

Fishing gears and crafts operated along the Chorward coast, Maliya (hatina), Gujarat along the west coast of India

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ABSTRACT

Rapid development of fishing technology in India during the recent years has paved the way for increased production availability of new synthetic materials, evolution of new designs of fishing crafts and gears and avoidance of ignorant harmful fishing techniques etc. In the state of Gujarat, there are about 7,819 OBM gillnetters in operation in out of these 4,524 OBM gillnetters are active in Junagadh district. Among these, total 1,144 OBM gillnetters are in active fishing in Veraval. The Chorward village is about 25 km far away from the main fishing port of Taulakha place, where the present study was carried out from February 2012 to April 2013.

Key words : Fishing gears, fishing technology, craft

The term 'gillnetting' denotes catching of fish by gilling. Gillnetting is a highly selective fishing gear. It is one of the most suitable fish catching method from conservation and stock regulation point of view because of its selective fishing nature. Gill net is a long wall of webbing kept suspended in water by means of floats on the head rope and sinkers on the foot rope, in which the fish is trapped by its gills or is wedged when it tries to swim through (Markad, 2004). Selectivity of fishing gear is an important tool for effective management of fisheries (Thomas *et al.*, 2002). The importance of selecting the optimum mesh size from the standard point of conservation of resources has been stressed by several investigators. Gujarat is a frontline maritime state of India located in the extreme west of the country (20.1° to 24.7° North and 68.4° to 74.4° East). Gujarat with about 20% (1600 km) of the country's coastline, 33% of the continental shelf area (1,64,000 km²) and over 2,00,000 km² of EEZ ranks first among the maritime states in marine capture fish production. Saurashtra peninsula is the major fishing area of the state. It consists of seven districts namely Amreli,

Bhavnagar, Jamnagar, Surendranagar, Junagadh, Rajkot and Porbandar. Saurashtra region occupies about 50 percent of state's coastline, and accounts for more than 70 percent of fish production of Gujarat state. There are 200 FRP canoes, in the Chorward village, out of which only 150 are active in fishing. Most of the population of this village depend upon fishing activities as the main source of occupation (Anonymus, 2012). The fisherman of Chorward operates only gill nets during the whole year. The details of District wise mechanized and non-mechanised boats of Gujarat state are in Table 1.

MATERIALS AND METHODS

As per the Marine Fishing Regulation Act of Gujarat 2003, the fishing activities remains closed from 10th June to 15th August, due to monsoon and also rough condition of sea. Due to this bad weather, fishermen find it very difficult to navigate their vessels in the monsoon month, so all the fishing activities remain closed. Therefore, barring above described period, data was collected from 1st February 2012 to 30th April 2013. In every week, one day was fixed for sampling i.e. total 30 vessels were taken in to consideration. Periodical purposive random sampling was done to

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Table 1 District wise mechanized and non-mechanised boats of Gujarat state (Anon, 2012)

Sr. No.	District	Trawler	Gill netter	FRP IBM	FRP OBM	Wooden OBM	Dol netters/ Others	Total Mechanized	Mechanized %	Total Non-Mechanized	N.M.%	Total Boats	Percentage
1	VALSAD	550	908	364	0	0	779	2601	11.32	563	4.63	3164	9.00
2	NAVSARI	250	0	125	0	0	319	694	3.02	378	3.11	1072	3.05
3	DANG	0	0	0	0	0	0	0	0.00	0	0.00	0	0.00
4	SURAT	0	10	127	12	0	0	149	0.65	870	7.15	1019	2.90
5	TAPI	0	0	0	0	0	0	0	0.00	2327	19.13	2327	6.62
5	BHARUCH	0	250	422	0	0	0	672	2.92	940	7.73	1612	4.59
6	ANAND	0	0	0	0	0	0	0	0.00	168	1.38	168	0.48
7	KHEDA	0	0	0	0	0	0	0	0.00	40	0.33	40	0.11
8	VADODARA	0	0	4	3	28	0	35	0.15	495	4.07	530	1.51
9	NARMADA	0	0	0	4	0	0	4	0.02	394	3.24	398	1.13
10	PANCHMAHAL	0	0	0	0	1	0	1	0.00	2145	17.63	2146	6.11
11	DAHOD	0	0	0	0	0	0	0	0.00	539	4.43	541	1.54
12	AHMEDABAD	0	0	0	0	0	0	0	0.00	359	2.95	359	1.02
13	GANDHINAGAR	0	0	0	0	0	0	0	0.00	0	0.00	0	0.00
14	SABARKANTHA	0	0	0	0	0	0	0	0.00	509	4.18	509	1.45
15	BANASKANTHA	0	0	0	0	0	0	0	0.00	154	1.27	154	0.44
16	MEHSANAA	0	0	0	0	0	0	0	0.00	0	0.00	0	0.00
17	PATAN	0	0	0	0	0	0	0	0.00	1	0.01	1	0.00
18	RAJKOT	0	0	88	0	0	0	88	0.38	861	7.08	949	2.70
19	KUTCHCH	12	230	850	1	25	173	1291	5.62	162	1.33	1453	4.13
20	JAMNAGAR	216	402	625	985	5	0	2233	9.71	385	3.17	2618	7.45
21	SURENDRANAGAR	0	0	0	0	0	0	0	0.00	464	3.81	464	1.32
22	BHAVNAGAR	0	0	206	0	0	0	206	0.90	20	0.16	226	0.64
23	PORBANDHAR	2313	115	16	2288	0	0	4732	20.59	133	1.09	4865	13.84
24	JUNAGADH	4078	122	332	4524	24	574	9654	42.00	257	2.11	9911	28.20
25	AMRELI	0	30	16	21	0	573	624	2.71	0	0.00	624	1.78
	TOTAL	7419	2067	3180	7819	83	2418	22986	100.00	12164	100	35150	100.00

Source : Anonymous, 2012

collect the required data. The collected data were analyzed as per the standard statistical methods (Snedecor and Cochran, 1967).

RESULTS AND DISCUSSION

Fishing operation

Actual fishing time varies from time to time and season to season, depending on various factors like climate, season and the availability of the fish. In the present study, it was observed that the fishermen of the Chorward coast started fishing at evening time i.e. 4 pm and reported back to the coast next day at 4-5 am early in the morning. Gillnetters which went for fishing at 5 am early in the morning reported back to coast 5 pm in the evening time. Gillnetting was done in the depth range of 20-50 m. Normally two crew members were going for fishing operation, except the owner. The fishing operation was carried out for 6-12 hours. It was found that fishermen were going for fishing for 15-17 days in a month. Depth of operation varied from five to fifteen meters along Tamil Nadu coast (Sathiadhas, 1989) and 20 to 45 m along Chennai, Tuticorin, Gujarat coast (Koya and Vivekanandan, 1992; Luther *et al.*, 1997) and 24-180 m along the Ratnagiri coast (Markad, 2004). It was observed from the reported results that the depth of operation of gill net along the Indian coast ranged from 5.0 to 45 m.

Vessel and Engine specifications

Among all the OBM gillnetters of Chorward village were Fibre reinforced plastic (FRP) coated. In

Chorward village, there are about 300 OBM gillnetters, out of which only 240 are active in fishing. For the present study, 30 OBM gillnetters were taken in to consideration for collection of data. These all OBM gillnetters were fitted with 2 cylinders, 8 Horse power (HP) engine. Table II shows the vessel and engine specifications for OBM gillnetters operating from Chorward coast, Maliya. The length of OBM gillnetters varied from 7.29 to 9.45 m with an average of 8.28 ± 0.10 , and the breadth of the OBM gillnetters varied from 1.21 to 1.80 m with an average of 1.58 ± 0.04 m. The tonnage of these gillnetters was observed in the range of 1.58 to 3.81 t with an average of 2.25 ± 0.10 t. Most of the gillnetters selected by different researchers for their study were found within the similar range of 6 to 12 m OAL. Silas *et al.* (1984) studied gillnetters along the Cochin coast which ranged from 9.14 to 9.62 m fitted with two cylinder and three cylinder engine whereas other workers have studied gillnetters of sizes 6.7 to 9.8 m with 8.0 HP engine at the Cochra-Nivti in Sindhudurg district of Maharashtra and Dhamlej in Junagadh district of Gujarat (Sehara and Karbhari, 1989), 6 to 16 m along the Kerala coast (Annamalai and Kandoran, 1990), 7.6 and 9.1 m along the Kerala coast (Sathiadhas and Benjamin, 1990), motorised nava with six to seven meters size at selected villages of Kanyakumari district in Tamil Nadu (Annamalai and Kandoran, 1993), 7.62 m OAL at Cochin (Iyer, 1993), 8.5 m mechanised gillnetters with 40 to 45 HP engine at Quilon and Ernakulam districts of Kerala (Panikkar *et al.*, 1993), 12 m motorised crafts with 8 HP engine along Veraval

Table 2 Vessel and engine specifications for OBM gillnetters operating from Chorward coast, Maliya.

Sr.No.	Specification	Minimum	Maximum	Mean ($\pm$ SE)
1	Overall length (m)	7.29	9.45	8.28 (± 0.10)
2	Breadth (m)	1.21	1.80	1.58 (± 0.04)
3	Cylinder	2.00	2.00	2.00 (± 0)
4	Engine power (HP)	8.00	8.00	8.00 (± 0)
5	Tonnage (t)	1.58	3.81	2.25 (± 0.10)
6	Crew number	2.00	2.00	2.00 (± 0)
7	Voyage time (hr)	6.00	12.00	8.93 (± 0.30)
8	Actual fishing time (hr)	16.00	5.00	10.5 (± 0.58)
9	Depth of operation (m)	13	50	30.23 (± 3.47)

coast in Gujarat (Doss *et al.*, 1997), of 10 to 13 m mechanised vessels with 20 HP engine along the Chennai and Tuticorin coast (Luther *et al.*, 1997) and 9.76-12.54 m with 20 HP engine along the Ratnagiri coast (Markad 2004).

Gear specifications

Data on gear specification revealed that the Chorward fishermen were using three different types of gill nets for catching varieties of fishes which are made of monofilament and multifilament. *Dhaker* gill net having mesh size 120-140 mm length of single piece was 130 m long and the numbers of pieces tied together were 10-12. *Chokla* gill net having mesh size 60-81 mm length of single piece was 110-150 m in length and the numbers of pieces together were 10-12. *Jada jal* had mesh size of 180 mm, where the length of single piece was 300 m and the numbers of pieces tied together were 50-100 as mentioned in Table III. Some of the workers have reported these aspects in their study. Silas *et al.* (1984) studied the drift gill nets off Cochin and reported that the mesh size variation was 70 to 130 mm. Mesh sizes reported by other workers ranged between 50 to 130 mm (Sehara and Karbhari, 1989b), 30 to 63 mm (Sathiadhas *et al.*, 1991), 65 to 215 mm (Koya and Vivekanandan, 1992) and 14 to 500 mm (Luther *et al.*, 1997). Total length and height reported by various authors varied from 800 to 1000 m and four

to eight m respectively (Silas *et al.*, 1984), and 100 m to 2500 m and three meter to 15 m respectively (Luther *et al.*, 1997). Authors have reported variations in number of pieces used at a time and were 9 to 12 (Silas *et al.*, 1984), 15 to 70 (Sehara and Karbhari, 1989b), 20 to 40 (Sathiadhas *et al.*, 1991), 30 to 60 (Koya and Vivekanandan, 1992; Luther *et al.*, 1997) and 20-36 (Markad., 2004).

Comparing the mesh size with other coasts it showed that in case of Chorward coast mesh size was found more similarly comparing the total length and total height with other coasts it was also found more in case of Chorward gill nets. The numbers of pieces used in this net were less as compared to the gill net used in the other parts of the country.

Fishing equipments

During the present study it was observed that none of the gillnetters was using the fish finding equipments as well as navigational equipments as the size of the vessel was not large enough to install equipments viz. eco-sounder and Sound navigation and ranging (SONAR). Very high frequency (VHF) set was not found on any of the gillnetters as they were going for one-day fishing trip and fishing grounds were not far away from the landing centre. No fire fighting devices were found on the vessel due to lack of space.

Table 3 Specifications of gill net operated by OBM gillnetters of Chorward coast, Maliya.

Type of net	Species caught	Mesh size (mm)	Length of single piece(m)	Number of pieces	Total weight of net(Kg)	Total length (m)	Total height (m)
Gill net (Dhaker) Monofilament	<i>Pampus argenteus</i> , <i>Parastromateus niger</i> , <i>Hilsa</i> etc.	120-140	130	10-12	75-100	1000-1500	12-14
Gill net (Chokla) Monofilament	<i>Lepturacanthus savala</i> , <i>Rastrelliger kanagurata</i> , <i>Scomberomorus commerson</i> , <i>Carnax para</i> etc.	60-81	110-150	10-12	75-100	1000-1500	12-13
Gill net (Jada jaal) Multifilament	<i>Scomberomorus commerson</i> and <i>Scomberomorus lineolatus</i> .	180	300	50-100	250-500	1500-3000	6-9

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