

HUMAN INTERVENTIONS AND CONSEQUENCES IN THE WETLANDS OF LAOKHOWA WILDLIFE SANCTUARY (LWLS), NAGAON, ASSAM, INDIA

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ABSTRACT

Wetlands are considered as the most biologically diverse of all ecosystems that provides home to many varieties of flora and fauna. Serving as a habitat of a rich biodiversity, the wetlands of Laokhowa Wildlife Sanctuary (LWLS) are facing serious threat of increasing human intervention. The fringe villages of LWLS are inhabited primarily by the agriculturists who frequently enter into the wetlands and their fringes for fish, fodder and other non-timber forest products (NTFPs) for their livelihood. Many of the encroachments even developed artificial fisheries inside the Sanctuary. They also cleared some patches of marshes and swamps, and used them for rice cultivation. This study aims at highlighting the pattern and intensity of human intervention along with its impact on the wetland habitats and their fringes in the Sanctuary from a geographical perspective.

KEYWORDS: Biodiversity, Wetland, Fringe Village & Human Intervention

INTRODUCTION

On the basis of water level, soil conditioner and plant growth, wetlands could easily be distinguished from other ecosystems which bear unique characteristics. The wetlands serve as a transition zone between dry lands and water bodies which supports a wide range of biological diversity covering both flora and fauna. Wetlands have a distinct ecosystem that remains saturated with water either permanently or seasonally. They are naturally occurring in every continent except Antarctica. The UN Millennium Ecosystem Assessment determined that environmental degradation is more prominent within a wetland ecosystem than any other ecosystems on the earth (MEA, 2001).

Functioned as 'Kidneys' of the earth, wetlands play a major role in maintaining the ecological stability of a region, minimizing flood damage, recharging ground water table and much more. But with the rapid growth of the population, they have been suffering from serious degradation particularly in the last century. Wetlands are increasingly suffering from drastic alteration due to increased human activities like extension of agricultural crop fields, use of unscientific fishing gears and over fishing, growth of industrial set up in their surroundings, urban sprawl, transportation and communication etc.

The wildlife sanctuaries of Assam generally have many wetlands like fresh water marshes, swamps, bogs and fens. The Laokhowa Wildlife Sanctuary has a few wetlands, which have clear water in the midst, popularly called as 'beel', while others are swamps of marshes. All these natural habitats have rich biodiversity, but are threatened for increased human interference in the recent years.

OBJECTIVES

The Objectives of the Study Are

- To analyze the pattern of human interference on the wetlands, and
- To find out the causes and extent of degradation of the wetlands and possible consequences in the Wildlife habitat.

DATABASE & METHODOLOGY

The study covers the wet areas of LWLS, but issues have been highlighted based on the in depth study on three wetlands (beels) viz. Khornoli (Sarolani), Dandua and Chatakuri, which have been highly affected by the activities of the fringe villagers. The field survey method has been used to collect the relevant data supplemented by open ended discussion with the forest officials, president and secretary of Eco- Development Committees and the local people of the fringe areas of the wetlands. Top sheet No 83^{B/10}, 83^{B/11}, 83^{B/14} & 83^{B/15} have been consulted to identify the location of the wetlands and to know the place names for analysis. Satellite imageries of 2008 and 2013 (LISS III 2008 and 2013 Imageries) have been analyzed to highlight the overall changes of land use and land cover of the Wildlife Sanctuary in which the effect of human interventions have been clearly reflected.

THE SYUDY AREA

Laokhowa Wildlife Sanctuary is situated on the flood plains of the mighty river Brahmaputra and covered with many wetlands of different categories. Being falls in sub-tropical climatic zone, the wolverine state Assam provides a favorable condition for the development of many wetlands which supports a rich biodiversity. The Sanctuary had around 30% water bodies for many years, which reduced to 14.33% in 1999 and 6.88% in 2013 (Bora and Sharma. 2016).

Even after rapid degradation of the forest cover area, considerable portions are still covered with tall trees, tall and short grasses, marshes and swamps. The Sanctuary has geographical extension from 26° 27' 36" N to 26° 31' 12" N and 92° 42'E to 92° 45' 36" E with an area of 70.13 km² (Figure 1). The wetlands of the sanctuary play a vital role in providing habitat to some rare species of flora and fauna. The main concern is that, the forest cover as well as the wetlands of Laokhowa WLS has degraded slowly since 1970 and very rapidly since 1980s.

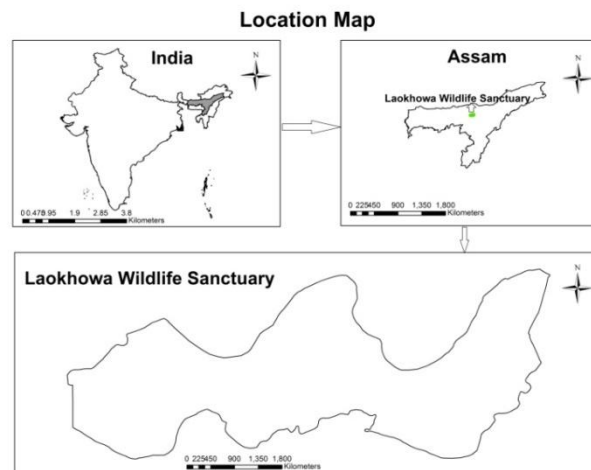


Figure 1: Location of LWLS

The genesis and growth of wetlands are directly associated with the geo- physical condition and tectonic evolution of the region, hydrologic and fluvio- geomorphologic behavior of the rivers and the pattern of land use and human occupancy in the river valleys (Bhagabati, et al, 2001). Wetlands of the sanctuary are basically river origin. They include fresh water small lakes, ox- bow lakes or abandoned elongated channels, marshy tracts and seasonal water logged areas. Most of these wetlands are partially vegetated and contain water with low turbidity. Some of them are getting coalesced to form a single big water body during rainy season. In local parlance the water bodies with water, spread area (sometimes covered with water hyacinth and other obnoxious plants) are called *beels*, while the marshes and swamps are generally known as *jolah*, *doloni*, *pitoni*, *doba* or *hola* etc. (Saikia and Datta 2006, and Sharma1993).

WETLANDS INSIDE LAOKHOWA WLS

In the midst of the tall grasses, mixed scrub, riverine dense forests, the wetlands have been found which are of different size, shape, depth and with different surroundings. Towards north of the sanctuary Dhania or Laokhowa Suti (distributor) and along the southern boundary Mora Lateri or Lareti Jan are flowing along which many of the wetlands of the Sanctuary found. Some small marshes and swamps are there, which usually dried up in the winter season, from the month of November to February. But during the rainy season the sanctuary is inundated by flood water of the river Brahmaputra and the channels and wetlands are merged together when it becomes difficult to demarcate their boundaries.

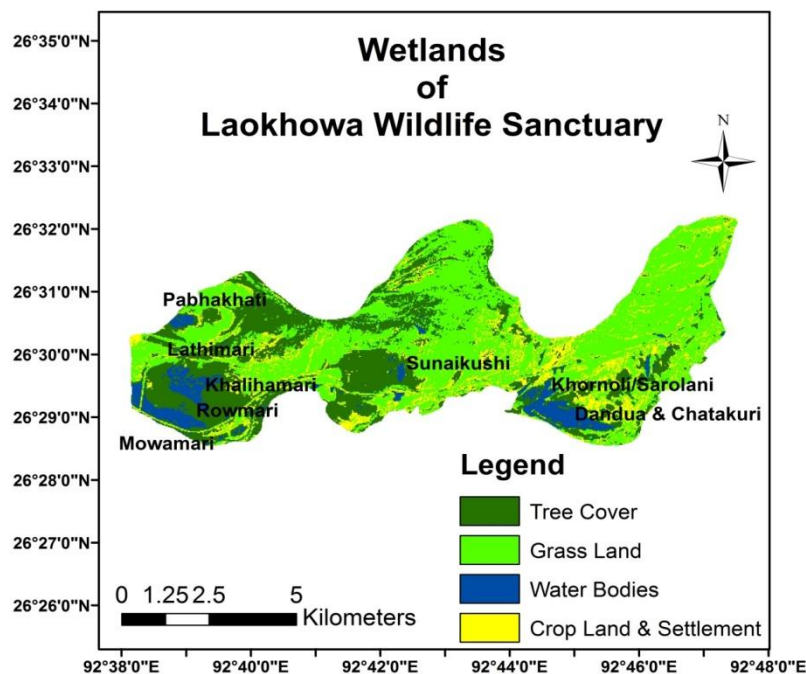


Figure 2: Location of the Wetlands

Large wetlands in the Sanctuary covered with water throughout the year are- Rowmari, Mowamari, Kholihamari, Dandua, Lathimari and Khornoli (Saralani). Medium sized wetlands (most of them are seasonally waterlogged) are- Pabhakhati, Sunaikushi, Chatakuri, Chatalia, Bangbeel (Banbara bil) Hizoltoli, and Rupahi and Jor beel. Besides these wetlands, there are many tanks and ponds which make the sanctuary rich in biodiversity (Figure 2).

HUMAN INTERVENTION

Human Activities and Wetland Encroachment

Laokhowa WLS has been suffered a deep alteration of its natural status due to the effect of varied human interference. The southern fringe of the sanctuary is very densely populated and the economic condition of the inhabitants is poor. These people often enter the Sanctuary for collection of various forest products for their livelihood, especially for food, fodder and collection of non timber forest products (NTFP). Hence a culture has been developed among them to treat the forest as a source of income rather than a site for conservation (Muthu Kumaravel 2011).

Fringe villagers outside the sanctuary and forest villagers inside the sanctuary have been involved in disputes, most of which are associated with fishing, agricultural activities and collection of forest products. It has been reported by many that some of the Muslim communities have been instigated by some political leaders to grab forest lands and encroach upon the wetlands. As a result, many temporary huts have been built in recent years surrounding the wetlands. Considerable forest areas have now been used for raising crops like rice, jute, mustered oil seeds, vegetables, etc. and also for cattle ranching (Cow, buffalo, sheep etc.).

When compared the land use data of Toposheet (No. 83^{B/11}) and the satellite images, it has been found that the amount of encroachment is very high in Khornoli Beel area followed by Chatakuri Beel, Bang Beel (Banbara Bil) and Dandua Beel. The Khornoli, Bang beel, Hizoltoli and Chatakuri beel are situated to the south of the embankment made for flood protection while the Dandua Beel is situated to the north of the same. Thousands of acres of forest land surrounding the wetlands mentioned above turned into agricultural lands in the recent years. In fact, the sanctuary area, south of the embankment is completely converted into agricultural land without leaving any wild grass cover and forest cover area. Among all the wetlands Khornoli (Saralani) Beel is the worst effected followed by Chatakuri and Hizoltoli from encroachment and land use change pattern point of view.

Taking a protection measure, the Forest Department of Assam has evicted 47 (Forty Seven) households in January 2017 who have encroached around the Khornoli Beel area. Immediately after the eviction situation became very tense and these evicted people attempted to attack the forest department officials for several times (Asomia Protidin 2017).

Chatakuri Beel is also a highly encroached by the fringe villagers. This Beel has been the bone of contention between tribal people living in the forest villages and Muslim people living initially outside the sanctuary area, but at present many of them living inside the sanctuary area. For a long time, Chatakuri Beel area has been encroached in the name of a Muslim Madrasa Society, for which, the Beel has now turned into a pond like water body and lost all the characteristics of the erstwhile natural wetland environment. Hizoltoli Beel also encroached by both Tribal and Muslim community people. Open fishing and hunting is regularly done which have not been able to stop by the departments concerned till today. People treat this wetland as their own community fishing ground.

Though encroachment around Dandua Beel is comparatively less, regular fishing and hunting has been going on, mainly by the people of the Muslim community. Moreover, people of its fringe areas regularly collect grass (*Dol Ghah-Adropogon* spp.) for their cattle. It has also been reported that some forest officials are directly or indirectly help the people to continue such activities. However, the other large wetlands situated near the fringe villages viz. Rowmari, Kholihamari, Mowamari etc. are not affected for encroachment but are losing its natural quality for illegal fishing and hunting of aquatic birds taking shelter in the wetlands.

From the comparison of the maps of 2008 and 2013 prepared from the satellite images, it becomes clear that (a) tree cover areas are drastically reduced, (b) croplands and settlement areas have been increased manifold, (c) Water spread areas have been increased and (d) the grassland with fallow land have significantly increased in 2013 over 2008. It is to be mentioned here that, though both the images brought under study belong to dry seasons, the 2008 image was of pre-monsoon and 2013 image was of post-monsoon season. It has been observed in another study that the wetlands are dwindling day by day (Bora and Sharma, 2016), but here in the map of 2013 the water spread areas have been increased. It is mainly for two reasons; (1) Some waters are remaining in the littoral areas of the wetlands for a long time in post-monsoon period, which become very dry before monsoon arrives, and (2) addition of man-made fisheries to the total water spread areas of the Sanctuary (Figure 3 & Figure 4).

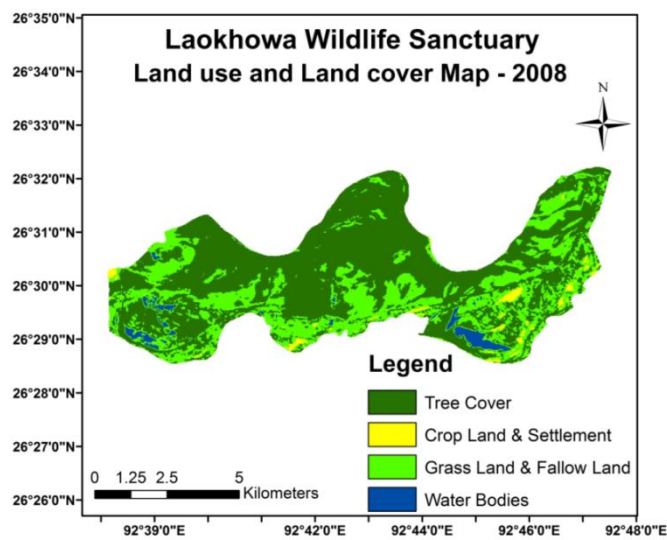


Figure 3: LU/LC Map of Laokhowa WLS, 2008

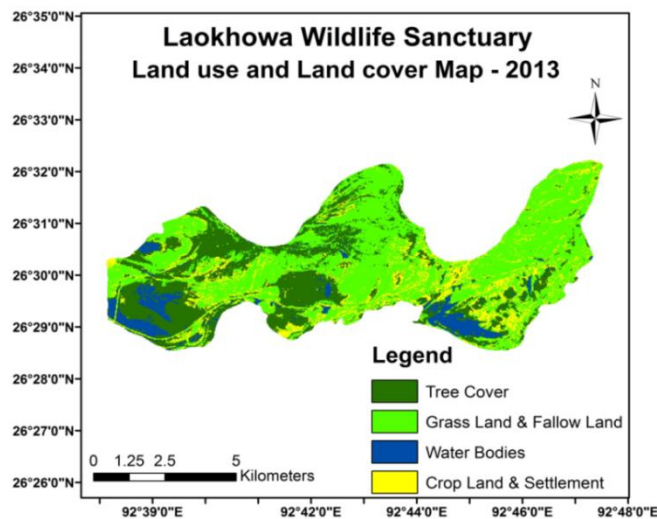


Figure 4: LU/LC Map of Laokhowa WLS, 2013

Manmade Fisheries

It is to be noted that people develop more than two hundred artificial fisheries inside the Sanctuary. Laterijan or Mora Lateri is blocked by encroachers and turned it into fisheries dividing into several parts. Many large fisheries have been developed near Chunchahar, Nolkata, Shingimari and Barunguri Forest Villages. Some fisheries cover an area up to 40 acres of land. Most part of these fisheries usually dried up during winter, leaving a small patch of water spread area at the centre. Most of the fishes produced in the fisheries are sold in the nearby Cholong and Shingimari markets.

Biodiversity and Habitat Degradation

From time immemorial the water bodies; marshes and swamps of the Sanctuary support a rich biodiversity. The sanctuary is the habitat of 225 bird species recorded so far. Among them Lesser Adjutant Stork (*Leptoptilos Javanicus*), Adjutant Stork (*Leptoptilos dubius*), Openbill Stork (*Anastomus Oscitans*), Large Whistling Teal (*Dendrocygna Bicolor*), Spotbill Duck (*Anas poecilorhyncha*), Ruddy Shelduch (*Tadorna ferruginea*), Indian Longbilled Vulture (*Gyps Indicus*) are the rare endemic species. The wetlands are the breeding ground of 39 species of fishes and it provides excellent living condition for the amphibians of which 9 species have so far been recorded. Fourteen species of reptiles have also been identified in the Sanctuary (LBWCS, 2009).

Moreover, the sanctuary provides the habitat of some rare species like Asiatic Water Buffalo, One-horn Rhinoceros, Wild Boar, Civet Cat, Leopard Cat, Fishing Cat etc. It is to be mentioned that at present not a single rhino present in the Sanctuary though the sanctuary is still favorable for Rhino habitat (Nath 2013). At one point of 60 Rhinos were there, but for continuous poaching, at present not a single Rhino left out in the Sanctuary. During the period from 1980 to 1993, as many as 692 rhinos were poached in the country, of which only in Laokhowa WLS, 41 rhinos were killed, virtually the entire rhino population of the Sanctuary (Menon 1996). There are 14 species of snakes and among them Indian Python, Cobra and Krait are notable (Dept. Of Environment and Forest; Govt. Of Assam).

Habitat destruction in Laokhowa WLS is mainly due to the increasing interference of fringe villagers. The main activities that cause the wetland impairment and habitat degradation within the Laokhowa WLS are as follows:

- Construction and development of roads and houses
- Encroachment and extension of croplands
- Application of chemical fertilizers, insecticides and pesticides in croplands
- Cattle rearing infringe villages and over grazing
- Development of artificial fisheries and introduction of hybrid varieties
- Over fishing and hunting
- Regular collection of NTFPs for livelihood, and
- Soil and water pollution along with rapid deforestation

CONCLUSIONS

The study reveals that the wetlands, marshes and swamps of the Laokhowa WLS have been degrading due to the interference of fringe villagers. They converted the forest land into agricultural land by uprooting the mixed jungles and

clearing/filling marshes and swamps for which the boundary area of the wetlands reduces gradually. Grass cover has been degrading due to overgrazing of domestic cattle; particularly, the southern part of the embankment has already been lost all characteristics of wildlife sanctuary.

Open fishing and hunting in the wetlands viz. Khornoli, Chatakuri, Hizoltoli and Dandua is still going on. Wetlands situated to the north of the embankment are to some extent protected, but in spite of it, some of the villagers go for fishing and hunting during night time. Muslim people are more aggressive in damaging the resources of the Sanctuary than the tribal people living in the forest villages.

Khornoli, Chatakuri, Bangbeel, Hizoltoli and Laterijan are polluted by unscientific use of chemical fertilizers, insecticides and pesticides used in agricultural fields. Though the assessment has not been done so far, the symptoms of degradation of plant and animal habitats in the Sanctuary have been surfaced in the recent years. Economic backwardness, very high growth of population, particularly among the Muslim communities and need of agricultural crop fields to support the increased population are the prime causes of human intervention into the Sanctuary. Steps taken by the Forest Department and NGOs for conservation of the Sanctuary proved to be meaningless except in a few successful eviction cases.

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