

Conservation Status of Mansbal Lake: A Case Study

Ajaz Ahmad Magray¹ and Tasleema Jan²
¹Department of Education, University of Kashmir, India
² Senior Assistant Professor, Department of Education, University of Kashmir

ABSTRACT: Mansbal lake is located in Jammu and Kashmir State of India. The present study aims to analyse the conservation status of Mansbal lake and also assess the impact of various anthropogenic activities on the lake. It can be concluded that there is an immediate need to conduct a collaborative study on the present status of the lake. Thus, the present study serves as a reference for the future conservation planning and management of the lake.

Keywords: Conservation, Mansbal lake, Water quality.

1. INTRODUCTION

Lakes are inland bodies of water which are formed in rock basins of various shapes and sizes. These play an important role in the economy of a region or country and are of tremendous academic, societal and economic importance. They act as natural water reservoirs and store a large quantity of water, which can be used for drinking, industrial, irrigation, aesthetic and other purposes. (Tantary and Rafiq, 2013).

Mansbal lake is located in Ganderbal district of Jammu and Kashmir State of India at 34:15N,74:40E; 1583 meters above sea level. Mansbal lake is situated about 29 kilometers north of Srinagar, the summer capital of Jammu and Kashmir State of India. According to Bagnoulus and Meher-Homji, (1959) the climate of Kashmir falls under Sub-Mediterranean type with four seasons based on mean temperature and precipitation. Mansbal lake is flanked predominantly by rural areas with three villages Kondabal, Gratabal and Jarokabagh overlooking the lake. Mansbal is considered to be supreme of all the lakes of Kashmir with lotus (*Nelumbo nucifera*) nowhere more beautiful and abundant than on the margins of this lake during July and August. It is the deepest lake of the valley and most probably the only one that develops stable summer stratification. Mansbal is classified as warm monomictic lake and circulates once in a year for a very short time. The other lakes in the region either have weak stratification or are polymictic. On the close of northern shore are the remnants of a fort which was built in 17th century

by a Mughal king to cater the needs of caravans that used to travel from Punjab to Srinagar. On the south, overlooking the lake is a hillock- Ahtug which is used for limestone extraction. The eastern part is mainly mountainous and towards the north is an elevated plateau known as karewa. The lake has no major inflow channels and the water supply is maintained through spring water inflow and precipitation. An outlet channel connects the lake with the river Jhelum. The local population uses the lake as a source of water for fishing and for obtaining food and fodder plants. Tourism industry is highly significant. The origin of the lake is still unresolved but there is no denying fact that Mansbal is very ancient lake. The local people believe in the legend that Mansbal is bottomless. Over the years as a result of human pressure the lake has become eutrophic. The water body is choked with submerged weeds particularly during summer which is the highest tourist season. Mansbal is considered as one of the most important tourist places and has caught the attention of people from the world over. The flora includes emerged macrophytes, *Phragmites australis*, *Nelumbo nucifera*, *Typha augustifolia*, *Cyperus.sp.* Floating macrophytes: *Nymphoides*.

Submerged macrophytes: *Ceratophyllum demersum*, *Myriophyllum spicatum*, *Potamogeton natans*, *P. pectinatus*, *P. lucens*, *P. crispus*, *Hydrilla verticillata*, *Charasp.* Phytoplankton *Cocconeis placentula*, *Cycotella comensis*, *Cymbella ventricosa*, *Fragillaria crotonensis*, *Navicula radiosa*, *Nitzschia acicularis*, *Synedra ulna*, *Cosmarium constrictum*, *C. reniformae*, *Merismopedia elegans*, *M. punctuata*, *Ceratium hirundinella*, *Peridinium sp.*

2. RESEARCH METHODOLOGY

As the conservation concerns have touched skies globally, the authors have tried their level best to have a detailed study of the present conservation status of Mansbal lake. Thus, the present study is an effort to highlight the current conservation status of Mansbal lake with special emphasis on conservation issues regarding the lake. The present study is qualitative in its nature and content. The authors have used both primary as well as secondary data to understand the issue of conservation in detail. The present study was started in March 2012 and was completed in July 2013. The present study aims to serve as reference for the future conservation planning and management of the lake.

3. RESULTS

The lake is located about 29km north of Srinagar. The surface area of the lake has declined to 2.67 square kilometres. The maximum depth is 13 meters with 4.5 meters as mean depth. The quality of water has improved a lot from last two decades as per the reports of various research institutes working on the lake. There has been significant improvement in the overall lake properties during the last few years. One of the important concerns for the physical and socio-economic environment like topography, air quality, water quality, soil, economic status is the rock mining and kiln works which is extremely high on Kondabal side. The current study reveals that there are 18 kilns present in the area and most of them are operational. Although the stone extraction and kiln work has been banned by the Department of Tourism, as it adversely affects the ambient air quality, but still no developments has been observed in this regard. Quarrying and kiln work in the area have direct bearing on the water quality of Mansbal Lake. Direct effects include increased silt load into the lake because of erosion and increased nutrient levels (Urich 2002). The indirect effects include less light penetration (Nwanebu et al, 2011) into the lake strata which causes decrease in primary productivity, increase in Biological Oxygen Demand and decrease of Dissolved Oxygen. During quarrying and transportation of gypsum there is a considerable increase in the noise levels which may prove deleterious for the biodiversity

in the area including humans (Fletcher and Busnel, 1978). Population of the Kondabal area is affected both positively and negatively, though negative effects are substantially at large. The recent studies have pointed out that Mansbal lake has a good oxygen content i.e., dissolved oxygen content of 8.6 (Rashid et al., 2013). This oxygen content helps in sustaining the aquatic biodiversity. There are higher levels of phosphorous and nitrogen content which can be attributed to the direct sewage ingress into the lake from the surrounding settlements. The agricultural runoff from the catchment population also adds to the pollution. This pollution level is extremely high on Kondabal side where people live on the extreme banks of the lake. The fauna recorded in the lake are the Zooplankton, Benthos and Fish. The economically important fishes reported are *Schizothorax niger*, *S. esocinus*, *Cyprinus carpio specularis*, *C. carpio communis* and *Neomacheilus latius*. Pollutants released from quarrying and kilnwork effect biodiversity particularly fish species (Vermeulen and Whitten, 1999, Lameed and Ayodele, 2010) in the Manasbal Lake. A species of fish, Ram Gurun (*Bortia birdi*) which was found in abundance just a decade ago is now extinct from the lake. In response to the pollution, the government has started relocating majority of the catchment population to minimise the said effect and the construction of a concrete foot path around the lake is at peak. No doubt the construction of the concrete footpath around the lake has been viewed as a negative aspect by many conservation biologists, as it may likely increase the public access to the lake confines. But the current study has revealed an overall positive impact of the construction of the footpath around the lake. The present status of the lake speaks high of the dedicated efforts of the Wullar and Mansbal Development Authority and the growing concern of the catchment people towards the conservation of Mansbal lake. One of the important findings of the present study is the fact that since the last 5 years there has been a tremendous increase in the tourist flow. This fact also serves as a social indicator about the improvement in the total aspects of the lake. The ongoing development activities around the lake are expected to act as a positive step towards the lake conservation as it will highly decrease the waste water inflow.

chalking out the future course of development for the lake.

4. Lake and the locals

The author while visiting the lake came across an interesting difference in the approach of the local people towards the lake conservation. Such a positive approach of the majority of the catchment people is a combined result of public awareness by the government and more particularly the simple nature and strict religious obedience. An analysis of the changing perspective of the locals regarding the lake conservation depicted that due to the emerging of Mansbal as a mass tourist place leading to the engagement of more and more people in different business activities, there has been a drastic change in the outlook of the locals regarding the conservation of the lake. The important vegetation includes orchards, *Salix*, *Populus*, *Platinus*, *Morus*, etc. The crops like maize, mustard, and wheat are also grown. The important industries include horticulture, food plants, fisheries, cage fish culture, stone grinding and tourism. The vexed problem that hinders the conservation concerns of the lake is inequitable economic distribution of the people.

5. CONCLUSION

Lakes serve as an important repository of indispensable flora and fauna and always have been a source of attraction for the tourists and local masses, there is a need to focus our attention for the study of various characteristics of lake, so as to maintain its glory which has been to some extent lost during the recent past due to the collective effect of multiple agencies. As the nature of the current study is highly qualitative, yet it provides a clear picturesque of the lake and the scope of future studies. The current study has been carried out on socio-scientific lines. The authors felt that there is an immediate need to afforest the barren area so as to reduce the silt load on the lake body. Despite the fact that many research institutes are currently focussing their studies on the different concerns of Mansbal lake, the authors feel that there is an immediate need to conduct a collaborative study on the present conservation status of the lake so as to put forth a useful research output that will help the government in

6. REFERENCES

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