

## Wetlands of International Importance in Himachal Pradesh

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### Abstract

The convention on wetlands of International importance called Ramsar convention of IUCN held in 1971 in Iran. This treaty attracted the global attention regarding conservation and wise use of wetlands and their resources. This convention is the only treaty which deals with particular ecosystem. In Himachal Pradesh three wetlands has been designated as the “Ramsar” site and are of International importance viz. Chardertal, Pong Dam Lake, Renuka. Wetlands are transitional zones or ecotones between permanently aquatic and dry terrestrial ecosystems bestowed with healthy environment. During dry periods these sites keep the water table high by retaining water in them whereas they reduce flood levels during heavy rains. Ramsar sites of HP support wide range of biodiversity, complex food web as they serve as feeding sites, breeding areas for wildlife, provide refuge for waterfowl. Located in different physiographic, climatologically and geologically regions act as sources of drinking water. Wetlands are vital for survival of plants and animals especially threatened and endangered species and of economic benefits. Fisheries, agriculture, timber product, wildlife resources transport, recreation and tourism opportunities are being harnessed by the local residents surviving around wetlands. These attributes can be maintained if the ecological processes of these sites are allowed to continue functioning. The recent assessment of ecosystems puts freshwater biodiversity as the most threatened of all types of biodiversity. Present review study and information about wetland ecosystem is an effort needed for their effective conservation.

### 1. 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”. A wide variety of wetlands like marshes, swamps, open water bodies, mangroves and tidal flats and salt marshes etc. exists in our country (Table 1).

The wetlands are among world’s most productive environments. They have biological, physical, chemical and socio economic functions. These sites are important because of their biological productivity. Their role in controlling flood cannot be neglected. These provide habitat to many wildlife species, terrestrial wild animals and migratory birds. In India, these sites habitat diverse flora and fauna especially endangered species and also support sustainable livelihood of many people residing nearby. Bioresources in these ecosystems support

majority of low income groups like traditional fishermen depend for their daily food fishes, health care and energy needs. Wetlands have their recreational and aesthetic values which attract ecotourism but also impose major threats like urbanization and anthropogenic pressure. Growth of aquatic weeds in water is another major threat, the fast growing weeds quickly cover the water bodies and subsequently these weeds fill up the water basin. People living nearby keep clearing these weeds but in vain. Throughout the world controlling the growth of aquatic weeds is a major challenge and billions of dollars are spent to overcome this problem (Madhyastha et al., 1990). Anthropogenic activities are the major threat. Strong cooperation of population is needed to restore the valuable wetlands. People in the head region of the river or stream should be vigilant about dumping of contaminants. The concept of ecosystem health and function needs to be highlighted to the communities along the river basin.

Earth’s wetland are amongst the most productive ecosystems and they have aptly been described as “the kidney of the landscape” (Mitsch and Gosselink, 1993) These “biological supermarkets”



support extensive food webs and rich biodiversity. In the economic sense, wetlands are capital assets require sustainable management, if these are to continue to produce the flow of wetland derived function goods and services as they render services both at local and global levels.

Wetlands account for about 6% of global land area and these are among the most threatened of all the environmental recourses. The Ministry of Environment and Forests, Government of India, has declared at least 21 sites of national importance and out of these, three - Pong Dam, Renuka and Chandertal are situated in Himachal Pradesh (Table 2). India has an estimated total area of 58.2 million km<sup>2</sup> under wetlands (excluding rivers). The state of Himachal Pradesh has 27 natural wetlands covering an area of 15km<sup>2</sup> and five are manmade covering an area of 712 km<sup>2</sup>. They spread over an altitudinal range of 450 meters to 5,093 meters above sea level and cover sub-tropical, temperate and alpine regions of the state. As wetland services become stressed and scarce in the future, their value will certainly increase. Considering their enormous utility and role in the economic sustenance of the local communities, wetlands goods and services must be given a quantitative value if their conservation is be chosen over alternative uses of the land itself or the water which feeds the wetlands (Anonymous,

Table 1: Classification scheme of wetlands

Type		Name
Inland Wetlands	Natural	Lakes or Ponds
		Ox-bow lakes or Cut-off meanders
		Waterlogged (Seasonal)
		Playas
		Swamp or marsh
	Man-made	Reservoirs
		Tanks
		Waterlogged
		Abandoned quarries
		Ash pond or cooling pond
Coastal Wetlands	Natural	Estuary
		Lagoon
		Creek
		Backwater (Kayal)
		Bay
		Tidal flat or Split or Bar
		Coral reef
		Rocky coast
		Mangroove forest
		Salt marsh or marsh vegetation
	Other vegetation	
	Man-made	Salt pans
		Aquaculture

1993 and 2000).

## 2. Chandertal Wetland

Chandertal is one of the high altitude wetland located in the cold desert part of Western Himalayas at a height of 4420 meters above mean sea level. Chandertal catchment is an area of meadows, rugged rocks, snow and scree. Legend of Chandertal goes back to the Mahabharata era, when the mighty Chariot of Indra, god of heavens, came down from his celestial abode to earth and bore away Yudhisthira, the eldest Pandava, to heaven. The ethereal Chandertal is believed to be the point of transit between two worlds. Limnologically, Chandertal is an oligotrophic fresh water natural wetland located in the Tethys Himalayas which requires least intervention.

It is believed that the lake is known as Chandertal (the lake of the Moon) because of its crescent shape. This lake pours some of its water in to the river Chandra, and lies between

Table 2: List of wetlands of international importance under Ramsar convention (India)

Sl. No.	Wetland	State
1.	Ashtamudi Wetland	Kerala
2.	Bhitarkanika Mangroves	Orissa
3.	Bhoj Wetland	Madhya Pradesh
4.	Chilka Lake	Orissa
5.	Deepor Beel	Assam
6.	East Calcutta Wetlands	West Bengal
7.	Harike Lake	Punjab
8.	Kanjli	Punjab
9.	Keoladeo National Park	Rajasthan
10.	Kolleru Lake	Andhra Pradesh
11.	Loktak Lake	Manipur
12.	Point Calimere Wildlife and Bird Sanctuary	Tamil Nadu
13.	Pong Dam Lake	Himachal Pradesh
14.	Ropar	Punjab
15.	Sambhar Lake	Rajasthan
16.	Sasthamkotta Lake	Kerala
17.	Tsomoriri	Jammu & Kashmir
18.	Vembanad-Kol Wetland	Kerala
19.	Wular Lake	Jammu & Kashmir
20.	Upper Ganga*	Uttar Pradesh
21.	Surinsar-Mansar*	Jammu & Kashmir
22.	Hokera (Hokersar)*	Jammu & Kashmir
23.	Rudrasagar*	Tripura
24.	Renuka*	Himachal Pradesh
25.	Chandertal*	Himachal Pradesh

\*Wetlands identified as Ramsar sites during the CoP9 meeting held at Uganda during 8-15 November, 2005.



low ridge and the main Kunzam range surrounded by snow and High Mountains (Sharma, 2007). Total area of wetland is about 1.53 sq km. The circumference of the Chandertal is about 2.5 kms. The lake is situated in the foothill of the main Kunzam range, which further joins the great Himalayan and Pir Panjal ranges. The wetland remains under snow cover for most of the time. During winters, the mercury dips down to as low as  $-40^{\circ}$  C. Chandertal is of special value for maintaining the genetic and ecological diversity of the region. Chandertal wetland is a natural habitat of some rare species of flora and fauna of alpine region (Table 3) and is a main source of water for there sustenance.

A large variety of migratory birds visit this wetland during their trans-Himalayan migration and some of them also use these marshes for breeding during summers. The wetland has scanty vegetation. The whole area receives heavy snowfall during winter season and the glaciers start melting in April and May leading to deposition of silt in the lake. In view of the special value of the Chandertal, prevalent plant and animal communities and for maintenance of the biological diversities of this region, special measures are being taken. The efforts are also made to keep the surrounding environment clean. For this purpose, a special work plan has been prepared with provisions for soil conservation works and public awareness programme. WWF is making to conserve high altitude lakes in the state of Himachal Pradesh by preparing preliminary management action plan, deputing volunteers from local villages to regulate tourism, conducting study to determine the current status of the lake and the impact of tourism on it, various educational and awareness programmes and involvement of local Gaddis for conservation of the lake.

### 3. Renuka Wetland

The oval shaped lake at an elevation of 620m above msl in the lesser Himalaya has water spread of  $670 \text{ ha}^{-1}$  and bound by  $30^{\circ}36'30''$  N latitude and  $77^{\circ}02'6''$  E longitude. The lake follows a riparian course between two steep hill slopes with forests and this and its detached part Parasram Tal are along the abandoned course of Giri River which got separated due to tectonic up liftment. The average rain fall in the region is  $150\text{-}199.9 \text{ cm annum}^{-1}$ . The Renuka Lake is 10.50m in length and 204m in breadth with a maximum depth of ₹ 13m and catchment area is ₹  $254.3 \text{ ha}^{-1}$ .

Wetland possesses rich bio-diversity having more than 440 faunal species from protozoa to mammal. The wetland is covered with vegetation of sub-tropical forest comprises of Chhal, Sain, Bahera, Harar, Kachnar, Tun, Shisham and Amaltas etc. Natural Sal forest exists in the northern side of the wetland. Although Renuka catchment is a small area of five hundreds hectares, yet it harbors a large variety of wild

life like Ghoral, Kakkar, Chital, Hare, Porcupine, Black Bear, Monkey and Langur etc. Wetland also possesses a good variety of aquatic life like fishes, tortoise and gradually becoming the habitat for many species of local and migratory birds. Major resident bird groups found in the area are pheasants, partridges, parrots, jungle fowl and magpie etc. Due to rich biodiversity and uniqueness of the area, Ministry of Environment and Forests, GOI has designated the Renuka wetland as "Wetland of National Importance" in the year 1988. Since then, a number of conservation works have been successfully undertaken to restore the wetland to its pristine beauty. Besides afforestation the planting of soil binding trees are being carried out to hold the soil from rapid erosion. Some important measures to be followed for protection of wetland are (i) throwing of household garbage in the water body be prevented by law, (ii) construction of building roads etc. should be restricted to the minimum necessity, (iii) periodical cleaning of open drains and selective harvesting of macrophytes, particularly the emergent and sub-merged, at the time of peak growth can substantially reduce nutrients from the lake sediments, (iv) harvesting of weeds should be increased to control excessive weed growth, (v) public awareness should be propagated for their involvement to protect their own property, (vi) water quality parameters should be checked from time to time for its pollution.

### 4. Pong Dam Wetland

The Pong Dam wetland is one of the largest man-made wetlands of northern India and was declared a National Wetland by the Ministry of Environment and Forest, Government of India in 1994. The wetland is located  $31^{\circ}80'$  to  $32.7^{\circ}26'N$  and  $75^{\circ}25' E$  in district Kangra of Himachal Pradesh at an altitude between 335-435m. It is the first major wetland offering a transitory resting reserve for migratory water birds coming from the trans-Himalayan zone. The area of the water body varies from 180 square kms. (at a minimum water level of 370 meters in the summer season) to 400 square kms. (at a maximum water

Table 3: Rare flora and fauna of Chandertal wetland

Plant Species	Animal Species
<i>Potentilla</i>	Marmot ( <i>Marmota bobak</i> )
<i>Ranunculus</i>	Snow leopard ( <i>Panthera uncia</i> )
<i>Rosulaia</i>	Red fox ( <i>Vulpes vulpes</i> )
<i>Acquilegia</i>	Wild Goat ( <i>Capra ibex</i> )
<i>Primula</i>	Blue Sheep ( <i>Pseudois nayaur</i> )
	Snow cock ( <i>Tetraogallus sp</i> )
	Chukar ( <i>Alectoris chukar</i> )
	Black Winged stilt ( <i>Himantopus himantopus</i> )
	Brahminy duck ( <i>Tadorna ferruginea</i> )
	Golden eagle ( <i>Aquila chrysaetos</i> )



level of 420 meters in August-September), immediately after the rains. The mean annual rainfall for the wetland is 1780mm. and the climate of the wetland is sub-tropical. The winter lasts from mid-December to mid-March and the minimum temperature recorded varies between 5<sup>o</sup>-6<sup>o</sup>. The mean annual rainfall for the wetland is 1780mm (Kumar and Kumar, 2012).

The catchment area mainly comprises agricultural land. The main kharif season crops are rice, maize, pulses, vegetables like potato. More than 80% of the total cultivated area is rainfed. The Bhakra Beas Management Board (BBMB) which undertook the construction of the Pong Dam has acquired 28,000 ha. of land in the catchment of the Pong Dam wetland. The villagers around the lake have fishing rights in the wetland and cultivate this land. There are about 1500 license holding fishermen and 12 Co-operative Fishing Societies here. This wetland is an important staging area for an annually migrating waterfowl population of more than 80,000 birds of about 220 different species, chief among them being the Black headed gull, Brahmany duck. Bar headed gees, Pintail Shovler, Plover, Grabe, Cormerant, Daster, Herson, Moorhen, Egret and Stock (Gaston, 1985). The arrival of about 81,846 birds' was recorded at the end of December which included more than 54 bird species. Coots recorded 28,000 birds followed by Comorants-27000 birds and Popchards-10,500 birds. The migratory birds start reaching the wetlands in the month of October and November and leave the wetlands in the month of March and April. During the initial stages, the fish fauna of the wetland consists chiefly of catfishes, minor carps and a few coarse fishes mainly residual and acclimatized from the river (Pandey, 1989).

The main species of trees in the tract posing a special attraction for the birds are; Acacia, jamun, Shisham, Mango, Mulberry, Ficus, Kachnar, Amla and Prunus. Apart from these tree species a variety of shrubs (*Murraya konigii*, *Zaziphus spp*s, *Carissa opaca*, *Adhatodavastica* and *Euphorbia*), grasses (*Saccharum*, *Dendrocalamus* spps, *Cymbopogen*, spps and *Arundinasia* spps) and climbers (*Bauhinia vahlii* and *Loranthus* spp) are also found in these forests. The main wildlife species found in the Pong Dam wetland sanctuary area are nilgai, sambar, barking deer, wild boar, clawless otter and leopard. Besides this, the porcupine and jackal are also found. Encroachments around the wetland area pose much greater threat to the ecology of the area. Pesticides and other toxic wastes generated in the fields go directly into the wetland, adversely affecting the ecology. The most serious threat comes from agriculture and forestry malpractices in the water catchment area (Prasher et. al., 2006).

In 1983, the entire reservoir was declared as a Wildlife Sanctuary by the Himachal Pradesh government. A management plan was prepared in November 1982 and approved in December, 1984,

for protection of the sanctuary. The State forest department has undertaken plantation work in the peripheral area of the lake. This has been done for checking the silt as well as providing nesting and roosting places for the birds. The island of Ramsar has been developed for nature conservation education, complete with rest house and boat facility. This year around 87000 birds of more than 90 species of migratory birds from Trans-Himalayan regions have descended on pond dam wetland. The birds such as bar headed geese, Ruddy shelduck, gulls, red necked grebes, cormonants, malbacds have migrated from China, Tibet, Iraq, Pakistan, Siberia and Mongolia due to congenial conditions here in the Pong lake. This year Ruddy-breasted crane in the Pongdam Lake have been spotted. Pong dam serves as breeding area for many of these migratory birds and is paradise for the migratory birds.

## 5. Conclusion

Ensuring conservation of wetlands, its ecosystem and available bio resources is gaining global attention. There is urgent need to engage stakeholders including citizens in information sharing and capacity building for their management. Chardertal Wetland, Pong Dam Lake, Renuka Wetland of Himachal Pradesh are designated as Ramsar Site i.e. wetlands of International importance. Wetlands serve as habitat for different types of flora fauna, thousands of people drive livelihood benefits. Wetlands provide opportunities to understand the implications of public policies and conservation role of individual.

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