

Impact on Water Quality due to Human Interference on Saleem Ali Lake at Aurangabad (Maharashtra)

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ABSTRACT

Now a days lake water quality is being deteriorated due to natural as well as due to human interference. The paper includes the study of impact on water quality of Salim Ali Lake at Aurangabad (Maharashtra) due to human interference. Salim Ali Lake is one of the historical lake associated with the name of Great Ornithologist Salim Ali. Earlier the lake water was used for recreational purposes.

The paper includes study of all the pollution performing activities in and around the area of lake. It also includes effect of pollution on human beings & aquatic life.

The findings in this paper will play a vital role in creating awareness regarding water quality in and around the Lake and become important reference material for administrative and educational institutions.

INTRODUCTION

Now a day's lake water quality is being deteriorated due to natural as well as due to human interference. The paper includes the study of impact on water quality of Salim Ali Lake at Aurangabad (Maharashtra) due to human interference. Salim Ali Lake is one of the historical lakes associated with the name of Great Ornithologist Salim Ali. Earlier the lake water was used for recreational purposes

The Salim Ali lake earlier known as Delhi gate talab (lake) selected for the present study is an urban lake situated near Delhi Gate in the historical city Aurangabad (Maharashtra state) at longitude-75° 30' and latitude- 19° 55' on the Aurangabad- Jalgaon highway .

BACKGROUND

The city Aurangabad is located in Marathwada region in Maharashtra, India. The city is a tourist hub, surrounded with many historical monuments including Ajanta and Ellora caves, World heritage sites, and presently, is the administrative headquarters of the Marathwada region. Aurangabad is said to be a 'City of Gates' as one can not miss the strong presence of these as one drives through the city.

Mughal Emperor Aurangzeb converted village Khadki in to the capital of his empire and renamed it as Aurangabad. There was no permanent water source in or around city to fulfill the needs of city, as there was no perennial river or lake nearby the city. The work of establishing of this new capital city was entrusted to Malik Ambar, the Subhedar of Aurangjeb's empire, by the Moghal emperor Aurangjeb .Malik Ambar constructed the water supply scheme called Nehar Ambari. Water was brought to city from hilly areas approximately 15 km from the city. Towards west side of Lake Aurangjeb established his residential campus .For recreation and to fulfill water needs of this campus, Delhi Gate talab (now called Salim Ali Lake) was costructed by Malik Ambar during 1610-1616 AD.

Lake is located towards north east side of old city and one may enter in this area through Delhi Gate and gate is at south side of the lake. Boundary wall of the city was constructed towards south and western side of lake. There is waste weir in the small nalla near Delhi gate which controls the water level in the Salim Ali Lake. The area of the lake is 20 Hectare. The depth of the centre is approximately 3.0 meters. The storage capacity of the lake is 0.60 Mm³. The soil along the lake is muddy and consists of algal biomass and macro and micro fauna. The basic purpose of Salim Ali lake was recreation and for the use of Royal military living on outskirts of the city. The lake is rich in bird fauna associated with it that includes some migratory species.

The lake is named after the great Indian ornithologist Dr. Salim Ali. He born Salim Moizuddin Abdul Ali, (November 12, 1896 - July 27, 1987), was an Indian ornithologist and naturalist. Known as the "Birdman of India", Salim Ali was among the first Indians to conduct systematic bird surveys in India and his books have contributed enormously to the development of professional and amateur ornithology in India. Soil erosion due to construction activities in the catchment generates a lot of silt, which along with the surface runoff ultimately enters the lake. Apart from addition of tons of silt, other waste material also enters into the water bodies.

Before a decade lake was well known for fish culture development and as well as, was a spot for migratory birds. In the course of time due to urbanisation and human interruption including water pollution, air pollution and noise pollution increased, which affected fish culture activity followed by reduction of migratory birds.

To study the impact of this pollution and change in topography of historical lake this paper includes especially water pollution and its effects on community followed by recommendation to sustain the Salim Ali Lake.

PRESENT STATUS

The lake is surrounded by residential area by which waste water and leakages of drainage line is discharged in to the lake. The sources of pollution of water in the lake are mainly from the domestic water and the disposal of garbage to some extent. Soil erosion due to construction activities in the catchment generates a lot of silt, which along

with the surface runoff ultimately enters the lake. Apart from addition of tons of silt, other waste material also enters into the water bodies.

METHODOLOGY

Following steps are taken for the study of Conservation and Restoration of Salim Ali Lake.

1. Walkthrough survey was carried out around the periphery of lake followed by discussions with nearby residents.
To find out point and non point sources of pollutants entered in the lake are also located by separate walkthrough survey along the nallas and drainage line in the catchment of lake around 15 km.
2. Before going in detail study of lake, we also visited various departments like CIDCO, Aurangabad Municipal Corporation, Revenue Department, Members of academic institutions and eminent research personalities in history of Aurangabad to find out any case study and research paper developed or published relating to this lake.
3. On the basis of information generated through said survey, we decided to highlight water pollution as a main issue, which is incorporated in this paper.
4. To overcome said issue, as the lake is divided in two parts by constructing band for boating. And the same situation is followed for collection of water samples for biological and chemical analysis to find out point and non point sources of pollution followed by pollutants thereon.

PROCEDURE OF SAMPLE COLLECTION AND ANALYSIS

- Four water samples with prescribed sampling technique, two samples from each part of the lake and analysed for physical, chemical and biological parameters. Results of parameters are shown in Table-1

DATA INTERPRETATION AND OBSERVATION

Interpretation of data in table-1 as per remarks shown in 'Remarks' column expressed that water is not suitable for any type of domestic use. It is harmful to human body and will cause skin diseases, water borne diseases, or sometimes epidemics also.

FINDINGS

- Water is highly polluted and harmful to human being.
- Pollution is mainly due to domestic waste disposal and pollutants through various point and non point sources.
- Part-B (East side of the lake) is highly polluted as compared to Part A (West side of lake).
- It is observed that silt is highly accumulated in lake.
- During the course of development of city by 'City and Industrial Development

Table 1 : Interpretation of Water Quality

Sr.No.	Parameter	Result for Part A	Result for Part B	Standard limit	Remarks
1	Colour	Dark Green	Dark Brown	Colourless	Not acceptable aesthetically
2	Odour	Soapy	Rotten eggs	Odourless	Contaminated
3	Temperature in ° C	26	25	25	OK
4	pH	9.1	7.5	6.5 -8.5	Alkaline
5	EC in micromhos/cm	935	1841	2250	Within limits
6	TDS in mg/lit	840	1159	500 mg /l	Increase in Siltation
7	DO in mg/lit	8.1	Not detected	> 6 mg /l	Affects aquatic life in part B
8	Total Hardness in mg/lit	224	256	300 mg /l	Within limits
9	Sulphate in mg/lit	340	721	200 mg /l	Gastrointestinal irritation
10	Chloride in mg/lit	255	129	250 mg /l	Within limits
11	Alkalinity in mg/lit	230	450	200 mg /l	Denotes presence of bicarbonates, carbonates or hydroxide in part B
12	Nitrate in mg/lit	6.1	9.1	45 mg /l	Within limits
13	Sodium in mg/lit	164	74	300 mg /l	Within limits
14	Turbidity in NTU	63	38	5 NTU	Causes deposition
15	Total Solids in mg/lit	2112	2870	500 mg /l	Causes deposition
16	Total Suspended Solids in mg/lit	1272	1029	-	Causes deposition
17	Total Coliform (MPN) MPN per 100 ml	more than 1.6 * 10 ⁵	more than 1.6 * 10 ⁵	0	Causes water borne diseases

Corporation' (CIDCO) this area was mainly developed for residential purpose create contamination and pollution of water by disposal of domestic waste and garbage into the lake since decade.

Various organisations (Govt. / Non Govt.), NGOs, and individuals have taken care of this issue and published various papers from time to time.

Govt.of Maharashtra has taken care of this issue and recently announced allotment of funds for restoration and development of lake through Aurangabad Municipal Corporation.

RECOMMENDATIONS

- Awareness of people residing around periphery of lake should be increased.
- On the basis of analysis, it is recommended that existing stored water should be properly treated, recycled and reused before taking development / restoration activity of Lake in hand.
- Proposals /designs may be called from community and prize be declared to the winner of the best proposal.
- There is scope to develop / restore this lake on B.O.T. basis.
- Public participation should be increased for protection of lake.
- Desiltation of the lake may be taken up on top priority.
- Water quality model should be developed to monitor water quality of lake followed by water quality analysis.

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REFERENCES

1. Article published in Daily Lokmat on by Dr.Shaikh Ramzan
2. Aurangabad,Maharashtra- Wikipedia ,the free encyclopaedia-Microsoft internet
3. Aurangabad Municipal Corporation,Aurangabad CIDCO,Aurangabad
4. Carpenter, S. R., and K. L. Nottingham. 1997. Resilience and restoration of lakes. Conservation Ecology [online]1(1): 2. Available from the Internet. URL: <http://www.consecol.org/vol1/iss1/art2/>
5. Research paper on Salim Ali lake by shri .Khadkikar Salim Ali (Ornithologist)- Wikipedia, the free encyclopaedia -Microsoft internet

