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Novel practices of idol immersion to conserve Hussain sagar lake

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ABSTRACT

Since ionic concentration in the lake influence the lake's ability to assimilate pollutants and maintain nutrients in water, a detailed study on water quality was undertaken to get an insight on the natural and anthropogenic processes operating in Hussain Sagar Lake during idol immersion in September- 2007. The water samples were collected before and after the immersion of idols and were analyzed for various parameters. The analysis results indicate that water quality of lake- decline after the idol immersion along with other anthropogenic activities. For conservation of this lake, suitable methods are suggested like immersion of idols in artificial ponds and two-size idol system should be practice to retain the glory and pristine beauty of this lake.

Key words: Heavy metal, pollution, idol immersion, Hussain sagar lake.

INTRODUCTION

The Hussain Sagar was constructed on a tributary of the Musi river by Hussain Shah Wahi during the reign of Ibrahim Quli Qutub Shah in 1562. One of the largest 24 kilometers man made lakes is situated at Hyderabad. In the present study an attempt has been made in Hussain Sagar Lake, which receives contaminants /pollutants from various industries, domestic sewage and idol immersion.

The traditional mud idols have been replaced by plaster of paris (PoP) statues. Plaster of paris contains gypsum, sulphur, phosphorus and magnesium which does not get dissolved or disintegrated fast. Particularly, Red, Blue, Orange and Green colours contain Mercury, Zinc oxide, Chromium and Lead, the potential causes of developing cancer. These materials poison water bodies, by increasing chemical and organic content. In the process, ecosystems of these water bodies get harmed where plant and fish species die in large numbers, blocking the natural flow of the water and causing stagnation and siltation.

Lake and their surroundings are unique assets and valuable ecosystems for both society and nature. These are of social, cultural, aesthetic and economic values [1].As the concern raised by environmentalists regarding pollution of the Hussain Sagar Lake due to immersion of thousands of idols, the High Court of Andhra Pradesh has also directed the Government to ensure environment-friendly immersion of idols.

MATERIAL AND METHODS

The water samples were collected from hussain sagar lake. Samples were collected in the plastic cans before and after immersion in September -2007 in duplicates. Water samples were

analyzed for pH, EC, DO, BOD, COD, NO_3, PO_4, SO_4, alkalinity, chlorides, hardness as per standard methods [2]. Reagents used in the study were of AR grade and double distilled water was used for preparation of various solutions.

RESULTS AND DISCUSSION

The biological health of a lake is crucially dependent on its chemical characteristics. The physico-chemical properties of water before and after idol immersion from hussain sagar lake is given in Table 1.

The pH of water sample before immersion (BI) was 7.8 which is neutral to slightly alkaline within the permissible limit of 6.5 to 8.5 as per the ISI standards [3]. Higher values of pH 6.1 were observed after immersion (AI). The pH values observed were in the same range as reported earlier for other Indian lakes[4] Considering pH range of 6.5 -8.5 as the desirable pH range as per the BIS criterion, these waters were safe even for potable use where as pH 6.1 indicate the slightly acidic conditions which will effect the life of eco-system.

Table 1: Physico chemical analysis of hussain sagar lake

S.No	Parameters	Before idol immersion (BI)	After idol immersion (AL)
1.	pH	7.8	6.1
2.	EC (mS cm^{-1})	0.65	3.1
3.	Dissolved oxygen	6.12	3.09
4.	BOD	2.81	5.2
5.	COD	355.1	860
6.	Alkalinity	242.3	559.2
7.	Nitrates	1.47	2.5
8.	Sulphates	54.3	56.9
9.	Chlorides	50.9	110.2
10.	Hardness	140.9	190.7
11.	Hg	0.9	2.98
12.	Cd	1.2	5.9
13.	Pb	2.7	6.3
14.	Cr	2.0	6.9
15.	Cu	35.2	69.6
16.	Zn	39.7	89.9

Note : Except pH all values are given in mg/l.

The electrical conductivity (EC) of water BI was 0.65 and AI was 3.1 mS cm^{-1} respectively. Higher electrical conductivity of water was found after immersion. The high values of EC could be attributed to the high amount of total dissolved solids and salinity. These results were in agreement with the observations recorded for several other Indian lake [5].

Dissolved oxygen (DO) in water samples BI was 6.12 and AI was 3.09 mg L^{-1}. The result of water samples AI is in bad agreement with those recorded for other lakes by [6] The AI value of dissolved oxygen in this lake was below the tolerance limit (5 mg L^{-1}) as prescribed by BIS. Comparatively low DO observed during AI may be due to the decomposition of organic matter and restricted flow of lake water which, leads to anoxic or anaerobic conditions in the lake water.

Biological oxygen demand (BOD) of water BI was 2.81 where as AI was 5.2 mg L^{-1} respectively.

A higher BOD value in lake water was found during AI as compared to BI. These values were in the same range as reported earlier by other workers [7]for Indian lakes. Considering 3 mg L^{-1} as the maximum value of BOD as per criterion the BIS, this lake water is in bad condition.

The chemical oxygen demand (COD) of water BI was 355.1 and AI was 860.1 mg L^{-1}. Higher values were found after immersion time. Similar range of COD values for the waters of various lakes was also reported by several other workers [8]. The high value of COD indicates pollution due to oxidizable organic matter.

The values of alkalinity were 242.3 BI and AI it was noticed as 559.2 mg L^{-1} respectively. Higher values of alkalinity in lake sample were found AI. These values were not within the same range as reported earlier by. According to [9] high alkalinity values are indicative of the eutrophic nature of the water body. For surface water alkalinity may result from waste discharge from industries and microbial decomposition of organic matter present in the water body. Considering 200 mg L^{-1} as the maximum value of alkalinity as per the BIS criterion, this lake water is unsafe for ecosystem as well as for potable use.

The nitrate - nitrogen in lake sample BI was 1.47 mg/l and AI 2.5 mg/l. Nitrate level are in prescribed limits by BIS. The values of phosphate in lake water BI was 1.3 and AI 5.6 mg L^{-1}. The maximum values of phosphate were found AI. The AI results were no in agreement with the observations recorded earlier for lake studies.

The values of sulphate BI 54.4 and AI 56.5 mg $L^{-1.}$ In the present investigation high concentration of sulphate have been reported BI and AI in the lake water. A high concentration of sulphate stimulates the action of sulphur reducing bacteria which produce hydrogen sulphide as gas highly toxic to fish[10].

The value of chloride BI was 50.9 and AI 110.2 mg L^{-1}. The minimum chloride concentration was found BI and higher concentration of chloride was found AI in lake water. These results are in agreement with those recorded by for various lakes.

The values of hardness in lake water BI mg L^{-1} was found to be 140.9 and AI 190.7 mg L^{-1}. The values of total hardness in this lake were below the tolerance limit (300 mg L^{-1}) prescribed by BIS. These results were below the prescribed level those obtained.

The heavy metals in lake water are beyond the prescribed limits by BIS. The observation made by[10] for lake water contamination by metals supports our findings. The highest concentrations of the Hg, Cd, Cr, Pb, Cu and Zn recorded during the study could be attributed to the indiscriminate discharge of industrial effluent from chemical industries and land drainage, domestic sewage and immersion of idols.

Recommendations

Methods for environmentally friendly immersion of idols

These environment friendly idol immersions are practiced in different cities like Pune and Mumbai which can reduce the pollution load and restore the pristine and beauty of the lake.

Two-size idol system

Two-size idol system should be followed during the ganesh festival. The bigger idol can call as 'Utsav Murthy' which is made of plaster of paris (PoP)/ fibre glass/cotton/paper pulp/cloth etc. The size of the most of these idols can range from 2ft to 6ft. The smaller idol is called as 'Pooja Murthy' which can be about 1ft size, made of shadoo (clay) and the same can get dissolved easily in the water. Both the idols should be installed in the respective pandals and worshiped during the 10 days period of festival season. On the day of the immersion, only the smaller idol (Pooja Murthy) should be carried in the immersion procession to the nimajjan point and immersed and the utsav murthy should be retain for worship next year.

Immersion of idols in artificial ponds

The Greater Hyderabad Municipal Corporation (GHMC) should construct water tanks or artificial ponds or temporary ponds near the

surroundings of the lake of size: 20 x 10 x $2^{1}/_{2}$ft, exclusively for immersion of idols. Continuous fresh water supply should be ensured into the ponds to avoid turbidity where the supernatant water overflows through the holes provided to the artifical pond [11].

Creating awareness among the various groups

- Use permanent idols made of wood, brass
- Do a symbolic immersion
- Avoid the use of thermo cole and plastics in decorations and immersion practices
- Use natural clay such as multani mitti, geroo and natural dyes such as turmeric and beetroot

Conclusions

The physico-chemical data show a very high level of pollution in hussain sagar lake. In general, an ion rich alkaline environment of these lakes makes them prone to the problem of eutrophication. Anthropogenic interferences due to immersion of thousands of idols raise the level of pollutant loads. The study concludes lake reclamation procedure should be implemented in order to counter act or reduce the toxic load posed by the industrial chemical, sewage and idol immersion. The overall impression on the idol-immersion practices should be followed by the people strictly because lake and their surroundings are unique assets and valuable ecosystems for both society and nature which are of social, cultural, aesthetic and economic values.

REFERENCES

1. Palharya J.P., Siniah, V.K. Malviya. S., Environmental impact of sewage and effluent disposal on the river system. Ashish Publ. House, New Delhi (1993).
2. APHA., Standard Methods for the examination Water and Wastewater. Port City Press, Baltimore, Maryland, USA (1998).
3. BIS., Tolerance limits for inland surface waters subject to pollution, Bureau of Indian Standards, New Delhi (1993).
4. Patil, P.R.,Chaudhari, D.N. and Kinage, M.S., Water quality status of Padmalaya lakes, Erondal at Jalgaon District, Maharastra State. *Environ. and Ecol.,* **22**(1): 65-68 (2004).
5. Sarwar, S.G., Naqshi, A.R. and Mir, G.R., Impact of floating gardens on the limniological features of Dal Lake. *Poll. Res.,* **15**(3): 217-221 (2007).
6. Rasool, S., Harakishore,K., Satyakala,M. and Murthy, U.S., Studies on the physico-chemical parameters of Rankala Lake, Kothapur. *Indian J. Environ.Poll.*, **23**(9): 961-963 (2003).
7. Kudari, V.A., Kanamadi, R.D and Kadadevaru, G.G., Present status of Naregal Tank (District Haveri, Karnataka) with reference to water quality, plankton and wetland birds. *Environ. and Ecol.,* **22**(1): 182-187 (2004).
8. Tiwari, D.R., Physico-chemical studies of the upper lake water Bhopal, Madhya Pradesh, India. *Poll. Res.* **18**(3): 323-326 (1999).
9. Baligar, M.B and Chavadi, V.C., Deposition of trace elements in the sediments of Basaveshwar Nagar pond around Gokul industrial area, near Hubli city, Karnataka, India. *Ecol. Environ and Cons.,* **12**(1): 81-84 (2005).
10. NEERI, Waste quality studies of the Jheel in Kolkata port area, National Enviornment Engineering Reasearch Institute, Nagpur (1990).
11. PMC, An eco-friendly Ganesh Utsav. Pune Municipal Corporation. India together, 1 (2007).