



STUDIES ON SOME ECOLOGICAL ASPECTS IN RELATION TO FISH PRODUCTION OF TWO DAM, FROM OSMANABAD DISTRICT OF MAHARASHTRA, INDIA.

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ABSTRACT

The important objective of this communication to explain the abundance as well as the status of fish fauna and impact of water pollution on fish production in Bori Dam and Khandala Dam, in Osmanabad District, Maharashtra. For the investigation of this problem the data of total fish production form last 7 years was collected by survey from fishermen societies of dam. For investigation ecological aspects of the dam water samples were collected and evaluate in the research laboratory. After the investigation the results observed that the pH of ranged from 8.3-9.2 and 8.4-9.8, the D.O. was observed 2.2-4.4 mg/lit and 2.3-3.3 mg/lit. The B.O.D. values 2.7-6.4 mg/lit and 2.9-6.3 mg/lit; T.D.S. values are 79-87 mg/lit and 82-92 mg/lit and 103-178 mg/lit the calcium ranges between 126 to 154 mg/lit and 54-127 mg/lit; Magnesium is ranges between 41-47 mg/lit and 31-38 mg/lit ; The chloride content was 34.2-43.1 mg/lit and 35.1-41.4 mg/lit ; The nitrate content was 0.04-0.05 mg/lit and 112 mg/lit; the total alkalinity content was ranges between 48-131 mg/lit and 74-143 mg/lit respectively observed in Bori dam and Khandala dam of Osmanabad district. The result values showed that the domestic activity, industrial effluents or wastes, agriculture waste etc. are the main source of pollutants of water. Other secondary natural causes are biodegrading portion of plants as well as animal waste and siltation by erosion of soil in the study area.

Key-words: Ecological aspects – Fish production water quality – pollution.

INTRODUCTION

Due to rich source of protein the fishes are preferred as food source and it is an important cash crop which is practiced in aquaculture in many regions of country as well as world. The water is the physical support in which they carry out their life activities like swimming, feeding, digestion, excretion as well as reproduction (Bronmark and Hansson, 2005). In the Asian part of the world, much of the fish production is formed traditionally cultured pond aquaculture or integrated polyculture in to wider aquaculture practices. After the results observation of Bori dam and Khandala dam the occurrence of 19 species and 14 species respectively which are belonging to 11 genera, 8 families and 4 different orders of classification (Jain et al. 2015). In aquaculture ecosystem the fishes are generally highly infected to toxic substances among the aquatic fauna of the water body Pazhanisamy K. and N. Indra (2007). The massive fish death in aquatic ecosystem in the nature is due to the untreated or partially treated industrial effluents, domestic activities and its waste water, supplemented heavy metals, as well as agriculture waste like pesticides, many organic and inorganic toxic compounds etc.

To improve the aquaculture economics of freshwater bodies the above problem was selected for investigation. The main aim of the present investigation was to assess the current status of aquatic fauna especially fishes those that occurred in the past and to evaluate the

causes and impacts of water pollutants and its effect on fish production in both freshwater dam Osmanabad district.

MATERIAL AND METHOD

To evaluate the abundance and status of fish fauna and water pollution impact on fish production status of both dam was conducted for the period of a year i.e. June 2014 to May 2015 to study water pollution. The water samples were collected in morning hours from both dam at different sampling sites and brought to the laboratory for further analysis of water quality parameter except pH and D.O. which are observed on sampling stations i.e. at spot.

The analysis procedures are based on standard methods which are suggested by APHA (1998), Datta et al. (2015), Imam and Khan (2014) and Trivedy and Goel (1984), etc. The fish production data of both dam was collected production year wise fishing society of both dam with personal interview survey. The results obtained from analysis were compared with values suggested in water quality standards given by BIS (1991) and WHO (1993).

RESULT AND DISCUSSION

In aquaculture the good water quality is characterized by proper temperature, adequate oxygen content, water transparency, limited levels of metabolites and other environmental factors affecting fish culture practice (Jain et al. 2015). During the study period there are 19 different fish species present in Bori Dam the year 2015. In the year

2011, large scale production was observed. In the year 2012, production was high but fishes were not able to survive due to various causes like turbidity, domestic waste and sewage of soil pollutant. In the year 2013 and 2014 the fish production of both dam was not observed in commercial scale which is noted from Table II of the data. The observation of investigation explain that the presence of major carps as well as exotic carps like grass carp, common carp silver carps species are not recorded in adequate amount from the fishermen personal interviews.

Table No. I

Comparative charts of some ecological aspects of both dam water with standard values of BIS (1991) & WHO (1993) evaluated during the period of June 2014 to May 2015.

Sr. No.	Parameter	Sampling station		Standards	
		Bori Dam	Khandala Dam	BIS (1991)	WHO (1993)
1	pH	8.3-9.2	8.4-9.1	6.8-8.5	6.5-9.2
2	D.O. (mg/lit.)	2.2-4.4	2.3-3.3	4-6	4-6
3	T.D.S. (mg/lit.)	79.87	82-92	500	1000
4	B.O.D. (mg/lit.)	2.7-6.4	2.9-6.3	5	6
5	C.O.D. (mg/lit.)	14.9-16	15.1-16.3	-	10
6	Total Hardness (mg/lit.)	90-130	103-178	300	100-500
7	Total alkalinity(mg/lit.)	48-131	74-143	50-200	200
8	Calcium (mg/lit.)	126-154	54-127	200	200
9	Magnesium (mg/lit.)	41-47	31-38	100	150
10	Nitrite (mg/lit.)	24-32	20-30	45	50
11	Chlorides (mg/lit.)	34.2-43.1	35.1-41.4	250	250

Table No. II

Comparative chart of Average fish production of both Dam are as follows,

Sr. No.	Year	Production per year	
		Bori Dam	Khandala Dam
1	2009	12 Tonne	8 Tonne
2	2010	10 Tonne	7 Tonne

3	2011	14 Tonne	9 Tonne
4	2012	10 Tonne	6 Tonne
5	2013	9 Tonne	5 Tonne
6	2014	7 Tonne	3 Tonne
7	2015	6 Tonne	2 Tonne

After investigation of some ecological aspects of both dams to find out the relationship of parameter and its impact on the fish production to evaluate the reasons for the decrease of total fish production, the water samples were collected from both dams for analyzed and compared. During the present investigation of study area the pH ranged in 3.3-9.2 in Bori dam and 8.4-9.1 in Khandala dam with fluctuation at various stretches of sites throughout the water body of both dam. The D.O. content of both water body ranges between 2.2-4.4 mg/lit for Bori dam and 2.3-3.3 mg/lit for Khandala dam. The T.D.S. value ranged between 79-87 mg/lit in Bori dam and 82-92 mg/lit in Khandala dam. The B.O.D. Content of Bori dam was 2.7-6.4 mg/lit and 2.9-6.3 mg/lit in Khandala dam. Then the chloride content was analyzed it was ranged between 34.2-43.1 mg/lit in Bori dam and 35.1-41.4 mg/lit Khandala dam, this showed that the chloride content of both dams was below the maximum permissible limit which was prescribed by WHO and BIS standards for drinking water quality values. The calcium content of Bori dam was 126-154 mg/lit and 54-127 mg/lit was in Khandala dam. The magnesium content of Bori dam was 41-47 mg/lit and 31-38 mg/lit in Khandala dam.

The nitrite content of Bori dam was ranged between 24-32 mg/lit and 20-30 mg/lit in the Khandala dam. The total alkalinity of Bori dam was ranged between 48-131 mg/lit and 74-143 mg/lit in Khandala dam.

After investigation the some ecological aspects of both dams the values are set a desirable limit of drinking water quality and all values are within permissible for drinking water quality standards of WHO (1993) and BIS (1991). After observing both sides of investigation concludes that the pollution of water body as well as the overfishing on the water body may be probably impact on the fish production of water body.

This communication indicate that the urbanization to a huge extent in polluting the freshwater water bodies of this area and over use of organic farming practices are the factors which was probably impact on the fish faunal diversity. So, it is time to maintenance of all

the factors becomes very essential and important for getting maximum yielding as well as earning from the aquaculture.

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