

# Wetland degradation and its impact on life and livelihood of people in the Majuli River Island, Assam

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## ABSTRACT

Wetland degradation is a major problem leading to serious livelihood crisis in rural, urban and suburban areas. Millions of people depend on these wetlands for their livelihood. Though there are number of studies on the causes and consequences of wetland degradation from the perspective of ecological and environmental sciences, there are very few sociological studies related to diverse dimensions of the problem. This research work selects to study the wetland degradation in Majuli, the biggest human inhabited river island in Asia, from a sociological perspective. Majuli which is the largest river island in the middle of the largest river of India, Brahmaputra, harbours around 155 wetlands of different size and shape, is found to suffer from degradation. The paper hence, highlights how wetland is a major life supporting system for the people in Majuli, describes the degradation of wetlands and the causes of such degradation and the impact it has on the life and livelihood of people. The paper is based on both primary and secondary sources of study, primarily dependent on qualitative methods of data collection from the field as in-depth interview, observation both participatory and non-participatory, etc. To gauge the impact certain historical method of data collection is also followed to have a comparative knowledge about the status of livelihood of people in the island.

*Key words:* Wetland degradation, Livelihood, Eco-Services, Beel, Majuli, Assam.

## Introduction

The problem of environmental degradation has both global and local implications. While international environmental concerns are usually put in broad terms like climate change and desertification, the environmental problem of concern to local settings and vulnerable groups is generally localised in nature, goes around immediate issues that threaten their livelihood and survival. The sustainable management of the environment and natural resources is very much the need of the hour in the face of a rapid environmental degradation and livelihood challenge.

When managed well, renewable natural resources, watersheds, productive landscapes and

seascapes can provide the foundation for sustained inclusive growth, food security and poverty reduction. Natural resources provide livelihoods for hundreds of millions of people and generate sizeable tax revenue. But it has been observed and reported that there is a rapid degradation of degradation of nature and natural resources which is observed locally as well as globally. The major environmental degradation is found in the form of habitat loss, soil erosion, deforestation, desertification, climate shift, flooding, resource depletion, invasive species, habitat fragmentation and wetland degradation. Each kind of degradation is cause of various types of problems of the people, leading to global warming, green-house effect, health hazards and livelihood problems etc.

Out of all environmental degradations, wetland degradation is causing a serious threat to the human and other biotic and abiotic life. There is a gradual loss of wetlands all over the world reported by various organisations. According to *Global Wetland outlook* (2018), 35 percent of wetlands, where data is available, has been lost since 1970, at a rate, three times greater than that of forests. Again, Wildlife Institute of India survey shows that the wetland area of the country has been reduced from 7 lakh hectares in 1987 to 4.53 lakh hectares in 1995.

It is found that, of all states, Assam has the maximum number of water bodies in India under floodplain wetlands, mainly associated with river Brahmaputra and Barak, locally known as *beels*. Assam has 1392 of *beels* spread over an area more than 1, 00,000 ha, constituting 61 percent of total lentic water bodies of the state. Total number of *beels* associated with Brahmaputra valley are 92,000 ha and Barak valley are 8,000 ha. But there is a gradual degradation of these wetlands in the last one century.

A number of studies on the causes and impact of wetland degradation are available that are carried out from the perspective of ecological and environmental sciences, but there are very few sociological studies related to diverse dimensions of the problem of wetland degradation. Besides no study prevails related to wetland degradation and its impact on livelihood in Majuli that applies qualitative method to grasp the diverse facts related to wetland degradation. The study is hence oriented to understand the causes of wetland degradation mainly social causes, and the kind of impact it has in the river island Majuli, situated in upper Assam.

## Review of Literature

Wetland as vital source of life and livelihood and a very important ecosystem is pointed out in most of the studies related to wetland. Groot de Rudolf Steven, (1992) vividly describes the functions of wetland which make them valuable ecosystems and integral part of economy of society. These are regulation, carrier function, production functions and fourthly contribution to mental health by providing scientific, aesthetic and spiritual information.

*The Millennium Ecosystem Assessment* (2005) estimated that wetlands cover 7 percent of the earth's surface and deliver 45 percent of its natural productivity and ecosystem services. These natural re-

sources are estimated at \$20 trillion a year. But despite the benefits, wetlands have been systematically destroyed by being converted to industrial, agricultural and residential land. According to the *National Wetland Inventory* (2011) there are 27,403 wetland units in India occupying 706 million hectares. Government of India reported that there are 757.06 thousand wetlands in India with 4.7 percent of total geographic area. The country has only 26 sites as wetland of international importance, even of these, 26 sites are plagued by uncontrolled development and illegal encroachment.

Singha and Hussain (2003) entailed how the wetlands of Assam and those around Guwahati city are under threat. The Silsako and Numalijalah wetlands around Guwahati city are reported to suffer threat to their existence because of the encroachment by the people. World Resource Institute (2005) focussed that population growth and increasing economic development are directly playing a major role in degradation of wetlands. This report also projects that continuous loss and degradation of wetland will reduce the capacity of wetland to affect human wellbeing, especially the poor section, including an increase in prevalence of disease. World Resource Institute (2005) studied the bio-diversity of *Doriabeel* in Assam an important wetland in Majuli. Many rural people of Majuli are dependent on the *beel* for their livelihood. But the fish population and other flora and fauna are getting reduced in number and quantity due to anthropogenic pressure, siltation on the bed of wetlands and soil erosion.

Saikia and Phukan, (2014) surveyed six selected wetlands of Golaghat District of Assam and found that wetlands are the dumping ground of the wastages of the municipality as well as other urban centres of the district. Mitra and Bezbaruah (2014) also highlighted that the railroad that goes over the *Deeper beel* near Guwahati city, has fragmented the wetland into at least two subsystems and has segregated the wetland-forest ecosystem which affected the wetland and in return the livelihood of the people dependent on it.

Lasmal *et al.* (2015) found that the wetland resource contributed significantly to the household economy of the people. Socio-economic factors such as large family size, large area of agricultural land, increased rate of resource extension are the major factors of wetland degradation. Das (2015) stressed that the construction of road from north to south at eastern side of the Dora wetland caused degrada-

tion of the *beel* area. Use of the wetland for grazing, dumping of domestic waste, garbage, etc. are prominent at the *beel* site.

Das and Bhattacharjee (2015) discussed about the livelihood problems faced by the fishing community in Sone *beel* of Karimganj in Assam. Sone *beelis* the largest wetland in Assam. A vast majority of people of Sone *beel* belonging to Kaibarta and Patni community, are in threat for earning livelihood due to gradual ecological change. People of Sone *beel* are completely depended on nature for their livelihood. As a result, climate change became a burning problem for them. They are struggling hard for survival.

Rahman (2016) observed that the Darang wetland of Bongaigaon District of Assam is encroached by different human activities, such as construction of house, roads, agricultural land and over-fishing etc. This also reduced the number of bird visitor in the wetland. Bhatta *et al* (2016) studied the Maguri Matpung *beel* of Tinisukia and its impact on livelihood of people. While overexploitation and siltation were identified by the people as the major issues resulting in the degradation of the wetland, the weak implementation of national laws and the lack of a management plan for the area are important factors contributing to the wetland's degradation. Bhuyan (2016) studied Hnahilabeel of Nogoan District. The *beel* has distinct economic and social impacts on the life of the people living in the adjacent villages. About 1246 people of the village are entirely dependent on the Hnahila *beel*. The environmental as well as biological condition of the *beel* has been deteriorating day by day. The various species of fishes, birds, plants and trees that grow on the bank as well as the nearby areas of the *beel* have been facing serious threats, which is directly affecting the livelihood of people.

Sharma and Bora (2018) stressed that due to human intervention, Laokhowa wetland and the marshes and swamps have been degrading. The villagers in fringe areas have converted the wetland into agricultural land by uprooting the mixed jungles and clearing/filling marshes and swamps, leading to reduction in the boundary area of the wetland.

### Operational Definition

**Wetland:** Wetlands are defined 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 tides does not exceed six metres" (*Ramsar Handbook*, 2016).

### Objectives of the Study

1. To study status of wetland degradation in Majuli.
3. To study social causes behind degradation of wetland in Majuli.
4. Impact of wetland degradation in Majuli on life and livelihood of people.

### Materials and Methods

The research is highly qualitative in nature. The primary data were collected from the field by following observation method, both participant and non-participant and in-depth interview. To gauge the impact, the historical method of data collection is also followed to have a comparative knowledge about the status of livelihood of people in the island in time frame. The secondary data are collected from reports of different governmental and non-governmental organizations, books and journals, newspaper, web portal etc. to substantiate the argument.

### Majuli; A Brief Introduction

The Majuli river island in Brahmaputra river lies between 26°49' and 27°22' N latitude and 93°39' and 98°35' E longitude and is situated in state of Assam in the north eastern part of India. The total area of the island is about 875 km. having a length of 80 km. along with the river Brahmaputra and a breadth of 10–15 km in the north-south direction of the state with a population of 0.2 million.

The River Brahmaputra divides into two channels – the northern Kherkutia channel and the southern Brahmaputra channel between Dibrugarh and Lakhimpur Districts and both the channels join again about 85 km downstream at Ukhalchuk - forming Majuli, the largest inhabited river Island in the world. The width (in North-South direction) of island varies between 10 Km to 15Km.

Baruah and Baruah (2009) maintained that Majuli consists of one major island, the mainland Majuli, and around twenty fragmented thinly inhabited isles. The total catchment area of Brahmaputra river is 580,000 sq.km, and is characterized by a large discharge (average annual yield of 537 billion cubic metres), a large volume of sediment load and very highly dynamic channel morphology. (Baruah and

Baruah, 2009 and Hussain *et al.*, 1993). Lateral changes in the channels leads to massive erosion of its banks which cause loss of highly fertile land every year. As a result of all these. there is a shift of outfall of the tributaries and drainage channels and leading to newer areas to remain permanently under water (Goswami, 1985). Saikia (2014) mentioned that the large quantity of silt carried by the Brahmaputra river from seismically disturbed and geologically fragile upper catchments very often bring a change to the surface geology of the island because of the recurring floods occurring in the island.

Again, the peculiar location along with the Brahmaputra and Subansiri rivers has made the island a composition of a large number of wetlands (*beels*) and grassland (*Chaporis*) areas. The number of wetlands distributed throughout the island is 155 with 148.34 km<sup>2</sup> area under water and 136 km<sup>2</sup> areas under vegetation cover. Majuli, composes of different tribal communities like Mishings Deuries, Sonowal, Kacharis, and non-tribal communities as Kaibartas and other general communities as found in other parts of the state, who are directly and indirectly dependent on these wetlands for their day to day livelihood. The majority of the population, belonging to tribal communities are distributed around the river or wetland areas. Of the total population of the island, the Mishing community has the largest number of people followed by the Deuri community. The fisherman community i., e., Koibarta, and the Mishing tribe is distributed in the nearby areas of the wetlands and are highly dependent on the wetlands for their livelihood.

Wetlands of Majuli are home to many migratory bird species. Out of eight 'Flyway's identified in the world for migratory birds, a major flyway "The central Asia/ India flyway" covers part of India and Assam as well. The Brahmaputra river and its valley from Sodiya and Dhuburi is a major part within this flyway (<http://majulilandscape.gov.in/fauna.php>). While winter visitors use the flyway, they also come to Majuli. The whiskered tern which is only found in Jammu Kashmir apart from Assam, is sighted in Chakolibeel of Kamalabari part of Majuli..

Four types of flora are found to be common in the wetland of Majuli (Nath, 2009). These are phytoplanktons, herbs, shrubs, and trees. Water hyacinth, water lettuce, *pati - doi*, *gughul*, are some wetland-born species found in Majuli. More than 200 species

of herbs are seen to be available in Majuli- like- *kher*, *khagori*, *kohuwa*, *nol* etc.

Besides its natural and geographical particularities, Majuli is also famous for the cultural mosaic it features through centuries. It is the place where the famous *satriya* Vaishnavism, a religious sect has come up due to the reformer Srimanta Shankardev, who established the first *satra* in Assam. *satra* is the local term for religious centre, of *satriya* Vaishnavism a different variant, of vaishnavite movement in India.

### Wetland Degradation in Majuli: A Brief Description

The dying of wetland is a very commonly reported phenomenon all over the world. There is no dearth of literature that talk about degradation of wetland all over the globe, nation and in Assam. The C.P.R. Environmental Education Centre, Report (2018) shows that the wetland area of the country has been reduced from 7 lakh hectares in 1987 to 4.53 lakh hectares in 1995. Between the periods 1950-1951 to 2008-2009 total cultivated land increased from 129 to 156 Million ha. both in agricultural and non-agricultural land which come at a cost of conversion of flood areas, primary forest wetland etc.

*National Wetland Atlas: Assam* (2009) reported that during the last few decades, the wetlands are degrading faster than ever. They are polluted, experiencing heavy siltation, and unregulated fishing. The report also presented nearly half of the Deepor beel of Guwahati city has dried and converted into paddy field while half is still existing as wetland.

Majuli, due to its geographical position, is found to experience a rapid degradation. For its peculiar location within the mighty Brahmaputra river, it has 155 big and small wetlands around it, which remained the source of fishing occupation for a larger section of people.

Majuli possesses a large number of wet-lands as well as swamps. A good number of natural drainage channels are found to drain the Island. But it is reported that in comparison to their existence in past there is a large-scale degradation of these water bodies in the island.

The sand deposits by the recurring floods caused by Brahmaputra river has choked these swamps, waterbodies and channels through breaches in embankments and reducing areas of larger bodies and making the smaller ones disappear. The recurring flood caused erosion and resultant reduction of cul-

tivable land. While growth of population is also leading to scarcity of lands. Besides the emergence of market and administrative centres are also leading to high rise in price of land. This has led to the reduction in size of land possessed by families. Majuli has already lost as many as 371 sq.km of its land mass in last 50 years with a reduction in area from 1246 sq.km in 1950 to 857sq.km in 1998 (Goswami, 2008). While the density of population in 1991 was 24 percent per sq.km (ibid), it reached a mark of 362 in 2001 (higher than state average of 340). Besides, unlike the earlier times when people used to increase the extent of land by cleaning jungle, now it is done by occupying the swamps, drains and low-lying lands. People are using it to fill up the *beels*, swamps and are using it for settlements and business purpose as well.

Again, the Brahmaputra river has engulfed many of these swamps and wetlands. While in 1917, the total number of swamps and wetlands was 112, by 1972, it decreased to 52 and, the figure stands at just 21 now.

**Table 1.** Status of Water-Bodies/Swamps and Drainage Channels in Majuli Island

Year	Number of swamps/ water body	Number of streams/ drainage channels
1917	112	49
1972	52	7
2013	21	1

Source: Sharma (2014)

To get relief from backwater effects that causes drainage congestion in different parts of the island, the natural channels were plugged in a bid. The sluices as well as outlets made for draining rain fed discharge, had become functionless because of the choking due to silt deposits caused by frequent occurrence of flood. The breach of flood embankments increases the level of congestion in the island.

Now the island is having only one drainage channel, i.e., Kakorikata Channel, that drains the whole mainland Majuli. The historical Tuni channel is no more flowing these days as it has opened several mouths due to erosion of its several segments which ultimately had to be plugged by the construction of embankment across the channel.

### Wetland as life support system in Majuli

THE interdependence between nature and life of

people is very much strong in rural life. The livelihood of people is very much intertwined with nature and natural resources. These resources are largely the type of land, water, biotic and abiotic resources etc. The livelihood and occupation of rural people is different from the urban people who work in secondary sectors, industries, factories, or in tertiary sector i. e., in service industry unlike rural people who work in primary sector.

Of all kinds of environmental degradations, wetland degradation is a major problem leading to serious livelihood problems in the rural areas. Wetland degradation is not only an environmental challenge but also equally a social challenge too. The ecological and hydrological functions of wetland benefit mankind. Wetlands are the best place for fish, and wildlife. It helps man in several ways like improving the water quality, flood control, conservation of bio diversity and as economic resource by providing livelihood to the poor section of the rural population. Millions of people depend on biomass source for their daily expenses. Globally, 1.5-3 billion people depend on wetlands as a source of drinking water as well as food and livelihood security (Ecosystem and Human Well Being, 2005).

The biotic and abiotic components in Majuli live in a symbiotic relationship. The livelihood support of Majuli river island mainly by its wetland are found in following forms:

### Land as a life supporting system

More than 70 percent of rural people in Majuli are engaged in agriculture. Majuli, unlike other parts of Assam is favourable for growing certain type of crops because of its geographical situation and soil type. It has mainly two types of land according to the classification by the local people.

1. Low lying land or "*Da*": the low-lying land is comparatively low from other land of Majuli. These land generally are available in nearby wetland and canal. This land is covered by water during winter and rainy season. This type of land is suitable for crops like "*Bau*" (a special type of rice that can grow in water) and mustard oil during summer.

Higher land "*tika*": this type of land is higher and suitable for growing seedling, different kind of fern and making homestead etc. While the scientific classification of land in Majuli is given as follows:

Besides agriculture, the particular kind of land also helped in developing pottery industry in

**Table 2.** Types of land in Majuli

Landuse categories	Area in Hectares
Woodlands	3575.97
Grasslands	18835.5
Non forest/agricultural land	23674.3
Water	3575.97
Sand bar	4922.55
Total	54584.29

Source: Sahariah *et al*

Assam. Pottery is one among these which is highly related to wetland. Pottery was the most significant craft in Majuli in past time and still practiced by nearly 5000 people. Nearly 600 families of *kumar* and *kalita* community of Majuli, are dependent on this. For this purpose, they dig the soil from bottom or bank of various rivers and wetlands.

Pots were generally exchanged for paddy in the past. Therefore, the potters used to travel from village to village by carrying the pots and used to exchange pots for paddy. Only few decades back potters started to sell pots for monetary values.

#### Water as a source of livelihood

Fishing is the second main economic activity of people of Majuli after agriculture. Fishing and selling of fish are important activities since early time. Two major communities of Majuli namely "Mishing" and "Koibatra" are practicing fishing as their traditional occupation since the time of human habitation on the Island Majuli. Till a half century ago Majuli was a land of numerous river channels, ponds, wetlands and these were once full of varieties of fish. This condition has given a distinct ecological and economic structure. Their number was enormous in initial years of creation of Majuli Island, but gradually the number decreased due to various causes.

Selling of fish was once mainly practiced by the "Koibtrras" although in recent years it has spread among some other community also. In earlier time, there were two classes of fish traders namely- *Pohari* and *bepari* (small trader) and *Vishaya* or lessee (big trader). *Poharies* were women traders who brought fish on small buckets and used to sell them by visiting people's houses.

Fish market is also a major component of the livelihood which is related to water resource. Major fish markets in Majuli are held in Kamalabari, Garmur, Phulani, Jengraimukh, Rawnanpaer, and

Bongoanon daily basis. Fish traders from all over Majuli come to the markets and sell fish. In the morning, there is lot of local fish available in these markets. But in the evening the markets are generally full of *Challani* Fish (imported from outside state) in those markets and local fish is rarely available. This is because, the local fishes collected from various places of Majuli are bought by some fish traders in the morning market and they take these local fishes to the nearby markets of towns of Jorhat district. They do so, because they get more profit when they sell fish outside Majuli than selling them inside Majuli.

Selling of dry fish were also practiced by some people in Majuli in the past but now, dry fish is not that much available. Availability of fish in Majuli is not same as it was in the past.

#### Forest resource

Woods and bamboo cane are very common in the forest of Majuli. A particular variety of grass locally known as "*Kher*" (Traditionally used for making roof of Clay house), and timber like *Gomari*, *Ikora* (stick like timber for making wall for Kaccha House), bushes all around the wetland and river of Majuli. In early time and still few decades back people were highly dependent on these timber for the construction of their houses and also for selling them in the market. But now a days due to the lack of or low availability of the timber people are using concrete for making their houses.

Boat is regarded as essential property of each and every family of Majuli. During Flood, without boat it is impossible to survive in Majuli. For fishing purpose also boat is must needed means of transport. That is the reason a particular group of people called "Naosal" is running several boat-making factories and earning their livelihood through it. They charge Rs. 10,000- 12,000 per boat depending on the size of boat. It is found that the occupation of "Naosal" is practiced by very few people and almost vanished from Majuli. It is because people no longer need boats as they are not in touch with water. The people who were earlier engaged with this occupation, now engaged themselves in alternative livelihood strategies for their living.

Making of traditional fish gear is also a cottage industry of Majuli. Many people of fishing communities along with their fishing occupation are engaged in making different kinds of fish gear. In the central places of Majuli, there are some shops that

sell fish gear. Each fish gear costs Rs.100-600 on the basis of the variety and quality.

Some Self-Help Groups of Majuli are currently making door mat, table mat, lady's bag, caps, table mat, wallet and various other items by using water hyacinth (*Meteka*). Because of the item's uniqueness and made of natural product these have now become worldwide famous.

### **Domestication of animals**

Livestock is a very important source of livelihood for the people of Majuli. The cattle, goats, pigs, chicken, ducks etc., are the major livestock in Majuli. Cattles and pigs seem to be the most valuable livestock in Majuli, in terms of economic value. In 2011, around 1600 people of Majuli are reported to depend on livestock for their income.

### **Natural landscape**

Eco tourism is a form of tourism which involves visits to natural areas, natural beauties which are undisturbed and prevented by many ways. The International Ecotourism Society in 1990s says that "ecotourism converses the environment and improved the well-being of local people. Majuli is the world largest river island and accessible by boat only and also Majuli is proposed for the world heritage site of UNESCO in 2010 which directly promote tourism. Secondly attraction lies in the Majuli's rich wild life, flora and fauna. In different season, many migratory birds' species visits Majuli very year.

In recent years many local people engaged themselves in the ecotourism sector. Presently there is four ecotourism resort cum park in Majuli managed by local people which benefiting the people and environment of Majuli as well. These are: Deluce Hogar Home Stay, Puspa Bilash, Ygdasill, Deka Sang Resort and Prasanti Ecotourism Resort. All of these resorts were situated on the bank of beels or rivers. They provide traditional food, boating, hunting and fishing which is a good example of recreation activity in the wetland of Majuli.

It is to be noted that the economic activities for their livelihood is centred on nature which gives Majuli the nature of a pure agriculture- based society.

### **Sociological explanation to the wetland degradation in Majuli**

There is almost no systematic sociological explanation for the degradation of wetland in Majuli. Ac-

ording to some study (Saikia, 2014 ) the degradation of wetland is said to start from unplanned, unscientific as well as haphazard construction of dykes, roads and embankments that obstruct the natural inlets of the wetlands in Majuli. Most of the studies show river bank erosion is the main cause of degradation of wetland in Majuli..

Demographic factor is regarded as another cause leading to wetland degradation in Majuli. Available data shows that in 1901 the island covered an area of 1325.51 sq.km, in the year 1941 the island had an area of 1324 sq.km, within 1966-1972 the area of the island is reduced to 564.01 sq.km (Sharma, 2014). According to the latest census report (2011) the island had 352 sq.km. During last 50 years the island lost more than half of its area. The shrinking size of the island can't be imagined without its impact on the society, economy, and demography of the island.

Despite continuous falling in land cover of the island, the population of Majuli is always increasing. During the period 1901 to 2001 the population of Majuli went up from 31,219 to 1, 53,362. This land - population distribution of Majuli resulted in many ways along with cutting of jungles, filling up of low yielding land and settlements in wetland covered areas.

The consequences of land erosion in one side and the increasing population pressure on the other over the years have brought a change in land scape of wetlands in Majuli,

### **Habitation pattern**

The settlement structure of the people of Majuli also brings threats to the wetlands. More than 70 percent of the total population of the wetland is from tribal communities, they always reside near river stream or water bodies traditionally. Their settlement near the wetland areas promotes developmental activities of governments in the areas which directly effects the environment of the wetlands.

### **Over harvesting**

Wetland in India have high direct and indirect dependence, often leads to over harvesting of the eco services of the wetlands. The resources of economic importance are over harvested and utilised in such a way that it creates degradation of bio-diversity in the wetlands. In case of fishing also people exploited the resource. Majulishows the same picture in this aspect. The people of the island

unsustainably exploited the wetlands resources. Even they go for de-watering methods for fishing in the wetlands which is the most dangerous fishing method.

The people of the island introduce non-native species to the wetland ecosystem which destructs the balance of eco-system. Over grazing has become quite normal issue to all wetlands of Majuli which is also posing threats to the wetlands.

### Political causes

Majuli is recently declared as first island district in 2016. It was under Jorhat district before that. Since it became a separate district, developmental activities are at the top in the district. Majuli experience a dramatic change during the last 4 years. The current Chief Minister of Assam, Sarbananda Sonowal is representing Majuli as he is Member of Parliament (MLA) from Majuli which brings force in development of Majuli. The developmental work always brings negative impact to the nature. During the last 4 years, more than 5 bridges are constructed above various wetlands along with digging the river Brahmaputra and its only tributary river of Majuli Tuni river. This digging and construction of bridges is hampering the natural flows of water to the wetlands of Majuli.

For protection of wetland and development of recreational activities in wetlands needs political will. According to the local people of Majuli, political leaders of Majuli never have any urge to recreate or develop wetland services. In the maintenance of the *beels* also political party or regional politics play a major role. Till today there is no training facility available for the management of *beels* in Majuli. Hence there is a need to provide training from time to time and produce some experienced person so that the wetlands of Majuli can be managed well. Prasuti Gogoi (2017), argues that Majuli being nominated under World Heritage Site or a National Heritage Site, which refers to a UNESCO World Heritage Site is a specific site, shall be regulated by the Central Wetlands Regulatory Authority.

### Cultural factor and degradation

Majuli is famous for the Neo-vaishnavism and its various *satras*. The *satras* are the religious institutions under the control of *Satradhikar* (Religious Guru). The *satras* are most well-known and influential in Majuli and Assam as a whole. Almost all of them possess extensive amount of land property

which the *satras* once received as revenue free grant in the past from the Ahom kingdom and initially from British rulers, and the national Government too endorsed them to certain extent. These *satras* are generally located in low lying land and mostly nearby wetland. The wetland situated near the *satras* becomes the *satras* property and many were altered by them as cultural fisheries.

As population pressure pushes its inhabitants towards the wetlands, the people of various communities use the wetland bank and sometimes some part of wetlands for establishment of *Namghar*, *Mandir* (the religious centre) etc., in it, because of the free or less value of price of land which also is a cause to degrade wetlands.

Some of the wetlands in Majuli are being used for various festivals and allocated for construction of stage for cultural events (*Ranga Maancha*), and also making of high platform ground for flood relief camp. Every year Majuli Festival (major cultural event of Majuli) takes place in Doria *beel* field which is in one part of the Doria wetland. Playing of loud music within the wetland area affects the bird's species, The dumping of waste causes pollution and degradation of Doria *beel*. In other parts of Majuli also this kind of scenario are commonly visible, which is threatening the wetland environment.

### Commercial factor

Business and market in Majulican also be considered as responsible for degradation of wetlands to some extent. In many areas daily markets are held in places nearby wetlands. Because of the recent development in communication facilities people start constructing shops, hotels etc. near the wetlands. Slowly some market places are growing near the wetlands; construction of bridge is one of the major factors behind it. Rawanaper daily market near Odubi wetland, Kamalabari market near Doriabeel, Thakursuti market, etc are located right near the wetlands. Recently some eco-parks are also established in Majuli which promote commercialization of wetlands and along with it brings threats to the wetlands.

### Impact of Wetland Degradation on Life and Livelihood of People in Majuli

Wetland degradation not only affects the natural environment as a whole which has clear imprint on the topography of Majuli, but also affects the life and livelihood of the people living in its vicinity.

The island experiences frequent floods of high magnitude. The Floods of 1987, 1988, 1994, 1998, 2000, 2004 inundated vast patches of land and recently the devastating flood of 2008 had a serious damage in the island which inundated almost the entire Island. To save the island Government has constructed around 100 km or more embankments surrounding the island to give a relief from these recurring floods. But the situation became worse due to the breaches in those embankments. As a result of this, the fertile lands get eroded and unproductive patches of landmass with sand deposits add to area of the island.

Wetland degradation affects the grass land and grazing in Majuli. There is a gradual decrease in grassland which is affecting the livestock as most of the herders are giving up their occupation. Moreover, their traditional knowledge does not provide them with knowledge of grassland rehabilitation and management to maximize their production. As is reported by a herder who used to maintain a farm of buffalo near the wetland Jor *beel*, he has sold his 25 buffalo's as these became costly to maintain for him due to non-availability of grasses or other ecosystem services from the wetland. It is also reported that there were around 100 or more herders in entire Majuli who used to earn their livelihood by buffalo rearing. The respondent informed that around fifteen years back or more a common site near each wetland was farming of livestock in each village, but recently there is no such sight is found. Again, there were also additional milkmen who used to supply those milk of buffaloes, but because of the degradation they also lost the job of milkman and are engaged as wage earners which is not a proper source of earning in a place like Majuli.

A study by Bhatta *et al.* (2016) on Maguri-Motapani wetland in Assam, shows that the wetland provides 29 total ecosystem services and there is a drastic change in the availability of resources as thatch, fish stocks, fodder, fuelwood and ecotourism due to loss of bird visitors. The study revealed that 75 percent of the respondents from effected villages expressed that there is a decline in tourism as a source of income due to the degradation of the wetland they studied.

The status of pottery industry has come down and entrust very low esteem to potter and a very low margin of profit is derived from it. Though the availability of new type of utensils as made up of plastics, aluminium, castings etc is one of the causes

of lack of profit and demand of pots, the wetland degradation and river erosion is a major cause of the decline of the industry. The ban on clay collection from the bank of Brahmaputra is a major cause of decline of the occupation of potters as it is very difficult for them to collect clay to make pottery.

Again, there is a decrease in number of *naoshal*, a place where boats are made, and the boat making occupation due to the degradation of wetland and decrease in water area in the island. Earlier most of the people who used to reside near the riverside had a boat of their own for everyday use like, collection minor forest produce, fish etc. There is a particular community called *kumar* who make this boat. They sell the boat at their own places or they sometime are called by the purchaser to make boat at their own house. Almost 70 percent of people of *kumar* village used to know how to make boat along with their knowledge of making pottery. In fact, there are a number of villages inhabited by the *kumar* community. But there is a gradual decline in number of people who have the skill to make the boat as well as pot. These all have taken place due to the degradation of wetland and lack of availability of ecosystem services due to that. Besides the decrease in the availability of resources like thatch, bamboo and woods the cottage industry like bamboo products, cane products as well as wooden items.

As a result of the lack of ecosystem services by the wetland, most of the youth have started diversifying their occupation according to their capability. A section of families are providing education to their children to engage them in modern occupation, while the unskilled and semiskilled youth are moving out of Majuli, sometime in the state capital or sometime to metropolitan cities to earn as unskilled worker or semiskilled workers. Example can be given of a village of *senchow*, which is inhabited by 90 fishermen families where out of 90 household more than 30 young people work outside the island mainly in urban centre. It is informed by *gaonbura*, the village headman that out of 30 boys who work outside mostly in metropolitan centre as *Bangaluru*, *Hyderabad*, *Mumbai*, 20 are working as security guard.

## Conclusion

The people of Majuli are mostly dependent on natural resources as there is no industrialisation and most of the people work in the primary sectors like

agriculture and allied activities. More than 80 per cent of the tribal and scheduled caste people depend on wetlands for their livelihood. The continuous degradation of wetlands in Majuli poses various challenges to the local people.

Majuli as social ecological system is going through an environmental, social and cultural crisis. The riverbank erosion by Brahmaputra has been affecting Majuli in various ways. There is a displacement of people from the outer periphery of Majuli towards inner core leading to population congestion and consequent pressure on wetlands which are shrinking in size. The reduction of resources viz., land, grass, timber, even traditionally skilled manpower is causing the displacement of tradition in one side and livelihood crisis in other.

The degradation of wetlands in Majuli has increased the plight of the people of Majuli. The two fishing communities namely Kaibarta and Mishing tribe is facing major livelihood threat in Majuli. Due to its historical geographical and cultural importance Majuli needs further concern from academicians, policy makers and development experts. Mere declaring it as world heritage site is not a solution to the degradation of the island and its wetlands. The guidelines set for such institution must be followed without which the very declaration will not bring any fruitful result. Though there are efforts from different governmental and non-governmental organisation, there is a lack of systematic effort to protect this entity in its entirety.

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