

A HOLISTIC APPROACH TOWARDS MANAGEMENT OF LAKE AND WETLANDS

T. Thomas, R.K. Jaiswal, R.V. Galgkate, S. Singhand T.R. Nayak
National Institute of Hydrology, WALMI Campus, Bhopal, Madhya Pradesh.

Introduction

Lakes in India are generally defined as natural, man-made or ephemeral water bodies including wetlands (Reddy and Char, 2006). The number of wetlands in the country is decreasing rapidly at an alarming rate in most of the cities, which once boasted of traditional ponds and lakes for water conservation, with many of them being ultimately turned into landfills. The Sagarlake located in Sagar district of Madhya Pradesh in central India is an interesting case study and is a classic example of the deteriorating health of the lakes in India. Sagar lake was constructed in the 11th century, with a water spread area of 580 hectares and depth of 60 feet. However, over the years, this lake has reduced drastically to 155 hectares with depth of about 16 feet (Yatheesh, 1990). The base map of Sagar lake depicting the topography and drainage is given in Figure 1.

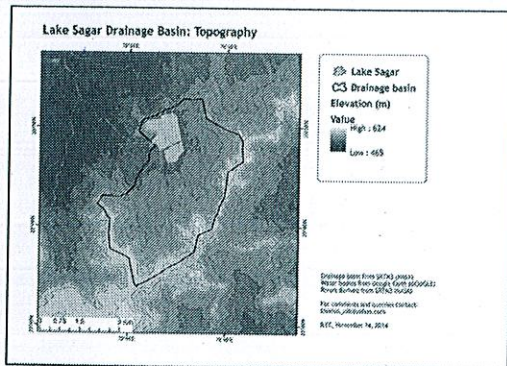


Figure 1: Sagar lake drainage basin and topography

Materials and Methods

Agriculture is the major land use (47%), followed by urban settlements (31.3%), forests (15.3%), water bodies (6%), barren (5.5%) and aquatic plants (1%). Singh et al. (2008) have done a preliminary water quality study on the Sagarlake and concluded that the trophic status of the lake has greatly increased since 1990 and the lake water has become unsuitable for drinking, bathing as well as fish culture and the lake is in a hyper-eutrophic state and urgent attention is required for its restoration. Some of the important issues responsible for the present state of affairs of Sagar lake include, inflow heavy silt deposits leading to storage capacity and nutrients, sewage inflow from lake fringe areas, of micro-pollutants including residual pesticides reduction, hospital waste disposal, bathing of cattle and humans, water based crop farming inside the lake, immersion of idols during festival season, inflow from storm water drains, and construction activities concentrated around the lake periphery. The restoration of the lake needs a holistic approach considering the management of the lake basin as well as the lake water body in totality.

Result and discussion

Detailed studies pertaining to the impact of land use changes particularly with respect to deforestation and urbanization, lake basin prioritization for identification of high priority

regions prone to erosion, sedimentation studies of the lake, soil erosion studies in the lake basin, climate change impacts on the future water availability and lake water quality for the sustainable management of the lake on a long-term are required. Policy level changes may be needed for creating separate Institutions solely responsible for catering towards the management of lakes in Madhya Pradesh, which at present is under the control of municipal organizations. The lake management plan including all these aspects may help to rejuvenate the lake.

Conclusion

The management approaches towards lakes and wetlands in general are mostly focused on improving the lake water quality. However the associated problems generally pertain to a much wider horizon, comprising the lake or the wetland alongwith the lake

basin, the ecosystem and biodiversity in the lake basin as well. In India, the ever expanding cities are engulfing lakes and wetlands and converting them into residential and commercial areas or dumping yards for liquid and solid wastes. Therefore a holistic approach is required by the coordinated efforts of the various stakeholders involved, so that the management of the lake comprises of the lake management as well as the management of the lake.

References

1. S. Singh, R. V. Galkate, T. Thomas, and R. K. Jaiswal, *Journal of Indian Water Resources* **28**(1) (2008) 29.
2. M. S. Reddy, N. V. V. Char, *Research & Management*, **11** (2006) 227.
3. S. Yatheesh, Ph.D. Thesis, Dr. H.S. Gour Vishwavidyalaya, Sagar (1990).