

TOWARDS CONSERVATION OF HARIKE WETLAND

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The Origin of Harike

The Beas River originates in the Rohtang pass of the Himalayas in the central Himachal Pradesh in India at an altitude of 3977.64 m and flows for the length of 470 km. The River enters Punjab at Mirthal in district Gurdaspur. The Chakki Khad is the chief tributary of the River Beas. After collecting the drainage of the Chamba Hills, it joins the Beas near Mirthal. It flows for 130 km before meeting Sutluj River to form Harike wetland.

The Harike wetland was declared as a closed area in 1976 vide gazette notification No. 4223- Ft-III-76/35745 dated 19th October 1976. The final notification of the area as a Sanctuary under section 26-A of the Wildlife (Protection) Act, 1972 was made in 1999 vide notification No. 34/7/99-F.t-IV/16393 dated 18-11-1999. The sanctuary spreads over an area of about 86 km² enclosing shallow, marshy tracts that serve as feeding and wading habitats for waterfowl in and around the confluence of Rivers Beas and Satluj. The significance of the area as a wetland of international importance was recognized and was declared as a Ramsar site in 1990. Harike Wildlife Sanctuary is a famous bird sanctuary of Punjab State which falls in the manmade reservoir created by impounding water 7m below the confluence of Beas and Sutlej rivers 150 Km North-West of Chandigarh. The head-works control the flow of these rivers water and throw back barraged into large lake called Harike Lake which touches three districts of Punjab State viz. Kapurthala, Amritsar and Ferozepur. This lake attracts a large number of migratory birds from other countries.



Fig. 1: Migratory birds



Fig. 2: Indus dolphin

Harike was identified as a site for conservation under the Indian National Wetlands Programme (1987-1988) and included in its conservation and management programmes. In 1990, Harike wetland was designated as a RAMSAR SITE (Ramsar Convention -2008). At the State level, it was declared a bird sanctuary (Harike Wetland Bird Sanctuary) by the State Government of Punjab in 1992, though fishing was allowed. However, in the year 2000 when it came under the Wildlife Act, fishing was totally banned in the wetland. The State Government undertakes various activities for conservation of the wetland including afforestation, protection of wildlife, control of weeds such as water hyacinth, conservation of soils and water quality.

The Topography

Harike Wildlife Sanctuary lying between 31°05'15" and 31°14'15" North latitudes and 74°-55'30" and 75°-07'30" East longitudes, fall in the Biogeographic province of Zone 4 A i.e. Punjab plains of the semi arid zone. It covered the larger wetland area once stretched from village Goindwal Sahib along the River Beas and village Gidderpindi along the River Sutluj upto the village Kirtowal. However, the present form of the Sanctuary came into shape after the construction of the Harike Barrage. Harike reservoir came into existence when a barrage was constructed at the confluence of the Beas and Sutlej rivers near the town of Harike. The present wetland area is more or less triangular in shape with the L.M.B. (Left Marginal Bund) forming one side, a road on the other and a canal on the third side. The area of Harike Wildlife Sanctuary is more or less plain, with slight

undulations here and there, especially on the Amritsar side of the boundary, waterlogged, and inhospitable. The elevation varies from 180 m - 210 m above M.S.L. The depth of water varies from 0.3 m to 1.8 m. though maximum recorded is 4.5 m (Ladhar *et al.* 1994). There are eleven islands in the sanctuary area. There is proper water level maintenance provision. The water is drained by many small rivulets and nallahs besides two feeders i.e. Ferozepur and Rajasthan feeders that emanate from the Harike reservoir.

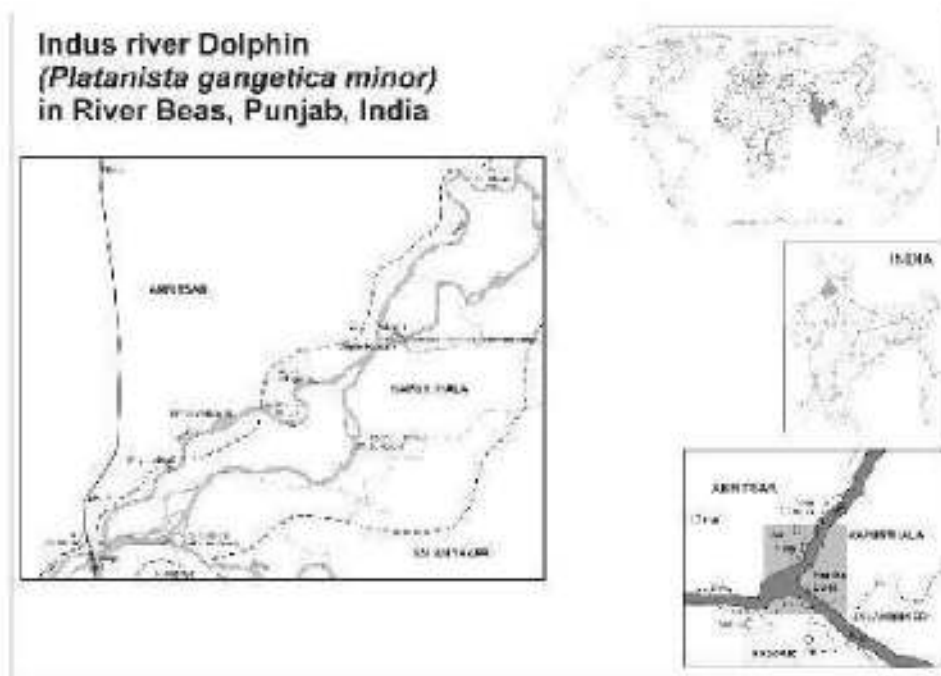


Fig. 1: Dolphin map

Habitat and Biodiversity Values of Harike Wetland

Lack of data, non-existence of state level water policy statement for water, low political will, non commitment and the negative attitude of the general public towards these ecosystems result in continuous degradation of these water bodies, resulting in rapid changes in the local hydrological regimes which in turn leads to loss of biological diversity (Parihar *et al.* 1986). A recent study in the catchment of River Beas by WWF-India in-collaboration with the State Wildlife Department, Punjab revealed that most of the areas of the river including the natural wetlands are under severe stress from habitat fragmentation. Other threats include drainage of low lands, reduced flow of water into natural wetlands, siltation and encroachment.

The Harike wetland is surrounded by agricultural fields on all sides and largely by townships of Tarn Taran and Kapurthala districts. The wetland is affected by domestic, agricultural and industrial waste brought in mainly by River Sutlej via Budda Nallah and Chittibein and to a lesser extent by River Beas and Kalibein. The drainage of this area is towards the south and south-west. The drains between Ravi and Beas are Sakki Nallah, Hudiara Nallah, Kasur Nallah and Patti Nallah. Two rivulets *Beins* flows between Beas and Sutlej i.e the West/Kali Bein and East/Safed *Bein*. The Rajasthan and Ferozepur feeder canals, located at the southern part of the sanctuary, carry away approximately 29,000 cubic feet per second of water to western Punjab and Rajasthan.

Diversity

The diverse habitat of Harike provide shelter to number of species including the endangered Indus dolphin (*Platanista gangetica minor*) which was supposed to have become extinct in India after 1930. Between December 20-22, 2007, its presence was confirmed in Harike wetland area and upstream 25 km along River Beas. During surveys between December 20-22, 2007 and April 28-30, 2009 two separate groups comprising of six and four individuals have been sighted (Behera *et al.* 2008). The occurrence of Otters was also confirmed from River Beas including Harike Lake. During surveys, a group of seven

Smooth-coated Otters was sighted at the Harike Lake and at c. 35 km upstream the author recorded signs (tracksets) of Otter occurrence near village Karmovala. Studies have also recorded more than 200 species of waterfowl, of which above 40 species are long distance migrants and are known to pass through or winter at Harike lake during the migratory season. About 50% of the total species of birds reported from Punjab have been recorded in and around Harike wetland area. Moreover, seven species of turtles belonging to six genera has also been reported from this wetland. Marsh crocodile once reported extinct have been rediscovered. The author has attempted to identify suitable habitats for Gharial release in the 66 km stretch along Beas River, which includes 12 km stretch in Harike Wildlife Sanctuary.

Management System

Harike has an excellent natural environment in the form of air and water covering the vast area. It is an exotic place for peace loving people. Water is clean and transparent. Typical dry deciduous forest along with many shrub species is found in this area. In spite of gradual environmental degradation, birds continue to migrate and hence wildlife survives. Efforts have been made to modify habitat by improving water features for increased bird migration.

Some important Gurudwara's like Baoli Sahib and Rababsar fall within the vicinity of Harike wetland. The religious places play an important role in conservation, as Gurudwara authorities do not allow any person to hunt the birds in the area. The famous religious place situated in the Sanctuary area is "Issar Dham".

Prior to the re-organization of states, the wildlife conservation was through implementation of provision of Indian Forest Act, 1927 and rules framed under wild Birds and Animal (Protection) Act, 1912. By the time Indian Forest Act, 1927 was implemented, shooting blocks were recognized and certain areas with rich-game were declared and hunting was allowed. Then Wildlife (Protection) Act, 1933 and 1959 came into force in the state after its promulgation in the Indian Board for Wildlife in 1952. It was implemented in the state of Punjab on 1-4-1975. Previously hunting was allowed in this area with prior permit. Three kinds of licenses viz. small game, big game and special game licenses were issued. This continued till 1976 after which area of this lake was closed for hunting after its recognition as one of the International Wetlands. This continued till now when area of 86 km² is declared as a wildlife sanctuary for a period of 10 years. Presently Harike Wildlife sanctuary is effectively managed under the control of Chief Wildlife Warden, Punjab under Wildlife (Protection) Act, 1972; Wildlife (Protection) Punjab rules 1975 and Wildlife (protection) Amendment Act, 1991. There was no central assistance before 1988. The Wildlife staff was involved in checking wildlife offences relating to hunting of migratory birds. The Government of India started providing financial Assistance from 1989 and several developmental works were undertaken. The sanctuary is open, now approx. 20,000 Rft. area of sanctuary is fenced. The entire land is a Government land. There is no tribal community and residing in this area. Of course the surrounding villagers do let loose their livestock released them in the area for grazing and also trying to encroach upon the land.

Problems and Threats

Siltation

Silt had started depositing near the barrage of Harike at the beginning of 1985. Siltation has reduced the erstwhile lake to shallow wetland now. A major amount of silt is deposited in the monsoon season when heavy rains wash down the soil from hill slopes and deposit in the catchment area of the two rivers. When the lake came into existence in 1952, it had an area of 41km² and supported a rich flora and fauna. By 1993, the lake has shrunk to a mere 28km² (though according to remote sensing data, the open water area is even less i.e 13km²) within a span of 40 years. Assuming the siltation rate does not increase, this gives the lake a life span of another 80 years. However, any increase in the erosion rate in the catchment will proportionately decrease the life span of the lake. As degradation of the catchment continues unabated, it is probable that the life span of the reservoir will be considerably reduced.

Intensive grazing and trampling of surface grasses loosen the topsoil, both in the immediate catchment of the lake and in the lower Shivaliks which then is washed away with the rains into the lake. Modern agricultural technologies include deep ploughing that increases runoff with precipitation. Pressure on forest resources for firewood, fodder and timber has caused extensive deforestation. In the lower Shivaliks, upstream of the Sutlej in particular, the foothills are highly degraded. Shorn of vegetable cover, the top soil is so loose that any impact causes it to crumble. Piles of loose silt are visible at the base of the hills which are washed into the nearest water body with the mildest rain. The water storage capacity of the lake has now decreased in a span of just four decades.

Weed Infestation

A glaring problem of the lake is the spread of water hyacinth (*Eichhornia crassipes*). At Harike Lake, for most of the year, little open water is visible; instead what is seen is the lush green growth of *Eicchornia*. During floods the plant may be flushed downstream, though hyacinth present in standing pools and areas cut off from direct contact with the river remains to proliferate and spread over the entire lake within a couple of months.

This unnatural spread is mainly due to *eutrophication* of the lake waters. Effluents from cities and villages in the catchment, and fertilizer run off that find their way into the lake result in a high organic loading which aids rapid multiplication of the weed. If the plant could be regularly harvested, it would help in regaining water quality of the lake, since *Eicchornia* is known to take up heavy metals and nutrients. A pilot *Sahyog* initiated by the army, and subsequent continuing of the techniques used in the project by the departmental staff to remove water hyacinth has resulted in clearing large areas infested by this weed. However, paucity of funds made available to the sanctuary, and the absence of a comprehensive plan to tackle the problem has made the efforts more or less ineffective. This is because the rate of multiplication of the weed is such that by the time a certain portion is removed of the weed, the weed has multiplied again to more or less the same level during the intervening period. It is therefore imperative that a comprehensive plan is put into place and adequate resources made available for its implementation.

Encroachment

The local population around Harike comprises relatively well-off farmers. The use of cooking gas for fuel and marketed feed for cattle removes active interaction of the local people with the wetland. Their interest lies only in the value of agricultural land. Although the lake is entirely state owned, encroachments by the local people for agricultural purposes are common. (The mechanization of agriculture has made quick digging, drainage, filling and planting easy). About 791.98 acres of the wetland have been encroached upon by local cultivators. Originally, before the existence of the barrage, the land now under water was occupied by a number of villages. After the barrage was completed, the submerged land and surrounding areas were brought under government control without proper rehabilitation schemes for the displaced villages. This decision is still being contested by the local population, which has taken to court the Wildlife Department for fencing off agricultural land. The lack of positive interaction between the locals and the wetland management authorities is a serious problem which needs to be tackled. Plans to maintain the wetland must incorporate local support if they are to be successfully implemented.

Pollution

Surrounded predominantly by agricultural land where the utilization of fertilizers and pesticides is high, the run off during the rains from fields, unprotected by bunds or fencing grasses is a major factor contributing to the pollution load of the lake. Wheat and rice are the main crops grown in the catchment. Wheat, which has a growing period of just over six months, utilizes approximately 130 kg of nitrogen fertilizer per acre. Since it is sown after the rains, the loss of fertilizer due to runoff is not as high as that in rice, which is planted with the start of tones/acre of organic fertilizer is applied to rice fields along with 100-120 kg nitrogen fertilizer. Fertilizer runoff may be very high if immediate rain follows. The loss of fertilizer from field is often up to 100% which compiles another application to the field. If rain does not follow immediately, the loss is about 10-25 per cent considering the fact that the catchment is almost entirely cultivated, with less than 3% forest cover, the agricultural runoff is substantial. All this waste fertilizer ultimately finds its way into the lake via groundwater, movement of surface runoff.

Fishing

Harike is auctioned for fishing, along with adjoining wetlands in Kapurthala, Amritsar and Ferozepur districts. Harike Wetland constitutes the major fishing area, fishing rights of Harike and adjoining wetlands are auctioned annually to a private contractor from an adjoining district. Field investigations reveal that, it is usually the same private contractor who is allotted the contract year after year. As Punjabis are traditionally not a fish-eating community, local fishermen are few. The contractor, therefore, brings fishermen from Ballia (Bihar) or Gorakhpur (U.P.), on an annual basis to undertake for fishing. More than 1600 fishermen are found plying 600-700 boat camp at various sites, residing on their open boats and makeshift hutments throughout the wetland. As the fisher come to the area for monetary compensation, fishing continues day and night throughout the wetland area. Although the Department of Animal Husbandry and Fisheries passed a notification in 1985 banning fishing 1600m upstream and 2000m downstream of the Harike Headwork, (this area being excluded from the fishing contract) boats can still be seen fishing within 500m of the barrage (Dua and Parkash, 2009). In addition, under the Wildlife Protection Act, 1972, fishing is not allowed in the sanctuary area. Till recently, the irrigation department has given permits to the contractors.

As fishing is considered the second major asset of the barrage, the first being irrigation, it is probably that it will not be curbed. The frequent movement of the fishermen and their boats over the lake is known to disturb the larger animals and avifauna and is a cause for their declining populations. All these disturbances adversely affect the habitat requirements of the avifauna. The gill nets used by fishermen cause mortality amongst ducks and turtles. Illegal fishing, using bait and fishing during the prohibited period also occur. Poaching of wild animals is reported as well.

Poaching

Recent media reports have highlighted the problem of poaching at Harike Wetland. According to these reports, pesticide soaked grains render the birds unconscious, which are then fished out of the water with nets. The entrails are removed and the birds are sold at the rate of Rs. 10 to Rs. 30 per piece, depending on size. Several cases of pesticide poisoning among consumers of poached birds have been reported from Gurdaspur district. Poaching continues despite preventive measures taken by the State Wildlife Department. Poachers caught within the sanctuary area face a minimum of a year's imprisonment; those caught in the act in areas outside the sanctuary are, however, fined a mere of Rs. 50-100.

The lake of international importance is under severe threat. Although some protection measures are taken up, they are not able to combat with the faster rate of depletion. It needs much more care to survive biologically for longer duration.

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