Diversity of Fish Fauna: A Case Study of Rajnandgaon District, Chhattisgarh (India)

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Abstract - The evolutionary processes of fishes, being guided by environmental and genetic factors have resulted in its charming diversity. There for, study of fish fauna diversity at the micro level would unravel some remarkable facts about its vivid order family and species existing in the near past and in the present. Keeping this in mind the topic entitled "Diversity of Fish Fauna A Case Study of Rajnandgaon District, Chhattisgarh (India)" has been chosen as a problems for investigation at this stage. The study is a part of minor research project to be sanctioned by the autonomous cell of the college. It is fully based on primary data generated through field observation and structured questioner. Analytical method has been used to draw inferences.
The study reveals that this small region is rich in fish fauna diversity as one finds 7 orders, 17 families and 43 species of fishes. Cypriniformis dominates the orders of the fishes, whereas it is cyprinidae which is the dominants family. It is also noted that the most common fishes in this region are *Labeo rohita, Catlacatla, Wallage attu, puntius, Mastcembelus sp., Clarius batrichus, Grass carp, Silver carp, Channa punctatus,* and *Piranha*. It has been reported that the fishes which are numbered, are included in the threatened category

IndexTerms - *Shivnanth River, Rjnandgaon, Fish Fauna, Diversity*.

I. INTRODUCTION

Fishes have been playing a vital role not only in the ecosystem but also as a food supplement for the human all over the time and space. Once there were uncountable number of species, but today most of them have disappeared. Even their quantity has also declined alarmingly. This has drawn the attention of both the government and non-government organization. Department of fish and fisheries has established separately. Central Board of Fisheries (CBF) introduced the word "Fisheries" for the fish production which uses of modern techniques in fisheries sector. Fisheries has grown as a sunrise sector with varied resources and potential which is engaging over 14.50 million people in India at the primary level and many more along the value chain. Constituting about 6.30% of the global fish production and 5% of global trade, India has attained second position in both fish production and Aquaculture nation in the world. (Ministry of Agriculture and Farmers Welfare Department of Animal Husbandry, Dairying & Fisheries) (2011). The vision of Blue Revolution is “has created an induced environment for integrated development of full potential of fisheries of the country. It has also taken care of the aspects of with substantially improvement in the income status of fishermen and fish farmers, on the one hand, and the sustainability, bio-security and environmental concerns on the other.

II. LITERATURE SURVEY

The fishes of the world are of varied nature in terms of body features, colorations and sense organs. This due to the geographical conditions in which they originate and grow. These conditions also determine their magnitude. That's why fishes of tropical land are quite distinct from that of the temperate and cold areas. Since tropical climate is further divided into four sub regions viz. Equatorial, Monsoon, Savanna and Hot Desert (Koeppen V., 1936). The tropical monsoon climate is characterized by scorching summer season followed by rainy session and harsh winter season. During the rainy season rivers, nalas and ponds overflow due to heavy rainfall in the eastern part. This also causes submergence of low-lying areas which look Likes Sea. Opposed to it the hot summer season experiences no rain thereby resulting in dryness of numerous rivers, Canal, ponds, streams and low-lying areas.
Even during the winter season most of these water bodies contain much less water. In such a climatic condition, variety of fishes is found in abundance for a small period of time whereas fish species and its quantity get drastically reduced during most of the time. Human factors like encroachment of water bodies,

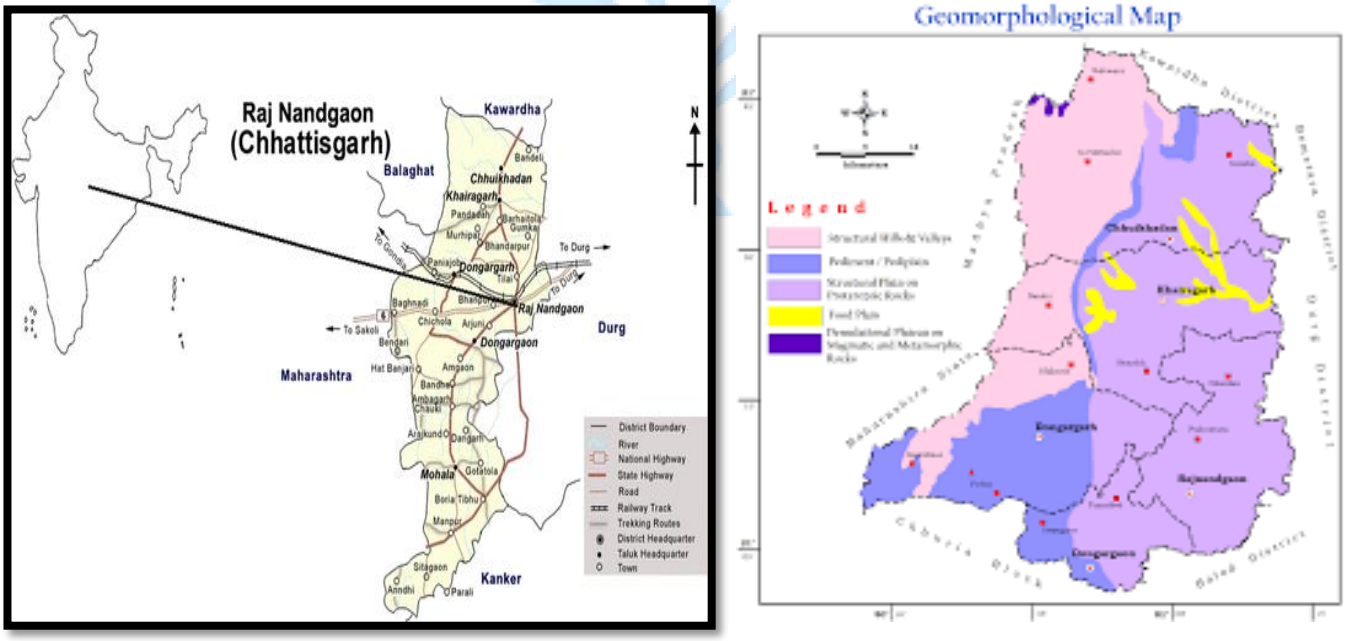
its pollution and unscientific way of fishing also seem to play remarkable role in the reduction of their species and volume. Keeping the above problem in mind, fish fauna diversity has been chosen for micro level research by taking up Rajnandgaon District of Chhattisgarh India, as a case study. The study area is largely inhabited by backward and tribal people which sizable section is directly and indirectly related with fishes.The aim of the present work is to fill a knowledge gap on the diversity status of fish fauna of the selected blocks of Rajnandgaon district and its identification. Maintained record of rare non-commercial fish species, endangered fishes. Same work done by Beata Wiecaszek et.al 2015 and Uttam kumar Sarkar et.al.2013.

III. MATERIAL AND METHODS:

Sampling and data collection were done for one-year June 2016 to May 2017. Two traverses have been selected for the field survey; first is Aundhi to Rajnandgaon in the southern and second is Rajnandagon to Gandai in the northern part of the district. Observation method has been applied to note down variety of fishes caught and brought by the fishermen for selling local hats and bazaar along this traverse.

Fish species were collected with the help of local fishermen and the tribal people at various locations. The specimens were preserved in 5% formalin, morphological measurement with the help of fishes of UP and Bihar by Gopal Ji Shrivastva (2010) and the fresh water fishes of India, Pakistan, Bangaladesh, Burma and Sri Lanka - A Hand Book by K.C. Jayram.1994(Edited by the Director, Zoological Survey of India, Kolkata). Species Diviersity of fishes are measured the following method. Sunita Bakawale and Kanhere R.R. (2013)

Study Area : The study area falls in the tropical monsoon climate. Its most of the rivers are seasonal excepting Shivnath River. Even the ponds and dams almost get dry during the summer season. The Shivnath River presents small and big patches of pool of waters. Its bed is stony in nature. But it overflows during the rainy season. In this season variety of fishes from downstream riches not only to its source area is including tributaries, nalas and ponds and low-lying fields. Thus, both volume and varieties of fishes increased; the abundance of fishes in this period and its rareness during the summer season attracters the researchers to take up a thorough study as it not only provides livelihood to fish catchers and its sellers but also provides reach source of protein to its consumers. The area of research in this region is virgin.



Study area Rajnandgaon District Map

Rajnandgaon is district of Durg Division. Its lies between 21.0971° N, 81.0302° E. (Fig. 1). Thousands of small and large ponds, nalas, small rivers and one major big river Sheonath has been water resources for the peoples of Rajnandgaon. Among the above-mentioned water resources many are perennial and annual. This very important fact the socio-economic status of village population and urban population has been depend on the available water resources, which are nearby. Fish marketing is one most important small-scale industry for

the urban and rural peoples. Especially it has been seen during weekly hat and bazaar in villages; find different varieties of small and large fishes. The monitoring surveys and identification oriented to common fishes, endangered and non- commercial fish's species which are observed during the study. Rapid degradation and serious threats of aquatic biodiversity has been seen in Indian scenario.

Chhattisgarh state (CG) state is situated in the central SouthEast region of India between 21.2787° N, 81.8661° E with 135,198 km². ist of major rivers flowing in the state are Mahanadi, Shivnath , Godavari, Indravati, Hasdeo and Son River. Almatti Dam Bilsspur, Khuntaghat Bilaspur, Gangrel Dam Dhamtari, Tandula Dam Durg, Bango Dam Korba, Mohara Dam Rajnandgaon. Chhattisgarh state has rich flora and fauna. The Recorded forest area in Chhattisgarh is 59,772 km2 which is 44.21% of its geographical area. Numbers of small rivers, large ponds small ponds and streams are found in the forest region. Rajnandaaon district is situated in the western part of Chhattisgarh state. The district lies between 20°70'- 22°29' North latitude and 80°23' to 81°29' East longitude. Total area of the district is 8070.25 sq. Kms. The district has been divided geographically into three parts viz. (1) the western hilly area, (2) The South plateau and (3) the plain area of Eastern part. The major important river of the district is Sheonath River which is a tributary of Mahanadi. It originates from Kothgul (Garh Chirouli District of Mahrarshtra State) from Panabaras Plateau and flows to north east direction. In addition, there are Amner, Ponk, Bhumaria, Karra, Pari, Tairi and Hump rivers which are tributaries of Sheonath and they flow towards East. Mohara, Bargaon, Aundhi, Salebara and Matiamoti area the main water reservoir of the district.

IV. **RESULT:** During the field observation and according to respondents recorded 43 species (table 1) were identified, comprising 31 genera and 17 families. In above table mentioned their local, scientific name and families. The present species reveals the orders cypriniformes and family cyprinidae are dominant which are contain total 17 species and order Osteoglossiformes, Beloniformes and Characiformes less numbers of fishes both order has contained only 1 species. While order Siluriformes, Perciformes and Synbranchiformes have respectively 12,7 and 3 fish species. Qualitative and quantitative analysis: Table 2 exhibits a total of 43 fish species belonging to 18 families were observed from the field during 2016-1. Cyprinid family dominates with as many as 17 species covering about twofifths (39.5 per cent) among the total species. Family bagarideae occupies second position by covering per cent nearly in double digits (9.3), which is closely followed by two families namely Siluridae and Channidae (7.0 per cent each). It is interesting to note that a dozen out of eighteen families have only single species. This distribution can be easilyhe above result shows that percentage of common carp fishes like rohu, catla, mrigal and silver carp are the dominant fishes in the study area. M. Tengna, M. Cavasiusu, M. Oar, and w. attu has found in moderate quantity. The third category of extremely low includes fishes like C.batrachus, A.testudineesas, C.nema, and A. Chuchia, which are found in the ponds and river pools inside the dense forest. comprehended through fig. 2.

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This uneven distribution of fish families and species seems to be attributed to the regular seed production and fish production of major carps in Chhattisgarh by both the government and the private hatcheries playing a vital role in view of taking the state amongst the highest fish producing state in the country. The rural and tribal fishermen are also showing much interest in purchasing fast growing fish seed for making more money in short duration. This is clearly seen in good price of Rohu, catla and mrigal in the market. These steps have also damaged the natural aquatic environment as large numbers of families and species are hardily seen nowadays. There low propensity has laid them to the verge of extensions that's why quit a good number of them have been reported as an endangered fish speices, which troubles the conservators and environmentalist.

Table 1: The Nature and Degree of Fish Fauna Diversity (Jun-2016 to May-2017).

Order	Family	Genera	Species	Local Name
Osteoglossiformes	Notopteridae	Notopterus	N. notopterus	Patola
Cypriniformes	cyprinidae	Amblyopharyngodon	A. mola	Mohral
	cyprinidae	Catla	C.catla	catla
		Cirrhinus	C.mrigala	mrigal
		Cirrhinus	C.reba	Borai
		Garra	G.gotyla	Butuwa
		labeo	L.bata	Bata
			L.Calbasu	Kamach
			L.rohita	Rohu
		Puntius	P.sarana	kotra
		Puntius	P.ticto	Kotri
			P.Sophor	Sidhari
		Rasbora	R.daniconius	Dadhi
		Hypophthalmichthys	H.Molitrix	Big head
		Ctenopharyngodon	C. idella	Grass carp
		Cyprinus	C. Carpio	Komal karp
		Crossocheilus	C. oblongus	Not known
		Salmostoma	S. bacaila	Chela
	Cobitidae	Lepidcephalichthgy	L.guntea	L.guntea
	Namacheilidae	Nemacheilus	N.botia	Rudwa
Siluriformes	Siluridae	Ompak	O. pabda	Bolia
			O.bimaculatus	Jalkapoor
		Wallago	W.attu	Padhina
	Bagridae	Mystus	M.tengara	Tengna
			M. cavasius	Tengna
			M.aor	singer
		Rita	R.rita	Marad
	Heteropneustidae	Heteropneustes	H. fossilis	Singh
	Pangasiidae	Pangasius	P. Pangasius	Padhina
	Clariidae	Clarias	C.battrachus	Mongri
	Clariidae	Clarias	C.gariepinus	Thai Mangur
Perciformes	Channidae	Channa	C.gachua	Birju
			C.punctatus	Khoksi
			C.striata	Bhunda
	Anabantidae	Anabas	A. testudineus	Kenvai
	Gobiidae	Glossogobius	G.giuris Khasadda	Khasadda
	Cichlidae	Oreochromis	O.mossambicus	Tilapia
	Ambassidaevassidae	Chanda	C. Nama	Chanda
Synbranchiformes	Synbranchidae	Amphipnous	A.cuchia	Tudum
	Mastacembelidae	Macrognathus	M.aculeatus	Jat bami
	Mastacembelidae	Macrognathus	M.armatus	Bam
Beloniformes	Belonidae	Xenethodo	X. cancila	cancila Kauwa
Characiformes	Serrasalmidae	Pygocentrus	P.natterei Roop -	Chanda

Table 2: Distribution of Species by family of fishes 2017

Sr. no.	Family	No. of Species	%
	Notopteridae	1	2.3
	Cyprinidae	17	39.5
	Cobitidae	1	2.3
	Namacheilidae	1	2.3
	Siluridae	3	3 7.0
	Bagridae	4	9.3
	Heteropneustidae	2.3	2.3
	Pangasiidae	1	2.3
	Clariidae	2	4.8
	Channidae	3	7.0
	Anabantidae	1	2.3
	Gobiidae	1	2.3
	Cichlidae	1	2.3
	Ambassidaevassidae	1	2.3
	Synbranchidae	1	2.3
	Mastacembelidae	2	4.8
	Belonidae	1	2.3
	Serrasalmidae	1	2.3
	Total 43		**100.00**

Source: based on field survey, 2017

V. CONCLUSIONS

In Rajnandgaon region fish abundance is little fluctuating the southern part of region is richly covered by dense forest and fauna comparatively northern part is low density of forest and fauna it is plain area. The observation indicates that the declining in the overall numbers of fish fauna in both traverse Rajnandagaon to Aundhi and Rajnandagaon to Gandai. The reduction of fish species is and indicative of encroachment of water bodies, unregulated fishing, poor monitoring system and unscientific fishing a fish culture. It is very necessary for the studying the life history traits and demography of the most important threatened fishes. This small effort in the field of fish fauna study; is open a new door for incoming researchers.

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