KALAVA FISHERIES OF PULLUVILA VILLAGE

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ABSTRACT

An account of the Kalava fishery of Pulluvila village, south of Trivandrum in Kerala State, during 1980 and 81 is given in this paper. Species composition of the catches, location of the fishing grounds, estimated catches during both the years and economics of the fishery are discussed.

INTRODUCTION

The fishermen of Pulluvila village (Latitude 8°20' 40"N. Longitude 77° 2' 5" E),situated about 25 km south of Trivandrum in Kerala, go for Kalava fishing during January to mid-April, a fair-weather season in the area. They go in northern direction to the Quilon area and return from the fishing grounds after 2-5 days. Kalava fishing is the main source of income to these fishermen during this season, as catches by other gears are generally poor. It is a well-organised and traditional fishery. In view of this an account of this fishery during 1980 and 1981 seasons is given here.

FISHERY

Plank-built boats, provided with sail, called 'Kalava Vallom,' are engaged in this fishery. Each boat is about 13 m long and 1.5 m wide. Eight to fifteen fishermen go in a boat at a time carrying food articles, and salt for preserving the fishes. About 50 such boats go for this fishery from this village.

The gear used traditionally is hook and line. Hooks of sizes 6 and 7, one to five on each line, are used up to 40 m depth, but after reaching deeper waters, single hook of size 5, which can catch bigger fishes, are used. Length of the line varies from 50-200 m, for which good quality nylon thread (monofilament) is used. One fisherman operates a single line during fishing and the number of lines in a boat depends on the number of fishermen engaged in a boat.

FISHING GROUNDS

The fishing grounds for this fishery lie 20 km south, 50 km north and 5 to 20 km off the Quilon coast. The fishing grounds are rocky, with stretches of

sand in between. The depth of the grounds ranges from 50 to 150 m, which are rich in snappers, rock cods, groupers, other perches, sharks and rays. The fishermen spend 30 to 40 h each way to and from these fishing grounds.

Fishing Operations

The season for this fishery starts every year in the first week of January and lasts up to end of April. Fishermen, while waiting for the 'Kalava' fishing season, get their boats repaired quite in advance. Fishermen from the nearby fishing village also are employed as crew in these boats.

The bait fish used during the period of investigations comprised of mainly lesser sardines, *Leiognathus* spp., *Decapterus russelli* and, sometimes, even young-ones of *Euthynnus affinis affinis*. They are purchased a day in advance from the gillnet catches and are preserved in salt. On their way to fishing grounds, some of the crew operate the hand lines and others row and steer the boat. But, after reaching fishing grounds, all the crew of the boat are fully engaged in fishing. Fishing usually continues during day and night except when fishermen take their food or rest for a while.

At the close of fishing for each day, the fish are split open along the back and the viscera are removed. After washing in seawater the split fish are stocked in layers, each being separated by a layer of salt.

Composition of Catches and Estimation of Yield

Composition of Catches: During both the seasons, altogether 25 species of perches belonging to four families occurred in the 'Kalava fishery.' Family Serranidae was represented by 14 species, while Lutjanidae and Lethrinidae were represented by seven and three species respectively. *Nemipterus delagoae* was the only species which was available among Nemitperids. The different species met with are listed below.

Family Lutjanidae:—

1. *Aprion* (Cuvier & Valenciennes)
2. *Aphareus* (Cuvier & Valenciennes)
3. *Lutjanus argentimaculatus* (Forskal)
4. *L. russelli* (Bleeker)
5. *L. fulviflamma* (Forskal)
6. *L. malabaricus* (Bloch & Schneider)
7. *L. gibbus* (Forskal)

Family Serranidae:—

1. *Epinephelus merra* (Bloch)
2. *E. boenack* (Bleeker)
3. *E. undulosus* (Q. G.)

4. *E. malabaricus* (Bleeker)
5. *E. areolatus* (Forskal)
6. *E. diacanthus* (Cuvier & Valenciennes)
7. *E. fasciatus* (Forskal)
8. *E. angularis* (Cuvier & Valenciennes)
9. *E. tauvina* (Forskal)
10. *E. maculatus* (Bleeker)
11. *E. argus* (Bloch & Schneider)
12. *E. grammicus* (Day)
13. *E. flavocaeruleus* (Lacepede)
14. *E. sonnerati* (Cuvier & Valenciennes)

Family Lethrinidae:—

1. *Lethrinus ornatus* (Valenciennes)
2. *L. lentjan* (Lacepede)
3. *L. nebulosus* (Forskal)

Family Nemipteridae:—

1. *Nemipterus delagoae*

Percentage composition of the different species: Lutjanidae formed 72.29% of the total perch catches, followed by Serranids (21.30%), Lethrinids (3.78%), Nemipterids (0.38%) and others (2.25%). During both the years *Aprion* spp. and *Aphareus* spp. (Family Lutjanidae) accounted for the bulk of the catches and contributed to 69.91% of the perch catches. It was not possible to identify these two genera up to species level due to practical difficulties. Although this fishery is traditionally known as Kalava fishery (Kalava in Malayalam generally refers to *Epinephelus* spp.) the catches in fact were dominated by species of *Aprion* and *Aphareus*. The next important species were *Epinephelus areolatus* and *E. diacanthus* which accounted for 6.55% and 4.75%, respectively, of the perch catches. Other species caught were *Epinephelus flavocaeruleus* (2.04%), *E. malabaricus* (1.98%), *E. merra* (1.56%), *E. angularis* (1.43%), *E. tauvina* (1.42%), *Lethrinus lentjan* (1.92%), *L. ornatus* and *Lutjanus russelli* (1.53%).

It is interesting to note that, although almost all the species of *Epinephelus* obtained by hook and line are also caught in trawls during the season, *Aprion* and *Aphareus* spp. are absent in trawl catches. Very little is known about the taxonomy and biology of these two groups of fishes which should receive the attention of the future investigators.

Dasyatis spp. formed about 2% of the total catches. *Echeniies naucrates, Rhina ancyclostoma* and *Saurida* spp. were the non-perches met with in the catches. Their contribution to the total catches was however negligible, yet occasionally they supported the fishery to a considerable extent.

Estimated Catch, Effort and Catch per Unit Effort

For estimating the effort, only the days when the boats were out at sea for Kalava fishing are taken as the period of a fishing trip and each 24-h period in it is reckoned as a fishing day for a boat. It is presumed that each boat was actively engaged in fishing when at sea. So the total number of days in a month the Kalava fishing boats were away from the Pullivila village for fishing formed the monthly effort. As and when boats were landed the total catch of each boat was recorded. The landings of all the boats of all the observation days in a month were added, which formed the estimated monthly total catch. This, when divided by a total estimated effort of the month, gave the catch per unit effort catch per boat|day for that month.

During 1980 season, 11,360.5 kg of perches were landed at Pulluvila out of which 6,340 kg were caught in January, 4,980 kg in February and only 40 kg in March. Next year, 6,277 kg of perches were landed of which 505 kg were caught in January, 4,562 kg in February and 1,210 kg in March (Table 1).

Fishing operations started from the first week of January during 1980 season. But next year, due to continuous bad weather conditions, fishing could start only from the fourth week of January and this affected the Kalava fishing considerably. Fishing effort during the 1980 season was 126.5 units in January, 145 in February and 7 in March. Next season it was 18 units in January, 138 in February and 39.5 in March.

Considerable variations in the monthly cpue were observed during the first season, it being 50.11 kg in January, 34.35 kg in February and 5.71 kg in March. But the next year the catch per unit effort did not show much variation, it being 28.10 kg in January, 33.10 kg in February and 30.62 kg in March.

Disposal of catches: As practised all along the coastal villages of Kerala, auction of the catches is made at the fish-landing site. Sometimes fishes are collected at the landing site by the merchants or their agents against the money they advanced to fishermen before going for fishing or even before the season. Kochupally being the nearest fish market, usually the catches are transported by headload and are disposed off in the market. As these fishes have good demand in the interior villages, the merchants sun-dry the catch and transport, mostly by bicycles, and sell them at good prices.

Sharing of catches: The fish caught are always shared between those who own the craft and gear and those take part in fishing operations. The former get a share of 20% of the catch and the latter divide the rest of the catch among themselves. When owner of the craft and gear also participates in fishing, he

TABLE 1. *Estimated monthwise catch, effort and catch per unit effort for perches for* 1980 *and* 1981 *seasons.*

	January			February			March			Total		
	E	C (kg)	C/E (kg)	E	C (kg)	C/E (kg)	E	C (kg)	C/E (kg)	E	C (kg)	C/E (kg)
1980	126.5	6340	50.11	145	4980.5	34.35	7	40	5.71	278.5	11,360.5	40.79
1981	18	505	28.10	138	4562	33.10	39.5	1210	30.62	195.5	6277	32.11
Total of the two seasons	144.5	6845	47.37	283	9542.5	33.72	46.5	1250	26.88	474	17,637.5	37.21

E = Effort, C= Catch and C/E = Catch per unit effort.

TABLE 2. *Gross income per boat per day during* 1980 *and* 1981 *at Pulluvila*

	January			February			March			Total		
	Total Units	Total Income (Rs.)	Income per Boat (Rs.)	Total Units	Total Income (Rs.)	Income per Boat (Rs.)	Total Units	Total Income (Rs.)	Income per Boat (Rs.)	Total Units	Total Income (Rs.)	Income per Boat (Rs.)
1980	126.5	31,700	251	145	24,902.5	172	7	200	29	278.5	56,802.5	203.95
1981	18	2525	140	138	22,810	165	39.5	6050	153	195.5	31,385	160.54
Average	144.5	34,275	237	283	47,710	169	46.5	6250	134	474	88,187.5	186

gets an additional share that is due to the crew. Thus after deducting the cost of bait fish, salt and food articles, as well as the share due to the boat-owner, share of the auctioneer, if he happened to be an outsider, and share to be given as donation to the local church, the proceeds of the auction are equally shared by all those who take part in fishing.

Price Trends and Income from the Kalava Fishery

Over the two seasons, a total of 17,637.5 kg of perches were landed at Pulluvila. Cost of the fish during these months ranged from Rs. 4|- per kg to Rs. 6|- per kg. Considering the average price of fish to be Rs. 5|- per kg, fishermen of Pulluvila village earned an amount of Rs. 88,187.5; out of the two seasons— Rs. 56,802.5 during 1980 and Rs. 31,385 during 1981. During 1980 Rs. 31,700 was earned in January, Rs. 24,902.5 in February and Rs. 200 in March. Next year, Rs. 2525 in January, Rs. 22,810 in February and Rs. 6050 in March.

Gross income per boat: About 50 boats are engaged in this fishery but only few of them go at a time for Kalava fishing. Gross income per boat per day was found to vary considerably during 1980 season, being Rs. 251 in January, Rs. 172 in February and Rs. 29 in March. But during next season it was Rs. 140 in January, Rs. 165 in February and Rs. 153 in March. Out of the two seasons the average gross income per boat per day was maximum in January being Rs. 337 while it was Rs. 169 in February and Rs. 134 in March (Table 2).

Discussion

Hornell (1961) pointed out the probable existence of good hook-and-line fishing grounds off the Travancore coast, and John (1948) mentioned that the sea off Anjengo and Chavara at 60-70 fathoms depth provides good perch-fishing grounds, which are not suitable for trawling because of rocky bottom. The existence of Kalava (*Epinepheluss* spp.) grounds in rocky coastal areas off Quilon, Varkala, Trivandrum, Poovar, Pulluvila etc., has been known for long to the fishermen of these coastal areas. Fishermen of Pulluvila have been fishing in these grounds for decades during Januray-April every year.

Mother-ship operations (towing a number of non-mechanised fishing boats to the fishing grounds by a mechanized boat) conducted by the Madras Government with two vessels, named Lady Nicholson and M. F. V. Gouhar Khaleeli, and three Tuticorin-type of boats during February-March 1949 in the Wadge Bank region (Chidambaram and Rajendran 1951) showed that 15 kg of fish per hand line per hour was available from these grounds. Of these 69% by weight consisted of *Epinephelus* spp., 9% *Lutjanus* spp., 11% *Aprion pristipoma* and the rest other fishes. *Epinephelus tauvina* constituted the single largest component being 55% of the catch.

Monther-ship hand-line operations by the Travancore University during January-April 1949 and January-March 1950 (Gopinath 1954), covering the region of Kayamkulam to Anjengo, revealed very good perch grounds in the area. The catches of their vessel CHANDRIKA (75 ft.) showed that 73% by weight of fishes caught on the line from the Kayamkulam-Anjengo stretch were Kalava, 15% *Lutjanus* spp., and 12% other fishes, consisting of sharks, *Anthias* and *Chronoleptis*.

Since 1957, Indo-Norwegian Project organised several trips for survey of the Kalava grounds off the Kerala coast. Their operations extended to almost all the rocky coastal areas lying in 73-110 metres depth zone from Trivandrum to Cannanore. In these grounds the trend of the catches showed that about 80% by numbers was composed of *Epinephelus chlorostigma*, 10% of *Aprion microlepis* and 10% of other *Epinephelus* spp., such as *E. areolatus*, *E. diacanthus* and *E. tauvina*.

But during 1980-81 Kalava fishing season at Pulluvila, the trend of the perch catches was different. Both the years' perch catches were dominated by the Lutjanids which formed about 72% of the total catches followed by Serranids 21.30%, Lethrinids 3.78%, and rest by other species. *Aprion* spp. and *Aphareus* spp. (Family Lutjanidae) accounted for about 70% of the total perch catches. *Epinephelus areolatus* (6.55%) and *E. diacanthus* (4.75%) were the two main species of *Epinephelus* which landed in all the months of both seasons. Although most of the *Epinephelus* spp. landed at Pulluvila were also caught in stray numbers by trawling during the season, *Aprion* spp. and *Aphareus* spp. were totally absent in trawl catches. Kuthalingam et al (1978) have given an account of mechanized trawl landings during August 1969-July 1971 at Neendakara, the nearest big fish-landing centre to Kalava fishing grounds. But they have not mentioned about the catches of *Aprion* spp. and *Aphareus* spp. during January-April period which confirms that these species are out of reach of trawl nets.

During 1980 season, fishing started from the first week of January and due to bad weather it was stopped abruptly in the middle of March. Next season, bad weather continued till the third week of January and Kalava fishing operations could start from the fourth week of January. Thus weather disturbed this fishery during both the seasons and because of this perch catches were poorer.

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