

Sustainable Conservation and Management of Lakes in Rajasthan

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BACKGROUND

Rajasthan is land of bravery and Rajput rulers who not only fought for freedom of the land but also created many facilities for their subjects. Princely States like Udaipur, Bikaner, Jodhpur, Jaipur etc. constructed a large number of water bodies for, providing employment to the people at the time of draughts, irrigating agriculture fields, defending their forts from external attacks and also for recreation facilities for the public as well as their families.

The water bodies constructed in the last 500 – 800 years in the State are under great pressure due to dense human population in the catchment area, urbanization and various anthropogenic activities. The use of water for other purposes like drinking water supply, domestic and industrial requirement has not only reduced the availability of quantity but also lead to degradation in quality of water. Most of these lakes have reached the stage of Eutrophication as very high levels of nitrates and phosphates have been observed in water samples. The Dissolved Oxygen level in the lakes is much below to sustain the aquatic life and fish-kills is a common phenomenon in these lakes.

LAKES OF RAJASTHAN

The historic Udaipur city of Rajasthan is known as the “city of lakes” which is multipurpose and providing water front to the urban centre. The lakes are main spot of tourist attraction. Out of four tourist visiting India one visits Rajasthan and specially Udaipur due to these lakes. Pichhola lake of Udaipur is the mother lake having interconnection with five other lakes namely Rangasagar, Kumaria Talab, Doodh Talai, Gowardhan Sagar and Fatehsagar. ¹

Mount Abu is the only hill station in Western India specially Rajasthan and Gujarat. Lakhs of domestic tourists visits Mount Abu every year due to its climate and cool atmospheric surrounding Nakki Lake. This has given a boost to tourism in Rajasthan. ⁴

Ajmer and Pushkar in Rajasthan have significant mark on the world atlas due to (i) Dargah of Khwaja Moiu-nu-din Chisti in Ajmer and (ii) Bhrama temple in Pushkar which is known as the holiest Hindu Sarovar. About 14 Lakh pilgrims visit Ajmer and Pushkar every year.

These five lakes namely Anasagar, Pushkar, Fatehsagar (Fig.1), Pichhola and Nakki have been prioritized by the MoEF for funding under Xth Five Year Plan for Rejuvenation and Conservation under National Lake Conservation Plan. A Sum of Rs. 225 Crores has been sanctioned under NLCP with 70:30 ratio of sharing by Government of India and State Government.

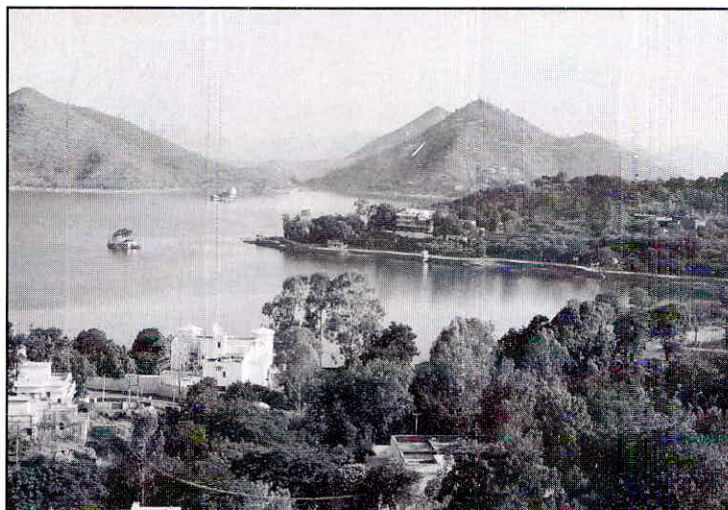


Fig. 1: A view of Fatehsagar Lake, Udaipur

ISSUES

The physio-chemical parameters of these five lakes were tested and it was observed that,

(1) Anasagar Lake

- a. The result suggest that the water quality in the lake is highly deteriorated. The TDS levels are very high; in the range of 2250 – 2260 mg/l. Also, higher alkalinity values have been found, in the range of 860 – 900 mg/l. Since, all the sewage is going into the lake it is polluted with Faecal Coliform bacteria as well. Their levels are at alarming level of 2400 MPN per 100 ml of water sample. The water appears visually polluted with typical greenish colour indicating algal pollution. ²

(2) Pichhola and Fatehsagar Lakes ¹

- a. The test results reflect that although nutrient concentration is moderate but very high value of BOD were recorded indicating flow of sewage in the lake. More than 100 hotels are constructed around the lake Pichhola and Fatehsagar which directly discharge the sewage and solid waste in to the lake.

- b. About 80,000 population of Old Udaipur city resides around these lakes which contribute for direct in-flow of pollutants in the lake. At present, there is no sewerage system for the Udaipur city and especially for the population in the catchment of the lakes.
- c. Number of industries viz. mining and agriculture activities in the catchment of the lakes not only pollute the lake water but also reduce the in-flow in the lakes which has rendered these lakes in Eutrophic condition.

(3) Nakki Lake ⁴

- a. About 17 Lakh tourist visit Nakki Lake throughout the year which increases in anthropogenic activities. The pollution loading to the lake originates from the various point and non-point sources in the catchment area raising BOD, Nutrients and Faecal Coliform levels.

(4) Pushkar Sarovar ³

- a. Pushkar Sarovar is silted with fine sand coming with the water during rains. This has reduced the water carrying capacity of the lake.
- b. Over the last five years there has been a considerable increase in the tourist arrival in Pushkar. On Kartika Purnima maximum tourists / pilgrims visit Pushkar Sarovar, these coincides with the cattle fair and around 4 Lakh people take a holy dip in the lake on this occasion. Analysis of various parameters in general depicts higher concentration of nutrients in Sarovar such as Nitrates ranging between 1.14 – 1.89 mg/l in epilimnion while 1.36 – 2.33 mg/l in hypolimnion. The concentration of Phosphate ranges from 2.2 mg/l – 3.2 mg/l in surface water and 3.4 mg/l – 7.3 mg/l in bottom water.
- c. The decreasing volume of water in Sarovar and increasing pollution load is changing trophic status from Oligotrophic to Mesotrophic and now to Eutrophic and Hyper Eutrophic as well.

INVESTIGATIONS

In order to estimate the current capacity and the conditions of the lakes and its surrounding area the following survey work have been carried out.

1. Topographic & Hydrological Studies
2. Bathymetric Survey
3. Water Quality Analysis
4. Environment-cum-Social Survey
5. Water Budgeting
6. Stakeholders Meetings

Hydro-graphic survey was carried out by an eco-sounder fitted on a boat. Water quality survey was done by collecting samples from the lake water. Environment-cum-

Social survey was done by interaction with proprietors of hotels, restaurants, District Administration, local people and tourists. A questionnaire was prepared and information about encroachment, pollution loading, Dhobighats, idol immersion and other festivals were gathered.

INTERVENTIONS

After careful study of the investigation results and GIS maps of catchment area it was observed that these lakes need rejuvenation and it can be achieved through improving the health of the catchment area, in-lake water quality improvement measures, social and policy interventions. Catchment area treatment and soil conservation measures have been suggested for each lake which includes construction of catch-water drains, check-dams & three tier plantations to check soil erosion. This will cost around 9-10% of the total project cost.

Lake water quality improvement by de-silting, de-weeding, interception and diversion of sewage flowing in the lake, solid waste management and fringe area treatment for each lake will cost 50% of the total project cost.

In-lake treatment by use of aerators, floating fountains and ozonizes to oxygenate the lake water. Demarcation of Lake Boundary and its beautification to attract more tourists and for more recreation of the local people by providing walkers track, sitting arrangements, nature related activities, development of local parks and eco-friendly boating system. This will cost about 10-15% of project cost.

Public awareness and its organizational strengthening is the essential part of lake rejuvenation and conservation plan as the engineering and bio-diversity interventions alone cannot improve the health of the lake. People's participation in implementation of the programme and maintenance of the lakes is equally important. The local bodies like Urban Improvement Trusts and Municipal Corporation will be made responsible for maintenance of these lakes after completion of these projects.

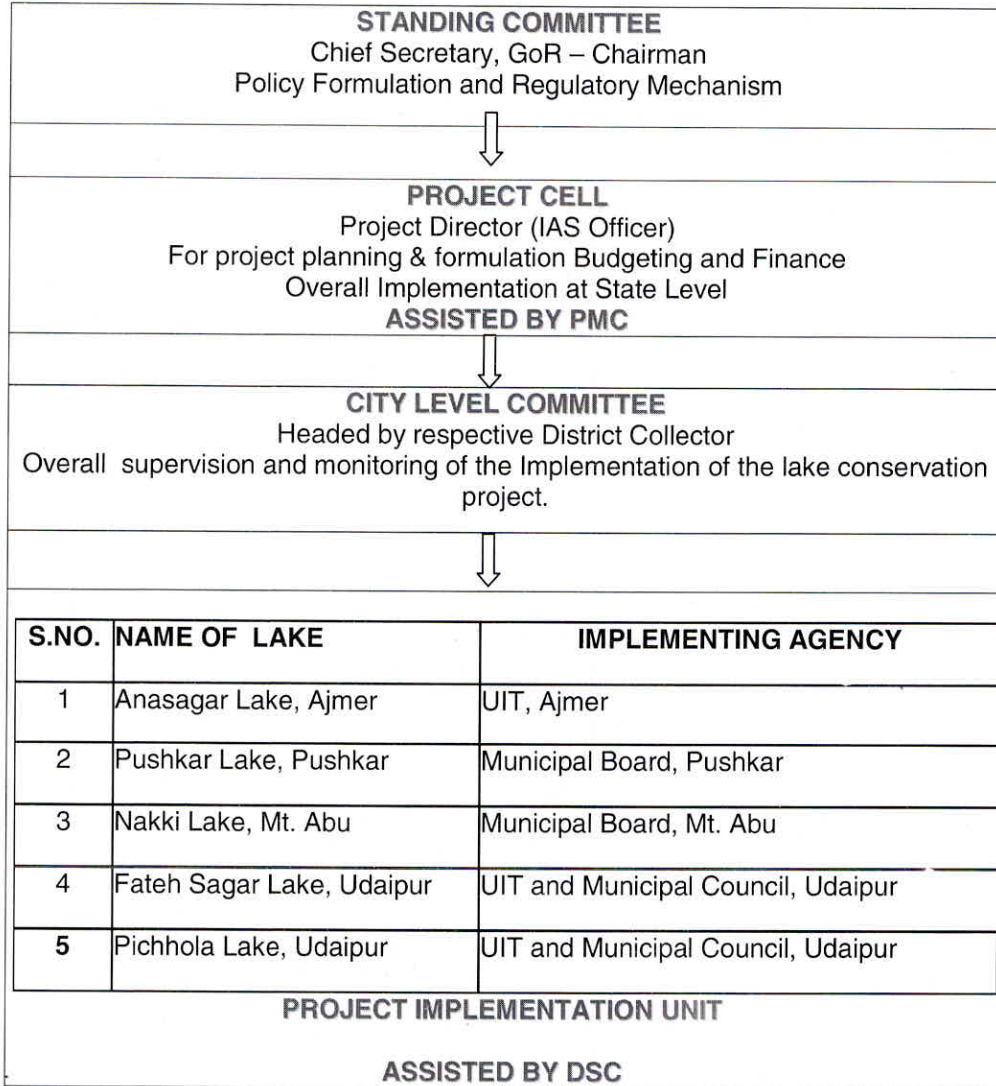
IMPLEMENTATION FRAMEWORK

The State Government is very serious about the successful and timely implementation of National Lake Conservation Plan in the State. The implementation plan is given in Table 1.

CONCLUSION

Implementation of conservation measures will result in increased lake storage capacity, improvement of water quality, increase in avi-fauna and bio-diversity, increase in tourist in-flux and increase in revenue of local bodies. This will help in improving the economy of the residents residing around the lakes.

Table 1 : Implementation Framework



REFERENCES

1. Detailed Project Report for Rejuvenation and Conservation of Pichhola and Fatehsagar Lakes, Udaipur
2. Detailed Project Report for Rejuvenation and Conservation of Anasagar Lake, Ajmer
3. Detailed Project Report for Rejuvenation and Conservation of Pushkar Sarovar, Pushkar
4. Detailed Project Report for Rejuvenation and Conservation of Nakki Lake, Mount Abu

