

VEGETATION AND WILDLIFE OF LAOKHOWA WILDLIFE SANCTUARY IN ASSAM,
INDIA.

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ABSTRACT: The protective areas like National Parks, Wildlife Sanctuaries and reserve forests have attracted worldwide attention to study vegetation, floral diversity and other wild lives for its conservation, sustainable use and also for proper management of bioresources. Laokhowa Wildlife Sanctuary has most ideal habitat for Indian one horned rhinoceros and is one of its representative area in Brahmaputra flood plain. The sanctuary is one of the rich and ecological habitat for the wild variety of animals and plants species. The natural vegetation of the area is mainly contributed by forests of tall trees, grassland and wetland vegetation. The woodland provides food and shelter to a variety of animals and the grassland is the haven for a variety of herbivores. Besides these the wetlands and aquatic bodies provides food and shelter to avifauna, fish fauna and other wildlife. The present paper deals with the vegetation present in the sanctuary. The vegetation comprises (a) Low alluvial savannah woodland (*Salmaria – Albizzia*)(b) Western Wet alluvial grasslands (c) Riparian Fringing Forests (d) *Barringtonia* Swamp forests (e) Wetlands (f) Plantation areas (g) Degraded Forests. About 40 sq km areas is grassland; 6 sq km area is occupied by alluvial grassland in the Sanctuary.

Key words: Vegetation, Wildlife, Laokhowa, Assam

INTRODUCTION

The protected areas like National Parks Wildlife Sanctuaries and reserve forests play a vital role to conserve biodiversity. These areas may vary considerably in size, design, purpose and effectiveness of management, but together form a solid basis of conservation of biological diversity. Our natural environment has been altered due to development and other factors and now it is ripe to conserve forest cover and natural vegetation from further destruction. Therefore it has become essential to conserve biodiversity in sizable natural areas for scientific, educational, ecological, recreational and economic development.

Our earlier knowledge on the flora of Assam started with the observation and contribution of J.B. Hooker's "Flora of British India"(1872-1897) and the first regional flora, "Flora of Assam" by Kanjilal and his colleagues (1934 – 1940) had focused the floristic composition of this region. Some other pioneer botanical works of north – east includes Buchanan – Hamilton (1820), Roxburgh (1820 – 24,1832), Robinson (1841), Hooker (1854.), N.L. Bor (1940). Rajkhowa (1961), etc. Some of the recent floristic studies of Assam are the out come of Ph.D. works viz. "Angiosperms of Kamrup District" by I.C. Barua (1992), "Systemic studies on the Dicotyledonous plants of Lakhimpur District" by R. Singh (1993), "Herbaceous plants of Karbi- Anglong District" by S.Sarkar (1993), "Floristic composition of Tinsukia District" by A.B. Gogoi (1997), etc. A number of floristic works have been carried out in the protected areas i.e. National Parks and Wildlife Sanctuaries of Assam in different period. Hajra (1975) conducted floristic study on Kaziranga and Manas National Park. In the latter period, Nath and Choudhury (1994), Nath (1999), Bora (1999) made some remarkable contribution on Orang Wildlife Sanctuary and Pabitora Wildlife Sanctuary of Assam respectively, which included primarily floristic works. Barua (1998), worked on the vegetation dynamics and periodic migration of animal population in relation to flood and fire in Kaziranga National Park. Bujarbarua (2002), worked on the ecological study of Gibbon Wildlife Sanctuary. In this context with vast and biodiversity rich areas, these works appeared to be significant. The Laokhowa Wildlife Sanctuary is one of the protected areas that are an ideal habitat for Indian one-horned Rhinos and other wildlives.

The vegetation of the area, a complex of deciduous forests grasslands and wetlands provide an ideal habitat for herbivores, including avifauna, fish fauna and other animals. The area with varied vegetation types, wetlands, flora and fauna can support helping in developing various disciplines like ethnobotany, ecology, genetics, forestry, conservation biology etc.

STYDY AREA AND LOCATION

Laokhowa Wildlife Sanctuary is situated in the Nagaon district of Assam, India between the latitudes 26°30' N to 26°32' N and longitude 92°40' E to 92°47' E in the flood plains of the river Brahmaputra. The Sanctuary is about 25 km from Nagaon town, the district headquarter of the Nagaon district of Assam. It is located in the central part of the state of Assam and is situated in the extreme northern boundary of Nagaon district and the southern boundary of Sonitpur district. It is bounded by Burachapori Wildlife Sanctuary, Laokhowa suti, Haldia suti, and Mara suti in the north, Nagaon –Silghat PWD road in the east, Leterijan (water body) in the south and forest road in the west

GEOMORPHOLOGY

Geomorphologically, the sanctuary consists of basically a flat land and the monotony of the plain is to a certain extent broken by the presence of nallas and beels. The land has gentle slope from south to north and east to west. It is a part of Brahmaputra valley. The soil of the area is mostly alluvial deposits of the river Brahmaputra. Soil is generally fertile, clay loam mixed with silt.

CLIMATE

The climate of the sanctuary is characteristically monsoonal with a rhythm of changing season. It changes with respect to the changing climatic elements, which effectively controls the biodiversity of the area. The climate of the Laokhowa Wildlife Sanctuary can be treated as sub-tropical monsoonal type climate. Annual temperature of the sanctuary varies between 9.6°C (min) and 33.8°C (max). Average annual rainfall remains around 2000 mm and about 70% occurs during June – September. The relative humidity varies between 65 – 95% and is lowest during the month of March.

VEGETATION AND FOREST TYPE:

The forests and woodlands are dominated by many tall deciduous trees of the top canopy. The dominant tree species are *Bombax ceiba*, *Albizia procera*, *Trewia nudiflora*, *Lagerstroemia reginae*, *Dillenia pentagyna* etc.

The middle canopy is not very dense and continuous, and is dominated by some shrubs and tall herbaceous plants. It is composed of dominant shrubs like *Ardisia solanacea*, *Leea indica*, *Litsea monopetala*, *Litsea salicifolia*, *Zizyphus mauritiana* and *Costus speciosus*. The undershrubs present in the forest includes *Cassia occidentalis*, *Cassia tora*, *Sida rhombifolia*, *Solanum myriacanthum*, *Solanum torvum*, *Triumfetta rhomboidea*, *Urena lobata*, *Hydrocotyle asiatica*, *Colocasia esculenta* etc. The climbers like *Mikania micrantha*, *Smilax perfoliata*, *Paederia foetida* etc are climber, which climb on small trees shrubs and herbs.

The ground vegetation becomes rich during the rainy season. The ground flora is regulated by the change of season. The ground vegetation is mainly composed of herbaceous members of the families viz. Asteraceae, Euphorbiaceae, Papilionaceae, Rubiaceae, Solanaceae, Poaceae, Cyperaceae etc along with terrestrial ferns and fern allies. Fern like *Diplazium esculentum* etc dominates some forest patches. The weeds viz. *Ageratum conyzoides*, *Alternanthera sessilis*, *Croton bonplandianum*, *Chromolaena odorata*, *Euphorbia hirta*, *Frimbristylis dichotoma*, *Gnaphalium luteoalbum*, *Polygonum barbatum*, *Rotala rotundifolia*, *Xanthium indicum* etc represent ground vegetation.

A special mention may also be made of the orchids and grasses in the study site where 5 species of orchids, all epiphytic have been recorded. Again 61 species of grasses belonging to 42 genera have also been recorded. Several exotic species have almost become naturalized in the area. Important among these are *Mikania micrantha*, *Chromolaena odorata*, *Ageratum conyzoides*, *Eichhornia crassipes* etc. Out of these species *Mikania micrantha* and *Ageratum conyzoides* are present in great abundance and are very troublesome weed of the study site. *Chromolaena odorata* become dominant in degraded forests areas. *Eichhornia crassipes* have become dominant in swampy areas and other wetlands. Two parasites *Macrosolen cochinchonsis* and *Cuscuta reflexa* have also been recorded.

Five species of Lianas has also been recorded namely *Butea parviflora*, *Dalbergia rimosa*, *Bauhinia scandens*, *Combretum alatum*, and *Quisqualis indica*. The flora of alluvial savannah woodlands is dominated by trees species like *Bombax ceiba*, *Albizia procera*, *Trewia nudiflora*, *Lagerstroemia reginae*, *Dillenia pentagyna* etc and are associated with patches of *Phragmites karka*, *Saccharum procerum*, *Erianthus rivanna* etc. The floras of riparian fringing forests are dominated by *Bischofia javanica*, *Terminalia myriocarpa*, *Lagerstroemia reginae* etc. On the other hand Barringtonia Swamp forest are dominated by *Barringtonia acutangula*, *Syzygium cumini*, *Ficus glomerata*, *Trewia nudiflora* etc.

THE GRASSLAND

In the extensive grassland of the study site the dominant species is *Imperata cylindrica*. Some of the common grass species found in the grassland includes *Erianthus ravanna*, *Themeda villosa*, *Saccharum spontaneum*, *Saccharum procerum*, *Cynodon dactylon*, *Vetiveria zizanioides*, *Phragmites karka*, *Tamarix dioica* etc. The flora of the grassland abounds in non-grass herbaceous plants. The chief associates of the grasses are *Euphorbia hirta*, *Mimosa pudica*, *Ageratum conyzoides*, *Cassia tora* etc. The common shrubs found in the grassland are *Ziphiphus mauritiana*, *Bridelia stipularis*, *Mallotus philippensis*, *Barringtonia acutangula*, *Cassia sophera* etc.

WETLANDS AND SWAMPY AREAS

A number of waterbodies have intersected the forest of the sanctuary and created many submerged saturated areas throughout the sanctuary. Some of the common aquatic plants found in the wetlands of the area are *Eichhornia crassipes*, *Nelumbo nucifera*, *Ipomea aquatica*, *Hemarthria compressa*, *Cynodon dactylon*, *Lemna perpusilla*, *Vetiveria zizanioides*, *Pistia stratiotes*, *Nymphaea nouchali*, *Hymenachne pseudointerrupta*, *Alpinia nigra*, *Trapa natans*, etc.

The plants growing in marshy or wetlands areas and dominated by *Cyperus brevifolius*, *C. digitatus*, *C. imbricatus*, *C. distans*, *C. iria*, *C. rotundus*, *C. kyllingia*, *Aeschynomene indica*, *Alpinia nigra*, *Alternanthera sessilis*, *Frimbristylis dichotoma*, *Phragmites karka*, *Polygonum hydropiper*, *Polygonum barbatum*, *Polygonum viscosum*, *Carex spiculata*, *Saccharum spontaneum*, *Cynodon dactylon*, *Arundo donax*, *Xanthium indicum*, etc. Moreover some common shrubs *Antidesma acidum* and trees like *Barringtonia acutangula*; *Lagerstroemia reginae*, etc. are common in marshy or wetlands areas.

WILDLIFE OF THE SANCTUARY:

Laokhowa Wildlife sanctuary is primarily a flood plain grassland area on the bank of the river Brahmaputra representing the ideal alluvial Brahmaputra valley Grassland Eco-system. It is also very rich in Biodiversity. Laokhowa Wildlife Sanctuary is a combination of grasslands in serial stage and varying stages of other natural succession process of different representatives of plant species. The area harboured by Rhinos was only till 1983 after which the population of this endangered species came down to nil.

The Eco-system of the protected area is a unique combination of grasslands, wetlands and different riparian forest types. It supports both migrant and resident waterfowls along with other terrestrial ones, avi-fauna of the Sanctuary includes Bengal Florican (*Houbaropsis bengalensis*), White Eyed Pochard (*Aythya baeri*), Pelecanus Anocrotalus, Greater Adjutant Stork (*Leptoptiles dubius*), Black Stork (*Ciconia nigra*) etc.

The important mammals of which it supports are tiger (*Panthera Tigris*), Elephant (*Elephas maximus*), Buffalo (*Bubalus bubalis*), Gangatic Dolphin (*Platanista gangetica*), Hog Deer (*Axis poranus*) etc. The place is a breeding ground of various species of fishes. However, the protected area is under massive confrontation with biotic interference in the form of encroachment, cattle grazing, illegal removal of Non-Wood Forest Produces (NWFP) and other forest produces. Still the protected area has high potential of harbouring a significant population of Rhinos and other wildlives due to its ideal highly productive habitat. The common wildlife of the sanctuary are given in Table 1, 2 and 3.

Table 1. Common Wildlife of the Sanctuary

Sl.No.	Animals	Local Name	Scientific Name
1	Civet Cat	Johamal	<i>Viverradeae species</i>
2	Hog Deer	Chagli Pahu	<i>Axis porcinus</i>
3	Indian Cobra	Pheti Sap	<i>Naja naja</i>
4	Indian Elephant	Hati	<i>Elephas maximus</i>
5	Jackal	Hial	<i>Canis ayreus</i>
6	Leopard	Naharphutuki Bagh	<i>Panthera pardus</i>
7	Lizard	Teipia	<i>Calotes versicolour</i>
8	Mongoose	Neul	<i>Herpestes species</i>
9	Python	Ajagar	<i>Python molurus</i>
10	Spipping frog	Jal Beng	<i>Euphyctis cyanophyctis</i>
11	Wild Buffalo	Bonoria Moh	<i>Bubalus bubalis</i>

Table 2. Common Birds of the Sanctuary.

Sl. No	English Name	Local Name	Scientific Name
1	Asian Openbill Stork	Xamuk Bhangra	<i>Anastomus oscitans</i>
2	Black Necked Stork	Telia Xareng	<i>Xenorhynchus asiaticus</i>
3	Greater Adjutant Stork	Bortokla	<i>Leptopilos dubious</i>
4	Grey Heron		<i>Ardea cinerea</i>
5	House Crow	Kauri	<i>Corvus splendens</i>
6	House Sparrow	Ghanchirika	<i>Passer domesticus</i>
7	Indian Myna	Ghar Xalika	<i>Acridotheres tristis</i>
8	Jungle Owlet	Fesa	<i>Vanellus vanellus</i>
9	Koel	Kuli	<i>Alcedo hercules</i>
10	Lesser Adjutant Stork	Hargila	<i>Leptopilos javanicus</i>
11	Little Cormorant	Pani Kauri	<i>Phalacrocorax niger</i>
12	Pond Heron	Kanamuchori	<i>Ardeola grayii</i>
13	Red-vented Bulbul	Bulbuli	<i>Pycnonotus cafer</i>
14	Rose Ringed Parakeet	Tiya	<i>Ceryle lugubris</i>
15	White Backed Vulture	Xagun	<i>Gyps bengalensis</i>
16	White Breasted Waterhen	Dauk	<i>Amaurornis phoenicurus</i>

Table 3. Common Fishes of the Sanctuary.

Sl.No.	Local Name	Scientific Name
1	Bhangon	<i>Labeo bata</i>
2	Borali	<i>Wallago attu</i>
3	Chital	<i>Notopterus chitala</i>
4	Goroi	<i>Channa punctatus</i>
5	Kandhuli	<i>Notopterus notopterus</i>
6	Kaoi	<i>Anabas testudineus</i>
7	Kholihona	<i>Colisa fasciatus</i>
8	Kuchia	<i>Monopterusuchia</i>
9	Kuhi	<i>Labeo gonius</i>
10	Magur	<i>Charius batrachus</i>
11	Mowa	<i>Amblypharyngodon mola</i>
12	Puthi	<i>Puntius sophore</i>
13	Rou	<i>Labeo rohita</i>
14	Singi	<i>Heteropneustes fossilis</i>
15	Sol	<i>Channa striatus</i>
16	Tengra	<i>Mytus vittatus</i>

RESULTS AND DISCUSSION

The present study has given a clear picture on the vegetation and plant resources of the Laokhowa Wildlife Sanctuary. The habitat of the area, a complex of deciduous forests, grasslands and wetlands with their rich biodiversity are swampy vegetation in association with deciduous trees are ideal habitat for wildlife particularly Rhinos.

The floristic composition of the Sanctuary was found to be quite rich. It has been observed that the vegetation of Laokhowa Wildlife Sanctuary has district affinity with Indo-Malayan floristic elements by representing species like *Albizia procera*, *Barringtonia acutangula*, *Bombax ceiba*, *Cassia fistula*, etc.

The vegetation of Laokhowa Wildlife Sanctuary show similarity with Kaziranga National Park, Pabitora Wildlife Sanctuary, Orang Wildlife Sanctuary, Burachapori Wildlife Sanctuary as it lies on the migration route of one-horned rhinos and also protect similar national habitat.

The vegetation of the Laokhowa Wildlife Sanctuary is mainly regulated by natural and biotic factors along with abiotic factors. The sanctuary lies in the Brahmaputra flood plain, and is greatly affected by annual flood. These phenomenons play a major important role in the ecology of Wildlife habitat of the sanctuary. The sanctuary is surrounded by many villages, so grazing, browsing and forcible fishing, felling of trees are the most important biotic factors that greatly influence the vegetation and wildlife sanctuary. The unfriendly villagers of the surrounding village who are poor and illiterate are destroying the habitat of the wildlife.

The forest and Taungya villagers inside the sanctuary have problematic day by day in the smooth management of the sanctuary. To conserve and minimize pressure on the natural habitat of the sanctuary, there is an urgent need to introduce eco-tourism, various wildlife conservation activities and joint forest management in particular.

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