979-80, but declined in 1980-81 and remained so during 1981-82. The higher catch rate in the beginning of the fishing season, i.e., during September-October was mainly due to better catches of elasmobranchs and pomfrets and in the end of the fishing season i.e., during May-June, it was due to better catches of pomfret, carangids and catfish.

It is also seen that *Chirocentrus dorab* and *Scomberomorus guttatus* are more abundant in the depth range 20-30 m, whereas elasmobranches, clupeids, catfish and sciaenids are more abundant in the 30-45 m. Some species, i.e., *Hilsa toli*, *Pampus argenteus*, *Scoliodon laticaudus Rhizoprionodon acutus* and *Chirocentrus dorab*, occur throughout the year, whereas *Parastromateus niger*, *Scombemorus guttatus* and tunnies are seasonal. An increasing trend was observed in the catch rate of *Hilsa toli*, *Parastromateus niger*, *Chirocentrus dorab*, carangids and *Scomberomorus guttatus*, whereas *Pampus argenteus*, sharks, rays and catfish registered a declining trend. Some of the fishes, viz. ribbonfish and perches, which were being landed in good quantities by trawlers (Sudhakara Rao and Kasim 1985), were poorly appearing in the gillnet catches.

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