Eradication of Uneconomical Fishes with Simple Gill Nets at Hirakud Reservoir

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Experiments with simple gill nets of mesh bar 25, 30, 35, 40 and 45 mm were carried out to determine the suitable mesh size for the eradication of the uneconomical fishes of Hirakud reservoir. Results show that net with 25 mm bar is more suitable particularly for *Gudusia chapra* (Ham), *Rohtee cotio* (Day) and *Eutropichthys vacha* (Ham).

Selective stocking of the desirable species or elimination of undesirable species is important for the management of reservoir fisheries (Lepitzky, 1965; Anon, 1976). The fishes other than desirable species have been classified as uneconomical fishes, undesirable fishes, trash fishes, weed fishes and minnows (Natarajan, 1976). The influence of these fishes on reservoir fishery has been discussed by Bennet (1962), David *et al.* (1969), Shetty (1969), Natarajan (1972 a, b) and Jhingran (1977). Jhingran (1977) while discussing the regulation of fish stock in the reservoirs of U.S.S.R. has suggested eradication of these fishes at the pre-impoundment stage either by selective fishing or through specific predatory fishes. Alikunhi (1971) has recommended better utilisation of these fishes. Natarajan *et al.* (1971) and David *et al.* (1969) have suggested removal of peripheral trees for the effective operation of gears for eradicating trash fishes. Job *et al.* (1955) found that, out of 86 species in Mahanadi, 62 were uneconomical. Except that of Znamensky (1967) systematic attempts to eradicate uneconomical fishes are lacking. This paper reports the authors' attempts to remove *G. chapra, R. cotio* and *E. vacha* from Hirakud reservoir by gill netting.

Materials and Methods

Simple gill nets of mesh bar 25, 30, 35, 40 and 45 mm were used for this investigation as detailed in Table 1. The nets were operated as surface set in the evening and hauled up next day morning. The nets were operated parallel and perpendicular to the shore and the positions interchanged giving equal chances to all nets. Day to day species wise catch and the morphometry of fish caught from September 1977 to May '78 were recorded (Tables 2 and 3).

Results and Discussion

As evident from Tables 2 and 3, the nets of 25 mm bar were found most effective followed by 30 and 35 mm bar nets. 25 mm bar net caught 2.716, 7.965, 16.520 and 27.534 times more by weight compared to those of 30, 35, 40 and 45 bar nets respectively. The predominant species were *G. chapra, R. cotio* and *E. vacha* of size ranges 141–200, 101–220 and 221–280 mm respectively.

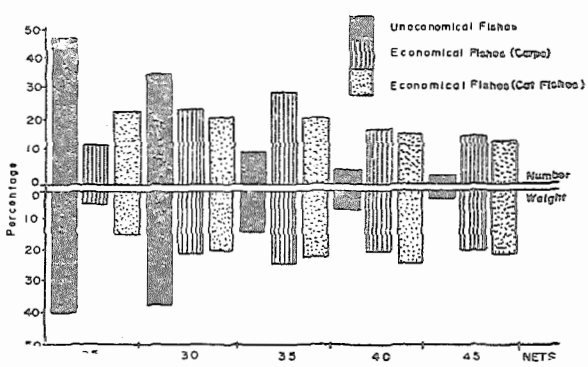

Fig. 1. Percentage catch in number and weight of economical and uneconomical fishes

Table 1. *Specification of nets*

Mesh bar mm	Material	Type of knot	Twine size	Number of meshes: Length	Number of meshes: Depth	Hanging coefficient: Vertical	Hanging coefficient: Horizontal	Selvedge	Head and foot rope	Floats	Sinkers
25			210/1/3	1400	70			2 mesh in		Alumi-	Mild steel
30		Double	210/1/3	1166	58			depth, both	Nylon	nium,	ring type
35	Nylon	trawl	210/1/3	1000	50	0.86	0.50	in upper and	rope,	75 mm Ø	weighing
40		knot	210/2/2	875	44			lower edges	3 mm Ø	spherical,	100 g,
45			210/2/2	778	39			with 210/2/2 winet		5 each	5 each

Table 2. *Catch composition*

Uneconomical fishes	25 mm bar net				30 mm bar net				35 mm bar net				40 mm bar net				45 mm bar net			
	Number	Percent	Weight kg	Percent	Number	Percent	Weight kg	Percent	Number	Percent	Weight kg	Percent	Number	Percent	Weight kg	Percent	Number	Percent	Weight kg	Percent
G. chapra	1580	72.25	71.03	53.08	1041	61.60	55.78	40.76	298	51.73	13.94	19.46	127	46.86	6.17	11.22	76	44.70	3.60	8.00
R. cotio	292	13.36	17.82	13.32	338	20.00	20.80	15.20	67	11.63	4.46	6.23	10	3.70	0.80	1.45	4	2.36	0.25	0.55
E. vacha	183	8.37	22.58	16.88	165	9.76	26.17	19.13	86	14.93	16.60	23.16	42	15.50	9.90	18.00	20	11.76	6.40	14.23
C. reba	9	0.41	0.85	0.63	10	0.76	1.70	1.25	7	1.21	1.20	1.70	2	0.73	0.45	0.82	—	—	—	—
B. sarana	9	0.41	0.66	0.49	5	0.30	0.50	0.38	2	0.34	0.30	0.42	3	1.10	0.60	1.09	1	—	—	—
R. chrysea	2	0.09	0.74	0.56	2	0.11	0.15	0.10	2	0.34	0.15	0.20	1	0.38	0.10	0.18	—	—	—	—
Economical fishes																				
C. catla	—	—	—	—	2	0.11	0.15	0.10	1	0.17	0.20	0.27	—	—	—	—	1	0.58	0.20	0.44
L. rohita	—	—	—	—	—	—	—	—	2	0.34	0.40	0.55	1	0.38	0.20	0.36	—	—	—	—
L. bata	4	0.18	0.28	0.20	2	0.11	0.20	0.15	8	1.38	1.36	1.90	4	1.47	0.85	1.55	1	0.58	0.20	0.44
L. fimbriatus	—	—	—	—	5	0.30	0.55	0.40	2	0.34	0.70	0.98	1	0.38	0.25	0.45	—	—	—	—
L. calbasu	6	0.27	0.62	0.46	10	0.60	3.50	2.56	11	1.90	2.40	3.35	8	2.98	2.70	4.91	10	5.90	5.75	12.79
Cat fishes																				
S. silondia	98	4.48	17.85	13.84	99	5.96	23.92	17.50	80	13.88	26.75	37.32	64	23.62	28.50	51.80	51	30.00	23.55	52.39
P. pangasius	2	0.09	0.50	0.37	5	0.30	1.20	0.87	1	0.17	0.10	0.13	—	—	—	—	—	—	—	—
M. seenghala	2	0.09	0.90	0.67	2	0.14	0.55	0.40	3	0.52	1.45	2.03	3	1.10	1.65	2.99	5	2.95	4.80	10.67
M. aor	—	—	—	—	4	0.24	1.65	1.20	5	0.86	1.45	2.03	2	0.73	0.95	1.73	—	—	—	—
W. attu	—	—	—	—	—	—	—	—	1	0.17	0.20	0.27	3	1.10	1.90	3.45	1	0.58	0.20	0.44

Table 3. *Catch of predominant fishes in various nets*

Fishes	25 mm bar net		30 mm bar net		35 mm bar net		40 mm bar net		45 mm bar net	
	Number	Weight kg	Number	Weight kg	Number	Weight kg	Number	Weight kg	Number	Weight kg
G. chapra	1580	71.035	1041	55.78	298	13.94	127	6.175	76	3.60
R. cotio	292	17.820	338	20.80	67	4.46	10	0.800	4	0.25
E. vacha	183	22.580	165	26.17	86	16.60	42	9.900	20	6.40
Total	2055	111.435	1544	102.75	451	35.00	179	16.875	100	10.25
Total area of net operated in sq. m	18480		46200		46200		46200		46200	
Catch/1000 sq. m kg	6.030		2.220		0.757		0.365		0.221	

Table 4. *Analysis of variance*

Source	ss	df	ms	f
Total	56.7891	399		
Between nets	18.1295	4	4.5324	112.47***
Between days	25.9215	79	0.3281	8.14***
Error	12.7381	316	0.0403	

*** Significant at 0.1% level

Statistical analysis of the data (Table 4) showed that 'between nets' and 'between day' variations were highly significant ($P<0.001$). The least significant difference at 5% level for 25 mm bar net was worked out to be 0.0620. The mean catches of the nets of 25, 30, 35, 40 and 45 mm bar were respectively 0.6967, 0.4860, 0.2386, 0.1692 and 0.1492 kg showing higher catch by 25 mm bar net. Further the 25 mm bar net caught the least number of economic fishes (Fig. 1) compared to other nets establishing its suitability over others.

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