WATER QUALITY STATUS OF JANGI LAKE IN AMBAD, MAHARASHTRA

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Abstract

Jangi Lake was constructed by Devi Ahilyabai Holkar for drinking water demand for Ambad town, Dist- Jalna, Maharashtra (India). The physico-chemical parameters were studied to assess the status of water quality. First, sampling points were selected and then samples were collected monthly during 2017-18 from two different sampling points and analyzed for **pH, EC, DO, BOD, COD, Total Hardness, Total Alkalinity, phosphates, nitrates, Chlorides** etc. The present study reflects that, the urban development in the town which led adverse changes in the physico-chemical and ecological characteristics of Jangi Lake water. The urban Sewage runoff, washing, bathing and dumping of solid waste, Ganesh idol immersion, and other activity deteriorated the water quality of Jangi Lake also providing nutrient for algae and other phytoplanktons so the water is shrinking gradually.In conclusion, the water is polluted and unfit for drinking, bathing purpose without any treatment. The eutrophic condition affected the aesthetic value of Jangi Lake. The suggested strategies for conservation of Jangi Lake are prevention of pollution, diverting of sewage waste water, treatment of waste water, lake cleaning by de-silting, de-weeding, bioremediation, public awareness and public participation.

Keywords: *Jangi Lake, idol, Lake Conservation, Water quality, Physico-chemical analysis*

Introduction

Lakes, reservoir is the main sources for drinking water supply. The quality of water recourses are usually depends on its physical, chemical, and biological characteristics. The good quality of water is used for drinking and agriculture purposes but the water quality is affected by different pollution sources. Water pollution is the contamination of water sources that is ponds, lakes, rivers, groundwater, and oceans. Water pollution occurs when pollutants are discharged directly or indirectly into waterbodies without treatment of harmful compounds, water pollution affects plants and organisms living in these polluted waterbodies and human beings using the polluted water.(A.K.Tripathi 2016). Physico-chemical analysis reflects the quality of water. The urban Sewage, washing, bathing and dumping of solid waste, Ganesh idol

immersion, and other activity are taking place in Jangi Lake from many years. The present work was undertaken to find out the water quality of Jangi Lake.

Material and methods

Jangi Lake is situated in between $19^{o}37'12''$N, 75o47'24''E Ambad town, Dist- Jalna, Maharashtra (India). The physico-chemical parameters of water of Jangi Lake were studied to assess the status of water quality. The water samples were collected using Plastic container and other suitable bottle, monthly and seasons wise during 2017-18 from two different sampling points and analyzed for pH, EC, DO, BOD, COD, Total Hardness, Total Alkalinity, phosphates, nitrates, Chlorides. The some physico-chemical parameters such as pH, DO were determined on the spot, using standard methods of APHA. (2005), Trivedi, R.K and Goel, P.K (1984) in laboratory. The ranges of values of different parameters during the period of study are shown in table.

Results and Discussion

The water quality data obtained after carrying out analytical studies is depicted in the **Table.01.**

pH Most natural waters are generally alkaline due to sufficient quantities of Carbonates and Bicarbonates, Samples showing pH at site A & B in average maximum way 8.15 -8.7 and minimum way 7.8 – 7.8.

Electrical Conductivity is the measure of capacity of a substance or solution to conduct electric current, At site A & B the average maximum Electrical Conductivity is 304.15 – 309.2 µmohs/cm and in average minimum level 240.8 – 265.55 µmohs/cm.

Total Hardness-Principal cations imparting Hardness are Calcium and Magnesium. The average maximum value of Total Hardness was found to be 257.85 – 254.75 mg/l and average minimum was 165.75 – 163.8 mg/l at site A & B

Total alkalinity average maximum value was 454.6 – 448.45 mg/l and average minimum value was 323.25 – 315.25 mg/l at site A & B.

Chloride - Due to the discharge of domestic sewage to water bodies, Chloride concentration increases in the lake water. Chloride concentration serves as indicator of sewage pollution. It showed marked variation during the study period with a range of 35.4 - 31.3 mg/l and 35.55 - 30.15 mg/l in the average at maximum and minimum level at site A & B respectively.

Phosphate content of water ranged from 4.65 – 4.3 mg/l to 4.0 – 4.85 mg/l at both site at average maximum and minimum range.

Nitrate content of water ranged from 2..05 to 1.45 mg/l and 2.05 to 1.35 mg/l in average maximum and minimum at site A & B.

DO was found at site A & B in average maximum & minimum range at 8.75 – 5.4 mg/l to 8.9 – 5.75 mg/l respectively.

**BOD** ranging from 23 – 19.25 mg/l to 22.75 – 19.25 mg/l in average maximum & minimum level at site A & B.

COD average maximum & minimum level at site A & B ranging from 160 – 121.65 mg/l to 163.25 to 117 mg/l.

Parameter	Site	Year	Rainy			Winter			Summer		
			Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Ph	A	2017-18	7.4	8.9	**8.15**	7.2	8.4	**7.8**	7.7	8.1	**7.9**
	B	2017-18	8.5	8.9	**8.7**	7.4	8.2	**7.8**	7.4	8.2	**7.8**
Elect-C	A	2017-18	234.4	247.2	**240.8**	242.3	246.2	**244.25**	279.2	329.1	**304.15**
µmohs/cm	B	2017-18	296.9	247.2	**272.05**	241.6	289.5	**265.55**	279.8	338.6	**309.2**
Total	A	2017-18	104.3	227.2	**165.75**	167.7	219.6	**193.65**	197.8	317.9	**257.85**
Hardness	B	2017-18	103.5	224.1	**163.8**	164.6	220.1	**192.35**	192.3	317.2	**254.75**
Total	A	2017-18	291.3	355.2	**323.25**	361.1	505.7	**433.4**	399.5	509.7	**454.6**
Alkalinity	B	2017-18	280.6	349.9	**315.25**	352.4	495.8	**424.1**	388.8	508.1	**448.45**
Chlorides	A	2017-18	30.4	36.1	**33.25**	25.6	37.2	**31.4**	32.4	36.2	**34.3**
	B	2017-18	29.1	31.2	**30.15**	27.5	37.8	**32.65**	33.7	37.4	**35.55**
Phosphate	A	2017-18	3.4	5.9	**4.65**	3.9	4.7	**4.3**	4.1	4.9	**4.5**
	B	2017-18	3.9	5.8	**4.85**	3.8	4.6	**4.2**	3.5	4.5	**4.0**
Nitrate	A	2017-18	1.7	2.4	**2.05**	1.6	2.1	**1.85**	1.2	1.7	**1.45**
	B	2017-18	1.6	2.5	**2.05**	1.2	1.9	**1.55**	1.2	1.5	**1.35**
Dissolved	A	2017-18	6.4	6.7	**6.55**	8.4	9.1	**8.75**	5.1	5.7	**5.4**
Oxygen	B	2017-18	6.2	6.6	**6.4**	8.5	9.3	**8.9**	5.4	6.1	**5.75**
BOD	A	2017-18	18.1	27.9	**23**	19.2	22.7	**20.95**	17.5	19.1	**18.3**
	B	2017-18	19.6	25.9	**22.75**	19.7	23.9	**21.8**	18.4	20.1	**19.25**
COD	A	2017-18	114.2	129.1	**121.65**	124.7	139.5	**132.1**	156.8	163.2	**160**
	B	2017-18	111.1	122.9	**117**	128.1	139.5	**133.8**	158.8	167.7	**163.25**

Table.01-Seasonal variation in physico-chemical parameter of Jangi Lake

(All values are in mg/l except. pH, EC)

Graphical presentation of physico-chemical parameter of Jangi Lake
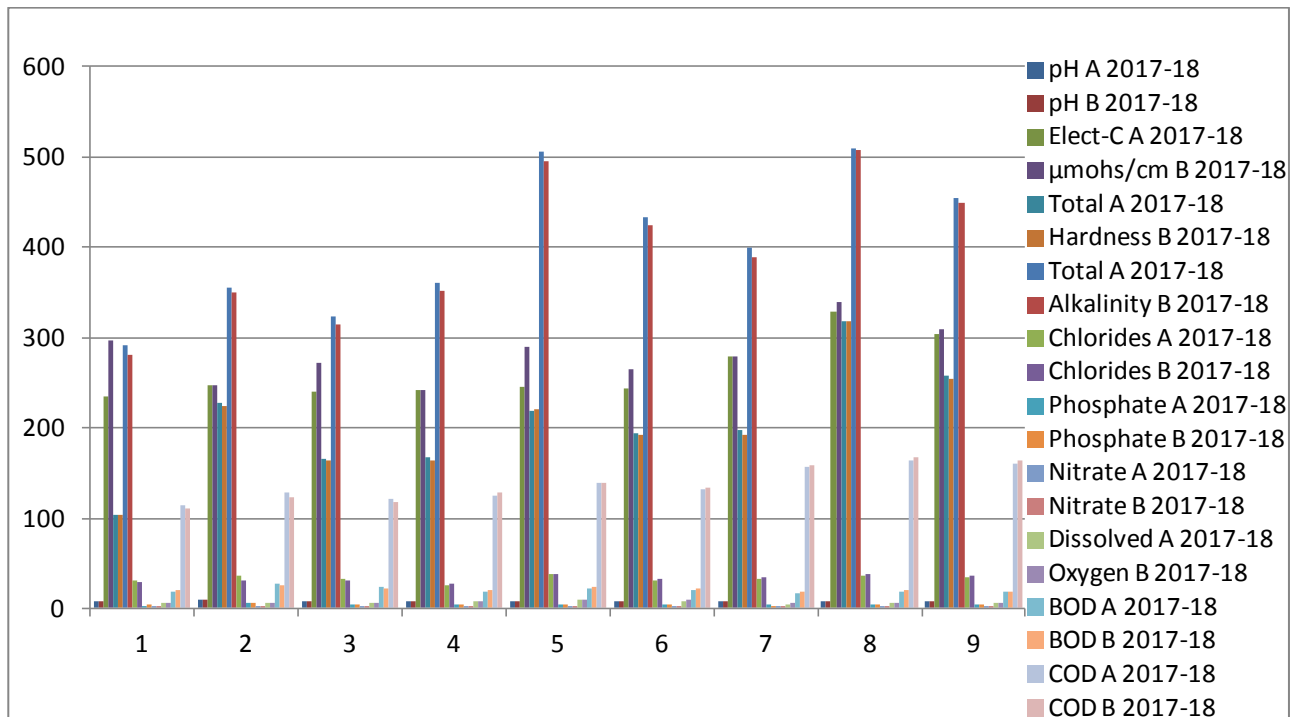
Conclusion

The study revealed that the water of Jangi is moderately polluted and unfit for consumption purpose without any treatment. The aesthetic value of lake is getting deteriorated due to different type of pollutant like Nitrate, Phosphate creating eutrophic condition to water body. Due to sewage water the lake is getting polluted at high level, so the best suggested strategies to overcome the lake water pollution are treatment of sewage water before discharging, deweeding of lake, public awareness and public participation.

Acknowledgement

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