



Study of Ichthyofaunal Biodiversity and Limnological Parameter in Kelo Dam of Raigarh, District – Raigarh C.G.

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The Kelo River is the lifeline of Raigarh. It originates from a place called Ludeg of Gharghoda. Its total length is about 90 kilometers. At a distance of 8 kilometers from Raigarh district on Raigarh Ambikapur state highway road, Kelo dam was constructed on this River in The Danout Village. It's also known as 'Late Dilip Singh Judeo project'. Limnological properties of Kelo dam water were

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tested as per Method Given by APHA 2005 which shown seasonal variation. The Current study on Kelo dam was carried out from March 2021 to February 2022. At the time of study the species of fishes were collected by different fish nets with the help of local fisherman. The collected fish were photographed and preserved in 10% formalin solution. The collected fishes were identified with the help of standard books of Jayaram, K.C. [1], Francis Day, [2], and Shrivastava, G. [3]. During the entire study period a total of 22 fish species were recorded from this study, it was found that most of the water parameter were under permissible limit and Kelo dam water quality is suitable for biodiversity and irrigation.

Keywords: Limnological parameters; biodiversity; Ichthyofaunal; nets; Raigarh District.

1. INTRODUCTION

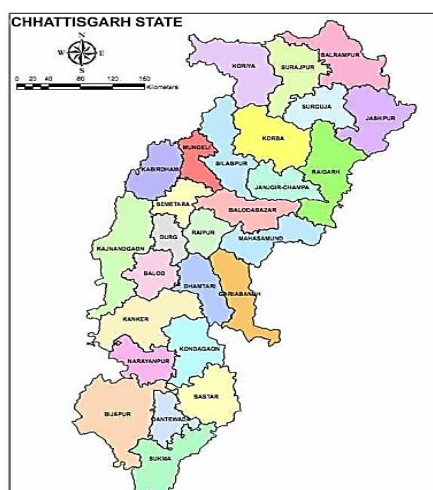
Biodiversity is the variability and variety of organism on planet earth which is a mega ecosystem. Biodiversity can be observed at gene level, species level and ecosystem level Water is a most important and essential abiotic factor of all kinds of ecosystems and also forms the habitat for enormous and also forms the habitat for enormous variety of organism in other words water form the biggest ecosystem, the aquatic ecosystem of the biosphere. The Kelo River is also known as the lifeline of Raigarh it originates from a Place called Ludeg of Gharghoda total length is about 90 kilometers. At a distance of 8 kilometers from Raigarh district on village it s also known. As late Dilip singh judeo project. Limnological parameter of Kelo dam water tested as per method given by APHA 2005 which shown seasonal variation. Fish were collected during the study and were identified with the standard books and keys the quality of the dam water directly or indirectly affected the fish diversity.

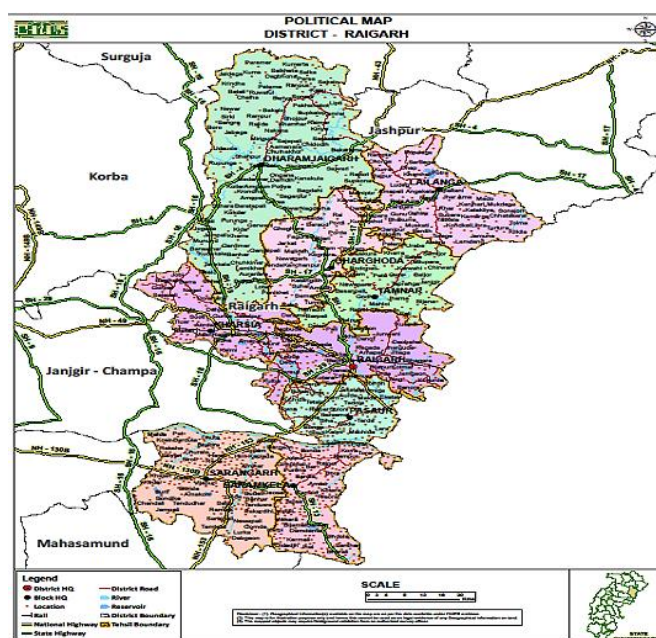
2. MATERIALS AND METHODS

The present study deals with the investigation of Ichthyofaunal Biodiversity and Limnological

Parameter in Kelo Dam of Raigarh. District – Raigarh Chhattisgarh India. The water Samples of the dam were collected in Monthly intervals from all the Sampling sites during march 2021 to February 2022 respectively and the water samples were analyzed spar standard methods of APHA 2005 in present investigation the following Limnological Parameter were analyzed R. K. Baghel, [4].

- I. pH – pH of Kelo Dam water sample was measured by digital pH meter
- II. Water Depth - Depth of dam water was measured by straight rod calibrated in meter.
- III. Water Temperature – Kelo dam water temperature was measured by using centigrade mercury thermometer.
- IV. Turbidity – The turbidity of the dam water was measured by secchi disc method.
- V. D.O. – The dissolved oxygen was measured by wrinklers Idometric method.
- VI. BOD – Biological oxygen demand of water samples ware measured by five days incubation methods with the help of BOD Incubator.





Map 1. Chhattisgarh and Raigarh District



Fig. 1. Study area Kelo Dam



Fig. 2. Collection of water and Fish Sample

VII. Total alkalinity – Total alkalinity of Dam water were determined by titration method.

VIII. Total hardness – The total hardness of the water samples was measured by EDTA titimetric method.

- IX. C.O.D. - Chemical oxygen demand was estimated by dichromate titration method.
- X. Calcium – the calcium of dam water samples are estimated by titrimetric method with using standard solution of EDTA.

The fish samples were collected by the help local fisherman from Kelo dam of Raigarh fishermen generally uses different types of nets like gill nets. Cast nets, drag net etc. the collected fishes were photographed and preserved in 10% formalin and brought into the laboratory for further studies. The collected fishes were identified with the help of standard books of Francis Day [2], Shrivastava, G. [3,5], Jayram K.C. (1999), and Shrivastava C. B. L. (2011),. Hora S. L [6], Mandal, S. [7], Singh, M. [8], Sahu S. [9], Sahu P. K. [10], Niyaji A. [11], Talwar P.K. [12], Sakhare V. B. [13], Swarnkar, S. [14].

3. RESULTS AND DISCUSSION

- I. **Water pH:** pH value provides information about the acidity, alkalinity and productivity of the dam water and aquatic environment, The pH value during the study shows variation according to seasons of the year. The present study pH range is observed between 6.5 to 8.5 with a mean value 8.0.
- II. **Water Temperatures (°C):** Water temperature is an important parameter that affect the growth and various Biological Process of Aquatic organism. Temperature varies according to different times of the day and different season of the year. The average annual temperature of dam water varies in between 17 °C to 39 °C the highest temperature of dam water was recorded (39 °C) in month may and lowest during moth January (17 °C) with mean value 28 °C.

III. **Turbidity:** Turbidity is an important limnological Parameter that affects sunlight penetration in into the dam water as well as photosynthesis during The detected turbidity values varied between 19 NTU (minimum march) to 310 NTU (maximum in July) the value of 102 NTU.

IV. **Dissolved Oxygen -** Oxygen is major gas found in dissolved form in water aquatic organism obtain oxygen by absorbing it from the atmosphere and through photosynthesis from aquatic plant during the study D. O. of Kelo dam water were recorded in the range between 7 to 8 with mean value 7.5.

V. **Biological Oxygen Demand:** The minimum BOD were recorded 3 mg/l in month of January and maximum BOD recorded 13 mg/l in April with an average value of 8 mg/l.

VI. **Water Depth:** The average depth of dam water was recorded 19 meters.

VII. **Total Alkalinity:** highest total value was recorded 250 mg/l in month of December and minimum total alkalinity value was recorded in month of august

VIII. **Total Hardness:** Total hardness values were ranged from 76 mg /l (minimum in April) to 134 mg/l (maximum in December) with average value of 108 mg /l. highest noted value ,

IX. **COD:** COD was found to be ranging from 10 mg/l (minimum in month of June) to 30 mg/l (maximum in January) with average value of 22 mg/l.

X. **Calcium:** Calcium was recorded to be varying from 13 mg/l (minimum in November) to 49 mg/l (maximum in April) with an average value of 26 mg/l.

Table 1. List of fishes recorded in Kelo dam

Order	Family	Genus and species	Local Name	IUCN Status	Commercial importance
Cypriniformes	Cyprinidae	<i>Labeorohita</i>	Rohu	LC	FF
		<i>Labeogonius</i>		LC	FF
		<i>Labeocalbasu</i>		LC	FF/OR
		<i>Labeobaggut</i>		LC	FF
		<i>Labeofimbrecultus</i>		LC	FF
		<i>Labeopangusia</i>		LC	FF
		<i>Catlacatla</i>	Bhakhur	VU	FF
		<i>Cirrhinusmrigala</i>	mirgal	LC	FF
		<i>Cyprinuscarpio</i>	Komalkar	VU	FF
		<i>Cirrhinusmrigal</i>	Miragal	LC	FF
Cypriniformes	Siuridae	<i>Ompakbimaculatus</i>	Baliya	VU	FF
		<i>Wallagoattu</i>	Padhina	NT	FF

Order	Family	Genus and species	Local Name	IUCN Status	Commercial importance
Cypriniformes	bagrididae	<i>Mystus singhala</i>	Singhitengna	LC	FF
		<i>Mystusaor</i>	Singhi	LC	FF
		<i>Mystus vittatus</i>	Desitengna	LC	FF
		<i>Mystus blakeri</i>		LC	OR
		<i>Rita rita</i>		LC	FF
Perciformes	centropomidae	<i>Chandaranga</i>	Chandari	LC	OR
		<i>Chandanama</i>	chandeni	LC	OR
Clupeiformes	Notopteridae	<i>Notopterus chitala</i>	Chital	LC	FF/OR
		<i>Notopterus notopterus</i>	Chital	LC	FF/OR
Beloniformes	Belonidae	<i>Xenentodon cancila</i>	Sodhi	LC	OR
Mastacemaliformes	Mastacembelidae	<i>Macrognathus aculatus</i>	Bami		

LC = Least concern, OR=ornamental fish, VU=Vulnerable, NT=Near threatened, FF=Foodfish



Labeo rohita



Labeo gonius



Labeo calbasu



Labeo bogat



Labeo fimbriatus



Labeo pangusia



Catla catla



Cyprinus carpio



Cirrhinus mrigala



Ompok bimaculatus



Wallgo attu



Mystus vittatus



Mystus bleekeri



Rita rita



Mystus vitus



Mystus seenghala



Notopterus chitala



Notopterus notopterus



Chanda ranga



Chanda nama



Xinthodon cancila



Microgenethus auletus

Fig. 3. List of fishes found in Kelo dam

Table 2. Fish biodiversity of kelo dam

S. No.	Order	Families	Genera	Species
01	Cypriniformes	03	08	16
02	Perciformes	01	01	02
03	Clupeiformes	01	01	02
04	Beloniformes	01	01	01
05	Mastacembeliformes	01	01	01
Total	05	07	12	22

In this study a total numbers of 22 fish species of the 12 genera has been identified which are including to 07 families of 05 orders namely Cypriniformes, Perciformes, Clupeiformes, Beloniformes and Mastacembeliformes. The order Cypriniformes was the most dominant group representing 16 species. Out of the 22 species, 16 species are belonging to Cypriniformes (09 species of family cyprinidae, 02 of siluridae, 05 of Bagridae) 02 species are belonging to order perciformes, 01 species of order Beloniformes and 02 species are belonging to Clupeiformes and 01 Mastacembeliformes.

4. CONCLUSION

From present study it was found that most of the dam water limnological parameter were under Permissible limit and Kelo dam water quality is suitable for fish biodiversity and irrigation.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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