IWRM Action Hub

CASE STUDY

India: Conservation and management of Bhoj Wetlands

Summary

Due to substantial population growth putting increased pressure on the water resources, their quality has started to deteriorate. This is perceived as a serious issue since water is inseparably linked with the socio, economical and cultural aspects of livelihoods. Action was taken through an integrated lake conservation programme, aiming to improve water quality. The most important lesson learnt is that awareness raising, education and stakeholder participation are essential.

Background

Bhopal city, the capital of the state of Madhya Pradesh, is endowed with several man-made lakes created through the centuries. The Upper and Lower Lakes of Bhopal, together called the Bhoj Wetlands.The Upper Lake and Lower Lake are the most important. The Upper Lake has special significance since it has been a source of piped water supply to the city of Bhopal for over 75 years. Even now, the lake accounts for some 40% of the city’s water supply.

Until 1947 the water quality of Upper Lake was so good that it required no treatment before being supplied to the public. However, tremendous population growth of the city (about 70,000 in 1951 to about 1.4 million in 2001) and rapid urban development around Lower Lake and on the eastern and northern fringes of Upper Lake subjected both the lakes to various environmental problems resulting in deterioration of their water quality mainly due to inflow of untreated sewage.

The Bhoj Wetlands of Bhopal comprises of the Upper Lake and the Lower Lake. These lakes are of immense importance since they are inseparably linked with the socio, economical and cultural aspects of the people of Bhopal and are referred as lifelines of the city.

Actions taken

The Government of Madhya Pradesh implemented an integrated lake conservation programme during 1995-2004 with the financial assistance of JBIC (Japan Bank of International Cooperation).
An agreement between the JBIC and the Government of India (Ministry of Finance, Government of India being the signatory) was executed for implementation of the "Lake Bhopal Conservation and Management Project" (also known as Bhoj Wetland Project), to be executed over a period of 5 years, beginning in April 1995.

The basic objective of the project was to improve the water quality as well as to increase the storage capacity of the lakes. The project activities involved both preventive and curative measures like increasing the storage capacity of the lake through de-silting, control of weed through de-weeding, prevention of pollution in the lake through diversion and treatment of sewage, catchment area protection through creation of buffer zone etc.

The implementation of these activities resulted in increasing the water holding capacity of Upper Lake

by 4%. Post project water quality monitoring confirms improvement in water quality of the lake when compared with the data of the pre-project implementation stage.

During implementation of conservation measures various types of administrative, social and legal issues have been encountered. The case study discusses how these issues have been addressed while implementing the conservation measures.

Outcomes

The implementation of the conservation measures resulted in substantial improvement of water quality besides increasing the storage capacity of the water body. Some other outcomes of the project are as follows:

- Diversion and treatment of 56 MLD domestic sewage has been developed, resulting in a 4% increase in lake storage capacity.

- A total of 1022 ha of shoreline and emergent weeds and 101351 tons of submerged weeds were removed.
- 75 check dams 2 silt traps having a cumulative silt trapping capacity of 0.36 million m^3, have been constructed across 31 inlet channels, resulted in increase in discharge of 566 m^3/sec.
- Reduction in input of detergents, improvement in water quality.
- Increase in dissolved oxygen concentration and biodiversity in the lake.
- About 40% reduction in the density of aquatic weeds in the first year with an increase in fish production by 130% was achieved.
- Infrastructure of municipal corporation was strengthened to enable additional collection and disposal of 70 tons of solid waste from the 18 municipal wards located in the urban watershed.

Lessons Learned

A lake and its catchment must be managed as a whole, since management of lakes and reservoirs for

their sustainable use is directly linked to their catchment.

Awareness raising, education and stakeholder participation are essential: stakeholder involvement, including lake-dependent communities and common people, should be an integral part of any management program. Their interest in lake needs to be sustained through awareness campaigns and other eco-friendly activities.

The lakefront is always prone to encroachments and pollution, thereby requiring protection as a major management action. This could be achieved by declaring a buffer zone from the full tank level of the lakes as a "No Construction Zone".

By their very nature, conservation measures are never one- time activities. The sustainability of the measures must be ensured for a long period, in order to achieve fruitful results.

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