

Conservation And Management Challenges at Sambhar Lake - A Ramsar Site in Rajasthan

Parul Gupta

Department of Botany, BBD Government College, Shahpura, Jaipur, Rajasthan- 303130, India.

Abstract: Sambhar Lake is one of the largest salt lakes in India. Situated around 60km west of Jaipur, the lake has been designated as a Ramsar site- A wetland of global importance for its biodiversity values. There are several environmental issues that are posing serious threat to the lake ecosystem. The present paper gives an insight to the major environmental issues related to Sambhar lake and assessment of innovative ways towards the wetland management.

Keywords: Sambhar lake, environmental threats, wetland management.



Published in IJIRMP (E-ISSN: 2349-7300), Volume 2, Issue 3, May-June 2014

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Historical Importance

Though Sambhar is not mentioned as such in the Epics, the place is very ancient and can be recognized by associations. There is mention of Raja Yayaat in Mahabharat who married Devyani, the daughter of Shukracharya, the high priest of Brishparva, the king of the Demons. In the Adi Parva of Mahabharat, details of the battle between the demons and the gods are given. It appears that this place was the capital of the king of the Demons, Brishparva. He secured the services of Shukracharya to guide him. There is the description of Devyani's marriage with Raja Yayaat, who was the Emperor of Bharat Varsha, tenth in the line of descent from Brahma. We can thus calculate the ancientness of the place from the incident. It takes us back by about 5,000 B.C. The place is thus ancient as civilization itself. The story of Devyani is repeated in Bhagwat Puran in the 9th volume, chapter 18th and 19th whose ancientness is undoubted (Aggarwal, 1951).

The history of Sambhar lake can however be distinctly traced to the era of the Mughal times. A curious Hindu tradition is attached to its formation. Traditions ascribes the formation of the Sambhar Lake to the gift of Shakambari Devi, the tutelary goddess of the Chouhan Rajputs, who about 551 A.D. in return of milk supplied by one of their cows to a religious ascetic, converted a forest into a vast plain of precious metals. The then inhabitants of Sirthula, a village situated a few kms. from Sambhar, looking upon it as a curse rather than blessing as it would be sure to lead to endless fends requested the goddess to retract her gift. But the goddess being too magnanimous to retract her favour converted it into a crude form and transformed the lake from silver to salt.

Location

The Sambhar Lake catchment lies within the geo-coordinates of 26°28'43" to 27°33'10" North latitudes and 74°35'40" to 75°50'28" East longitude, whereas the lake lies within the latitudes of 26°52' to 27°02' North and 74°54' to 75°14' East. The area is in elliptical shape with its major axis in northeast to southwest direction. The whole catchment is spreads over the four districts i.e. Jaipur, Ajmer, Sikar & Nagaur of the Rajasthan state in India. The Sambhar Lake itself centrally located in the catchment area. Sambhar is a shallow lake, reaching only about 3.0 m at its deepest, with an average depth not exceeding 0.60 m. The lake basin is divided into two unequal parts by a 5.16 km long dam between the settlements of Jhapok to the south and Gudha in north. The western part is a natural, undisturbed, continuous sheet of water.

Need for Conservation

Conservation of natural resources requires in-depth knowledge of area along with relationship between activities, which are responsible for degradation and development. When we talk about planning of conservation activities, there is need for prioritization the conservation activities. The goal of prioritization depends upon the objectives by considering important issues involved. The conservation planning depends upon multiple factors like intensity of problems, needs of local people, availability of funds and the agencies involved in restoration and rehabilitation work. Sambhar Lake is one of the largest salt lakes in India. Situated around 60km west of Jaipur, the lake has been designated as a Ramsar site- A wetland of global importance for its biodiversity values.

The Ramsar Convention

The *Convention on Wetlands* is an intergovernmental treaty adopted on 2 February 1971 in the Iranian city of Ramsar, on the southern shore of the Caspian Sea.

Source: *The Ramsar Convention Manual, A guide to the convention on wetlands (Ramsar, Iran 1971) 3rd Edition*

Environmental Issues in the Sambhar Lake Area

There are several environmental issues that are posing serious threat to the lake ecosystem. People in the area are not much educated and are unaware of the environmental hazards. Despite of being a Ramsar site no agency is specifically working towards the conservation and environmental management of Sambhar lake . There is an urgent need to understand the environmental impact of any activity around the lake and risk assessment should be an integral part of the decision making process for developing a management plan for a long term sustainable lake restoration. The present paper gives an insight to the major environmental issues related to Sambhar lake and assessment of innovative ways towards the wetland management.

Sambhar lake provides a unique habitat for very specialized group of algae *dunaliella* and bacteria *Serratia sambhariana*, which gives it a distinct colour (Fig.1). There are several migratory birds visiting Sambhar lake in the months of October to February every year.(Fig.2), Table 1.

(Fig.1)



(Fig.2)

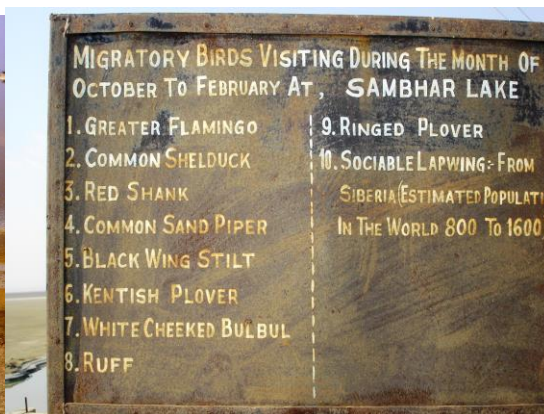


Table 1: Waterfowl census, Sambhar, 1993

COMMON NAME	SCIENTIFIC NAME	NUMBER
Grey heron	<i>Ardea cinerea</i>	7
Grater flamingo	<i>Phoenicopterus ruber</i>	390
Lesser flamingo	<i>Phoeniconaias minor</i>	6400
Common teal	<i>Anas crecca</i>	53

Northern shoveler	<i>Anas clypeata</i>	415
Common coot	<i>Fulica atra</i>	319
Black winged stilt	<i>Himantopus himanopus</i>	47
Little ringed plover	<i>Charadrius dubius</i>	15
Kentish plover	<i>Charadrius alexandrinus</i>	107
Little stint	<i>Calidris minuta</i>	160
Temminck's stint	<i>Calidris temminckii</i>	107
Herring gull	<i>Larus argentatus</i>	35
Great Black headed gull	<i>Larus ichthyaetus</i>	360

Wetland ecosystems are one of the most productive ecosystems of the world & have significant biodiversity resources (Cox, 1993). Wetlands can play an important role in both economic development and biodiversity conservation. Despite this awareness and economic investment, there are still many difficulties in the management of wetland use. Sambhar Lake in Rajasthan is one such wetland, which is experiencing the difficulties of partitioning the interest of human being and wetland conservation. Therefore it is important to critically analyze the whole Sambhar lake catchment and considering the main issues, which will be helpful in evolving a management plan for planning conservation of this important wetland site.

It is very important that specific objectives be laid down before considering appropriate management strategies for any wetland. The objectives are determined by the wetland values, which are perceived to be of greatest importance. There may be natural processes or human activities in the wetland or around it that are causing or are likely to cause degradation (loss of perceived values) of the wetland. Sufficient information about the wetland is however required to lay down the objectives.

There are several alarming issues in the area which need to be addressed immediately and in sustainable manner. Intensive field work has been carried out to know the present situation of the problems, existing conservation practices and correct location. For this purpose Participatory Rural Appraisal (PRA) technique has been used in the villages. Various people and organization, involved in the development and utilization of resources of the lake were interviewed.

The issues can be categorized under two categories- Can be either created by humans or by the nature itself . The eastern part of the basin area of lake is used exclusively for salt extraction, covers about 80 km² and comprised two large reservoirs for holding the brine, a series of canals and pans. All these pans can be approached by the narrow bunds that separate them. After the brine reaches a certain level of concentration, it is transferred from the western part of the lake to the reservoir through two sluice gates in the dam. Illegal salt mining is one of the major issues in the area (Fig.3) The authorized salt production agency (Sambhar Salt Ltd.) mainly utilizes the surface water for making salt. But in situation of scarcity of surface water they go for sub soil water for certain extent. At the same time, however many unauthorized private salt producers are digging borewells to produce salt which is reducing the water table in serious ways thus creating pressure on the lake environment, causing habitat loss for the waterfowl population. If this present trend continues then there will be a serious threat to the lake in future.

The area is also facing cattle grazing pressure by the local herdsmen (Fig.4). Another problem is of illegal anicuts and checkdams on the river feeding the lake (Fig.5)

Fig.3



Fig.4



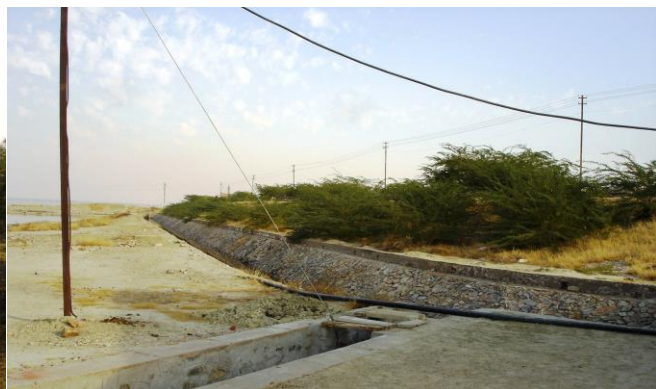
Fig.5

The next set of problems observed in the catchment area are not created by the humans but are equally serious. The area has extremely sparse vegetation cover (Fig.6)and the local vegetation in the area is threatened by the spread of invasive *Prosopis juliflora*. (Fig.7). Restoration has also become so difficult . People of 38 villages around the lake are highly dependent directly or indirectly on this wetland for their livelihood.The local people are facing several problems which need to be addressed before looking for sustainable conservation of the area. There is very low agricultural production in the area and lack of proper drinking water in the area is major problem faced by the locals. Its an economically backward area and people are not much educated. Other major problem is lack of environmental education and ignorance of laws and regulations. There is no opportunity for the public to take part in decision making on environmental issues of their own area.

Fig.6



Fig.7



The major findings of the study can be summarized as follows:

The lake surrounding has under gone significant transformation over the years. The dependency of local population on lake resources has increased due to demand of salt and more and more people are relying on

salt making business for their livelihood. The lake water spread has decreased due to prolong dry spell and scanty rain. This is evident after comparison of water line as shown in archived map and its comparison with the satellite derive actual water line. There is progressive waterfowl habitat degradation in last few decades. The salt making activities around the lake has increased and such activities are mostly carried out within one kilometer from lake boundary. The loss of agriculture land is the gain for salt making activities. In other words the some lands kept aside for agricultural activities have been converted to salt pans, causing the land unsuitable for agriculture. The spatial distribution of vegetation and its cover in the total catchment area is low and it requires urgent vegetation restoration. There is a scope for upliftment of socio-economic condition of the people by various eco-development measures. The areas where intervention is needed to integrate the requirement of local communities with that of conservation and developmental activities, alternate resource utilization, creating awareness among local people and direct involvement of people in conservation activities.

Acknowledgements

I am thankful for the financial assistance from UGC and the entire team of Sambhar Salt Lake Ltd. For their kind support, cooperation and outright help during entire course of my study.

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