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Study of Different Parameters of Manmade Mohari Reservoir from Pathardi Tahsil, MS, India

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Abstract

When water is polluted by various ways that means it affects flora and fauna of that area. The villagers mainly used it for irrigation and pisciculture activities. Water sample collected in Mohari dam located in southern part of Pathardi Tahasil, District-Ahmednagar (MS). Water is most precious natural resource expected to before from pollution. The physiochemical parameters are atmospheric temperature (AT), water temperature (WT), pH, electrical conductivity (EC), total dissolve solid (TDS), acidity (acid), alkalinity (alk), carbon dioxide (CO_2), dissolve oxygen (DO), were mentioned on monthly basis for period of one time annual cycle that is Jan 211 to Dec- 2011. The result revealed that the reservoir water is useful for human use.

Keywords: Irrigation, Mohari Dam, reservoir, parameters.

Introduction

Artificial dams are constructed in some rivers for providing irrigation to crop fields. Dam is constructed over a large area causes biodiversity loss in that area. Beside this inundation of adjacent lands withes over flowing water from dam sometimes causes great havoc to the inhabitatants and also causes loss of biodiversity in surrounding area of the dam. However there are no such studies from this region therefore present work is under taken. The present paper deals with the result of water analysis of manmade reservoir Mohari from Pathardi Tahasil of Ahmednagar District (MS), India.

The present study was conducted for one year that is Jan 211 to Dec- 2011 through the monthly sampling of Mohari reservoir. Mohari reservoir located in southern part of (19^0 9' N, 75^0 10' E) Pathardi Tahasil, which falls in Arangaon range of Balaghat, District-Ahmednagar. The reservoir is situated in southern part of Tahsil, which is hilly area with drought condition. The Mohari reservoir is Minor irrigation project type of reservoir near Mohari, about 9km from Pathardi Tahasil. It is constructed during the year 1973 having height of 14.35 meter. The catchment area is 9 square miles, which stores 72.50 mc.ft water and area under submergence is 75.30 hectors.

The density of diversity of zooplanktons is depending on water quality of reservoir. The zooplankton is microscopic free living floating organism, which occupy a central position between the autotrophy and other heterotrophs and from an important link in aquatic food web. Human life is living pattern without the presence of aquatic animals. All over the world, all fresh water habitats, lakes, ponds, reservoir, dams etc. The present paper deals with the result of water analysis of manmade reservoir Mohari from Pathardi Tahsil of Ahmednagar District, Maharastra State, India.

Figure-1
Location of Pathardi Tehsil, Ahmednagar (MS)

Figure-2
Location of Mohari reservoir, Pathardi

Material and Methods

The water samples were collected monthly. The physiochemical parameters are atmospheric temperature (AT), water temperature (WT), electrical conductivity (EC), total dissolve solid (TDS), acidity (acid), alkalinity (alk), carbon dioxide (CO2), dissolve oxygen (DO), were carried out on field. Physical chemical characteristics of water were estimated following standard method[1].

Results and Discussion

The present investigatory study of Mohari Dam revels all parameters are in favorable range for aquatic life, irrigation and domestic use. Present studies showed pH range favorable for aquatic life, irrigation and domestic use. The investigated results are as follows:

Temperature (AT and WT): Atmospheric temperature of surface water ranges from24.6^{0}c to 43.5^{0}c during the study period. Minimum (24.6^{0}c) and maximum (43.5^{0}C) atmospheric temperature (AT) were recorded during winter and summer season respectively. The water temperature was maximum during summer (43.5^{0}C) and minimum during winter (24.6^{0}C). The result show that water temperature varies with the atmospheric temperature, similar result were found Singhai S. et.al.[2], also found by a direct relationship between air and water temperature. During the summer season, solar radiations are and clear sky condition enhanced the atmospheric temperature. Where the during monsoon season, rainfall and cloudy-skies brought down the atmospheric temperature and subsequently the water temperature to minimum[3].

pH: pH value of all sample lies in the range of 7.2 to 8.6 are slightly alkaline and suitable to irrigation purpose that is there is no alkalinity hazard (7.2- 8.1) during winter and higher value (8.1 to 8.6) during summer. Higher pH is normally associated with a high photosynthetic activity in water[4-6]. The pH of the water appears to be dependent upon the relative's quantities of calcium carbonite and bicarbonites, being alkaline when disposal of wastes also bring about changes in the pH[7,8].

Electrical Conductivity (EC): Electrical conductivity (EC) is a measure of the salt content of water in the form of ion. EC value ranges from 189 µS/ cm to 294 µS/ cm with an average of 235µS/ cm. The month wise value shows the minimum during December. The concentration of EC increases during summer and reaches maximum in July. The increase in EC during pre monsoon period may be due to evaporation. This is in agreement with result obtained by Shankar P. et al.[9].

Total Dissolve Solid (TDS): Total Dissolve Solid (TDS) are various kinds of minerals substances present in water. Some dissolve organic matter may also contribute to total dissolve solid. TDSA value ranges from 105 mg/l to 169 mg/l. The season wise value shows the minimum during winter. The concentration of TDS in water gives an idea about suitability of this water for various uses including potable water [10]. All the values of TDS were within the (500 mg/l) highest desirable limit[11].

Acidity (Acid): Acidity is found maximum during winter and minimum during summer. Acidity value s of all sample lies in the ranges of 17.1 mg /l to 34.2 mg/l. Acidity of water is its quantitative capacity to react with a strong base to designated pH. Value of the acidity is about 200 mg/l [12] and observed values are far less than this, indicating that acidity of sample water is a safe range.

Alkalinity (Alk): Total Alkalinity shows seasonal variation in the study. Alkality value ranges from 215 mg/l to 284 mg/l. The values were high during the summer and low during winter. The fall in values during monsoon may be due to dilution of water. The high value of alkalinity indicates the presence of weak and strong base such as carbonate and hydroxide in the water body[13,14].

Carbon Dioxide (CO_2): The carbon di oxide level fluctuated between 1.8/l to 2.5mg/l. The seasonal value was 3.82 mg/l in winter, 2.27 mg/l in summer and 3.22 mg/l in rainy season. Low value of free CO_2 as observed during summer are mainly because of CO_2 is utilized in the polysynthetic activities[14].

Dissolve Oxygen (DO): The dissolve oxygen is most important factor in fresh water life. In present study DO is ranged between 3.4 mg/l to 4.3 mg/l. The average DO value were 3.56 mg/l in summer, 4.05mg/l in winter and 3.95 mg/l during rainy season The value of DO was obtained as following order, winter> rainy> summer season in present study. The results are similar and co related with investigation of Dwivedi B.K.[15]. The phenomenon of re-oxygenation of water during monsoon may be due to the circulation and mixing by in flow water monsoon rains[16]. It further r progressed in winter may be due to the circulation by cooling and draw down the DO in water.

Conclusion

The present study concluded that the Mohari manmade Reservoir is indicates the higher values of some parameters of the samples. They minimize the suitability of these samples for drinking purposes without treatment. But, after the filtration and disinfection, naturally present impurities can be removed in water, which provide its suitability for drinking and domestic purposes. People depend on this water are often prone to health hazards due to polluted drinking water. Therefore, some effective measures are urgently required to enhance the drinking water quality by delineating an effective water quality management plan for the region.

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Table-1
Monthly reading in four sites of Mohari Reservoir (Jan to Dec. 2011)

Month	AT^{0}C	WT^{0}C	pH	Ec µs/cm	TDS mg/l	ACID mg/l	Alk mg/l	CO2 mg/l	DO mg/l
Jan	24.6	23.5	7.8	181	113	11.1	237	1.8	4.1
Feb	26.9	25.9	8.2	190	125	9.8	261	1.97	4.26
Mar	31.5	28.9	8.6	199	133	8.9	274	1.83	4.37
Apr	43.5	42.6	8.5	205	156	8.6	284	2.15	4.61
May	42.1	40.6	8.1	254	145	9.6	276	2.27	3.56
Jun	43.2	41.2	8.2	265	169	6.5	240	2.3	3.47
Jul	42.2	40.6	8.3	294	140	18.2	243	3.1	3.4
Aug	31.5	29.7	7.6	250	133	19.5	231	3.22	3.95
Sep	30.1	28.4	7.5	236	110	18.9	218	2.11	4.01
Oct	27.6	25.4	7.2	221	112	17.1	215	1.92	4.03
Nov	25.6	23.6	7.6	192	110	18.2	223	1.9	4
Dec	2.6.9	24.5	7.8	189	105	15.1	234	182	4.05

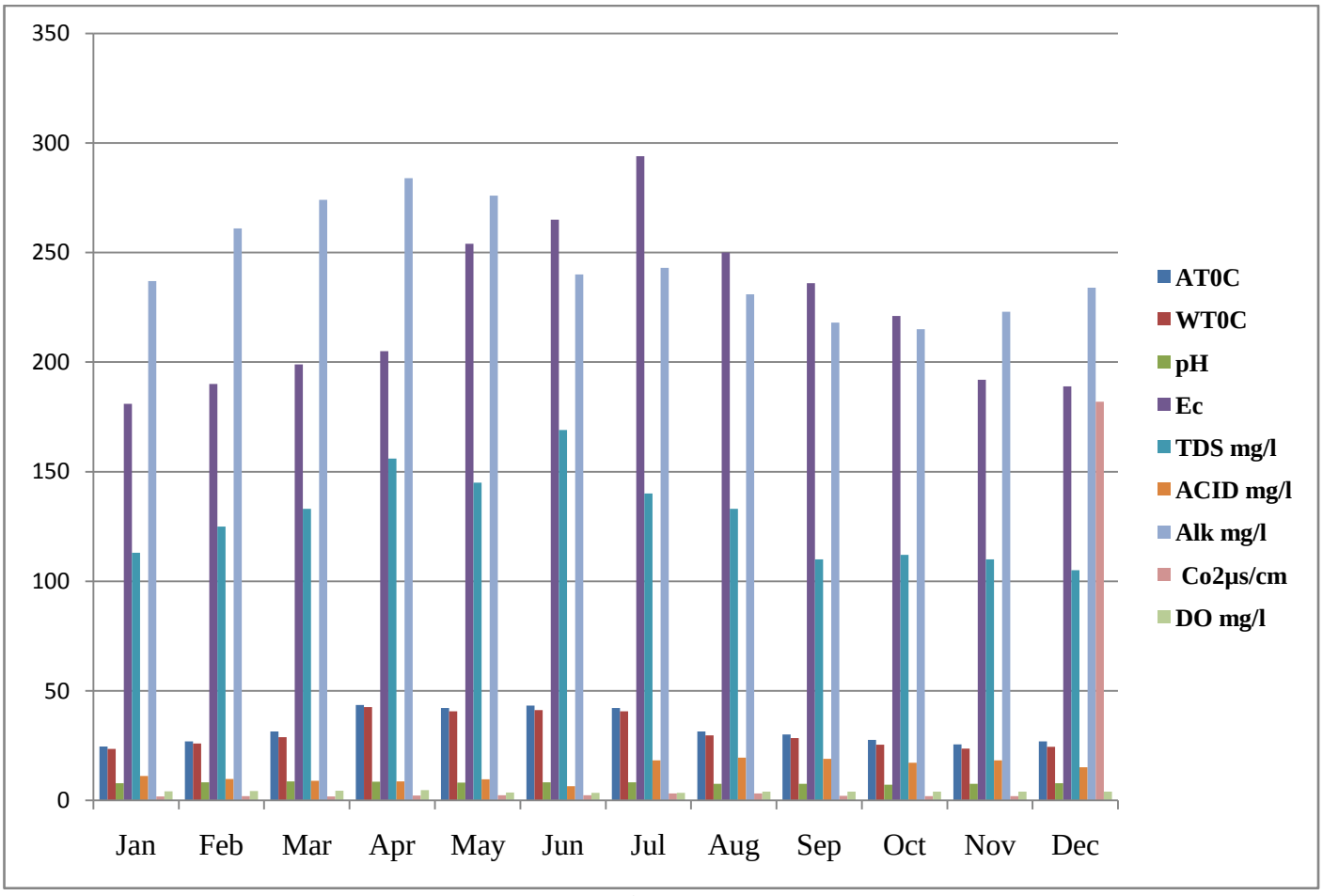

Figure-3
Monthly readings in four sites of Mohari Reservoir (January to December, 2011)

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