

# Eco restoration of Urban Wetlands-A case study Of Silsako Beel, Assam

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**Abstract** —Wetland is highly related to tourism and the two supplement each other. Assam, is a place endowed with the beauty of such wetlands namely Deepor Beel, Silsako, Son Beel and many more. At one hand, wetland possesses conditions and sites for tourists to have various activities such as boating, fishing and watching wild animals; on the other hand, income gained from tourism can provide financial support to wetland protection and realize a sustainable development of this rich biodiversity. At the same time, people's expectation and environmental problems resulted from tourism will make government to attach importance to the protection and management of wetland. Carrying out wetland ecotourism will not only promote sustainable development of the regional economy and protect ecological environment of the wetland but also promote and increase concern about ecological civilization construction through practical environmental education and knowledge to tourists. The conservation of lakes is with the vision intended to bring people close to nature and to make them understand and respect nature once again and to preserve the diverse habitat of birds, aquatic and terrestrial animals. The infrastructures designed in the study have been done using softwares –Autocad and Google Sketchup.

**Index Terms** — Biodiversity, Conservation, Ecotourism, Flora, Fauna, Ramsar Convention, Wetland Preservation.

## 1 INTRODUCTION

WETLANDS are the part where water is the primary factors controlling the environment and the associated plant and animal life of it. Under the Ramsar Convention's broad definition, wetlands are "areas of marsh, fen, peat land 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 metres". Wetlands are among the world's most productive environments. They are cradles and the backbone of biological diversity, providing the water and productivity upon which countless species of plants and animals depend for survival.

As a large wetland ecosystem and water body that is seasonally flooded with storm water runoff from the surrounding hilly terrain, Silsako Beel provides a natural setting with an emergent urban edge. The potentiality of the wetland to become an active recreation facility such as an eco-tourism park while leveraging the natural setting to address the storm water management for the city can also bring necessary benefits for the wetland itself. As a bridge between a natural setting and urban growth, this article focuses on limiting further encroachment by fencing and defining the open areas and taking them under an open space management plan that improves and enhances the environmental setting of Silsako beel. Refinement of the lake and its surroundings to act as an appealing spot attracting people for enjoying nature on one hand and to generate economy on the other, generating the steps for a sustainable future. The design is driven by the need to keep the balance of the aquatic ecosystem and the recreational need of the growing urban habitat. Silsako lies within the urban fabric and the landscape sited to be done in its vicinity will contrast the urban concretescape and grab the attention of whoever visiting the spot. The protection and conservation of the Silsako lake and its aquatic ecosystem is the prime focus, along with the provisions for development of recreational fa-

cilities leading to the generation of economy and employment opportunities for the locals. The conservation and restoration of lakes is with the view intended to bring people close to nature and to make them understand and respect nature and to preserve the diverse habitat of the aquatic life. As a large wetland ecosystem and water body which is seasonally flooded with stormwater run off from the surrounding hilly terrain. The silsako beel provides a natural setting within an emergent urban edge. It has the potential of to become an active recreation facility. The main aim is to refine the site by developing an urban eco tourism park which also attract tourist and local visitors to enjoy nature and at the same time create awareness among the people to save nature.

## 2 LOCATION

The basin is located in the easternmost region of the guwahati metropolitan district. The area occupied by the basin is approximately 2.8 sq.km.

The wetland is bordered by amchang wildlife sanctuary in the east, VIP road in the west, narengi north and chachal in west.

## 3.ABOUT THE BEEL

### 3.1 Significance

- Silsako is a natural wetland, which is one of the most important natural drainage to carry rainwater of guwahati city.
- Present investigation documented 96 species of macrophytes and 38 species of fishes from the wetland.
- Ecologically it is of great significance for an area as they support different food chains and foodweb, recharge

ground water and trap solar energy and provide shelter to large number of flora and fauna having great ecological and economical value.

### 3.2 Evolution of the Beel

Although silsako wetland is rich in plants and indigenous fish diversity certain factors have threatened the existence of wetland itself in recent years approximately 10.66 hectares of land of silsako wetland have been illegally occupied by encroachers.

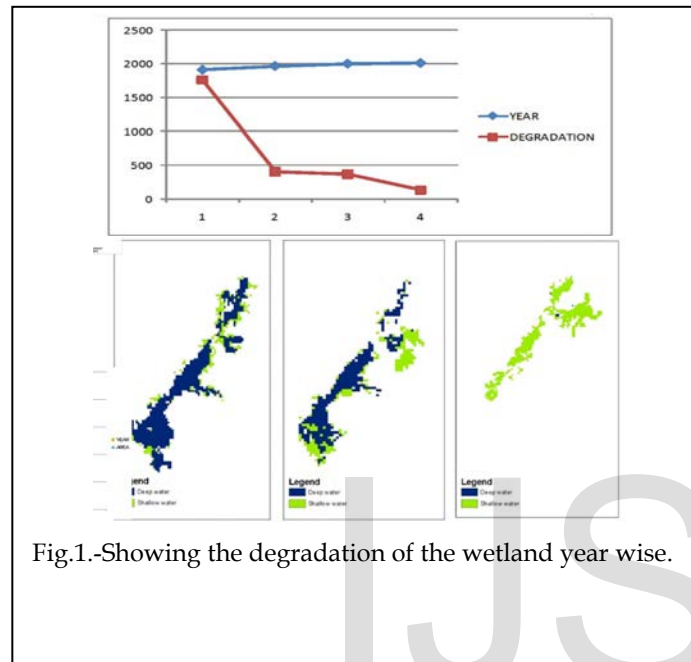


Fig.1.-Showing the degradation of the wetland year wise.

### 3.3 Constraints about the wetland

- 1) Urban encroachment- Encroachers on silsako wetland have started earth filling thereby blocking the drainage channel. The surrounding buildings encroaching the wetland was more than 5 storey RCC structures. As a result, more of wetland areas have been converted to built-up areas constraints.
- 2) Spread of invasive plants and spread of invasive species particularly water hyacinth
- 3) Garbage disposal/pollution The surrounding area consists more of residential plots, so dumping of Household as well as industrial Waste both solid and liquid takes Place thereby polluting the area.
- 4) Siltation

### 3.4 Present activities around the wetland

- 1) Fishing
- 2) Dredging of land by Guwahati Metropolitan development authority to increase the retention capacity of the Beel. After years of encroachment, the District administration has started eviction drive at the silsako beel the water retention capacity has also been reduced by heavy sedimentation and encroachment.

### 3.5 Inferences from the present activities

- 1) In order to conserve the Wetland, strict vigilance for the enforcement of laws for Wetland conservation should be done.
- 2) Due to swampy land, the need to revive the water body must be taken into consideration.
- 3) Release of contaminated water to the beel water should be avoided to preserve the beel.
- 4) Demarcation of beel area is required
- 5) Even though the master plan is proposing district development Centre, the government should integrate their scheme with existing water body.

## 4. SITE ANALYSIS

Selection of site and its analysis

Site area-85994 sq.m = 925631.7 sq.ft =21.2 acres

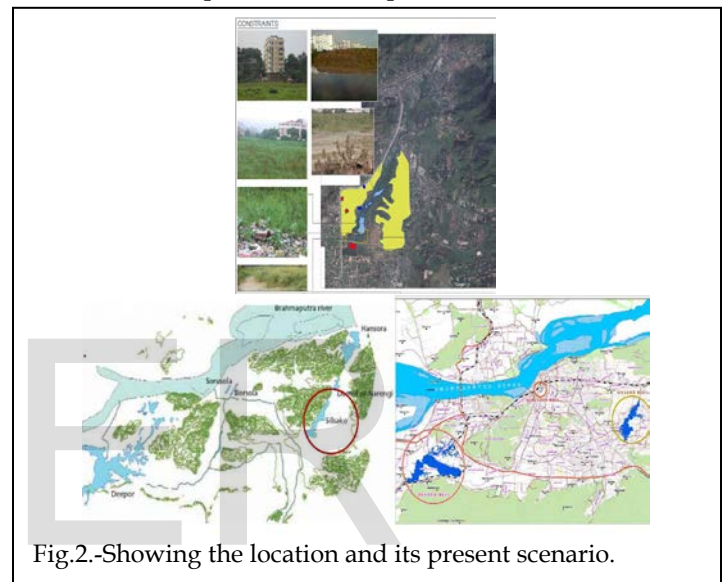


Fig.2.-Showing the location and its present scenario.

### 4.1. Existing natural features

Vegetation

1. Native wetland plants observed pondweed, water lily, water hyacinth, colocasia
2. Few trees were observed at the periphery of the road as well as within the site
3. Spread of coix lacrymajobi plants and also cleome synopsa.

### 4.2. Soil conditions

The soil condition of the site is swampy.

### 4.3. Topography

On north of the site exist the Japorigog hills and on south, the Khanapara hills. (Assam)

### 4.4. Groundwater Zone

The entire area around the site belongs to high ground water potential zone.

## 5. AIMS AND OBJECTIVES

### 5.1 Research Question

Every water bodies represent different settings and have varying use, potentials and ecological importance. But majority of it are facing threats due to urban encroachment, illegal use of it for which the need to reclaim it comes into play. One of such degrading beel is the silsako beel.

What should be done for preserving the significance of Silsako beel from urban influence?

### 5.2 Aim

To restore the Silsako Beel through development of urban eco-tourism park.

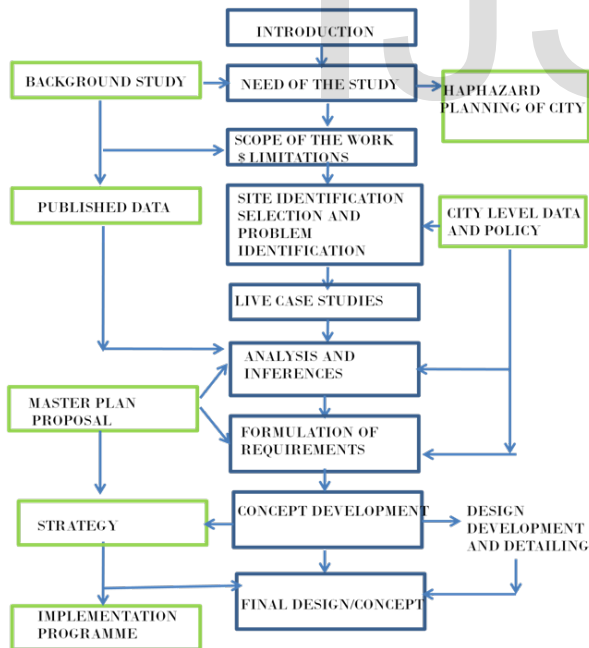
### 5.3 Objectives

- Addressing the value and significance of a natural habitat
- Exploring the potentiality of the beel (Silsako beel).
- Promoting ecological balance and expressing natural values
- Redefine relationship between park and city by connecting the natural ecological aspects of the site with urban context
- To result in a design for the harmonious relationship of man and nature.

### 5.4 Scope

The suitability of establishing a park, that would conserve and protect the natural resource threatened by development, encroachment and population, and also protect and enhance the natural resource, i.e. the beel. (Wetland)

### 5.5 Methodology



### 5.5 Limitations and delimitations

- A module of the entire beel is selected for the site which will be detailed out along with necessary social infrastructure within the site.
- Height restriction of structures due to eco-sensitive zone.
  - Design more of environment friendly structures
  - Design in two levels-policy level and a detailed module.

The byelaw concerning the wetland itself proves to be another limitation for the project.

## 6. CASE STUDIES

### 6.1 Lotus Lake National Wetland Park

The Lotus lake national wetland park in Tieling, China is an example of the important role landscape architecture plays in creating a compendious development plan that protects and enhances natural systems. Designed by the Beijing Teinghua planning and design institute, the public park provides a unique focus and identity for a new development while restoring a badly degraded habitat and water system.

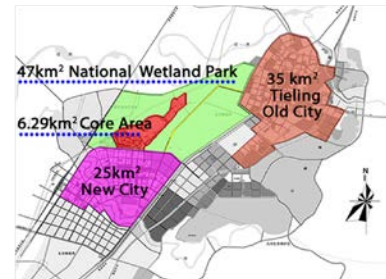


Fig.3.-Location map of Lotus Lake National Wetland Park, China

### 6.2 Ras Al Khor Wetland Park

WWT Consulting undertook the masterplanning for a wetland visitor park located in the 6.2 sqkm Ras Al Khor Wetland Sanctuary (RAKWS) on Dubai Creek. RAKWS is an internationally important site for waterbirds and has recently been designated a Ramsar site.

This work included site surveys and assessments, the identification of target habitats and species and production of concept habitat designs for the sanctuary. The project also included the detailed design of a wetland treatment system to treat waste water from a neighbouring development, interpretation masterplanning, business and operation plans and concept design of the visitor centre.

## 6. CONCLUSIONS

As there a number of large size wetlands in Assam, the restoration and development measures to be taken in Silsako beel may be replicated to selective other wetlands. If the proposed plan could be executed, benefit will definitely go the students and researchers, poorer section of the locality, general public of Guwahati who look for a easily accessible site for recreational activities and educating their children. The work will definitely slow down the degeneration of the wetland. This may also help in generating resources, employment opportunities and awareness about the wetland preservation among the people not only around the Silsako beel but also the wetlands of the region. The perception of conserving lake and its surrounding area is guided by the need to preserve natural setting and confer cognizance amongst people about the impor-

tance of nature in their lives and their duties towards it. The primary focus of the conservation of this lake will be towards checking of further degradation, destruction and pollution of the water and the shoreline. The conservation of lakes is with the vision intended to bring people close to nature and to make them understand and respect nature once again and to preserve the diverse habitat of birds, aquatic and terrestrial animals. This will also lead to creation of a green sink to absorb the CO<sub>2</sub> emitted unscrupulously by the urban Area.

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