

Observations on Coastal Fishery of Okhamandal in Gujarat State

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The characteristics of coastal fishery of Okhamandal in Gujarat State are described. About 24000 fishermen, majority of them seasonal migrants from other places, produced on average of 36234 t of seafood every year valued at Rs. 44.6 crores. Over 1900 fishing vessels including trawlers and gill netters are seasonally in operation in this region. The landings consisted of crustaceans (12%), molluscs (2.7%) quality fish (29.4%), trash fish unsuitable for human consumption (45.4%) along with miscellaneous varieties. A capital investment of Rs. 72 crores and annual working capital of Rs. 25 crores were involved in the fishery. Infrastructural facilities for landing, berthing and dry docking of fishing vessels, storage, preservation and processing of catch, accommodation of fishermen, education of fisherchildren, medical care, sanitation were found to be inadequate whereas civic amenities like the municipal drinking water supply and electric power were absent. The fishery economy was controlled by about 250 merchants who contracted 70% of production by hypothecation against monetary advances to boat owners. The average net annual earnings of an owner hypothecating the catch to merchant ranged between 0.5 to 0.53 lakhs while the merchant earned between Rs. 0.3 to Rs. 0.4 lakh per boat. The majority of fisherfolk working as crew and shore labour (92%) earned annually between Rs. 0.12 to 0.24 lakhs in respect of crew and Rs. 0.05 to Rs. 0.03 in case of women and children doing shore labour.

Gujarat State has rich marine fishery potential. The state has 164180 km² of con-

tinental shelf along the 1260 km long coast line. The 50 m depth zone of the coast is

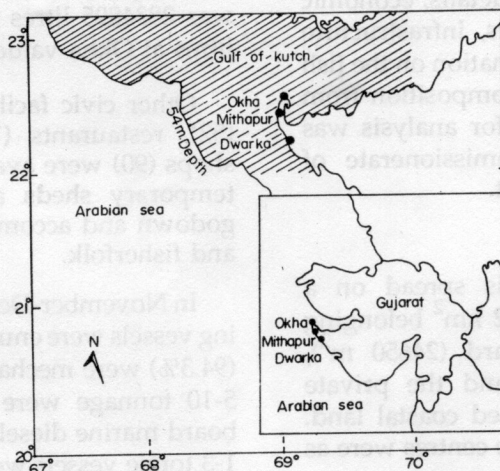


Fig.1. Inshore fishing area between 22-23° Lat. and 67-68° Long. fished by fishing vessels based at Okha and Dwaraka

extensively exploited by inshore fishing vessels. Available information indicate a standing stock of 2,23,540 tonnes of demersal fish in a surveyed area of 55726 km² (Joseph, 1974). Sivaprakasam (1986) has described the area off Okhamandal coast (22-23°N Lat. 68-70° E Long.) to be highly productive having remarkable catch rates of 526 kg/h in the 20-40 m depth zone and 422 kg/h in the 40-72 m depth zone (Fig.1).

Every year fishing vessels and fishermen migrate to Okhamandal and participate in an inshore fishery from August-September to April-May. Detailed investigations were undertaken during 1990 to survey the characteristics of the fishery. The results are reported and discussed in this paper.

Materials and Methods

There are two fish landing centres located 20 km apart, along this coast. They are Okha and Rupen (Dwaraka). The fishing vessels operating in the Gulf of Kutch land the catches at Okha and the fishing vessels operating along the Arabian sea land the catches at Rupen. Contact method was adopted to collect the data regarding fishing vessels, fishermen, catch details, economic status, operational aspects, infrastructure and trade practices. Information on the fish production and species composition from 1987-88 to 1989-90 used for analysis was obtained from the Commissionerate of Fisheries, Govt. of Gujarat.

Results and Discussion

The fishery activity is spread on a seashore area of about 1.2 km² belonging to Gujarat Maritime Board (24650 m²), Panchayats (24650 m²) and the private owners and also unclaimed coastal land. The main facilities at these centres were as in Table 1.

Facilities such as boat repair yards, engine service stations, dry docking, ice factory, cold storage, pulverising units,

Table 1. *Details of utilities at fishing centres*

Utilities	Area m ²		Total
	Rupen	Okha	
Fish landing (beach)	29070	-	29070
Fish auction	400	-	400
Shrimp peeling	333200	222200	545400
Godown/storage	7100	6400	13500
Fish drying	506070	1050	507120
Fisher huts	64780	3000	67780

fishmeal plants, or any other processing utilities were absent. Electric power supply, drinking water, medical attendance, permanent accommodation schools for children and adequate hygienic conditions were lacking.

There were 1372 conveyances of various types to transport men and materials, with a total capacity of 1352 tonnes operating in the fishery areas. Of this 627 conveyances were plying to Rupen and 745 conveyances plying to Okha.

Supply of diesel at subsidised rates for the fishing vessels was through the Gujarat Fisheries Development Corporation. The consumption of diesel at the two centres was 2834895 litres at Rupen and 7801425 litres at Okha valued at Rs. 3.96 crores.

Other civic facilities like the tea stalls (52), restaurants (10) and pan-cigarette shops (90) were available. There were 260 temporary sheds and shanties used as godown and accomodation for merchants and fisherfolk.

In November-December 1990, 1903 fishing vessels were enumerated, of which 1794 (94.3%) were mechanised. Large vessels of 5-10 tonnage were mechanised with in-board marine diesel engines and the small 1-3 tonne vessels were motorised with imported outboard motors. The fishing vessels had a length range of 6 to 15.5 m LOA. and the mechanised vessels were in the size range of 7.5 to 14.8 m LOA. The stern

trawlers had a length range of 12.8 to 14.6 m LOA. All vessels except the dugout canoes, were plank built type and fabricated in Gujarat boat building yards while the dugout canoes were built in Mangalore in Karnataka.

From 30 fishing centres of Indian coast 1431 fishing vessels migrated to Okhamandal in August at the onset of the season and returned at the end of the season in April-May as there are no facilities for drydocking and engine repairs etc. for all the vessels. Of them, 68 were from Maharashtra, 6 from Tamilnadu, 10 from Karnataka, 10 from Daman, 126 from Diu and the remaining 1211 belonged to 23 fishing centres located far and wide along the Gujarat coast.

The fishing vessels seen at Rupen and Okha were as below :

	Rupen	Okha
Trawler	80	700
Mechanised gillnetter	838	176
Non mechanised gillnetter	18	91
Total	936	967

The cost of the fishing vessels ranged from Rs. 1.5 to 4.5 lakhs in respect of mechanised gillnetter with inboard engine, Rs. 0.5 to 1.0 lakh in respect of the mechanised gillnetter with outboard motor and Rs. 4.0 to 6.0 lakh in case of trawlers. The non- mechanised boats cost between Rs. 0.5 to 2.5 lakh depending upon the size. The cost of nets per vessel was around Rs. 0.35 - 0.55 lakhs for trawlnets and 0.9 - 1.00 lakh for gillnets in case of mechanised vessel and Rs. 0.2 to 0.3 for gillnets in case of non-mechanised vessel.

In all 24000 fisherfolk were seen engaged in the fishery and 78.4% of them were migrants from other fishing centres of Gujarat and other states and Union Territories of India. At Rupen 5392 and at Okha 8220 active fishermen were enumerated. As

in the case of fishing vessels, Okha centre attracted more fishermen. Most of them migrated with boats and brought their families.

The literacy of the fisherfolk was very poor, 4% of men, 3.1% of women and 8% children only were literate. This illiteracy and the lack of a co-operative effort are factors contributing to their vulnerability to economic exploitation by merchants. Table 2 gives the employment profile of fisher community.

Inspite of owning and operating the boats themselves, the fishermen have given away this advantage to the merchants by

Table 2. *Employment profile of fisherfolk*

	Rupen	Okha	Total
<i>Men</i>			
Owning fishing vessel	936	967	1903
Not owning fishing vessel	6136	9320	15456
Working as deckhand	3852	6461	10313
Working on shore labour	1832	1967	3799
Engaged in other jobs	452	892	1344
<i>Women</i>			
Employed in shrimp peeling	419	311	730
Employed in fish drying	364	349	713
Engaged in other jobs	309	318	627
<i>Children</i>			
Employed as deckhand	546	200	846
Engaged in other jobs	1415	196	161

Table 3. Details of advances given under fishing contracts

Sl. No.	Item	Trawler	Mechanised gillnetter with inboard engine	Mechanised Gillnetter with outboard motor	Mechanised hook & line (Shark) vessel	Non-mechanised vessel
1.	Advance	Rs. 60000-80000/- with 1% interest on amount exceeding 40000/- (only for pomfret, quality prawns & lobster)	Rs. 40000-60000/- with 1% interest on amount exceeding 40000/- fish,	Rs. 15000-40000/- with 1% interest	Rs. 20000-60000/-	Rs. 5000-20000/-
2.	Fishing expenditure	Rs. 3000-6000/- (diesel), Rs. 500-1000 (ice) & Rs. 600-1000 (crew) (per trip)	As per fishing requirement	Rs. 3000-5000/- for entire season	As per fishing requirement (including for boat)	Rs. 200-1000/- per trip
3.	Occasional advance	Rs. 2000-7000/-	Rs. 2000-5000/-	Rs. 4000/-	Rs. 2000-5000	-
4.	Exceptionally good catch	Rs. 1000-10000/-	-	-	Rs. 1000-4000	-
5.	Miscellaneous expenses	-	Rs. 1000-5000/-	-	-	-
6.	Advance for purchase of fishing nets	-	Rs. 5000-20000/- with 1% interest	Rs. 5000- 10000/-	Rs. 5000/-	-
7.	Price of fish	Price as per Bombay, Indore, Delhi	1) Price as per Bombay Indore, Delhi rates 2) For fish from 9.8 to 14.6 m vessels fixed as per Satpati rate	Price as per Bombay, Indore, Delhi rates	-	Price as per Bombay, Indore, Delhi rates
8.	Prices of prawns a/cs	Once in 2 months as per Bombay Veraval rate	-	-	-	-
9.	Setting a/cs	-	-	Once every month	-	-
10.	Price variation	-	-	Price lower by Rs. 2-14 from Bombay bazar rate	-	-

accepting monetary advances against hypothecating the catches. Around 74.5% of the boat owners have their catches hypothecated to merchants. It was seen that 677 trawlers, 654 mechanised gillnetters and 91 non-mechanised vessels were contracted by 253 merchants who operated in the fishery area. Different types of contracts were entered into with the boat owners by the merchants (Table 3).

While 155 merchants contracted the boats with catch, gaining absolute control, another 98 merchants had contracted only

the catch. Like the fisherfolk, the majority (95.4%) of merchants migrated to this fishery area from elsewhere in Gujarat and even from Bombay and Mangalore in Karnataka. It was seen that 101 merchants acted as suppliers of raw material for freezing plants. It was also noticed that 135 of the merchants were dealing only in fresh fish, 9 of them in shrimp and lobsters and 118 of them in dry fish and trash fish, while 6 of them handled all seafood varieties.

A total investment of Rs. 7176 lakhs in fixed assets and Rs. 2522 lakhs in working

capital towards operational expenses was estimated and details are given in Table 4.

Table 4. *Investment in the Okhamandal fishery*

Investment details	Rs. in lakhs
<i>Fixed</i>	
1. Fishing Vessels	5379.75
2. Fishing nets	1392.25
3. Preservation & storage	42.00
4 Transport	350.00
5. Others	12.00
Sub total	7176.00
<i>Operating expenses</i>	
1. Mechanised gillnetter vessel	1064.70
2. Non-mechanised vessel	38.15
3. Trawler	1419.60
Sub total	2522.45

The operating expenses varied with the type of vessels. An average expenditure of Rs. 1.05 lakh per mechanised gillnetter, Rs. 0.35 lakhs per non-mechanised gillnetter and Rs. 1.82 lakhs per mechanised trawler was seen (Table 5).

The trawlers and mechanised gillnetters fish up to a depth of 50 m while the small

Table 5. *Details of annual operating expenses of fishing vessels*

Item	Mech. Gillnetter Rs.	Non-Mech Gillnetter Rs.	Trawler Rs.
Fuel	52480	12000	104160
Crew	12000	8000	24000
Ice	19200	-	32000
Engine/boat repairs	2500	1000	2500
Port dues	6656	6656	6656
Other operating expenses	500	500	500
Repayment of loans	5000	5000	5000
Owner's expenses	6500	4200	7000
Total	105036	34556	18201

fishing crafts operate within 20 m depth. The vessels operating from Rupen base, fish along the area of Arabian sea off Okha and Miyani and the vessels operating from Okha base fish in the Gulf of Kutch between Okha and Jhakhau. The trawlers and the larger mechanised gillnetters stay in the sea and fish for 5-7 days whereas smaller gillnetters operate on a 2-3 days fishing trip while the canoes do daily fishing cruises. The trawlers carry a crew of 7, the large gillnetters 5 and the canoes 2-3. Generally around 32 fishing trips were made by trawlers and larger gillnetters.

The seafood production during 1989-90 was estimated at 37691 tonnes. However, the average annual production for three years from 1987-88 to 1989-90 was 36234 tonnes valued at Rs. 4455 lakhs based on the boatside price of various varieties of catch (Table 6).

Table 6. *Details of the composition and estimated values of the seafood production in Okhamandal, 1989-88 to 1989-90*

Variety	Production (tonnes)	Per- cen- tage	Avg. boat side price Rs. in lakh per tonne	Esti- mated value (Rs. in lakh)
White pomfret	2163	5.97	0.40	865.20
Black pomfret	420	1.16	0.40	151.20
Threadfin	583	1.60	0.36	209.88
Jew fish (Ghol)	1221	3.37	0.20	244.20
Elasmobranchs	1556	4.30	0.06	93.36
Catfish	1820	5.02	0.06	109.20
Eel	658	1.82	0.08	52.64
Leather jacket	312	0.86	0.05	15.60
Spanish mackerel	964	2.66	0.15	144.60
Ribbonfish	763	2.10	0.02	15.26
Silver bar	724	2.00	0.03	21.72
Perch	225	0.62	0.06	13.50
Squid and cuttlefish	989	2.73	0.05	84.40
Prawns	4233	11.68	0.48	2031.84
Lobster	93	0.26	1.74	161.82
Other miscellaneous fish	5156	14.23	0.03	154.68
Trash catch	14354	39.62	0.006	86.12
Total	36234			4455.22

Table 7. *Fluctuations in the landings of major varieties in Rupen and Okha*

Variety	Estimated production (tonnes)								
	1987-88			1988-89			1989-90		
	Rupen	Okha	Total	Rupen	Okha	Total	Rupen	Okha	Total
White pomfret	830	1176	2006	1354	1083	2437	779	1266	2045
Black pomfret	362	121	483	279	99	378	254	146	400
Threadfin	960	2	962	151	105	256	389	141	530
Jewfish (Ghol)	594	365	959	525	960	1485	590	629	1219
Elasmobranchs	887	540	1427	705	276	981	894	1367	2261
Catfish	1061	871	1932	779	862	1641	792	1095	1887
Eel	69	131	200	826	395	1221	22	330	552
Leather jacket	299	139	438	104	114	218	110	170	280
Spanish mackerel	620	306	926	616	420	1036	559	370	929
Ribbonfish	249	204	453	191	6000	791	513	531	1044
Silver bar	437	243	680	260	152	812	325	356	681
Perch	399	76	475	29	45	74	888	37	125
Other misc. fish	1877	1949	3826	1899	4816	6715	1933	2994	4927
Trash catch	5913	7300	13213	5659	8568	14227	4873	10750	15623
Squid and cuttlefish	299	77	376	406	497	903	694	994	1688
Prawns	1559	2491	9050	1728	3528	5256	1081	2313	3394
Lobster	103	18	121	25	28	53	31	75	106
Total	16518	16009	35527	15536	22548	38048	14127	23564	37691

Centre-wise production for Okha and Rupen showed that the catch from the Gulf of Kutch which is the source of landings at Okha contributed on an average 57.3% of total landings in Okhamandal fishery, fluctuating between 49.2% in 1987-89 to 59.2% in 1988-89 and 62.5% in 1989-90. Detailed analysis showed that the bulk of the catch at Okha were from trawlers. The fluctuation of the main varieties of the seafood production during the three years are given in Table 7.

It was seen that the high value crustaceans recorded a decline at Okha from 15.5% in 1987-88 and 15.6% in 1988-89 to 9.8% in 1989-90. The molluscan group represented by squid and cuttle fish, however,

steadily increased from 0.5% to 2.12% to 9.8% in these consecutive years. The major component of the trawl catch, namely, the trash fish formed on the average 39.8% of the total landings. Okha centre contributed 71.8% of the prawn and shrimp landings of Okhamandal fishery establishing the greater distribution of crustaceans in the Gulf of Kutch. This attracted 89.7% of the trawlers participating in the Okhamandal fishery to Okha base only. Average catch/vessel was estimated to be 16.45 and 21.41 tonnes and its value Rs. 1.73 and 2.15 lakhs respectively for Rupen and Okha. The catch per vessel was found to be 30.15% more and the value of catch/vessel 24.2% more than Rupen, indicating a greater fishery productivity of the Gulf of Kutch.

The socio economic welfare of the fishermen depended entirely on their net annual earnings (Table 8). Since 74.5% of the catch was hypothecated to merchants, very little of the fish they caught was left to bargain for better prices. The average annual net earnings of fishermen owning and not

under contract was Rs. 0.68 lakhs, while the average earnings of vessel whose catch was hypothecated was Rs. 0.39 lakhs, lower by 74.4%. Detailed analysis showed this loss to be 54.7% in case of mechanised gillnetter which lands the prime exportable fish varieties in the area, whereas for the

Table 8. *Details of earnings of various categories of population involved in Okhamandal fishery. Annual earnings (Rs. in lakh)*

Sl.No.	Category	Gross earnings	Expenditure incidental to profession	Nett earnings
i.	Operating own boat			
	a) Trawler	2.86	1.82	1.04
	b) Mechanised gillnetter	1.87	1.05	0.82
	c) Non-mechanised vessel	0.22	0.05	0.17
ii.	Owner lending boat			
	a) Trawler	2.32	1.82	0.50
	b) Mechanised gillnetter	1.58	1.05	0.53
	c) Non-mechanised vessel	0.19	0.05	0.14
iii.	Boat Crew			
	a) Trawler	0.24	-	-
	b) Mechanised gillnetter	0.12	-	-
iv.	Shore labour			
	a) Woman	0.05	-	-
	b) Children	0.03	-	-
v.	Merchant			
	a) Contracting trawler	2.73	2.32	0.41
	b) Contracting mechanised gillnetter	1.87	1.58	0.29
	c) Contracting non-mechanised vessel	0.22	0.19	0.03
	d) Dry fish trade	13.00	-	-
	e) Fresh fish trade	8.60	-	-
vi.	Others			
	a) Restaurant owner	0.30	-	-
	b) Teastall owner	0.25	-	-
	c) Grocery vendor	0.60	-	-
	d) Vegetable vendor	0.20	-	-
	e) Miscellaneous trader	0.10	-	-
vii.	Gujarat State Government			
	a) Maritime Board	3.97	-	-
	b) Fisheries Department	0.13	-	-

trawlers landing the most sought after prawns and lobsters, the loss was 108%. The 1418 vessels under contract earned an estimated Rs. 553 lakhs/year and the 253 merchants who advance loans for all reasons and occasions and manipulate the prices to their advantage, keeping the marketing of the fishery products under their control, earned Rs. 340 lakhs.

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