Rational Exploitation of *Catla catla* (Ham) from Hirakud Reservoir - A Preliminary Account

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Frame nets and simple gill nets of identical mesh size were experimented to determine their comparative efficiency for exploiting economic size group of *Catla catla*. The results indicated that frame nets of 90 mm mesh bar as the most effective.

Gangetic carps occupy the most important place in reservoir fisheries. According to Natarajan (1976) *C. catla* is a highly priced economic carp. Jhingran (1977) and Natarajan (1976) emphasized the importance of stocking this species in reservoirs in view of its rapid growth. The occurrence of *C. catla* has been recorded in almost all reservoirs. In Rihand, *C. catla* is the only major carp that dominates the fishery (Natarajan, 1976). Job *et al.* (1955) recorded the occurrence of *C. catla* in Mahanadi river. Subsequently Sulochanan *et al.* (1968), George *et al.* (1973) and Khan *et al.* (1974) confirmed that this species contributed to one of the most viable and productive fisheries of Hirakud reservoir. These workers have suggested frame nets as the most suitable gear for catching commercially important fishes of the reservoir. But their conclusions are based on observations with nets of 75 mm bar.

Znamensky (1967) recommended frame nets of 75,85 and 100 mm mesh bar for Hirakud reservoir. However, hitherto no attempt has been made to find out the optimum mesh size for the exploitation of commerical size groups of *C. catla*. Studies on these lines are of vital significance as these investigations apart from evolving an effective gear for the capture of *C. catla* will also pave way for the proper management and conservations of the fishery. To achieve this objective different designs of nets were experimented during November 1977 to December 1978 and the results presented in this communication.

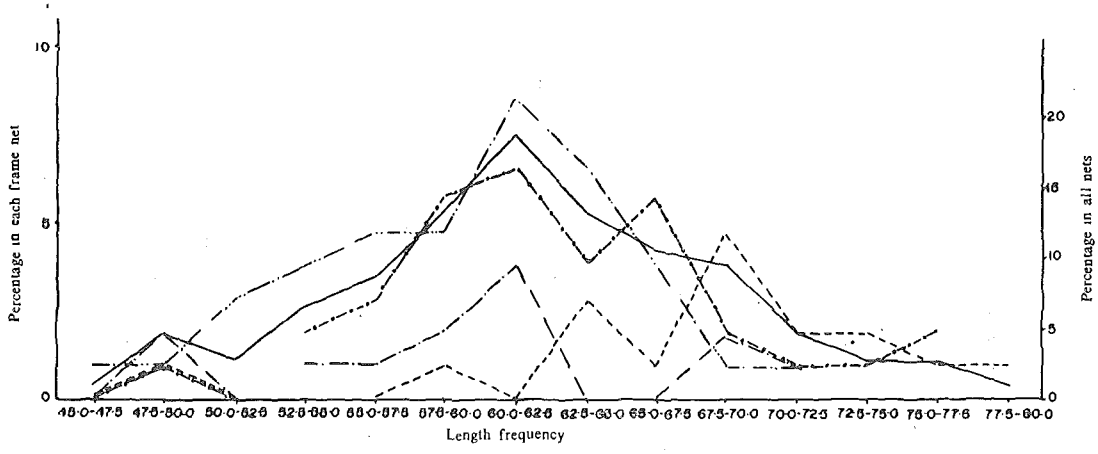

Fig. 1. Percentage representation of C. Catla in frame nets and its length frequency distribution

Table 1. *Design details of nets*

Type of gear	Mesh bar mm	Twine size	Material	Number of meshes in length	Number of meshes in depth	Co-efficient of hanging horizontal	Co-efficient of hanging vertical	Specification of head rope & foot rope	Specification of floats	Number of floats	Number of sinkers	Specification sinkers
Frame net	75	210/2/3	Nylon	467	70	0.5	0.50	5 mm Ø polyethylene monofilament braided rope	Aluminium, 127 mm Ø, spherical, extra-buoyancy 780 g each	5	5	140 mm Ø mild steel ring of 8 mm thick rod, 120 g each
	90	210/2/3		390	59							
	105	210/2/3		334	50							
	120	210/2/3		292	44							
Simple gill net	75	210/2/3		467	40	0.05	0.86			4	4	
	90	210/2/3		390	34							
	105	210/3/3		334	29							
	120	210/3/3		292	25							

Table 2. *Percentage weight of C. catla and yield per unit area (1000 sq.m) in frame and simple gill nets*

Mesh bar mm	Area sq.m	Frame net			Simple gill net		
		Total weight kg	Percentage	Yield per unit area kg	Total weight kg	Percentage	Yield per unit area kg
75		42.40	8.05	1.025	8.60	1.63	0.208
90		190.80	36.24	4.614	5.90	1.13	0.142
105	41343	168.98	32.09	4.087	16.20	3.08	0.391
120		79.00	15.00	1.910	14.65	2.78	0.354

Table 3. *Analysis of variance of C. catla*

Source	ss	df	ms	f
Total	47.9352	599		
Nets	4.3946	1	4.3946	67.82*
Meshes	0.9545	3	0.3182	4.91*
Days	8.8124	74	0.1191	1.84*
Error	33.7737	521	0.0648	

* Indicates significance at 1% level

Materials and Methods

Two shots of frame and simple gill nets of mesh sizes 75, 90, 105 and 120 mm bar were operated at different locations in the reservoir. The design details of nets are given in Table 1. The nets were suitably set so as to get equal chances for all nets. The nets were surface set in the evening and hauled up the next morning. The morphometric data of each fish caught by the different nets were recorded.

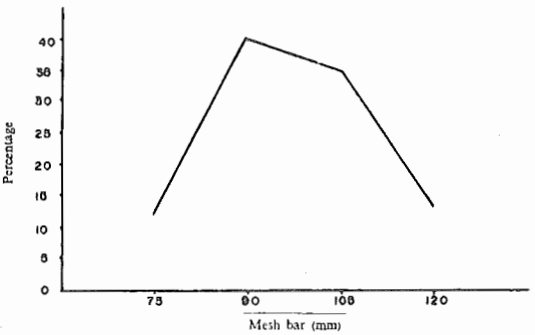

Fig. 2. Percentage representation of predominant size group of C. Catla in each frame net

Results and Discussion

The catch per unit area (kg/1000 sq.m) for individual net is given in Table 2. Fig. 1 depicts the percentage length frequency distribution of *C. catla* in all frame nets and in individual frame nets. Fig. 2 shows the percentage representation of predominant size groups in each frame net. Figs. 1, 2 and Table 2 clearly indicate that net with 90 mm mesh bar as the most effective for capturing the predominant size groups of *C. catla,* followed by net with 105 mm mesh bar.

Analysis of variance (Table 3) shows that between nets, between meshes and between days, variations are highly significant ($p<0.01$). The average catch of the simple gill nets and frame nets was 0.0302 and0.2014 kg respectively in the logarithmic scale. The average catch of nets with different meshes, namely, 75,90,105 and 120 mm mesh bar were 0.0636, 0.1584, 0.1498 and 0.909 kg respectively in logarithmic scale, indicating better performance of 90 and 105 mm mesh bar. Simple gill nets of 105 mm bar landed more *C. catla* while frame nets of 90mm bar scored the maximum.

As seen from Tables 2 and 3, frame nets caught more *C. catla* than simple gill

nets. The frame nets landed 91.38% of the total catch by weight (Table 2). This was further confirmed by the analysis of variance (Table 3). Though 105 mm mesh bar simple gill nets caught more *C. catla,* the quantum of catch was negligible when compared to that of frame nets. The observation that frame nets are more efficient than other types of gill net is also noticed by earlier workers (Sulochanan *et al.* 1968).

Among frame nets the maximum catch was obtained with 90 mm mesh bar nets. The catch by this net was 1.129 to 4.5 times more than that of other frame nets. A similar trend is noticed with regard to the number of fishes caught. Analysis of variance of catch also confirmed that 90 mm bar frame net is superior to others.

The predominant size group of *C. catla* (Fig. 1) ranging from 55 to 70 cm constituted 73.58% of the total catch. This size group is worth commerical exploitation as it represented the economical size group of *C. catla* in Hirakud reservoir. Jhingran & Ghosh (1978) fixed 55 cm length as the minimum size limit of *C. catla* for exploitation from river Ganga. According to Natarajan & Jhingran (1963) those between 50 and 55 cm length range attain maturity. In the absence of published records with respect to the biology of *C. catla* from Hirakud reservoir, it is presumed that fishes which have crossed this size are matured ones and hence can be exploited. Since 90 mm mesh bar net landed 40% of the predominant size group, it is better suited for the exploitation of *C. catla.*

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