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Fish Catch Trend in Dhaura Reservoir of Uttarakhand, India

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Abstract

The present research paper reveals the faunal contribution to the catch of reservoir Dhaura. The study of reservoir conducted for the six months during November 07 to April 08, indicated the reservoir productivity, faunistic diversity and landing pattern, contribution of fish species, suitability to a particular environment and dominancy among the fish catch landing. It was found that the fish *Labeo gonius* (Kursa) dominates quantitatively and numerically and showed the homogenous landing pattern viz. 5,302, 14,090, 6,642, 5,809, 4,116 and 2,664 kg respectively and total production of *Labeo gonius* (38,623 kg) was more than the total catch of rest of fish catch (13,708.5 kg) landed at Dhaura landing center during the study period.

Key words : Reservoir, Landing center, Dhaura reservoir, Kursa.

Harnessing the rivers for irrigation and hydro-electric power generation has been the main focus of developmental activities in India ever since the country gained independence. One of the direct results of these projects is the creation of a chain of man-made lakes in the developed world, fisheries of inland lakes largely cater to the recreational needs, whereas in a highly populous developing country like India, these resources can play a vital role in augmenting food production for human consumption the rural society. Development of open water fisheries is highly labor-intensive, having the potential to provide gainful employment to the weaker sections. That the man-made lakes hold tremendous potential for inland fisheries development in India has long been recognized. However, this vital resource is not contributing to the inland fish production of the country to the extent it should and these resources offer ample scope for fish yield optimization through adoption of suitable management norms. Any attempt to increase productivity in inland fisheries has to rely heavily on the reservoirs.

The man made lakes in Kumaun region have been constructed in the post independence period and are located at 28^0 18´ to $29^0$55´N Lat. and $78^0$18´ to $79^0$55´ E long., and the reservoir Dhaura, around which study is centralized is constructed (1961) on rivers Dhaura and Katna located geographically $29^0$55´N and $79^0$40´E at an altitude of 200 msl with a catchment area of nearly 4,442 km^2 and has a capacity of spillway (cusec) of 19200, covered a area under basin is 1,200 ha, dimensions of basin is 9.0 km (length of bundh), 11.9 m (height of bundh) and average rain fall in this area is 1,700 mm. This reservoir was mainly constructed for irrigation but it also harbors various fish species, consist of consist of ecologically different ecosystem and bears mixed lotic and lentic environment. Apart from these, now a days reservoir fishery contributes significant role in Inland fish production, flow of energy in aquatic ecosystem and maintains integrity between lotic and lentic environmental flora and fauna.

Notwithstanding the overriding importance of reservoirs, documentation of this vital resource is grossly inadequate. Dearth of a firm database and lack of requisite research support are often cited as the main inhibiting factors for speedy development of reservoir fisheries in India. Areliable estimate on the fish production from the man-made lakes is still eluding us due to a number of reasons. Moreover, the reservoirs and their fish landing center are highly scattered, remote and often inaccessible. The problems are further confounded by the involvement of unauthorized money lenders in the fish trade, who do not part with the catch figures due to obvious reasons. Surprisingly, no serious efforts have been made to build up a database on the reservoir fisheries resources of India, taking into account the total water

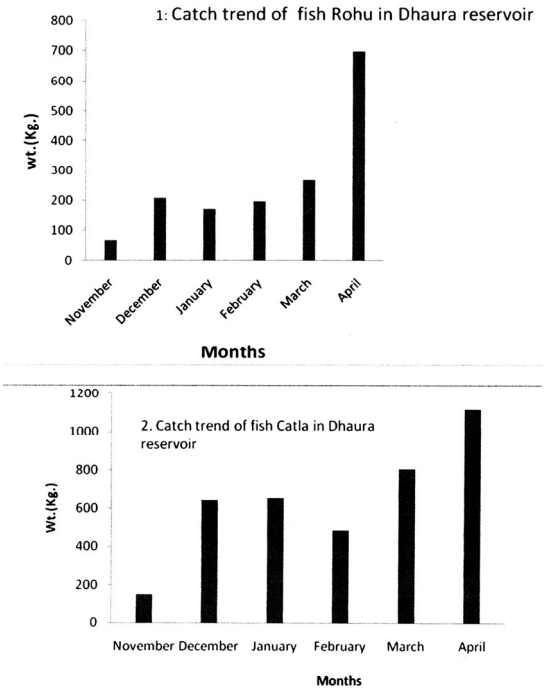

Figure 1. Catch trend of fish (1) rohu (2) catla in Dhaura reservoir.

area under different categories of man-made lakes, their biogenic production propensities and fish yield potential. Thus, a database on abiotic and biotic parameters, and the fish stock of the reservoir ecosystem is an essential prerequisite for a meaningful management of the resource.

Fish yield optimization from man-made lakes has become the focus of attention in recent years and consequently, many development projects have been initiated at the state and national level to exploit the fish production potential of this resource. While the reservoir fisheries in India is well-poised for a steady growth, this document attempts to meet the long-felt need for a comprehensive status of faunistic diversity in Dhaura reservoir.

Methods

Observations on fish catch statistics of reservoir Dhaura were regularly monitored and data were recorded. Specimen were brought to the College of Fisheries for proper identification (1—3). Study was

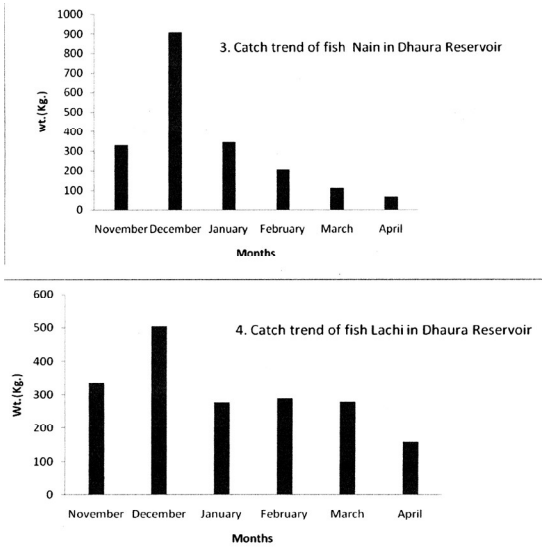

Figure 2. Catch trend of fish (3) nain and (4) lachi in Dhaura reservoir.

conducted for six months from November 07 to April 08.

Results and Discussion

The study conducted for fish catch composition

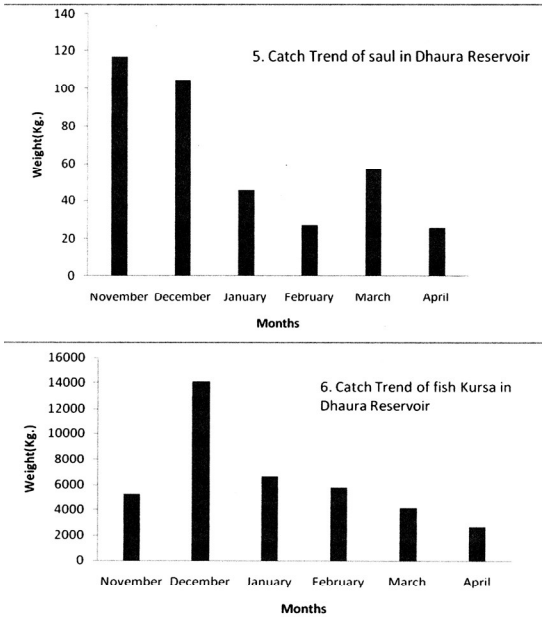

Figure 3. Catch trend of (5) saul and (6) Kursa in Dhaura reservoir.

Table 1. Quantitative representation fish catch trend of Dhaura reservoir. Values in parentheses indicate the percentage against total value. Weight of fish in kilogram.

Month species	Rohu (wt)	(%)	Catla (wt)	(%)	Nain (wt)	(%)	Lachi (wt)	(%)	Saul (wt)	(%)	Kursa (wt)	(%)	others (wt)
Nov	67.5	4.17	152	3.93	328.5	16.73	334	18.17	117	30.03	5302	13.72	698
Dec	210	12.98	641	16.6	908	46.25	503	27.36	105	27.85	14090	36.48	944
Jan	173	10.69	652.5	16.9	345	17.57	276	15.01	45.5	12.06	6642	17.19	568
Feb	198.5	12.27	486.3	12.59	206	10.49	288	15.66	27	7.16	5809	15.04	875
Mar	269	16.63	808	20.93	110.5	5.62	279	15.17	57	15.28	4116	10.65	656
Apr	699	43.22	1120	29.01	65	3.31	158	8.59	25.5	6.76	2664	6.89	313
	1617		3859.8		1963		1838		377		38623		4054
Total	(3.35)	100	(7.9)	100	(0.37)	100	(4.07)	100	(0.78)	100	(80)	100	(8.4)
G. total	48282.34												
CD at 5%	23.15	—	35.26	—	38.56	—	13.25	—	13.11	—	146.25	—	15.24

and landing pattern of Dhaura reservoir reveals and bring out the conclusion about the contribution of Indian major carps, Indian minor carps, catfishes, weed fishes and miscellaneous groups. The study conducted for six months reveals the natural production potential and needs to manage the particular reservoir ecologically, which potential and production may sustained by following up the ecological demand to manage to increase the fish production through preservance of natural dominant food chain without putting any perturbance.

Graphic presentation of most important fish species *Labeo rohita* reveals that maximum landing occurred during April, which account 43.22% of total landing of fish rohu alone, while 3.35% out of total landing at of reservoir (Fig.1). The next species of this group *Catla catla* contribute maximum of its catch in April (Fig. 2), quantity of landing was 1,120 kg which is 29.01% of its own, while 7.9% of total landing at centre. On other hand third species of this group nain *(Cirrhinus mrigala)* (Fig. 3) contributed maximally in December month which is 46.25% of total of its own, while total landing of nain accounts for 0.37% of total landing.

Likewise catfish *Wallago attu* (lachi) contribute maximally in December month (Fig.4) which accounts merely 27.36% of its own landing. Share of Lachi in total catch is 3.8%. Another important representative of catfish saul contributes merely 0.78% (Table 1). Minor carp group representative maximum contribution is given by *Labeo gonius* (Kursa) total landing of its was 38,623 kg which account 80% of total landing (Table 1). Others which include weed fish, *Channa* sp., *Notopterus* sp., eels and other several low price fishes were categorized for this group accounts for 8.4% of total landing and maximum contribution is in December.

Numeric presentation of catch, the fish rohu land-

Table 2. Numeric representation of catch trend of Dhaura reservoir. Values in parentheses indicate the percentage against total value. Weight of fish in kilogram.

Month species	Rohu	(%)	Catla	(%)	Nain	(%)	Lachi	(%)	Saul	(%)	Kursa	(%)	Others
Nov	32	4.38	38	4.27	190	16.56	469	18.51	205	41.4	15915	15.87	16849
Dec	88	12.05	158	17.79	529	46.12	718	28.34	121	24.44	28185	28.11	29799
Jan	76	10.41	149	16.77	191	16.65	377	14.88	50	10.1	19930	19.88	20773
Feb	91	12.46	127	14.3	128	11.15	370	14.6	27	5.45	17430	17.38	18173
Mar	133	18.2	184	20.72	69	6.01	387	15.28	70	14.14	10132	10.1	10975
Apr	310	42.46	232	26.12	40	3.48	212	8.36	22	4.44	8642	8.62	9458
	730		888		1147		2533		495		100234		106027
Total	(0.34)	100	(0.42)	100	(0.54)	100	(1.2)	100	(0.233)	100	(47.26)	100	(50)
G. total	212054												
CD at 5%	23.25	—	11.52	—	23.25	—	14.65	—	9.54	—	108.45	—	149.56

ing in terms of number was 730 which is 0.34% of total landing and maximum during April. Though fish catla represent maximally in December which deviate from the maximum value gained in quantity which indicate abnormal weight of catch landed. Similarly nain also caught maximally in December which is 46.12% of its own landing. Catfish lachi were caught maximally in December while another species. Saul contributed in the catch maximum in November (Table 2). Next most dominant fish *Labeo gonius* (Kursa) account 47.26% of total catch and maximum contribution was in January.

The quantitative and numeric data indicate poor management practices. Catch statistics is centered around the capture of minor species kursa indicates the ecological dominance which is a key indicator species for the particular ecosystem. Landing pattern of the reservoir shows that ecosystem is suitable to fish kursa.

Fish landing of fish rohu fluctuation from 47% (November) to 43.22% in April, catla 3.93% (November) and 29.01% in April,these finding are accorded with the trend reported by Singh et al. (4) and fish landing data showed that the highest quantity was in summer with the fluctuation of fish catch in different months (5). But production trend of fish nain was in reverse possibly due to different ecological niche and highest in December. In general major carps production is lower than the minor carps (kursa) and weed fishes due to competitiveness and probably prey by the carnivorous fishes in the reservoir (6).

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