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Effect of water quality on fish productivity in Talwada pond in district Barwani (M.P.)

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Abstract
Physicochemical parameters of water in Talwada pond were investigated with correlation between water quality and fish productivity. Water and fish samples were collected and determined water testing parameters. Outcomes of present study that pond water with average of air temperature 27.5, water temperature 25.5, transparency 22.5, pH 8, alkalinity 135, DO 10.35, BOD 7.7, free CO_2 3.12, chloride 13.35, phosphate 1.35, sulphate 83.75 and nitrate 0.58 were observed. The water quality directly affects the fish production in tank. The total fish production during the present study period when combination of three species were cultured, the average annual yield of 1965 kg/hac/year was obtained. The stocking density of 57500 to 45000 fingerlings.

Keywords: Fish productivity, water quality, alkalinity, BOD

Introduction
Clean, safe and fresh water is essential for human being and all other living organisms in the world. Physicochemical parameters of water are responsible for growth and productivity of aquatic life of organisms. It is source of all life. It's play key role in plants life, animals and rich varieties of aquatic animals. Science time fresh water has always been of vital importance to man as his early habitats were within easy reach of river, tanks, dams, ponds and tanks.
Fish farming in controlled or artificial condition has become the easier way of increasing the fish production and its availability for consumption. Fish productivity is commonly measured as total biomass. However, in many cases additional parameters are required to make through studies. Farmers can easily take up fish culture in village pond, tanks or any new water body and can improve their financial position substantially.

Materials and Methods
Talwada tank is permanent pond in the present study. This pond is situated at Talwada village. Which is located on “Barwani - Rajpur” road 17 km away from the Barwani town. water testing carried out by standard methods as described by Trivedi and Goel (1986) and APHA (2017 and 2023) [1, 2]. Fishes were collected by small mesh sized gill net, cast net and drag net with the help of local fisherman. The collected fishes were preserved in 5% formalin and brought to laboratory for further investigation. Fishes were identified up to species with the help of "The fishes of India" by Day (1987).

Result and Discussion
In studied pond the total fish production comprises of three species *Catlacatla*, *Labeo rohita* and *Cirrhinus mrigala*. The total fish production was 1965 kg/hac/year and total income (1 kg.-120 Rs.) was 235800 Rs./hac/year. Net profit (Total income-Investment) was 220700./hac/year. This profit was divided into 21 members of fish society of Talwada pond and each got Rs. 10509.52/hac/year.
The various levels of fish production achieved through composite culture in India clearly indicate that carp culture is no longer in its infancy, a growing awakening has been noticed on the use of quality seed, nutritious feed and monitoring of water quality and fish health in culture practice.

Observation

Table 1: Annual fluctuation in physicochemical parameters of the water of Talwada Tank (2022-23)

S. N.	Parameter	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Max	Min	Mean
1.	Air Temperature	28	29	30	32	26	23	20	25	30	35	Dry	Dry	35	20	27.5
2.	Water Temperature	26	25	27	30	24	21	18	21	28	33			33	18	25.5
3.	Transparency	13	11	12.6	13	14.5	18	19	20	21	34			34	11	22.5
4.	pH	7.6	7.5	7.4	7.8	8	8.1	8.4	8.5	8.2	8			8.5	7.5	8
5.	Alkalinity	80	70	90	105	112	150	190	200	180	160			200	70	135
6.	Dissolved Oxygen	10	10.2	10.1	10.2	10.4	10	10.7	10.4	10.5	10.4			10.7	10	10.35
7.	BOD	7.4	7.3	7.4	7.9	7.4	7.2	7.2	8	8	8.2			8.2	7.2	7.7
8.	Free Carbon dioxide	3	2.92	3.2	3.65	4.25	2	3.15	3.45	2.85	2.25			4.25	2	3.12
9.	Chloride	9.5	8.6	8.5	12	14.1	14	18.2	15.5	16	16.2			18.2	8.5	13.35
10.	Phosphate	0.88	0.68	0.58	1.25	0.95	0.89	1.55	1	2.12	0.92			2.12	0.58	1.35
11.	Sulphate	38	35.5	55	69	75	80	78	85	92	132			132	35.5	83.75
12.	Nitrate	0.68	0.54	0.18	0.22	0.24	0.37	0.54	0.98	0.86	0.85	Dry	Dry	0.98	0.18	0.58

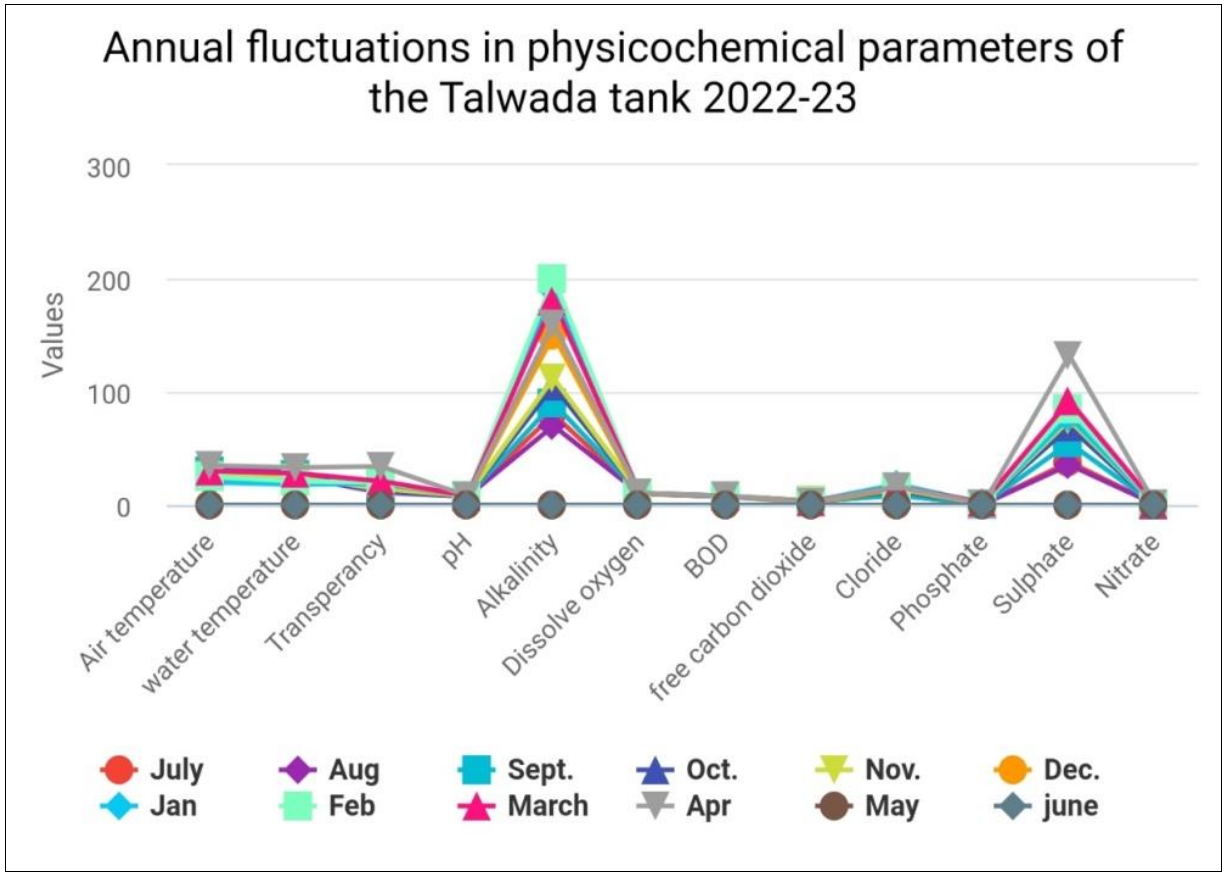

Fig 1: Fish production in Talwada tank (1Hac.Area) 2022-2023

Table 2: Fish production in Talwada tank (1Hac.Area) 2022-2023

S. N.	Species of fishes	Ratio	No. of fry	No. of fish (Catch)	Mortality	Length mean	weight of fish	No. of fish	Total weight
1.	*Catla catla*	33%	Total fry = 18750	7620	59%	210 mm	75 gm	6000 fish	450kg.
			25 mm-50 mm=9375				100 gm	1600 fish	160kg.
			50 mm-75 mm=9375				500 gm	20 fish	10kg.
2.	*Labeo rohita*	33%	Total fry = 18750	8040	57%	280 mm	75 gm	6800 fish	510kg.
			25 mm-50 mm=9375				100 gm	1200 fish	120kg.
			50 mm-75 mm=9375				500 gm	40 fish	20kg.
3.	*Cirrhinus mrigala*	35%	Total fry = 20000	8630	56%	280 mm	75 gm	7200 fish	540kg.
			25 mm-50 mm=10000				100 gm	1400 fish	140kg.
			50 mm-75 mm=10000				500 gm	30 fish	15kg.
Total	03 species		57500	24290	57%				

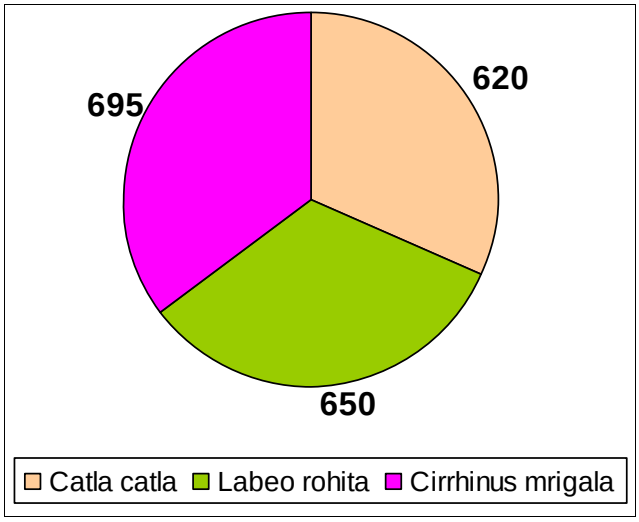

Fig 2: Fish production in Talwada tank (1Hac.Area) 2022-2023

Conclusion

Fish Farming has been an old occupation in India. The result from this study revealed that physiochemical parameters can positively support the fish productivity with correlation between the total dissolved solids, pH, temperature, plankton and fish diversity. The impact of fish production in the rural area is very much seen in the economic condition of the people. This study is helpful for fish farming will encourage not only the economic development of the people but also a good social life.

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