

Present Status, Future Prospects, Conservation and Restoration of Ansupa Lake, Orissa

Lakshman Nayak¹, Sanjiba Kumar Baliarsingh¹ and Sonali Nayak²

¹*PG Department of Marine Sciences, Berhampur University,
Berhampur-760007, Orissa, India.*

e-mail: sanjibakumar@gmail.com

²*Deptt. of Computer Science, Jagannath Institute for Tech. and Management,
Allurinagar, P.O -Sitapur Paralakhemundi-761211, Gajapati, Orissa.*

e-mail : sonali27btech@yahoo.co.in

ABSTRACT

Ansupa lake is the second largest lake of Orissa. It stretches over 3 villages namely Kadalibadi, Bishnupura and Subarnapur of Banki subdivision of Cuttack district. It is a fresh water lake. The lake is 3 km long natural water body with varying width from 250 to 500m. It covers an area of 750 acres with a water spread area of 350 acres and rest is land area. It harbours a numerous array of organisms from plankton to the large fishes. A number of migratory birds visit to the lake for breeding and feeding. 40,000 migratory birds visit to this lake where as only 3,000 birds are indigenous to this lake. There are about 202 numbers of fishermen families depending on this lake for their livelihood. There are about 70 numbers of boats and 202 numbers of nets used for fishing in the lake. The fishermen are not habituated for any alcoholic drinks. There are two cooperative societies operated in the lake for the benefit of the poor fishermen. The domestic tourist arrived to this lake was 35,350 numbers and only 30 were from foreign tourists during recent years. There are several tributaries draining into the lake and the depth is declining due to siltation and soil erosion. The water depth varies from 6 meters to 2 meters during monsoon and summer season of the year. The conservation and restoration measures to be taken by the Government and Non-Government Organization (NGOs) have been discussed in detail in this paper.

INTRODUCTION

Wetlands are the ecotones or transitional zones between permanently aquatic and dry terrestrial ecosystems. Ramsar Convention has defined wetlands as "areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters". All over the world, significantly large areas of wet lands have been lost or are degraded to different degree due to various anthropogenic activities, which primarily cause hydrological changes (Gopal, 2003, Junk, 2002) A wide variety of wetlands like marshes, swamps, and open water bodies,

mangroves and tidal flats and salt marshes etc exists in our country. India is a subcontinent consisting of several lakes and lagoons located in different states. Lakes have repeatedly changed in size and volume over long term period due to climatic influences. Lakes as well as rivers and string are important water reservoirs and often economically significant (Jose et al 2001). Orissa is an important eastern state of India. After Chilika, Ansupa is the second largest lake of Orissa. It is a fresh water lake. Fresh water habitats are among the most threatened and valuable eco system (DeMeester & Declerck, 2005). There are no global estimates for rates of change in the extent of fresh water habitat or for the over all changes in the condition (Dudgeon, 2003). Ansupa lake is just 10 km from Athagarh under Subarnpur block stretching over three revenue village namely Kadalibadi, Bishnupur and Subarnapur of Banki sub-division of Cuttack district. It is a 3 km long natural water body with varying width of 350 to 500 meters at different places. The lake is about 3km away from the river Mahanadi and connects to and from both sides facilitating in flow and outflow of freshwater during rainy season. The lake covers an area of 750 acres during rainy season and rest is land area. There are about 202 numbers of fishermen families who depends on this lake for their livelihood. The country boats and nets are very few as compared to the fishermen population in and around the lake. Different species of freshwater fishes are caught and marketed throughout the year. But the abundance of the fishes occur during rainy season of the year. The water depth is decreasing due to soil erosion and water in flow to the lake. The lake is infested with large and huge marginal, submerged as well as floating weeds. Large number of indigenous migratory as well as exotic migratory birds congregates in the lake during different season of the year. The state Government as well as the Central Government has taken initiatives to make this lake as the tourist paradise by implementing different programmes and proposals.

ORIGIN AND LOCATION

The Ansupa Lake is a horse-shoe shaped lake (Fig 1). It is about 5000 years old originated due to Mahanadi River's run off and cut off later on. The area of Ansupa Lake is about 748 acres and now it has reduced up to 352 acres. The area of Ansupa Lake is reducing day by day due to soil erosion, flood and effect of aquatic weeds. The water depth of the lake has come down to 10 feet due to occurrence of aquatic weeds, aquatic plants and soil erosion. (Samaj, 2008).

Physicochemical Parameters of Ansupa lake

Physicochemical parameters play an important role in the dynamics of any ecosystem. The physicochemical parameter like Temperature, pH, dissolved oxygen and Transparency of the Ansupa lake has been studied during June 2007 to May 2008 following the standard methods (APHA, 1998). The temperature of the lake water varies from 24.4°C to 34.8°C during different season of the year (Table 1). The dissolved oxygen of the lake water varies from 4.1ml/l to 7.6 ml/l during summer May 2008 and June 2007

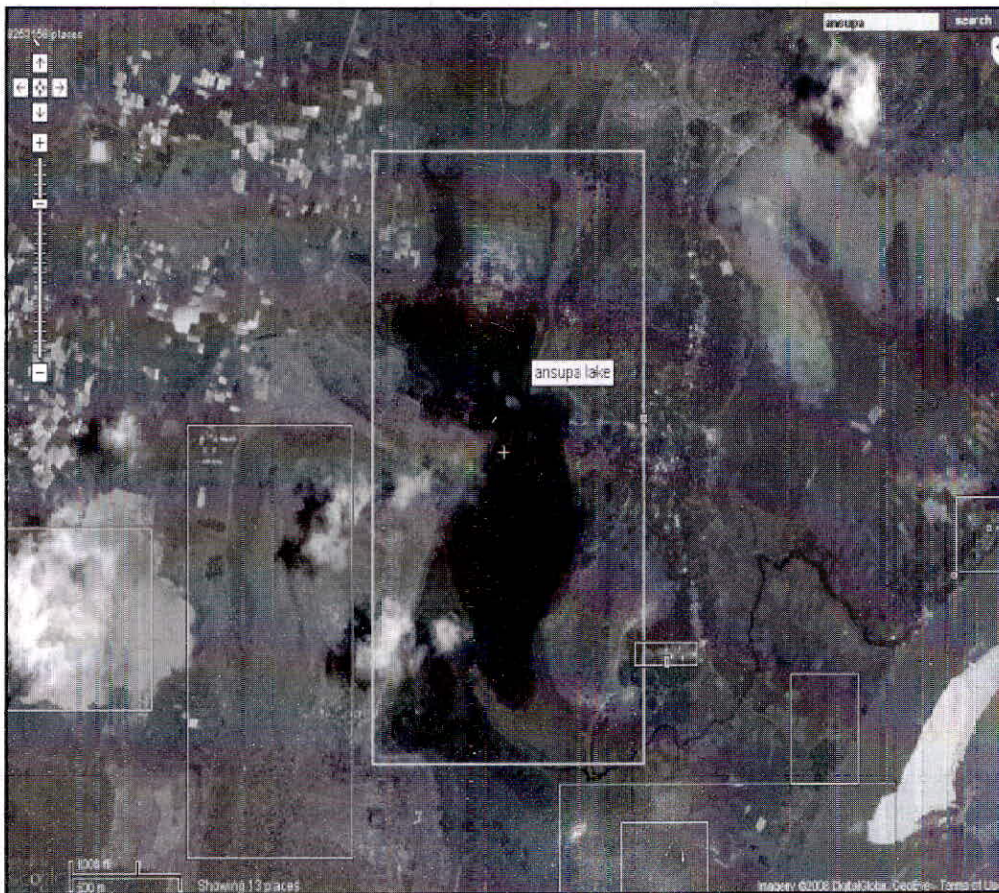


Fig. 1: Map of Ansupa Lake, Orissa

respectively. The pH value of the lake varies from 6.9- 8.5. Transparency of the lake water was measured by Sechhi disc and the value observed varied from 0.60-1.80 meters during different season of the year.

Fishery

Fishery plays an important role in the economy of the country in general and the regional area in the particular. The 202 fishermen families generally depend upon the lake fisheries for their livelihood. The fishing generally includes fin fishes like *Catla catla*, *Labeo rohita*, *Chirrhinus mrigala*, *Wallago attu*, *Chana punctatus*, *Ophiocephalus species*, *Heteropneustus fossilis*, *Clarius batrachus*, *Amblypharyngodon mola*, *Mystus gulio*, *Puntious serena*, *Labeo calabasu*, and shell fishes like *Macrobrachium rosenbergii*, *Macrobrachium malcolmsoni*. Besides these fishes the larvivorous fishes such as *Brachidanio rerio* and *Ophocephalus* are also seen in the lake. There are about 202 number of country boats operated in the Ansupa Lake. The fishermen are using nets of

Table 1 : Physiochemical properties of Ansupa Lake during June 2007 to May 2008

Month/Year	Temperature (°C)	Dissolved Oxygen mg/l	pH	Transparency In meter
June-07	28.6	7.6	7.5	0.75
July-07	24.4	6.8	7.2	1.25
Aug-07	26.7	4.5	6.9	1.40
Sep-07	27.9	6.3	7.6	1.80
Oct-07	26.2	6.8	7.9	1.75
Nov-07	25.3	6.2	8.1	1.65
Dec-07	28.2	7.1	8.4	1.52
Jan-08	25.0	6.7	7.7	1.45
Feb-08	25.8	4.8	8.2	1.30
Mar-08	30.5	4.2	8.5	1.10
Apr-08	33.2	4.5	7.8	0.80
May-08	34.8	4.1	8.0	0.60

different sizes to capture the fishes. The fish production is decreasing year to year due to soil erosion, infestation of weeds, pollution and over fishing. *Catla catla*, *Labeo rohita*, *Chirrhinus mrigala* and *Wallago attu* dominate the Ansupa fishery. *Labeo rohita* contributes 60% of the total catch which is followed by *Catla catla* and *Chirrhinus mrigala* contributing 25% of the total catch. The minor species like *Murrel* and *Mystus gulio* contribute to the rest of the fish catch.

Flora of Ansupa Lake

The biotic component of Ansupa lake are varied type, which include, macrophytes, phyto plankton, zooplankton, periphyton, macro invertebrate and air breathing fishes. Four characteristic vegetational communities were recognized in the lake. Those are free floating type e.g. *Eichhornia crassipes*, *Trapa bipinnosa*, *Lemna minor*, *Lemna major*, *Salvinia natas* and *Salvinia molesta*, bottom rooted floating type e.g. *Euryale ferox*, submerged type *Hydrilla verticillata*, *Potamogeton sp.*, *Najas graminea*, *Ceratophyllum demersum* etc; and Emergent type. e.g. *Cyperus sp.*, *Cattail*, *Sweet flag*, *Spike rash* etc. The detail phycology of lake revealed that the lake possess 7 genera 31 species of desmids, 17 genera, 19 species of diatoms, 3 genera 39 species of *Euglenoids*, and 11 genera 23 species of blue green algae respectively. The lake system being free from pollution can be used judiciously as one of the important ecotourist spot for the economic development of the local community.

Table 2 : Fish production for 10 years from 1998 to 2007 from Ansupa Lake, Orissa

Year	Fish Production (In tones)	Growth of fish production in Percentage (%)
1998	2.1	
1999	2.3	8.69
2000	2.8	10.71
2001	3.1	9.67
2002	2.9	-6.89
2003	3.8	23.68
2004	4.0	5
2005	4.2	4.76
2006	3.5	-20
2007	4.5	22.22

Present status of Ansupa Lake

Ansupa lake is just 10 Km from Athagarh under Subarnpur block stretching over three revenue village namely Kadalibadi, Bishnupur and Subarnapur of Banki sub-division of Cuttack district. The lake covers an area of 750 acres during rainy season and rest is land area. Fishery plays an important role in the economy of the country in general and the regional area in particular. The 202 fishermen families generally depend upon the lake fisheries for their livelihood. Fishery production is not constantly increasing. Rise and fall in the fishery production has been observed from the lake which is represented in table 2. During 2006 the fishery production has decreased by 20 %. People of this area depend upon fishing from the lake through out the year for their livelihood. Their socio economic condition is not so good. Ansupa lake has not been well studied for its fauna, flora, physico-chemical parameters and the socioeconomic condition of the local community. The lake is degraded due to siltation, eutrophication, excessive growth of aquatic weeds and decrease in fish production.

Conservation and Restoration measures for Ansupa Lake

Planned management of natural resource or the total environment of a particular ecosystem to prevent exploitation, pollution, destruction or neglect and to ensure the future use of resource. Natural resources are classified as either renewable or non renewable. Although protecting uncultivated land from poachers and loggers can some times be difficult. Natural parks and nature preserves are maintained on a wide scale in some countries. These preserves protect endangered species and afford natural laboratories for research. Fisheries as well as wild life parks help in increase natural resources by humanity is necessary to conserve the environment for the future. (Jacob, 1976).

The constant in flow of soil erosion and silt from the catchment area is decreasing the depth of the lake. Therefore dredging work should be done continuously to reduce the rapid siltation. Plantation should be made in the Saranda hills and Bishnupur hills to check the soil erosion. Ring embankment should also be constructed to check the flood water influx and entering of the silt during rainy season. The socio economic status of the lake fishermen is very low. So the socio-economic status should be improved by engaging them in lake improvement works. Prohibition of cattle and buffalo grazing inside and on the embankment of the lake will help the lake from soil erosion and siltation. Efforts should be made to create a sense of belongingness of the local people for the fresh water ecosystem. Eradication of weeds should be made through the community participation by way of utilizing weeds for the production of bio gas. Grass crap should be cultured for the deweeding process. Introduction of culture based capture fishery in the lake should be under taken by releasing the seeds in the lake. Provision of adequate quantity of fishing crafts and gears should be made in the lake to increase fish production. Financial assistance should be provided to the fishermen for purchasing advanced boats and nets. Government of India has taken steps to construct a ring dam of 1500 meter from Jatamundia of Banki to Subarnapur, north side of Mahanadi to make the Ansupa lake an International tourist center. The tenth financial commission has allocated Rs-6.41 crores for the development of the lake. The government has established an Ansupa Development Authority to look after the developmental work of Ansupa lake. Government should declare the Ansupa lake as the bird sanctuary because 30,000 to 40,000 birds are migrating to this lake for feeding and nesting. The lake Ansupa can be developed in to an Eco-tourism destination in near future.

Some Important Conservation and restoration measures to be taken for Ansupa Lake.

- Over fishing and over exploitation of fishes should be checked by creating general awareness among the local fishermen.
- The rapid growth of human population around the periphery of the lake should be checked so that the pollution from domestic sewage, pesticide and agricultural

chemicals can be minimized to some extent which has a long term benefit to the lake.

- Smaller fishes should not be caught from the lake; collection of the fish seeds from the lake should be banned.
- The socio-economic condition of lake fishermen is very low .So; the socio-economic condition can be improved by engaging them in developmental work, of the lake
- The congregating birds must be protected from bird poachers by Wildlife Protection Act. So that it can be converted into a tourist place later on.
- Establishment of fish seed bearing centers near by the lake should be done for facilitating continuous stocking of fingerlings /juveniles.
- Development of road, communication network and strengthening of embankment should be made which is the first step for restoration work.
- Strengthening of present earthen embankment with provision of wire mesh screen at inlets an out lets should be made for proper management of the lake.
- Renovation of peripheral dry and marshy areas of the lake should be done to increase the water holding capacity.
- The plantation around the lake and gully control should be made for controlling the soil erosion.
- Eviction unauthorized encroaches from other agricultural activities must be done.
- Awareness camps should be done at the village level for scientific and ecofriendly management of the lake.
- Efforts should be made to create a sense of belongingness of the local people for the environment and the ecosystem, so that they will take care of the lake.
- Long term research work is to be carried out by university, Ansupa Development Authority or any organizations for proper management and monitoring of the lake.

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