

# Flood, Environmental Degradation and Riverline Habitation: The Case of the Lakhimpur District of Assam

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**Abstract:** *The District of Lakhimpur is one of the prominent high flood-prone districts of Assam. The aims of this study are to find out how the floods are leading to environmental degradation and thereby its effects. The study revealed that soil erosion, deforestation, degradation of soil quality, loss of thousands of plants, domesticated as well as wild lives even human being, water pollution etc. are caused by the floods which hamper the riverline people to a great extend.*

**Keywords:** flood, environmental degradation, riverline habitation, society

## 1. Introduction

The state of Assam of India has been suffering a lot by flood which is continued to be the burning problem of the state. The rivers Brahmaputra and the Barak along with its more than hundred major and small tributaries originating from the hills and mountains surrounding the State is largely responsible for the recurring floods.

National Flood Commission had estimated the area vulnerable to flood in Assam as 31.50 lakh hectares against 335.16 lakh hectares for whole India. Assam thus accounts for 9.4 per cent of total flood prone area of the country. As a result the state has not been able to achieve the desired progress and prosperity, in spite of having vast natural resources[1]. The numbers of affected areas and population have increased and the major districts of the State have been experiencing serious effects of flood and its multi-facet manifestations over the decades.

The Lakhimpur District of Assam over the last few decades has been an example of such devastation. The river Brahmaputra along with its tributaries which are flowing through the district such as the *Subansiri, Ranganadi, Dikrong, Kadam, Kakoi, Pichala, Singara* etc. are engulfing floods in many areas. It has been leading to environmental degradation affecting society to a great extend. Therefore the study was designed to search how floods have been leading to environmental degradation as well as its effects on the people of the affected areas of the District.

## 2. Methods

This study was conducted on the basis of both primary and secondary data. The primary data were collected through field study in some flood affected areas such as Matmora, Bihpuria, Bholabori, Silikhaguri, Majghat, Dolohat etc. During the field study the investigator adopted observation as well as personal interview with some affected people. Besides, a number of secondary data about the district with regard to the annual records of flood, flood damages, etc. were collected from some of the Governmental Offices, Documents, Internet etc.

## 3. Results

The results regarding flood, environmental degradation and their impacts on riverline people are discussed below.

### 3.1 Riverbank Erosion

Among the various soil degradation processes, soil erosion is the most serious degradation problem in the Indian subcontinent. Erosion due to water and wind occurs over large areas. He also pointed out that as per estimates of the Central Water Power Commission, about 1356 million acre ft. of water flows annually through the rivers to sea, of which 1.87 million acre ft. runs off annually, causing soil erosion[2]. In Assam the riverbank erosion is a severe problem. In the State as a whole total area eroded by the Brahmaputra, Barak and their tributaries since 1954 is 3.86 lakh hectare, which constitutes 7 per cent of the total area of the State.[3]

In the studied area erosion has been occurring in the riverline areas. The river Brahmaputra and its tributaries such as *Subansiri, Ronganadi, Kadam, Kakoi, Kani, Singara, Moridikrong, Pichala* etc. are causing it. In the areas like Matmora, Bihpuria, Bodoti, Silikhaguri, Majghat, Chamoguri, Bonpuroi Jamuguri, Bornahoroni, Burhaburhi, Tatibahar etc. it has been occurring in a high magnitude causing loss of hundreds hectors of land and thousands of plants. Official records revealed that in Lakhimpur during 21.06.05 to 31.08.05 the number of villages affected by soil erosion was 40 where 286 hectares land was eroded and 605 families were affected. The value of the property loss was Rs.1, 63, 62,500.00[4]. Still it is a divesting phenomenon of the district. Therefore, soil erosion is causing in land degradation as well as deforestation in many parts of the area under study. Contextually, it may be mentioned that in the Assam as a whole total area eroded by the Brahmaputra, Barak and their tributaries since 1954 is 3.86 lakh hectares, which constitute 7 per cent of the total area of the State and an average 2500 hectares of land is being eroded by the Brahmaputra annually [5]. It results hundreds of people landless virtually destroy the socio-economic development.

Many people of the studied area have been suffering from acute riverbank erosion among whom many cultivators have already lost their entire land; which stands as a vital problem in front of them. It hampers all types of crops; even in some areas tea cultivation is disrupted in the district. In this regard the best example is the Harmuty Tea Estate which is affected by soil erosion in its west side by the river *Dikrong*.

In many areas due to the riverbank erosion people have been displaced and even many of them have been residing on the river dykes with a minimum livelihood standard. The evidents of this situation are seen in Matmora, Bodotighat, Bonpuroi Jamuguri, Silikhaguri and Majghat areas. It leads to the problem in case of food and nutrition, shelter, drinking water, health, financial aspects, education etc. and in most of the displaced sites women and the children are affected more.

Besides, many embankments, roads, the buildings of many institutions and departments, office of many social associations, play ground; recreational centres etc. are destroyed by the riverbank erosion in the area under study. Therefore, the riverbank erosion leads to various social problems in the studied area. The Statistical Handbook of Assam, 2010 reported that in 2009, 3 embankments was breached in 11 sects with a length of 2670 meter and in 2010, in 2 sects of 820 meter of 1 embankment was breached in the Lakhimpur District[6]. Since, in those places the embankments are the prime road communication; therefore, it disrupts the communication for many people.

Phukan(2007) studied in the Matmora region of Lakhimpur district of the state has reported that almost a huge sunk of this region has already been vanished disrupting people's livelihood[7]. In another study on effect of flood on education, Gogoi and Phukan(2010) stated that due to flood and soil erosion, people have been in a serious problem food for which there is more expenditure on food and day-to-day necessities of life. Economically, people become poorer every year. It has a serious consequence on children education. The drop-out cases of children at various levels of education have started increasing[8].

In a study on impact of displacement on women conducted among the erosion induced displaced people in Dibrugarh district Gogoi (2007) has discussed that the displaced women have to face many problems such as problems in household activities, problems in food and nutrition, disruption in occupation, problems in income generating activities etc[9].

### **3.2 Siltation and Loss of Soil Quality**

Siltation caused by flood water causes land degradation. Hussain (1996) pointed out that the fertile plains and flat valleys of the North-east are subjected to degradation by deposition of new soils (Sand and boulders carried by streams and rivers coming from surrounding hills and mountains)[10].

In Assam, the deposition of sand due to flood in many areas causes loss of agricultural land to some extent by diminishing the fertility of soil. In the district under study it

has been a severe problem that hundreds hectare of land including a huge area of agricultural land is submerged by the sands and silts carried by the floods. It is leading to the degradation of soil quality which ultimately hampers in agricultural production. In some places the available paddy fields have become completely barren due to heavy siltation. Besides, deposition of sands and silts in many ponds hampering fish cultivation and deposition of huge siltation on roads leads to communication problem. Therefore, the high siltation leads to disruption in agricultural production, fish cultivation, communication etc. Phukan(2007) in his study relating to flood in the Lakhimpur District revealed that damage of paddy fields, crops, buildings etc. by the siltation are the regular incidences in the areas under study[11].

In another study Gogoi(2008) has reported that in Sadiya Region of Tinsukia District of the state, suddenly occurred deposition of huge amount of coarse to medium grained sand on the existing agricultural fields due to influx of flood water makes much of the resourceful lands into wastelands[12].

### **3.3 Loss of Plants**

Flood causes destruction of trees. It occurs due to submersion of the plants for long period under the flood water, due to diseases caused by flood and due to heavy soil erosion. In my field investigation, I have found that hundreds hectare of paddy and jute crops, tea plants, coconut tree, pineapple, betel nut, papaya tree, betel vine, black pepper, many trees of the forest areas are being destroyed by submersion under the flood water, diseases caused by flood and heavy soil erosion of the rivers. It is resulting deforestation in many parts in the district.

In a study Gogoi(2007) has revealed that up to 2007 at Rohmorria area 20 Nos. of *Beels* with fodder tree and 8 Nos. of small forest area with valuable trees have already been lost due to erosion[13].

### **3.4 Loss of Domesticated as well as Wild Lives**

As reported by some victims, a huge number of domesticated as well as wild lives have already been lost due to drown off and diseases during or post flood. Besides, fishes of individual as well as public ponds are lost due to diseases caused by flood and these losses affect society. Especially the loss of domesticated birds, animals and fishes affect society in different ways. First, it affects financial aspects since many households domesticate fowls, ducks, goats and practice fish cultivation etc. for income purpose. Secondly, the loss of cattle affects agriculture since almost all the cultivators except the tea cultivators are depended on animal power in ploughing. Thirdly, many people domesticate cows and buffalos for milk production. But such losses impact people's livelihood. Contextually, it may be mentioned that in 2010 the floods occurred in different regions of Assam 3754 cattle were lost[14].

### 3.5 Loss of Human Lives

Flood may cause loss of human lives. It may be due to two reasons- drown off in flood water and diseases occurred during or post flood period. As revealed from the report of The Lakhimpur District Administration, during last five years 15 human lives were lost due to drown off in flood water and a number of people were died due to different diseases caused by flood. It signifies a severe effect on society. It may be mentioned that 227 people died due to floods during 2005 to 2010 in Assam[15].

### 3.6 Effect on Sources of Water and Water Pollution

The major sources of drinking water of the rural areas in Assam are the wells, tube wells and in some cases ponds and rivers. It is most common phenomenon that due to flood these sources of water and their quality might be affected to a great extent. It results the shortage of water for the many rural inhabitants. Kharghoria (2003) has stated that existing water sources are contaminated by flood water. As a result of contamination there is scarcity of safe drinking water[16]. It leads to water born diseases. It is due to contamination of polluted flood water with the wells, tube wells etc. that becomes hazardous for drinking purpose.

During the present investigation, it was found that most of the people take drinking water from tube wells, wells, ponds etc. and the common source of drinking water is tube wells. These sources of water are both personal and public. It is also significant that sometimes many riverline inhabitants use water from the rivers even they take it as drinking water. But the water of almost all the sources is polluted due to contamination with flood water. Thus, there is shortage of safe drinking water in the flood affected areas and the people have to use the polluted water due to the scarcity of pure water, which leads to various waterborne diseases.

### 3.7 Creation of Hellish Atmosphere

Many of the affected people reported that after flood, the rotten and stinking garbage create a hellish atmosphere. In this regard, I have also witnessed many such cases where rotten and stinking garbage are deposited. The offensive smell of those particulates degrades the atmosphere of an area and it leads to an unhygienic living condition.

## 4. Conclusion and Recommendations

In above result, it has been found that flood is one of the causes of environmental degradation. Soil or land, water, air, plants, animals and human lives are being affected and all these effects hamper the people of the affected areas. Therefore, some protective measures should be taken by the Governmental and Non-governmental agencies. Moreover, some individual efforts may be fruitful to some extent. These are –

1) There should be a Central Plan by the Government to reduced large scale riverbank erosion in Assam in general and in the Lakhimpur District in particular. In this regard permanent solid spar at the riverbanks should be made.

- 2) The Governmental Departments such as The Flood Control Department, The Brahmaputra Board etc. should think to reduce flood problems in the state in general or in the Lakhimpur District in particular.
- 3) Through the District Administration, the District Natural Disaster Management Department and the N.G.O.s should take initiatives to provide quick and proper rescue operation to the affected areas.
- 4) State Agricultural Department should take initiative to practice alternative agricultural practices such as *rabi* cultivation.
- 5) The residential houses, granaries, cowshed etc. should be built highly to save from flood.
- 6) If such efforts are adopted by these Governmental Departments, N.G.O.s, voluntary organizations, the effects of the floods on environment as well as society could be minimized.

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