



## Deepor Beel Wetland: Dependency Of Indigenous Communities And Its Changing Ecosystem

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### Abstract:

The city of Guwahati is expanding at a high pace where the boundaries are becoming sparse. Deepor Beel, only Ramsar site is located in the south-west of Guwahati, Assam. It works as a water storage basin for the city besides having ecological importance. With the growing urbanisation peri-urban areas were formed in the fringe areas of the beel which led to enormous changes in the livelihood patterns of the communities. A framework has been developed to understand the current challenges as well as opportunities for the development of the local communities. The present situation is in the need of meaningful state intervention for sustainable planning of the communities as well as developmental activities.

**Keywords:** Beel, Peri-urban, Indigenous Communities, livelihood

### Introduction:

The economic and social wellbeing of the indigenous communities are inter-winged with the wetlands. The term “wetland” acts as an umbrella to bring together a wide range of habitats known by hundreds of regional names in different parts of the world (Gopal, 2003). The loss of wetland have severe repercussions on the sustenance of the communities who are directly or indirectly dependent on them. The loss of wetlands worldwide has been estimated at 50 per cent of those that existed in 1900. One of the most non significant feature of the biodiversity loss is that it has drastically lossed without much consideration of the socio-economic benefits of the communities. (Barbie et.al 1997; Verma 2001) The benefits derived by wetland is multifaced, McCarney identified a few of them: chemical cycling, biomass production, groundwater discharge and recharge, nutrient transformation, maintenance of biodiversity etc. (McCarney et al. 2004) These functions not only benefits the people living within or nearby but have effects on the people residing downstream and maintains the whole ecosystem. The loss of the wetland are directly associated to ecosystem loss which in turn places communities in vulnerable position from the point of view of economic position as well as their introduction to natural hazard. Over the last few decades water related natural disasters have increased which has impacted the livelihood and environment such as drought, flood storm surge. Waterland acts as a natural reservoir towards the management of the natural hazards by balancing the ecosystem in many factors. (R. Kumar et al. 2017)

**Definition:** The formal definitions of wetlands used for both scientific and management purposes have been given by the United States, Canada and Ramsar Convention (Mitsch and Gosselink, 2015). The definition of wetland given by Ramsar Convention is broadly and internationally accepted. Under the text of the Convention (Article 1.1), wetlands are described as: “*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*” (Ramsar Convention Secretariat, 2016).

Additionally, for the purpose of protecting relevant sites, the Article 2.1 presents those wetlands to be included in the Ramsar list of internationally important wetlands: “*may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands*”

The well-being and poverty mitigation of human are intervened with the wetlands ecosystems . People living near the wetlands are particularly dependent on these services and are directly affected by their degradation. Availability of fish and water are the most important services provided by the wetlands (Millennium Ecosystem Assessment, 2005) which makes the communities weave their economic dependence on that. In spite of these valuable services provided towards the well being of human society, the freshwater ecosystems including wetlands are often degraded, damaged and even destroyed by various anthropogenic activities.

Wetlands are almost referred to be the “kidneys of the landscape” which plays a vital role in water quality and quantity management. Water supply in many metropolitan cities are wetlands only. They are the most productive ecosystem in the world as compared to coral reef and rain forest. Mitsch and Gosselink 2000 and Greb and Di Michele 2006 stated that wetlands provide a number of goods and services that are now widely recognised. Wetlands are also important global homes, sinks and carriers of various elements in the earth’s numerous biogeochemical cycles. Specifically wetlands, as transitional zones between land and water, provide a natural protection against extreme floods and storm surges. It is estimated that every kilometer of wetlands can reduce or lower storm surge by 5-7 centimeters (Stokstad 2005). Despite these facilities wetlands are the first target of the anthropogenic exploitation and most prone towards natural hazards. McCartney, Swallow and McGonagle (2004) and Woodward and Wui (2001) identify the various functions performed by wetlands, though not exhaustive, to include: reservoirs of biodiversity; climate change mitigation; cultural value; flood

control; groundwater replenishment; wetland products; including fish and shellfish, blueberries, cranberries, timber, and wild rice, as well as medicines that are derived from wetland soils and plants; recreation/tourism; storm protection and water purification. Wetland supply water to the region; stabilize local climate, particularly rainfall and temperature; purify, recharge and discharge ground water; retention of nutrients, sediments, pollution and act as natural infrastructure by mitigating flood and drought, thus making the cities and human settlement safe and resilient. (ibid) According to Turner et al. (2000), interactions among wetland characteristics, structure and processes result in the performance of functions, are not of economic in nature but provide a flow of goods and services which are valued by society.

**Wetlands in India:** Asia is considered to be the habitat center for a variety of plants and animals. Apart from the wetlands 830,000 kilometer square consist of swamps and peat bogs accommodating more than 300 number of species. Half of the Asia's wetland are either loss or under pressure and most of them are unrecognized. (Map of wetlands of International Importance in Asia ) Wetlands in India are spread over a wide range of diverse climatic conditions, extending from cold and humid conditions in Jammu and Kashmir to hot and humid in Peninsular India (National Wetland Atlas, 2011). India has 26 sites designated as Wetlands of International Importance, with a surface area of 689,131 hectares (National Wetland Atlas, 2011; The Annotated Ramsar List: India, 2012). India has around 757.06 thousand wetlands together with a total wetland area of 15.3 m ha, (approximately 4.7% of the overall geographical area of the country) (National Wetland Atlas, 2011)

The state Assam is dominated by natural wetlands and a total of 5097 wetlands are mapped. A total of 6081 small wetlands have been identified where the total estimated area of wetland is 764372 ha that is approximately 9.74% of the geographic area (National Wetland Atlas, 2011).

“Deepor Beel” One of the Ramsar site is situated in Assam (2002) among the three Ramsar sites of north-east India it is the second declared Ramsar site after Loktak Lake in Manipur declared in 1990 and the third one is Rudrasagar Lake in Tripura declared in 2005. It is the largest and the only Ramsar site in the Brahmaputra Valley which was included under Ramsar List ( ASTEC 2002). Deepor Beel is an aground channel of the Brahmaputra River which acts as a typical wetland comprising of the unique feature of core and a fringe area inhabited by indigeneous communities from more than a decade. The Deepor Beel is home of several endangered species such as Asiatic elephants, leopards, fishing cats, tiger, many migratory birds etc. Among the avifauna population in Deepor Beel, 102 species were found in the Beel, of which 55 are residential, 27 are locally migratory and 20 are migratory birds. The Beel have an effective self-purification capacity. Due to many anthropogenic factors in and around the Beel, its ecology and environment is being affected, impacting its biological diversity, ecosystem services and environmental quality (Gohain, A. K. 1991).

In case of the Deepor Beel, these values are direct or indirect use of such goods and services availed by the communities. Deepor Beel fresh water eco-system performs various functions. These functions provide a varied set of resources and services to local communities, the benefits of which are derived not only by resource users but by non-users as well.

**Study Area:** Beel in Assamese means a wetland or waterbody of varying size connected to any of the two major rivers of assam Brahmaputra and Barak or to their tributaries with diversified flora and fauna. Deepor Beel is the largest freshwater beel in the Brahmaputra Valley of Lower Assam having great biological and environmental importance endowed with huge fauna and flora. (ASTEC 2018) Deepor Beel Wildlife Sanctuary is located between 90°36'39" and 91°41'25" E longitude and 26°05'26"N and 26°09'26"N latitude to the South of Brahmaputra river in Kamrup Metropolitan District about 18 Km South West of Guwahati City, Assam. (Mikirpara EDC 2016) Deepor beel has an area of 40.14 sq kilometer as recorded in the rainy season with an encroached area of around 30.8 sq kilometer. The present area of the wetland is around 9.27 sq kilometer. But eventually actual area has been found to be 4.1 sq km. Depth of the beel ranges about 6m to 1.5m, based on the season. A large number of paermanent and migratory birds are found around the beel which made it to be a significant Bird Sanctuary and has been designated as an Important Bird Area by Birdlife International 2002.(Pandit. S 2016)

India entered the Ramsar convention on 1st February 1982 and a total of 26 sites are designated as Ramsar sites (TERI 2013) Deepor Beel was recognized as Ramsar site by the Ramsar Convention in 2002; and was notified as wildlife Sanctuary on 21 February 2009. Government of Assam, Forest Department has declared Deepor Beel as the Wildlife Sanctuary on 12 January 1989 under section 18 of the Wildlife Protection act 1989. This wetland is surrounded by Bharalu basin on the East, Kalmani river on the west, jalukbari hills on gthe north and the Rani Garbhanga Reserve forest on the southern boundary. (ref5) Deepor beel has been serving as a storm water receptable of the surrounding areas since time immemorial. It use to receive storm water from north, south and east during rainy season. The beel is a unique wetland habitat for wild flora and fauna.the entire beel is utilized as traditional fishing ground by the communities of the village. The northern part of the beel has the thickly populated village called tetelia which can also be referred as a peri urban area which extends upto NH-37 on the easter side of the Beel.(ibid) The geographical fragility of the Beel also acts as a reason towards the degradation of the ecosystem of the beel. There are 22 tribal villages located in the southern fringe of the hills such as Kalitapara, Mikirpara, Pamohi, Deosotol village. (ref 5 rept)

**Data Collection and Analysis:** The broad methodological orientation of the study is that of qualitative research. The study is based on both primary as well as secondary resources. Primary data has been directly collected through field based empirical method from the villages located near the beel and the stakeholders to understand the transforming dynamics of the community and environment interface in relation to the beel. The data collection methods that were used in the study included focus group discussion, structured/semi structured interview using interview schedule, in-depth discussion direct

observation, oral narratives of the communities. Considering the sensitive issue of the involvement of communities means of livelihood along with the growing urban sprawl which indirectly benefitted the communities the present study has to be flexible. Because of these mixed methods of data collection were used so obtain deeper insight of the problem under study. The data collection techniques that was used was purposive and snowball sampling for the selection of the respondent. Besides, secondary data sources including books, journals, official records, policy documents, newspaper articles, etc are being referred as a part of literature. It is to be pointed out that the pilot was conducted in the nearby areas prior to the selection of the villages to get well acquainted with the field sites to understand the methodological relevance. The significance of this study lies in the fact that there is scarcity of sociological research studies in the context of a wetland affecting the livelihood of the communities specifically in the light of growing urban sprawl. There is a very little work done on the unplanned expansion of Guwahati city creating an indirect pressure on the wetland situated just nearby. Though there are some scientific research studies were seen to be conducted in the area yet they focused on the ecological impact of urban growth on the beel. Through this study the communities dependent on the beel were attempted to be studied. The city of Guwahati is expanding at a rapid pace accumulating the rural areas nearby the beel within its peri urban interface, where there is a linkage between the rural and urban. (Narain and Nichal 2007, Sarma. I and Das.S 2022) These peri urban areas contests with the transforming features provided to them as a means of development. The livelihood patterns and socio economic dependability were at stake in the context of both ecological accessibility and developmental upliftment.

**Human Interference and Degradation of the beel:** The location of the beel places it in a challenging position where it is intervened to the extent of degradation due to various anthropogenic factors such as-

- i) The construction of the southern railway track by the Indian Railways on 2001 which have divided the wetland into two parts. Thus disturbing the whole ecosystem of the beel.
- ii) Settlement of various government and private agencies such as universities, factories and construction of residential areas as well as illegal settlements in the fringe areas have acted as a challenge for existence of the beel.
- iii) Waste disposal acts as a major threat to the inhabitant species as well as towards the beel. Filth and waste of the growing city is disposed in the beel from Bharalu and Bahini river. Further the surrounding areas of the beel have turned to be a growing hub of factories and industries which again dispose off their garbage and waste. All this have contributed to a large scale pollution of water along with the spread of water borne diseases both for the aquatic life as well as for the land life.

According to the assessment conducted by TERI of the Guwahati city the current observation witnesses the vulnerability of the beel as it is found that rapid unplanned urbanization and change in land-use pattern has put immense pressure on the natural landform and on the entire ecosystem of the city. The encroachment in Guwahati city has set the stage for conflict on housing for those who does not have legal land tenure and the surrounding of the wetland could be seen in the same threatening position. While encroachment of the bourgeois class was legitimized, the poor became the victims of eviction, which has led to the cycle of violence and counter violence all around the ecologically fragile areas where boundaries are sparse. (Mahadevia.A.M 2017)

**Indigenous Communities and the inter-relation with the beel:** The settlement of the communities around the beel is unrecorded. As narrated by some households they were settled in the area from the time of their forefathers who migrated to the place in search of livelihood. The major earthquake of 1950 have also forced a group of population to migrate to this area as settlement near wetland is feasible. The anthropogenic intervention transformed parts of wetland to cultivable lands. Deepor Beel provides benefits both directly and indirectly for fourteen villages around the wetland. Almost 500 families of scheduled caste people are directly dependent on fishing and collection of medicinal plants. The population settled near the beel comprise of two groups of communities- one directly dependent on fishing as their occupation and the other is the peasant class. However the event of 1950 pushed them to the areas adjacent to the beel which made access the water body as being peasant class and getting affected by the mutability of the transforming ecological condition of the beel due to the urban sprawl.

The two major communities who claim to have inhabited in the area are the Karbis and Koibortra. In the Karbi community, are peasants class who cultivate rice in the fringe areas of the wetland and were self-sustainable earlier. They also cultivated vegetables which were sold in the local market and Deepor Beel was used as a mode of transportation for their agricultural products. The community has a unique culture with their own type of rice cultivation, weaving, culture and dialect. For centuries, the Koibortra fishing community has been dependent on the wetland for their livelihood. They belonged to the historical fishing community of Assam.

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**Guwahati city and its dependence on the Beel:** The city of Guwahati is prone to frequent flood, earth quake, erosion landslides which causes serious disruption of the habitat population of the city causing widespread human, environment

and material loss. Major flood events of 1986, 1988, 1996, 2000 and 2004 created a havoc situation in the city pushing the poor vulnerable groups further into severe contestable position. The city experience annual flood between May-August which poses huge loss to human life, infrastructure, crop and livestock.

The rapid urbanization in India as observed have a direct effects in the peripheral areas which are positioned in the rural urban linkage. The emerging peri urban space are turning to be the sites of conflict and dynamism as the transition and adaptability of the communities are always at a contesting position. As argued by Marshall and Dolley “..... the most important context of this urban transition is at the peri- urban interface, where there is a juxtaposition of rural and urban activities, and institutions in poverty, inequality and environmental degradation are most often closely associated.”

As a result of growing urbanisation the beel faced tremendous pressure. With the increase of population the carrying capacity of the city kept on declining pushing a huge number of population to settle in the fringe area of the city are converted to private land for the construction of houses. The agricultural lands were sold for setting up of industries. This directly affected the water quality as the waste disposal of the industries are released in water.

The traditionally dependent communities severely suffered due to the pressure created on beel. The peasant communities primary cultivation is rice who resides in the immediate nearby villages of the beel like Pamohi, Mikirpara, Kalitapara, Deosotol. “Boro Dhan” “Bou Dhan” and “Hali Saul” which are cultivated during the month of December April and in the monsoon season. The community synchronized their cultivation in accordance to the availability of water from the wetland. The water of the wetland is getting polluted which forced these communities to take up other professions. The fishing communities inhabited in the areas like Keotpara, Matiya, Barbari, Hirapara from centuries. At present there are recorded 831 fishing household who are directly dependent on the beel. With the declaration of beel as Ramsar site fishing was banned without giving them alternative livelihood. Due to contamination of water fishes are dying leaving them with very little scope of alternative livelihood.

**Conclusion:** the close proximity of the beel to the Guwahati city have created major threats to the beel. The main threat to the beel is water pollution, changing land patterns, decline in fish population, disbalance of the whole ecosystem. Though the city is contributing towards varied developmental opportunities yet there are constraints for the indigenous communities as well. The establishment of non farm industries have opened up multiple income opportunities for the younger generation of the communities. The state interventions should be properly balanced keeping in consideration the needs of the indigenous communities along with the avenue of development. In recent times indigenous knowledge are highly recognized in the studies of abroad as well as India for both the environmental and economic importance. The state should utilize this tool in the model making for the conservation of the wetland.

**Notes:**

- i) Beel means large aquatic body or wetland in Assamese.
- ii) Peri-Urban is referred to the sparse population accumulated near the beel due to scarce carry capacity of the city.
- iii) Boro dhan means paddy cultivated by traditional boro communities in the time of December.
- iv) Bou dhan means paddy cultivated by traditional boro communities from the month of April.
- v) Hali Saul traditional later mature variety of paddy in Assam.

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