



MARINE FISHERIES INFORMATION SERVICE

TECHNICAL AND
EXTENSION SERIES

No.37
April 1982

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE
COCHIN, INDIA

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

DRIFT GILL NET FISHERY OF THE DAKSHINA KANNADA COAST*

Introduction

With the advent of purse seine in 1975 in the Dakshina Kannada (Karnataka) the indigenous gears particularly *rampani*, *pattabale* and *chala-bale* used for shoaling fishes have almost become non functional. However, the drift gill net (*odubale*), which is employed for fishing bigger fishes, of late have assumed greater importance because of its economic viability. In fact in recent years a trend is set for fixing out-board and inboard engines to the existing canoes for harvesting fishes by employing gill nets. Perhaps this would be the forerunner for the development to take place particularly in the Dakshina Kannada and other areas. The drift net catches from Dakshina Kannada constituted about 3% of marine pelagic catches of Karnataka during 1979.

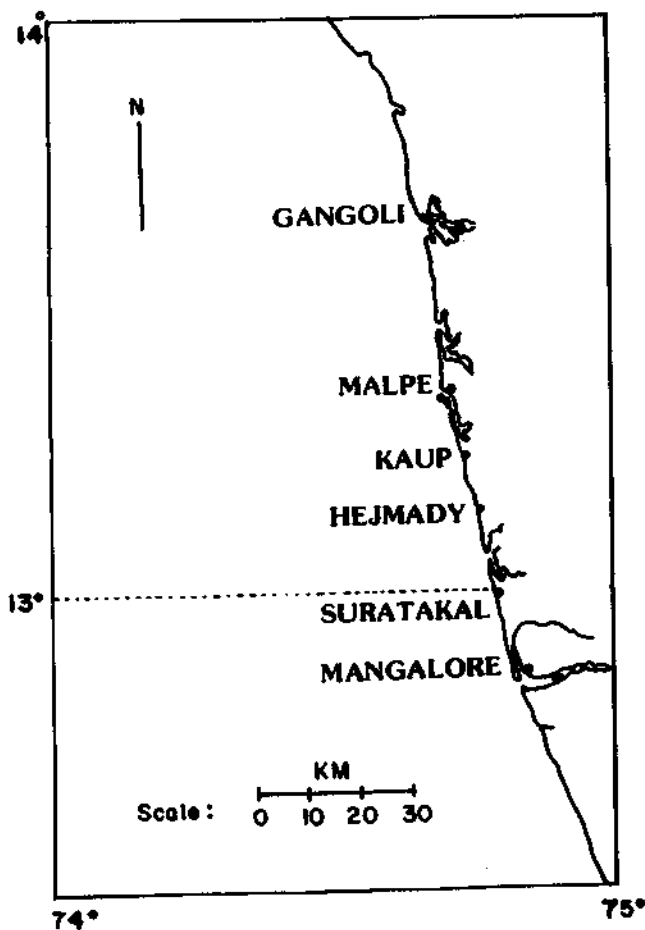


Fig. 1. Map showing drift gill net landing centres in South Kanara.

However, the interesting fact is that once the Dakshina Kannada fishermen could boast of their *odubale* catches. But with the gradual augmentation of trawler and purse seine fleets the local fishermen of this area no longer pursue fishing with this gear. With the result in recent years the fishermen of Kanyakumari and Vizhinjam (Trivandrum) area have made inroads to this region gradually by employing this gear off Dakshina Kannada area. Usually their arrivals commence in the Mangalore area (Mangalore, Suratkal, Hejmady, Kaupu, Malpe and Gangoli) (Fig. 1) with the close of the south west monsoon. These fishermen, who are experts and very hardy, extend their fishing activities till March/April. The strength of these immigrant fishermen varies from 1,200 to 1,300.

Craft and gear

Usually they hire, on contractual basis, the dug-out canoes (Thoni or Vallum) of 5-6 m length along with the drift gill nets from local fishermen. Besides, they also bring along with them a good number of mechanised vessels of 9.7 m length which afford them greater mobility in quest of better catches.

Generally the fishermen use a dull pink coloured nylon net with mesh size varying from 65 to 135 mm. The length of the net varies from 450 m to 700 m and height 6 to 7 m. However, the mechanised boats employ comparatively longer nets. The fishing operations are confined to 20-60 m depth zone. The concentration of gill nets are more at Kaup than at other centres probably because of better market demand and other facilities. At the close of the season these fishermen return the canoes to the local owners and shift their mechanised boats back to Kanyakumari-Vizhinjam. However, a few enterprising fishermen have permanently brought in their own canoes.

Fishery

Though the fishery is supported by several species the important groups among them are seer fish, elasmobranchs (especially sharks), cat fishes, tunas and bill fishes, mackerel and pomfrets (Fig. 2). Not uncommon are *Chirocentrus*

*Prepared by C. Muthiah

spp., black king-fish (*Rachycentron canadus*) and carangids.

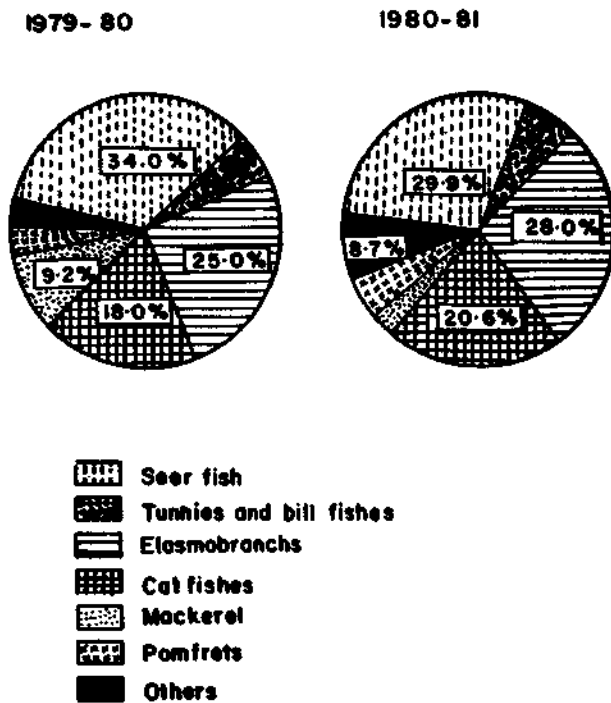


Fig. 2. Catch composition of fish landed by drift gill nets in South Kanara during 1979-80 and 1980-81.

The estimated monthly fish landings for the years 1979-80 and 1980-81 are given in Table 1 and the effort in Fig. 3. It is seen from the table that in the former year the catch amounted to about 2,072 tonnes, showing an increase of 38% during the next year. To certain extent it could be attributed to the extended fishing season by a month. However, the annual catch per unit effort of 90.4 kg in 1979-80 decreased to 80.4 kg in the next year (Fig. 4). The data presented on the Catch Per Unit effort (Fig. 4) and on the species composition (Table 2) of the mechanised and non-mechanised drift gill net units for the period of study show that there is little difference in the catch rates as well as in the relative abundance of different species in the catches by these two types of units.

Catch composition

Seer fish

The catches comprised of king seer, *Scomberomorus commerson*, spotted seer *S. guttatus* and streaked seer *S. lineolatus*. The first two species occurred in all months whereas the last one occurred in few numbers during December-April. *S. commerson* dominated the catches usually from September to December, of which the earlier months being more productive. This species alone formed about 69% of seer fish catches in both years whereas its contribution to the total

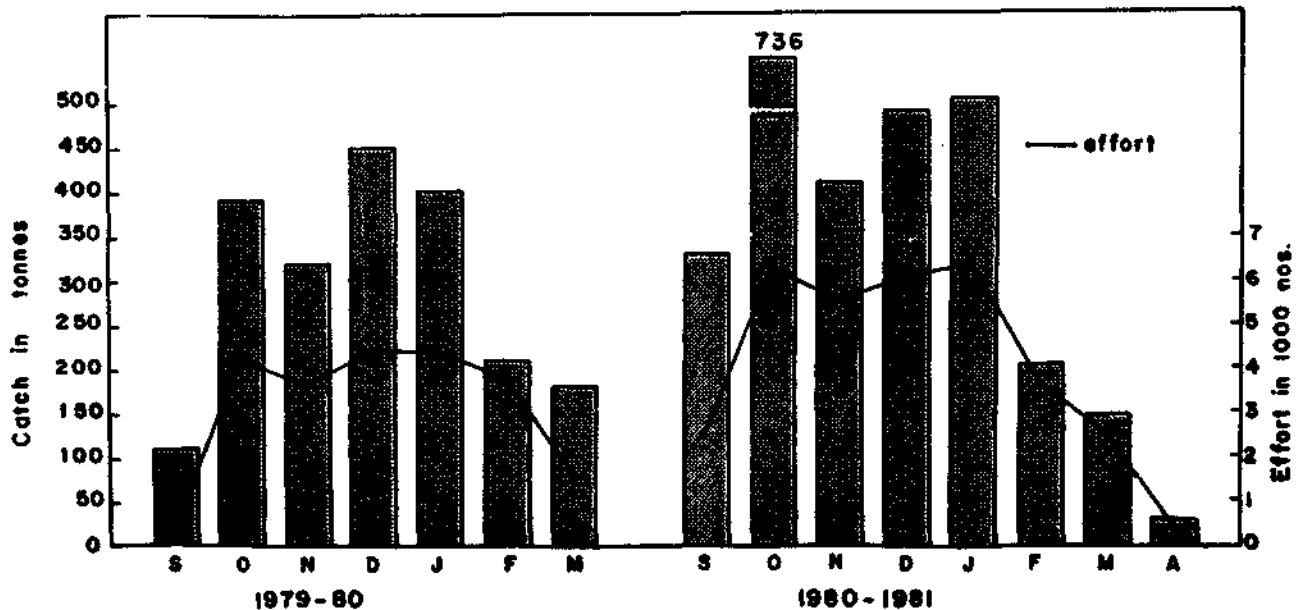


Fig. 3. Month-wise total catch and effort expended during 1979-80 and 1980-81.

Table 1. Estimated month-wise fish landings (in tonnes) by drift gill nets in Dakshina Kannada during 1979-80 & 1980-81.

Species	September		October		November		December		January		February		March		April		Total		Grand Total
	1979-80	80-81	79-80	80-81	79-80	80-81	79-80	80-81	79-80	80-81	79-80	80-81	79-80	80-81	79-80	80-81	79-80	80-81	
1. Seer fish	9.8	90.0	71.3	327.4	207.1	140.0	174.0	148.7	143.8	126.7	55.9	11.5	41.7	6.7		4.5	703.6	855.5	1,559.1
2. Tunnies	24.1	54.5	20.6	32.1	20.7	1.1	16.2	10.1	6.8	-	0.3	0.1	-	-	-	-	88.7	97.9	186.6
3. Bill fish	-	10.0	4.5	6.4	16.3	18.0	4.9	1.6	2.3	-	-	-	-	0.5		0.1	28.0	36.6	64.6
4. Elasmobranchs	29.3	97.8	88.7	160.1	28.2	109.1	183.6	65.6	67.8	126.9	47.7	127.5	74.1	107.9		7.2	519.4	802.1	1,321.5
5. Cat fishes	24.4	58.6	149.7	96.5	25.1	52.4	26.9	129.7	74.8	188.8	36.0	39.9	41.3	18.1	-	4.9	378.2	588.9	967.1
6. Pomfrets	-	4.9	48.6	41.0	4.4	29.6	5.2	42.8	7.8	13.0	4.0	12.7	0.7	3.4		0.3	70.7	147.7	218.4
7. Mackerel	25.0	0.4	4.5	7.8	11.7	0.7	18.3	42.8	65.5	13.9	45.6	0.1	19.5	5.4		11.8	190.1	82.9	273.0
8. Carangids	-	2.8	-	11.2	-	10.2	4.1	4.1	-	0.9	0.7	0.4	-	0.3		-	4.8	29.9	34.7
9. Chorinemus	-	0.4	-	8.9	-	4.1	0.3	1.2	20.7	5.0	-	-	-	-		0.1	21.0	19.7	40.7
10. Wolf herring	-	3.9	-	2.9	-	28.7	7.4	31.4	2.1	18.3	2.7	1.4	0.1	0.7		0.1	12.3	87.4	99.7
11. Oil sardine	-	2.9	-	0.2	-	-	-	-	-	-	-	-	-	-		-	-	3.1	3.1
12. Black King-fish	-	4.8	2.2	32.0	-	6.4	0.9	0.2	0.4	1.3	9.3	1.0	-	0.1		-	12.8	45.8	58.6
13. Perches	-	-	0.3	2.0	-	-	-	0.4	1.3	1.6	5.8	2.9	0.3	0.5		-	7.7	7.4	15.1
14. Miscellaneous	-	1.9	0.5	7.4	-	8.7	8.1	7.9	7.3	5.5	2.9	5.5	2.7	3.8		1.8	21.5	42.5	64.0
15. Mammals	-	-	3.0	-	7.3	0.2	-	2.0	-	2.5	-	1.5	-	-		-	10.3	6.2	16.5
16. Turtles	-	0.8	-	0.2	-	-	2.9	1.3	-	1.4	-	2.2	-	-		-	2.9	5.9	8.8
17. Crabs	-	-	-	-	-	-	-	-	-	-	-	0.8	-	1.4		0.1	-	2.3	2.3
Total	112.6	333.7	393.9	736.1	320.8	409.2	452.8	489.8	400.6	505.8	210.9	207.5	180.4	148.8	-	30.9	2,072.0	2,861.8	4,933.8

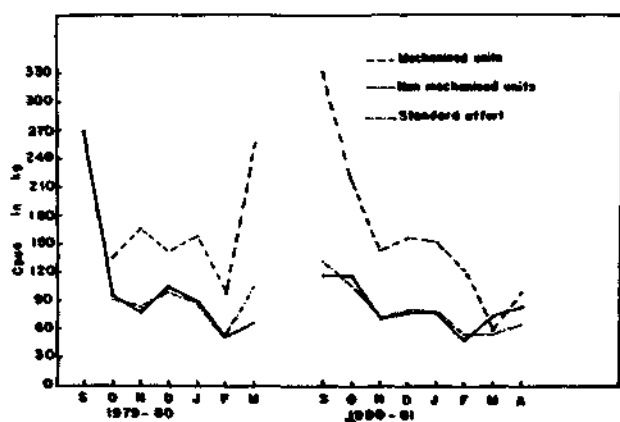


Fig. 4. Month-wise catch per unit effort by drift gill nets during 1979-80 and 1980-81.

gill net catches amounted to 23.4% and 20.5% during 1979-80 and 1980-81 respectively.

In case of spotted seer *S. guttatus* the productive months were October-December and its contribution in seer fish landings amounted to 10% and 9.3% during 1979-80 and 1980-81 respectively. Though the streaked seer *S. lineolatus* was observed in the catches its contribution to the fishery could be considered to be of little significance in view of its meagre catches.

Tunnies

This group formed a fair proportion in the gill net catches. The little tunny *Euthynnus affinis*, the northern bluefin *Thunnus tonggol*, frigate tuna *Auxis thazard*, the bullet tuna *Auxis rochei* together with the oriental bonito *Sarda orientalis* constituted about 4.3% and 3.4% of the total catch of fishes in 1979-80 and 1980-81 respectively. *E. affinis* usually starts appearing in the catches from September and becomes rarer by January. This fish contributed to the tuna catch as high as 92.5% in 1980-81, an increase of about 15.2% over the previous year. The occurrences of *T. tonggol* were rather erratic in nature and its contribution on an average for both years was about 9.4%. An interesting feature of the gill net fishery was the landings of frigate tuna, bullet tuna and oriental bonito, hitherto remained unexploited in the Dakshina Kannada. They collectively formed about 11.7% of the tuna catches in 1979-80, however, declining to 0.4% in the subsequent year.

Bill fishes

So far the potentiality of this resource remained unexploited because of lack of venture of fishermen to deeper waters. The sail fish *Istiophorus platypterus* and the black marlin *Makaira indica* each accounted about 31 tonnes. The catch of the

Table 2. Species composition of non-mechanised and mechanised gill net catch (in tonnes) in Dakshina Kannada for the years 1979-80 & 1980-81 (pooled)

Species	Non-mechanised units	%	Mechanised units	%	Total	%
1. Seer fish	1,051.5	33.31	507.6	28.56	1,559.1	31.60
2. Tunnies	133.4	4.22	53.2	3.00	186.6	3.78
3. Bill fish	50.9	1.61	13.7	0.77	64.6	1.31
4. Elasmobranchs	736.1	23.32	585.4	32.93	1,321.5	26.78
5. Cat fishes	584.8	18.53	382.3	21.51	967.1	19.60
6. Pomfrets	147.3	4.67	71.1	4.00	218.4	4.43
7. Mackerel	224.3	7.11	48.7	2.74	273.0	5.53
8. Carangids	26.5	0.84	8.2	0.46	34.7	0.70
9. Chorinemus	20.1	0.64	20.6	1.16	40.7	0.83
10. Wolf herring	69.7	2.21	30.0	1.69	99.7	2.02
11. Oil sardine	3.0	0.10	0.1	0.01	3.1	0.06
12. Black King-fish	37.1	1.18	21.5	1.21	58.6	1.19
13. Perches	5.1	0.16	10.0	0.56	15.1	0.31
14. Miscellaneous	46.7	1.48	17.3	0.97	64.0	1.30
15. Mammals	14.0	0.44	2.5	0.14	16.5	0.33
16. Turtles	4.1	0.13	4.7	0.26	8.8	0.18
17. Crabs	1.7	0.05	0.6	0.03	2.3	0.05
Total	3,156.3	100.00	1,777.5	100.00	4,933.8	100.00
No. of units	36,234		11,270		47,504	

latter species which amounted to 10.2 tonnes in 1979-80 showed almost a two fold increase during the subsequent year. Though these fishes occurred during the September-December period it could be said that November formed the most productive month for both species.

Elasmobranchs

The gill net catches invariably were dominated by *Scoliodon sorrakowa*, *Carcharinus limbatus* and *Sphyrna blochii*. Their total catch was as high as 802 tonnes in 1980-81, 35% over the previous year. Their importance could be gauged from the contribution of this group to the total catch which varied from 25% to 28% during the years of observation. Their share to elasmobranch catch was as high as 94% in 1979-80 and maintained the same tempo during the next season also. It is seen from Table 1 that the catches extended from October to March, the most productive month being December.

Cat fishes

This group was represented by *Arius thalassinus*, *A. dussumieri*, *A. serratus* and *A. tenuispinis*. The catch of about 378 tonnes in 1979-80 sharply increased by 29.2% during the subsequent year. They were caught almost throughout the season, however, the middle part of the season accounts for bulk of the catches.

Mackerel

It has to be said that gill net of mesh size 65-135 mm is not definitely meant for small species like mackerel. However, large sized mackerel were often caught and their landings amounted to 190 tonnes in 1979-80 which was almost 1/10 of the total catch of all fish (Table 1). However, the catch decreased by 50% during the next year. They were obtained mainly during December-February period.

Pomfrets

The most sought after fish both for financial returns and gourmet needs are the pomfrets. The catches consisted of the white pomfret, *Pampus argenteus* and black pomfret *Parastromateus niger*, totalling about 71 tonnes in 1979-80 and showing a two-fold rise during the succeeding year. Usually the black pomfrets are caught in good numbers during December-January whereas *P. argenteus* in October.

Carangids

Amongst the carangids the important species are the horse mackerel, *Megalaspis cordyla* and

Carangoides chrysophrys. Less important were *Chorinemus lysan*, *C. tol* and *Alectis indicus*. Their percentage contribution to the total catch varied from 1.3 to 1.7 during 1979-80 and 1980-81 respectively.

Wolf herring

Chirocentrus dorab and *C. nudus* were observed in the catches. Their catches amounted to 8.7 tonnes during 1979-80, showing an increase of 91% during the next year (Table 1). In both seasons high catches were recorded in December.

Oil sardine

Like mackerel, large-sized oil sardines were also occasionally caught. Their catch was 0.5 tonnes in 1979-80, increasing to 3.1 tonnes in 1980-81.

Black king-fish

Not infrequent was the occurrence of black king-fish (*Rachycentron canadus*). Its estimated catch amounted to about 13 tonnes during the first year, going up by 35% in the next year. In both seasons October appeared to be the productive month for this species.

Sciaenids

This group was represented by *Pseudosciaena diacanthus*, *Otolithes ruber* and *Johnius* spp. The first species dominated the catches in both years. The catch of 1.4 tonnes during 1979-80 increased to 12.5 tonnes in the next year.

Perches

A variety of species constituted this group, the most important in order of abundance being *Lutianus* spp., *Pomadasys hasta*, *Serranus* spp., *Pristipoma typhus*, *Nemipterus japonicus* and *Therapon theraps*. Their contribution however, to the total catch during both years never exceeded more than 1%. These are available in good numbers during the months of January-February.

Miscellaneous fishes

Fishes like *Belones*, *Sphyrna* spp., *Trichurus* spp., *Coryphaena* spp., *Megalops cyprinoides*, *Muraenesox talabonoides*, *Lates calcarifer*, *Lobotes surinamensis*, *Polynemids*, *Platycephalus* spp., *Echeneis naucrates*, *Saurida tumbil* and *Chanos chanos* collectively amounted to about 20 tonnes and 27 tonnes in the two years respectively. The first five categories of fish were found to be dominant and they were best obtained during November to January.

Dolphins and porpoises

These are mammals accidentally caught when moving in herds. Nevertheless their catches amounted to 10.3 and 6 tonnes during 1979-80 and 1980-81 respectively.

Turtles

The peak season for turtle appears to be December. A total of 2.9 tonnes were landed during 1979-80 and in the subsequent year the figure was 5.9 tonnes.

Crabs

About 2.3 tonnes of crabs comprising *Scylla serrata* were caught during January-April period of 1980-81 season.

Marketing and disposal

The fish catches are usually auctioned at the landing centre. For purposes of this study, the information was gathered at the landing centres during the auction time. During 1979-80 the price realised through the sales was Rs 4.5 million whereas in the next year it amounted to Rs 6.7 million (Fig. 5). During the first year seer fishes fetched Rs 1.67 million and it increased to Rs 2.04 million in the following year. Sharks and rays netted Rs 1.41 and 2.13 million in 1979-80 and 1980-81

respectively. Pomfrets fetched Rs 0.07 million in 1980-81 season.

While at Gangoli, Hejmady and Suratkal the fishes are auctioned, at Kaup (Plate 1), the wholesale merchants and fishermen offer mutual discussion through a commission agent agreed upon to fix prices for quality of fish. The prices fluctuate depending upon the quantum and quality of fish available. There is a severe competition among the traders to corner the catches. As such they lure the needy fishermen by making advance payments.

However, at Mangalore a different pattern is followed. To avoid the monopoly of few merchants cornering all the catches at the landing centre (Bunder), a new method has been devised. The catches are removed to the wholesale market in the city which helps the fishermen to get better returns for their hard labour.

Kaup is the biggest fish landing centre in the Dakshina Kannada as far as gill net catches are concerned. Naturally this has generated a lot of employment opportunities among the rural folks. As the landing place at Kaup is rather away from approach road the catches have to be transported by head-load for which purpose invariably women folks are engaged in view of their low wages. Nor-

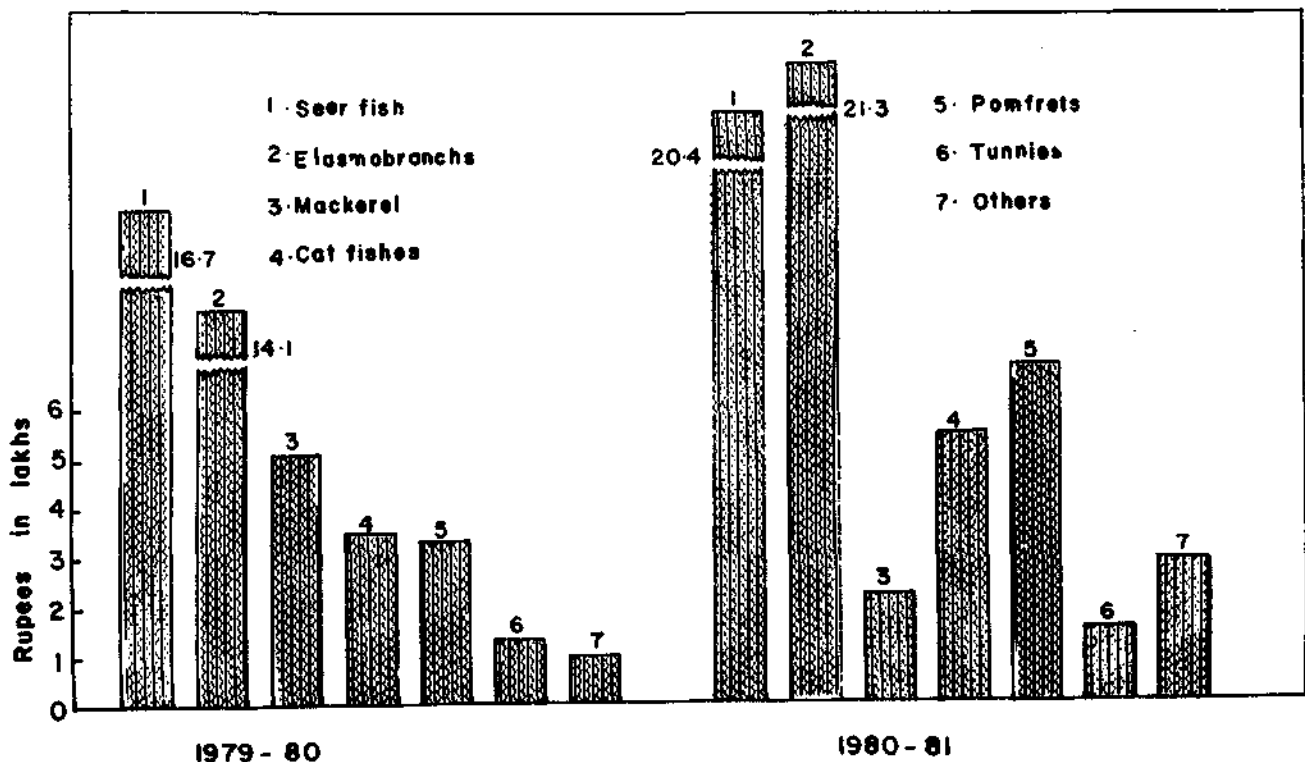
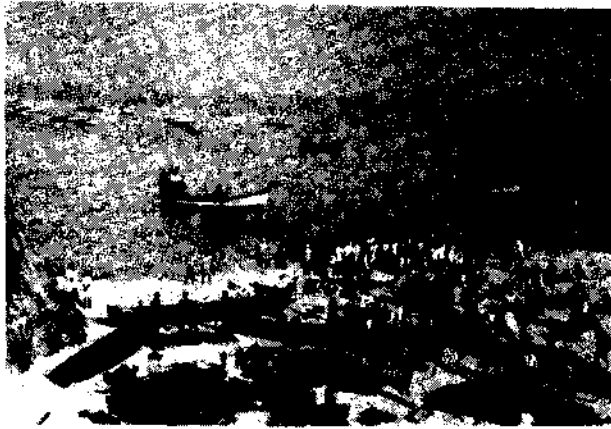


Fig. 5. Value of various fish landed during 1979-80 and 1980-81.



Photographs (Plate I) showing handling of different categories of fishes from the gill net landing centres in South Kanara.

mally half a rupee is paid for each trip for carrying the fish. It is estimated that on an average a women labourer earns about Rs 6-10 per day.

Usually cat fishes, sharks and bill fishes are salt cured. The quality fishes like seer, pomfret and black king-fish are packed in deal wood boxes with ice and transported by lorries to far off places like Bangalore and Madras. Tunas have no local market and as such they are sent to Kerala where there are ready markets for this fish. In spite of the escalation of freight rates by road, merchants churn out handsome profits. In other words, it amply proves how the middle men deprive the fisherfolk of their legitimate financial return for their catch. Hence to safe guard the interest of the toiling fishermen there is an imperative need of setting up of organised marketing agencies either by the Government or co-operative societies or fishermen unions.

General remarks

It is evident from the foregoing account that gill nets in Dakshina Kannada region are playing a

major role in the small scale fisheries sector even after the introduction of purse seines. Unlike purse seines the gill nets are presently operated during night, and often for larger and higher value species and hence there exists no competition between these two gears for exploiting the pelagic resources. Considering the present trend of fish catches and financial returns by gill nets it is felt that this class of artisanal fishing operations could be encouraged to substitute the presently idle indigeneous gears (rampani, shore seine, boat seine etc.). It is encouraging to note that action in this direction has been already taken by some local fishermen by deploying dugout canoes fitted with out-board engines in Dakshina Kannada for going out for drift gill netting. In view of these facts it may safely be stated that there exists a tremendous potential in coastal Karnataka for augumenting the gill net fishing for exploiting under exploited marine resources, thereby increasing fish yields and financial benefits to a large number of people engaged in the artisanal fishery.

