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Fish population density, diversity and ecology of Maan reservoir Jirabad Dhar (M.P.) India

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ABSTRACT

The Maanirrigation project was developed under the Narmada Valley Development project .Dam was constructed on the river Maan near village Jirabad district Dhar,it was drought prone area now about 1500 hectares of agriculture land covered under the command area of reservoir where 87% tribal farmer communities used water for domestic irrigation and fishculture Freshwater fish density and diversity was meagerly studied so that there was no proper documentation on fresh water fish resources of M.P. In the present studies 36species belonging to 21genera, 10 families and 4orders were recorded the family Cyprinidae was dominant group with the highest density and diversity while family Notopteridae and family Centropomidae had shown the lowest density and diversity during the course of study. The ecological parameters temperature, transparency TDS, pH, D.O. Alkalinity, BOD, hardness, chlorides were analyzed to determined the water quality status, the quality of water was under the limits of ICMR and WHO recommendations and suitable for fish culture and domestic purpose.

1. Introduction

The ecology of reservoir depends to a large extent on the synergetic effects of a number of meteorological, morphological, and hydrographic features and biotic communities exist in the ecosystem[1]. Fish diversity has enormous economic and aesthetic value for maintaining and supporting over all environmental health. The study of fish diversity has great cultural and scientific significance thereby having relevance to livelihood of millions of people[8]. Fish and fishery products have immense importance to mankind because of fish constitutes an important source of nutrients rich food and cheaper source of high grade protein, minerals, fatty acids and essential micronutrients for balanced nutrition and good health for population[5] Madhya Pradesh is blessed with vast aquatic resources and sustaining rich fish diversity which is a major source of livelihood[3]. Existing and emerging threats perception and conservation of fish diversity therefore be essential to protect the ecological integrity of fresh water bodies[3-4]. A number of ichthyologist have made contributions on the fish diversity and systematic of fresh water fishes of M.P [6-7].

2. Materials and methods

The geographically the Maan reservoir is located at latitude of 22° 24' 20"Nand longitude of 75° 05'40"E and altitude 590 feet above the sea

3. Analysis of physico-chemical parameters

Physico- Chemical parameters were analyzed by Standard methods of American Public Health Association (APHA 2012)[2]

4. Analysis of Fish Population

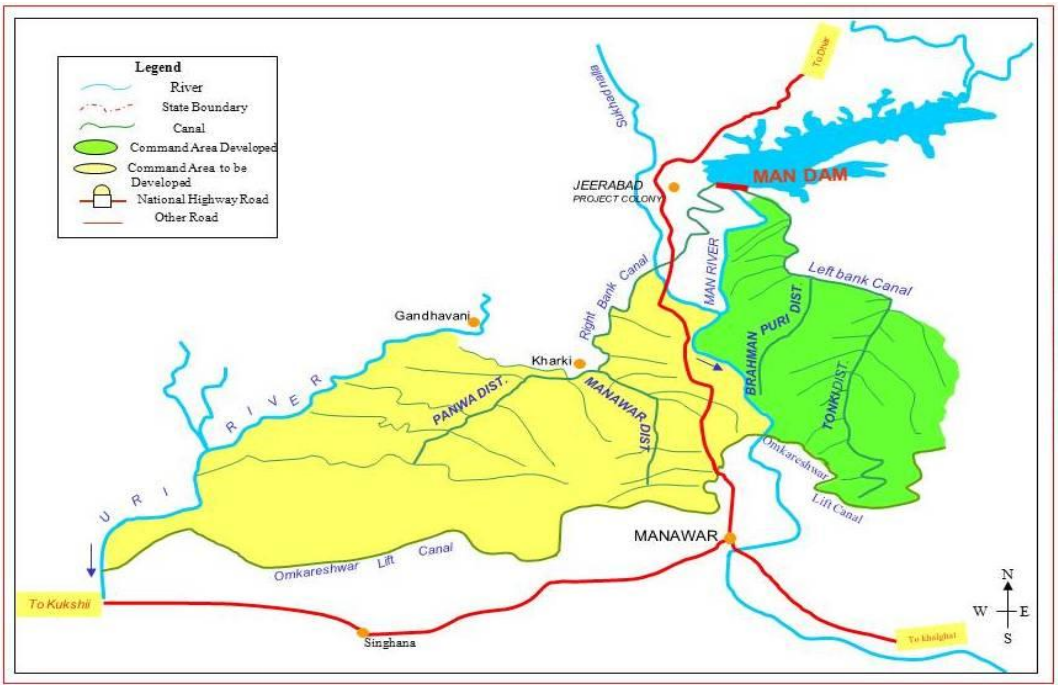
(i). Collection, preservation and identification of fishes:- Fishes were collected with the help of fisherman by using different fishing methods viz.dragnet, small mesh size gillnet,basket net,triangular nets, ghagria jal, hooks traps etc. fish samples are been preserved in formalin solution and identification of fishes were made by using literature Day (1958), Qurashi and Qurashi(1975), Jayram (1981), shrivastva(1980), Jhingran(1992).

(ii). Estimation of fish population density and diversity: Analysis of Shannon's diversity index, wiener's evenness of species, Density represents the numerical strength of species in the community. The number of individual species in any unit area is its density. It is calculated according to Ricker 1958 and Kahl's 1964)

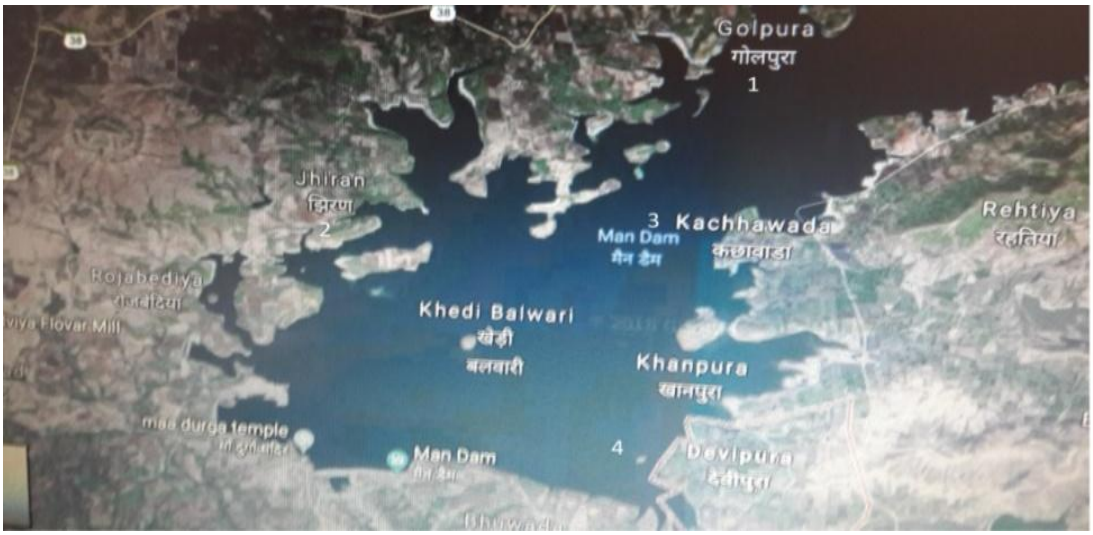
Density of fish population $= \frac{\text{Number of Species A}}{\text{Total Species}} \times 100$

Shannon's species diversity $\bar{H} = \sum[(n_1/N)In(n_1/N)]$

Where, *N* = Total number of individual organisms.
n = number of individuals of a particular species.
Evenness = H/H_{max}



Map of Maan reservoir Jirabad, Dhar



Sattelite map of Maan reservoir Jirabad Dhar

5. Results and discussion

Statics of physic-chemical parameters of Maan reservoir Jirabad Dhar M.P.

	Parameters	standard value	Unit weight	station -1 Mean-SD	station -2 Mean-SD	station -3 Mean-SD	station -4 Mean-SD
1	PH	6.5- 8.5	0.216	7.67+_ 1.77	7.82 + 2.2	7.65+_0.20	7.9 + 0.167
2	TDS	500	0.0037	130.75+_11.32	137.52+_10.5	128+_6.97	153.85+23.43
3	DO	5	0.331	6.4+_0.17	7.5+_0.80	7.8+_0.48	6.42+_0.53
4	BOD	5	0.331	3.32+_0.37	3.72+_0.78	3.85+_0.65	4.6+_0.77
5	Alkalinity	120	0.0138	134.75+_11.70	119.5+_13.52	127.7+_12.5	129.91+14.69
6	Total hardness	300	0.0061	122.5+_13.17	133.25+_7.54	127.25+_7.97	118.25+8.59
7	Chloride	250	0.0073	24.32+_2.78	30.+_1.21	19.78+_2.48	21.96+4.5
8	Sulphate	150	0.0122	6.37+_0.55	6.30+_1.38	6.92+_0.85	7.62+1.08
9	Nitrate	50	0.041	0.564+_0.172	0.44+_0.02	0.58+_0.21	0.438+_0.164

The physic-chemical parameters were analyzed with standard methods and Maximum water quality index 82.462 and minimum value of WQI 72.54 were observed the results obtained were under the limits of ICMR and useful for domestic use, irrigation and fish culture.

Estimation of relative abundance of fishes according to Ricker (1958) and Kahls (1964) at Maan reservoir Jirabad

		Pre-Monsoon		Post-Monsoon	
	Family	High relative Abundance	Low relative Abundance	High-relative Abundance	Low relative Abundance
1	Cyprinidae	52.0	48.40	55.03	49.6
2	Bagridae	9.50	7.20	10.74	7.22
3	Cobitidae	7.81	7.03	4.21	3.19
4	Ophiocephalidae	6.81	6.57	7.45	5.27
5	Notopteridae	5.21	2.80	7.98	6.6
6	Siluridae	4.78	4.87	5.37	4.30
7	Claridae	6..13	1.81	4.64	2.98
8	Matacembelidae	6.00	5.93	7.99	5.30
9	Cichlidae	9..30	6.52	2.75	2.36
10	Centropomidae	1.6	1.14	1.01	0.08

1. Family- Cyprinidae a large and dominant group having represented by 21 species, the highest density 55.03% whereas the lowest density 48.40% was observed .
2. Family- Bagridae It was subdominant and second large group represented by 4 species, the highest density 10.74% while low density 7.20% was recorded.
3. Family-Centropomidae two species reported maximum1.14%,whilminimum 0.08% relative abundance values were observed during the course of stud

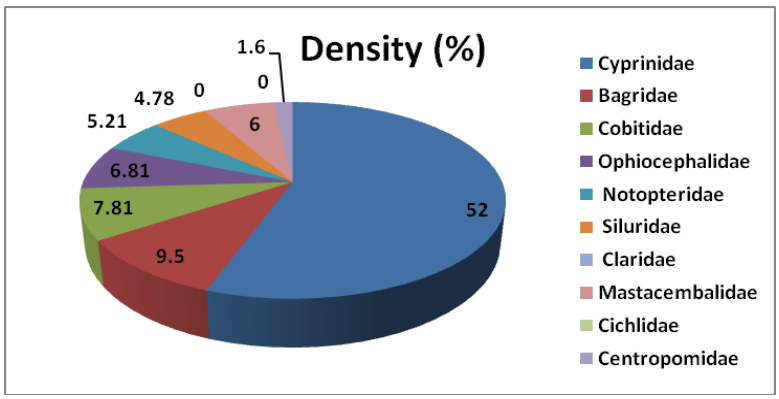


Diagram showing fish species density (Pre-Monsoon) in the year 2016-17

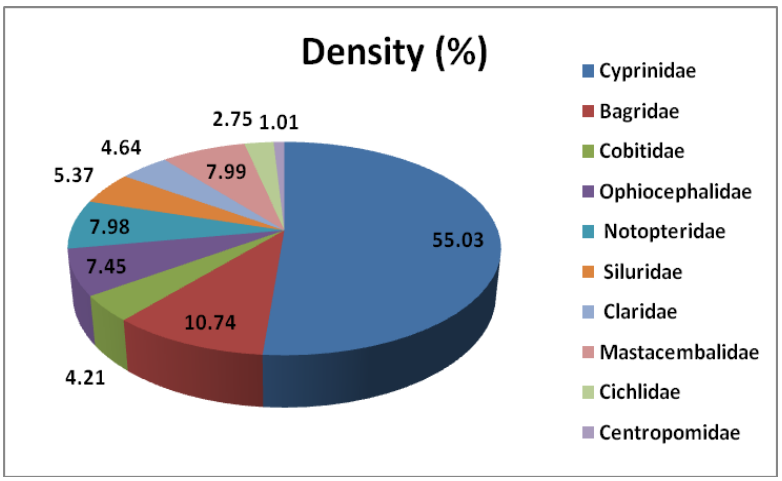
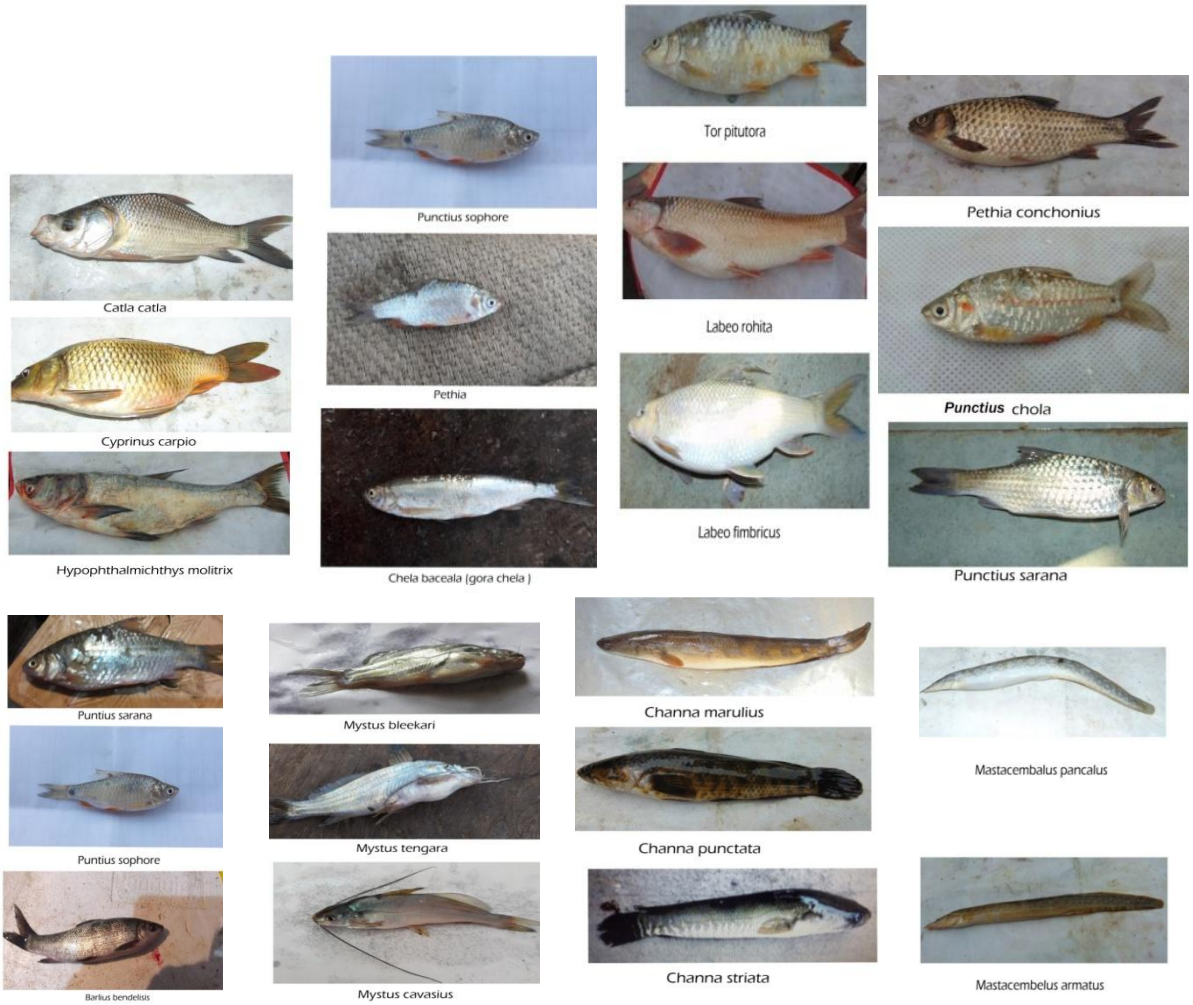


Diagram showing fish species density (Post-Monsoon) in the year 2016-17

Fish species status of Maan reservoir Jirabad,Dhar M.P.

Order-Cypriformes	Family-Cyprinidae	Genus / species	Status
		Puntius sophore (Ham	C
		Tor pitutora (Ham)	V
		Punctius ticto (Ham)	V
		Tor-tor (Ham)	VR
		Labeo bata (Ham)	V
		Labeo -Calbasu (Ham)	C
		Labeo rohita(Ham)	C
		Punctius sarana (Ham)	C
		Labeo fimbriatus (Ham)	VR
		Chella bucaila (Ham)	V
		Cata- calta (Ham)	C
		Cirrhinus mrigala (Ham)	C
		Cyprinus carpio (Ham)	C
		Cirhinus reba (Ham)	V
		Rasbora daniconius (Ham	V
		Gara gotyla (Gray)	C
		Gara lamta (Gray)	V
		BarliusGarrabendelisis (Ham)	VR
		Hypophthalmichthys molitrix	V
	Family-Cobitidae	*chitura savona*	C
		Namachilus botia	C
	Family-Cichlidae	Tilapia mossambica	C
		Oreochromis mossambica	C
Order-Beloniformes	Family-Ophiocephalidae-	*Channa striatus (Ham)*	V
		Channa punctata (bloch)	VR
		ChannaMarulius (bloch)V	V
	Family-Bagridae	-Mystus Seenghala (skyes)	C
		Mystus cavasius (Ham)	V
		Mystus Tengara (Ham)	C
	Family-Siluriae –	*Ompak bimaculatus (bloch)*	VR
		Wallago attu (schn)L	V
		Ompok padba	V
Order-Mastacembeleformes	Family- Mastacembalidae		
		Mastacembelus pancalus (Ham)	V
		Mastacembelusarmatus (lac)	C
	Family-Clariidae -		
		Clariusbatrachus (magur) (linn)	C
		Clarius gariepinus	C
	Family-Notopteridae	*Notopteruschitala(Pallas)*	C
		Notopterusnotopterus (Pallas)	V
Order-Perciformes	Family-CentroPomide	*Parambassis-ranga*	VR

C= common, V= vulnerable, VR= very rare



6. Conclusion

Biodiversity is the most valuable but least appreciated resource and it can play a key role to maintenance of the word (Wilson 1992). The biological diversity, species conservation and genetic diversity is one of the critical challenges for the conservation of biodiversity[6-7] The Maan is a tributary of river Narmada so the diversity of fish fauna almost similar but due to impounded water conservation of species needs to be more care.

References

[1]. **Ary,S.C,Rao,K.and Shrivastava (2001)** Biodiversity &Fishery Potential of Narmada basin western zone (M.P.). India with special Reference to fish conservation in environment & Agriculture pp.108-112

[2]. **APHA, AWWA,APCF (2012)** Standard methods for the examination of water and wastewater,17th edition American Publication Health Association. Inc NewYork

[3]. **Bhat, A (2002) :** A study of the diversity and ecology of the fresh water fishes of four river systems of **Uttar Kannada** District, Karnataka India. Dissertation submitted in partial fulfillment of Ph.D. degree, **Indian Institute of Science, Bangalore, India.**

[4]. **Bhalerao, S.N (2012):** Study of Fish Diversity and Water Quality at Kasar Sai dam, Jinjewadi, Pune,M.S. India Int.J. of Bio. Sci., Vol. 1(14), 51-5

[5]. **CIRFRI158-66:** Present Hydro biological Fishery status of Narmada Valley Directorate of fisheries Madhya Pradesh, Research Report Project Reports (1967-71)

[6]. **Mishra, R.Mathur,R. Gupta, R.and Mohit Arya (2010),** Limnological studies of Sakhya Sagar Lake ,Shivpuri(m.p.) J Environ. Res. and Develop.vol-IV(4):993-998.

[7]. **Pathak, S.K. and Mudgal ,L.K.(2005):** Limnology and biodiversity of fish fauna in Virla Reservoir,District West Nimar M.P.(India) Environmental Conservation Journal 6(1):41-45.

[8]. **Vyas V.and Parashar V. (2012):** Fish biodiversity of Betwa river in Madhya Pradesh with special reference to asacred ghat, Int.J.of Bio.&cons.Vol.4(2):pp.71-77.

