

A report on the flood menace: Will Assam ever be safe from its annual ravaging?



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List of Abbreviations:

AASU: All Assam Students Union

ASDMA: Assam State Disaster Management Authority

ASHA: Accredited Social Health Activist

CMD: Chairman & Managing Director

DC: Deputy Commissioner

DDMA: District Disaster Management Authority

DPO: District Project Officer

DPR: Detailed Project Report

EIA: Environment Impact Assessment

FLEWS: Flood Early Warning System

HRLN: Human Rights Law Network

IIT: Indian Institute of Technology

MoU: Memorandum of Understanding

MW: Mega-watt

NEEPCO: North East Electric Power Corporation Limited

NESAC: North Eastern Space Application System

NGO: Non-Government Organisation

NH: National Highway

NHPC: National Hydel Power Corporation

PAD: Peoples' Action for Development

PHC: Primary Health Centre

P&RD: Panchayat& Rural Development

RoR: Run-of-the-river

Rs.: Rupees

USD: United States Dollar

INTRODUCTION

Floods are an annual recurrent event in Assam, causing damage worth crores and affecting thousands of lives. All rivers in Assam are liable to floods, mainly because they receive heavy rainfall within a short period of time. These rivers are in their early stage of maturity and are very active agents of erosion. The river waters collect a tremendous amount of silt and other debris, raising the level of river beds. Therefore, it becomes impossible for the main channel to cope with the vast volume of water received during the rains.¹ 39.58% of the total land area of Assam is flood-prone, while only 10.2% of the total area of the country is prone to floods – making Assam four times as vulnerable.² In absolute terms, about 4.75 lakh hectares of area in the state is chronically flood-prone.³

The major river of Assam is the Brahmaputra and is one of the largest rivers in the world. It originates in the Kailash ranges of the Himalayas and enters India after flowing through Tibet through Arunachal Pradesh. It flows through Assam and Bangladesh before it joins the Bay of Bengal. The drainage area lying in India is 194,413 sq. kms. The sub-basin lies in the States of Arunachal Pradesh, Assam, Nagaland, Meghalaya, West Bengal and Sikkim. The largest drainage area of the Brahmaputra lies in Arunachal Pradesh, covering an area of 81,424 sq kms followed by Assam with a drainage area of 70,634 sq kms. Thus, floods in Assam are significantly influenced by rain in Arunachal Pradesh. The rainfall in Brahmaputra basin is mainly due to South-West monsoon and out of total annual rainfall, 85% occurs during the monsoon months from May to September. Moreover, during its course in the Assam valley from Kobo to Dhubri, the river is joined by about 20 important tributaries on its northern bank and 13 on its southern bank.⁴ In addition to the Brahmaputra river system, the Barak is another major river flowing through the state, with its main tributaries -- Katakhal, Jiri, Chiri, Modhura, Longai, Sonai, Rukni and Singla. The Barak valley also faces floods when precipitation occurs.

¹Assam State Disaster Management Authority.

²Water Resources Department, Government of Assam.

³Economic Survey, 2015-16, Directorate of Economics and Statistics, Government of Assam.

⁴Ibid.

The severity of flood problem in the state has been further aggravated by the acuteness of erosion on both banks of the river Brahmaputra and its tributaries. Studies reveal that 4.27 lakh hectares of land in the state have been eroded by the rivers since 1950 – about 7.40% of the state's net area. The average annual rate of erosion is 8,000 hectares.⁵

The floods are concomitant with huge losses in the state. In addition to the material loss including damage to croplands, people and livestock are also killed by the floods and many more are injured. Lakhs of people are affected. A cumulative flood report of the 2017 flood season prepared by the Assam State Disaster Management Authority (ASDMA) and updated up to August 2, 2017, states that 29 districts have been affected by the floods and the total crop area affected is 2,09,051.65 hectares. These are only government figures and the actual quantum of loss could be much more.

The state suffers losses of hundreds of crores. In 2017, Assam suffered losses to the tune of a whopping 2,939 crores apart from the human and animal lives lost.⁶ Moreover, the state spends a large amount of money on both preventive and rehabilitative measures. During 2014-15, the Planning and Development Department of the State Government undertook 97 Flood Management Schemes (both new and ongoing) in different districts of Assam.⁷

Recently, a total package of Rs 2,350 crores was announced by Prime Minister Narendra Modi for all northeastern states for mitigating the impact of floods in the short- and long-term basis.⁸ This amount is meant to be shared between the Northeastern states and the share of each state is still to be worked out. Assam, being the worst affected, is likely to get the lion's share of this package.

To understand the ground realities of the effects of floods, a team of activists and lawyers from Human Rights Law Network (HRLN) and Peoples' Action for Development

⁵Economic Survey, 2015-16, Directorate of Economics and Statistics, Government of Assam.

⁶ Assam Floods Aftermath: Crores of rupees wasted in state's ineffective fight against annual deluge, Firstpost.

⁷Economic Survey, 2015-16, Directorate of Economics and Statistics, Government of Assam.

⁸ PM announces Rs. 2,350 crore aid for flood-hit Northeast States, The Hindu.

(PAD) visited some flood affected villages of Lakhimpur district in Assam which is the worst affected of all districts in the State.

Lakhimpur and its Geography⁹

The name Lakhimpur is believed to be originated from the word '*Lakshmi*', the goddess of prosperity. The district is mainly dependent upon agriculture and paddy. Paddy is regarded locally as '*Lakhimi*'. The word '*pur*' means 'full'. Lakhimpur therefore means 'full of paddy' or the place where paddy is grown abundantly. The district was notified as Lakhimpur district through a proclamation issued by then Governor General on July, 1839. On 2nd October, 1971, the district was reorganized with two sub divisions -- Dhemaji and North Lakhimpur. In 1989, it was reorganized again with two subdivisions, Dhakuakhana and North Lakhimpur, leaving Dhemaji as a separate district.

The district covers an area of 2277 Sq. km out of which 2257 Sq. km is rural and 20 sq. km is urban. The population of the district as per Census 2011 is 10,42,137 of which 5,29,674 are male and 5,12,463 are female.

Lakhimpur district is situated on the north-east corner of Assam and at the north bank of the river Brahmaputra. It is bounded on the north by Siang and Papumpare district of Arunachal Pradesh and on the east by Dhemaji district and Subansiri river. The river Brahmaputra along with Majuli district stands on the southern side and Gohpur sub-division of Sonitpur district is on the west. The main rivers in the district are:

1. The Brahmaputra: The mighty Brahmaputra is the southern boundary of the district and touches all along the southern and southeastern boundary.

2. The Subansiri: Subansiri originates from Tibet and enters the plains of Lakhimpur and Dhemaji district. The total length of the river is 326 miles up to the international border. The catchments area of the river is 10148 Sq miles in Arunachal Pradesh and 440 Sq miles in Assam. The river discharges 2,09,546 cusecs of water at Bhimpara Ghat.

⁹lakhimpur.nic.in; Official website of Lakhimpur district, Assam, India.

3. The Ranganadi: The river originates from the Dafla hills of Arunachal Pradesh. The total length of the river is 90 miles and total catchment area is 839 sq. miles in Arunachal Pradesh and 296 sq. miles in Assam. It discharges 17,500 cusecs of water at 2 miles upstream of National Highway-52.

4. The Dikrong: The Dikrong originates from the Dafla Hills of Arunachal Pradesh. In Arunachal Pradesh, it is known as Par Nadi. It enters the plains near Harmutty Tea Estate and runs 25 miles to join the Brahmaputra at Badati. It discharges 20,000 cusecs of water at 1 mile downstream of National Highway-52. The catchments area of the river is 512 sq. miles in Arunachal Pradesh and 101 sq. miles in Assam.

Floods in Lakhimpur

Lakhimpur is the worst-affected district in Assam. The district located on the foothills of the Himalayas has received 1493.2 mm of rainfall during the period between 01-06-2017 to 02-08-2017 -- which is 29% more than the normal rainfall in the district during the same period.¹⁰

The parts adjacent to the north of the district receive a lot of rainfall, causing floods in Lakhimpur. A flood report of the District Disaster Management Authority updated till 30-07-2017 reveals the following information:

1) Total number of revenue circles affected: 7 (Nowboicha, North Lakhimpur, Subansiri, Narayanpur, Bihpuria, Kadam, Dhakuakhana)

2) Total number of villages affected: 462

Nowboicha:	73
North Lakhimpur:	133
Subansiri:	61
Narayanpur:	67
Bihpuria:	73

¹⁰District wise rainfall distribution, Indian Meteorological Department, Hydromet Division.

Kadam: 8

Dhakuakhana: 47

3) Total population affected: 3,34,041

4) Total crop area affected: 24,511.04 Hectares

5) Total number of animals affected: (i) Big: 97,200, (ii) Small: 55,744,

(iii) Poultry: 53,000

6) Human lives lost: 13

Flood: 6

Landslide: 2

Storm: 3

Electrocution: 2

7) Missing persons: 1

8) Total number of animal lives lost: 58

9) Health camps organized: 457

10) Houses damaged: Fully: 179 (Kutch), 4 (Pucca)

Partially: 7536 (Kutch)

11) Infrastructure damage: 852

Roads: 105 (Rural roads – 64, State roads – 41)

Embankments: 7

Bridge/Culverts: 59

Under P&RD: Roads – 152, Agri Bund - 66

12) Total schools affected: 463 (LP – 334, UP – 77, HSS/HS – 52)

Fully damaged – 19 (UP – 2, LP – 17)

Partially damaged – 392 (UP – 75, LP – 317)

RELIEF MEASURES

1) Relief camps: 21 (Subansiri, Nowboicha, North Lakhimpur, Bihpuria & Kadam)

2) Inmates in relief camp: 5447 (442 – Subansiri, 713 – Nowboicha, 235 – Kadam, 2788 – North Lakhimpur, 1269 – Bihpuria)

3) Rescue operations: total evacuated – 2651

4) Relief distribution points: 242 (Nowboicha – 81, North Lakhimpur – 68, Narayanpur – 11, Subansiri – 46, Bihpuria – 18, Kadam – 16, Dhakuakhana – 2)

The Dam effect

A common perception amongst many people is that the severity of the 2017 floods that hit Lakhimpur district is primarily due to the release of large amounts of water from the 405 MW Ranganadi Hydroelectric Power Plant at Yazali (in Arunachal Pradesh) that is run by the state-owned North East Electric Power Corporation Limited (NEEPCO). This is a run-of-the-river project and in 2008, after similar accusation of causing floods, the then CMD of NEEPCO had said, “The Ranganadi project in Arunachal Pradesh is a run-of-river scheme. The natural flood occurring in the upstream of the project cannot be absorbed by the small reservoir and excess water from the upstream has to be released to control the water level. There is no other option.”

Many articles have reported on the flood situation created by the release of excess water from the dam. A couple of excerpts from articles with regard to the role of NEEPCO in the floods of Lakhimpur follow:

- “Release of excess water from 405 MW Ranganadi Hydro-Electrical Power Plant by North East Electric Power Corporation Limited (NEEPCO) at Yazali in Arunachal Pradesh led to flash floods in the lower areas near Pahumara in Lakhimpur. The release left the Ranganadi river overflowing with an alarming speed.

According to the District Disaster Management Authority, NEEPCO released 3500 mm of water through its Gate No. 1, 5000 mm water through Gate No. 3 and 2000 mm water through its Gate No. 5 at 3.30 pm on Sunday. The situation was such that national highway was blocked due to the flash flood.

In Bihpuria, the dam-induced flood water of Dikrong inundated 18 villages stretching from Badatighat to West Laluk in Bihpuria revenue circle area.”

(NEEPCO dam water causes floods in Lakhimpur, NH in pathetic condition; thenewsmill.com)

- “The sudden rise in water level was induced by NEEPCO’s 405-MW Ranganadi Hydro-Electrical Power Plant at Yazali in Arunachal Pradesh, which caused havoc in the district since the early hours of Sunday by breaching the embankment at one point, besides inundating thousands of hectares of cropland....

The overflowing waters of Ranganadi also breached its embankment on the right hand side at Jainpur village last night and destroyed households and swept away cattle of 10 families. The breach on the embankment submerged 50 villages under TelaheeGaonPanchayat of North Lakhimpur Revenue Circle and Nowboisa Revenue Circle.

The rise of the Ranganadi due to release of water by the NEEPCO dam today claimed the life of one KanakGogoi, who drowned at Bagaleejaan area of Ranganadi as he tried to oar a boat....”

(Dam-induced flood and nature’s fury devastate North Lakhimpur; silchar.com)

The NEEPCO flood fiasco is not a new affair. The project has been blamed for floods in the Lakhimpur and Dhemaji region since its inception. The accusation that the Ranganadi dam aggravates the problem of flooding in the downstream district of Lakhimpur is as old as the dam itself, which became operational in 2001.¹¹

In 2008 as well, NEEPCO was accused for its part in the devastating floods that had hit the state. The then chief minister Tarun Gogoi blamed NEEPCO for the flood fury and demanded compensation from the power major. Gogoi had said, “Excess water released from Ranganadi dam without prior warning caused the floods.”

Many including the All Assam Students Union (AASU) have called for a shutdown of the Ranganadi project. Partha Jyoti Das, head of the Water, Climate and Hazards Programme of the Guwahati-based non-profit Aaranyak said, “The nature and patterns of the floods would have been very different in the absence of the dam. People living in downstream areas always lived with natural floods always, but with the dam, the river’s course has been altered and the nature of floods has completely changed. Yes, there would be floods even without the dam, but the hazards would be much less.”

The flow of the Ranganadi is very erratic. By design, if the Ranganadi’s flow is greater than 160 cubic metres per second, the surplus water is released into the river downstream to protect the dam. In the winter, the river flow is, more often than not, less than that. Therefore, no water is released into the Ranganadi at all, which results in a practically dead river. People also claim that the continuous flushing of sediments at the dam site at Yazali has raised the river bed significantly, so it was unfair to say that the dam has not increased the intensity of the floods.¹²

¹¹ Severity of Assam floods heightens old fears about dams in the Brahmaputra basin; Scroll.in.

¹² Severity of Assam floods heightens old fears about dams in the Brahmaputra basin; Scroll.in.

Now with so much talk about NEEPCO being responsible for the floods, one would be curious about what NEEPCO's stand on the matter is. In fact after the little fiasco, NEEPCO published a clarification in a newspaper where it termed all allegations made against it holding it responsible for the flood in and around North Lakhimpur as totally untrue and malicious. It explained how the dam in subject is a run-of-the-river (RoR) project with very little storage capacity (5.7 million cum live storage). It said that the small reservoir of the RoR project stores water for running turbines only for a few hours. It is unlike the storage hydro power projects whose reservoirs are significantly bigger and can store water for running of turbines for a longer period of few weeks or few months. It also stated that when water was released on July 9, 2017, information was communicated to concerned authorities in downstream areas. It said a flood of this quantum would have occurred even without the dam and reservoir. Further, it went on to state how its engineers are stationed at remote area with little comfort and that the allegations made could demoralize them.¹³

So now that both perspectives have been placed, it is only experts who can judge better on the role of NEEPCO's dam in the floods of Lakhimpur, while we will focus on what is the effect of the floods on the local people.

But let us also take a glimpse at the development of dams in Arunachal Pradesh, which lies in the upstream region of most rivers that flow through Assam. Over the last decade, over 150 memorandum of understandings (MoU) for Hydel power projects which would make Arunachal home to one of the greatest concentration of dams in the world. Taking for instance the river Lohit, six dams were proposed on this river by 2013 and the space between these dams was 1km, 9.5km, 1.8km, 3.8km and 1.8km. And this was despite the lack of studies on what such clustering means for a river.¹⁴

Former environment minister Jairam Ramesh used the term 'MoU Virus' to describe the speed at which the Arunachal Government was signing MoUs.¹⁵ Although most of these

¹³ Clarification Regarding Allegation Against NEEPCO For Flooding in North Lakhimpur.

¹⁴ M Rajshekhar (Jan 30, 2016), The Mess in Arunachal Pradesh that no one is talking about; Scroll.in.

¹⁵ SANDRP (March 1, 2014), Hydromania in Arunachal Pradesh: Massive 1850 MW Dam Planned Without Any Basic Data, Not even Water Flow Data...

projects either never took off or were stalled, they are potent threats and are mired in controversies. Residents of Arunachal Pradesh have long been concerned about the proposed projects. And now, the private companies that had earlier queued up to build the dams are losing interest and asking the public sector National Hydel Power Corporation (NHPC) to take over their projects.¹⁶ The future course of action must definitely take into consideration all potential impacts on Assam along with that on Arunachal Pradesh.

Fact-finding on the effect of floods on people

Methodology:

On the 30 and 31 August, 2017, a three-member team from the Human Rights Law Network (HRLN), assisted and guided by members from Peoples' Action for Development (PAD), visited some of the flood-affected villages of Lakhimpur district in Assam and interacted with local villagers to learn about the situation in these villages. They also visited two places where the Ranganadi had breached its embankments to enter with great force into residential areas, causing severe damages. The team also interacted with personnel from the Lakhimpur District Disaster Management Authority, personnel from Americares and PAD -- two NGOs that were actively involved in relief work in the district.

The effect of floods in Telahi block, Lakhimpur:

Jainpur:

The team first visited Jainpur village in Telahi block. To reach this village, the team had to take a boat across the Ranganadi. The river, at the time of the visit, was hardly 4-5 feet deep and the width was probably less than a hundred metres. There were many

¹⁶AzeraParveenRahman (February 25, 2016), Private Dam Builders back out of Brahmaputra dams; thethirdpole.net

children swimming in it. We wondered what was on the other side of the river. The body of water looked deceptively innocent.



The Ranganadi&Spot of the breach of embankment in Jainpur area

Jainpur is one of the clusters of villages that were devastated when the **embankment protecting Jainpur and nearby villages from the Ranganadi broke** letting in the raging waters into the village areas and wreaking havoc. It rained quite heavily on July 9, 2017, and the Ranganadi, which is otherwise a shallow rivulet that can be crossed on foot in drier times, was swollen. Some villagers were alarmed and were anticipating a breach of the embankment at one particular point which had been weak. Some of them had rushed to this vulnerable spot in the heavy rain to repair it, said Sitaram Bania of Jainpur, who was one of men who went for the repair.

But the breach in the embankment unexpectedly occurred at a different spot around 9.45 pm on the July 9. Floodwaters gushed in right in the middle of the village and took the villagers by surprise. Very few could rescue valuable items. Moreover, those who were engaged in the repair of the embankment had no time to salvage anything at all.

The waters immediately inundated Jainpur and struck Majgaon village. At Jainpur, there are over 100 households. 15 houses were completely destroyed and others suffered partial losses. The houses that suffered the most damage were *kutch*a huts – those made of mud and bamboo. One Tilak Das's house was completely destroyed. In front of his house, another villager, Prasanta Das, had set up a little shop to sell household

items; this was also completely broken down. Both Tilak Das and Prasanta Das could salvage very little.

Pucca (permanent) structures also suffered damages, with the earth underneath them being displaced, weakening the foundations. The houses filled up



The gutted house of Tilak Das in Jainpur

with mud; toilets were filled with sand, rendering them useless. In

addition to the losses they suffered, the villagers were also now faced with the task of cleaning and repairing their shelters.

Large pools of water lay stagnant in these areas, turning into a potent ground for the spread of diseases. In the past few weeks, there had been several cases of fever, vomiting, diarrhea and skin diseases among the villagers, they reported. But they have received little to no assistance. Very few doctors and healthcare workers have visited the area and the extent of damage is such that a lot of the sick are beyond the reach of the small handful of doctors. “The government has hardly done anything to take care of the health of people. A few doctors or health personnel were sent but those who came could not cover much of the population. But NGOs and organizations like the Ramakrishna Mission and Americares have come with their own doctors and their efforts are appreciable and they have tried to cover as much as possible,” one villager said.

There is also a severe scarcity of drinking water. Even though water lies all around, there is very little to drink, reminding one of the lines from the famous poem ‘The Rime of the Ancient Mariner’. Packaged drinking water has been distributed among villagers but the stock has dried up now and the people have resorted to filtering the water

through crude methods, such as with sand and rocks. However, the river water which is the primary source for these villagers is so dirty, even the 'filtered' water looks slurry.

Adding to their woes, a large number of their livestock -- cows, goats and poultry -- died. The villagers were taken by surprise by the flood and had no time to rescue their animals. Almost every household has lost an animal, but has been no proper count of the loss. Numalia Das, whose house was destroyed, also lost three cows and six goats. The cowsheds of every household were *kutchha* structures that were broken down in the floods. For the surviving animals, some amount of fodder has been provided by the government and a veterinarian was also sent to check on animals, but there has been no compensation for those who lost their animals to the flood.

Many villagers also operated fisheries and these too suffered losses, sometimes worth lakhs as the fish escaped and the structure of fisheries entirely decimated. A lot of money had been put into setting up the structures, said a villager, Ganesh Das.

The economic losses from the flood, then, were huge. These villagers are primarily dependent on agriculture for livelihood, with some of them owning land and others working on a daily-wage basis on others' lands. There are hardly any salaried employees, and the few that hold down jobs work outside the villages in other towns and cities. The floods deposited a thick layer of silt on farm lands, destroying the existing crops and also rendering the land useless for further cultivation for the next several years. In some spots, the silt is over 2 feet thick. Therefore, at present, there is no economic work for the villagers, and they worry about making ends meet.

The residents of Jainpur, at the time of the fact-finding team's visit, were residing in makeshift, self-made camps on the embankment. They had also made sheds for the remaining livestock and cattle there. Those who lost their houses to the flood plan to stay there until they find another solution, while the villagers whose houses



were not completely decimated aim to finish repairs before they return.

These temporary structures have been built with tarpaulins, tin sheets and bamboo. The tarpaulin was provided by the state two days after the disaster on July 9 – one tarpaulin per family and raw material to prepare food. The villagers salvaged the bamboo and tin sheets from the ruins of their damaged houses. However, there are complaints that the government-issued tarpaulin was of poor quality and began to tear down after a couple of days. The villagers preferred using better quality tarpaulin provided by NGOs such as Oxfam. The NGOs also shared essential provisions such as good items, buckets, mugs, hygiene kits with soaps, nail cutters, toothbrush, and toothpaste, among other things. For this help, the people seemed grateful to the NGOs, but were scornful towards the Government.

Gopalpur:

The fact-finding team then went to Gopalpur, which is a village located opposite Jainpur and was affected less than Jainpur. The floodwaters had struck Jainpur first and were a little less forceful by the time they reached Gopalpur, but this village faced another peculiar problem. Jainpur, having been struck first, was inundated with large large amounts of silt, creating an elevation and leaving Gopalpur at a lower level. Consequently, a lot of water was stuck in Gopalpur, pooling in many houses for long period of time. The fields of Gopalpur were still under water when the fact-finding team visited. Many residents of this village too were residing on embankments. The conditions in Jainpur and Gopalpur were similar, but there was less infrastructure damage in Gopalpur.

Schools in Gopalpur had been shut for about three weeks when the team visited, again due to the pooling of water. It did not seem likely that they would reopen anytime soon. The floors of the classrooms were covered with slush and the entire compound had become a breeding ground for vectors of diseases such as mosquitoes. Much of the furniture and other articles were also damaged. The floods have had a drastic impact on the education of children.

Jamuguri:

From Gopalpur, the team went to Jamuguri, another village near Jainpur and Gopalpur. Jamuguri too was inundated, but being a little further from the breach of the embankment, the infrastructural damage was less. Since several houses were damaged, some villagers were living on the embankment, while some others remained in their houses and some had just moved back. These people were living in houses inside which water still remained.

The team met JitaKalita, a pregnant woman from the village. She was 27, and seven-months pregnant. On the night of the breach, she and her family had to rush to the embankment. Jita used to go to the Panigaon Primary Health Centre (PHC) for her check-ups, by taking a boat across the Ranganadi to Panigaon.

Since the flood, which was about three weeks ago, she had not been able to go for any check-ups even though it was due. The local ASHA (accredited social health worker), also besieged with problems brought by the floods, was not able to help either. Jita was not sure when she could go for a her check-up, because her house was filled with slush and water pooled around it, with no indication that this would clear up soon. This made movement very difficult for her and she was forced to live in unhygienic conditions. Moreover, in all likelihood, there are chances of further rain. The roads too had been damaged to such an extent that all traffic of four-wheeler vehicles to and from Jamuguri had stopped. The only option for her, if she wanted to go for a check-up, would be to walk a couple of kilometers to reach the boat which would take her across the Rangandi and return back the same way – a difficult journey that she was not sure she could undertake. She had hoped that the doctors who came for health camps would check her too, but they had not. And she had bigger worries: she wasn't sure if the road would be repaired in time for her delivery so an ambulance could take her to a health centre.



A damaged part of the road near Jamuguri that also connects Gopalpur, Jainpur, and some other villages

Majgaon:

Majgaon was one of the worst affected villages. Located right behind Jainpur, the floodwaters struck Majgaon with great force, causing huge losses. The team too witnessed the damages caused to almost every single one of the 55 households.

The main road in Majgaon is *kuccha* and parts of it are still submerged, while the rest of it has been reduced to slush, making it difficult to tread on.



The road in Majgaon

Due to the suddenness of the flood, the villagers had very little time to move to safer grounds. In addition to infrastructural damage and loss of livestock, several people also lost important documents and household items. The villagers here are mostly engaged in agriculture, but some men also work in other cities as security guards to be able to sustain their families.

Those engaged in farming suffered huge losses: their crops were damaged and the flood left behind thick layers of silt on the fields, rendering them unfit for cultivation. Tractors too were damaged and huge stocks of grains (known locally as '*bhoral*') were lost.

Families from which men were working in other cities suffered terribly too; in the absence of men, women were forced to carry the children and some belongings to safety, but they were unable to salvage any perishables from their houses.

Jayanta Das is one such villager who works as a security guard in Hyderabad; he had used this money to build a fishery and a house for his wife and infant child. He visits home twice or thrice a year, but when the floods came, he was in Hyderabad. His wife managed to rush to higher ground with their child, aided by other villagers. When he heard of the flood, Das attempted to return home as soon as he could, but tickets were not easily available. He undertook a five-day journey starting from July 10, and changed four trains to finally reach home on the 15th. When he reached, he found his house had sustained severe damages and that all the fish had escaped from in fishery. The fishery had also been made shallow by huge silt deposits. Das cannot go back to work any time soon, and his scared wife does not want him to go at all. For now, they have modified their food grain store into a makeshift residence. Living in constant fear of return of the floodwaters, they have fixed their beds at a height of four feet to keep them safe. Hardly any furniture remains in their house, and during the day, their child lies on a tarpaulin sheet spread on the ground. They eat the food provided by NGOs and the state government as relief material.



JayantaDas' living conditions

MakanBania has a similar story to share. Her husband too works as a security guard in Bangalore, and she lives with her 10-year-old son in Majgaon. MakanBania also ran a shop, which was wiped out by the floods and she couldn't salvage anything. Now, her son is also suffering from fever and has been vomiting, but has still not been checked by a doctor. Makan is hoping for a doctor's visit soon or she'll be forced to take her son to Panigaon. She is facing all these difficulties without anyone to help her. Her husband was informed about the flood but has not been able to get leave from work and return from Bangalore to visit them.

In the same village, there's an old, blind couple. They managed to stay alive the night of the flood climbing to a raised platform inside their house. They feared their house would collapse entirely, but it held up somehow. They were rescued next morning by a relative.

Another couple, Sri Ramnath Das and his wife, Majoni Das, narrowly managed to survive. Ramnath has a disability and has difficulty walking. On the night of the flood, they didn't know what to do and thought they would die. They managed to reach the Majgaon market that was near their house, clambered on to a raised pucca structure and stayed there till the waters receded. Some other villagers too assembled at the spot. But their kutchha house was decimated entirely, along with all their belongings.

A ten-year-old boy from the village was swept away by the flood waters and was dragged for almost a kilometer before another villager rescued him. After the incident, the boy is still in shock, and has stopped eating or drinking. His family says that he starts screaming suddenly sometimes, for no reason. The Deputy Commissioner, on one of his visits, was apprised about the boy's condition, but no medical assistance has been provided to him yet.



KonDas' son who was swept away in the floods

Many animals have also been lost in Majgaon, with the net loss of cattle, poultry and fish reaching several lakhs.

The village also has an Anganwadi and a lower primary school that have all been inundated in about 2.5 feet of silt brought by the raging river. Food grains, books and toys stored in the Anganwadi are almost entirely destroyed. The school definitely is not in a condition to reopen for a long time.

Some NGOs and student organisations, such as All Assam Students' Union, have been conducting relief work for the rehabilitation of the villagers. This is mostly in the form of food items such as rice, dal, oil, salt and drinking water, and handy items like buckets, tarpaulins, mugs, hygiene kits, etc.

Villagers believe that relief providers have significantly focused on Majgaon, because of which it has received more relief material than the other villages. Correspondingly, this village also appeared to be the worst-affected of all the villages visited by the fact-finding team. There has been just one health camp organized in the village since the floods and it has not been enough to cater to the entire health needs of the people.

The team also visited Gokhaipam and Kohuadoloni, two other villages located in Telahi block that was affected by floods. The situation in these villages was similar to that in

Gopalpur: infrastructural damage, diseases, damaged fisheries, and damaged crops. A *pucca* road passes through Kohuadoloni that connects the aforementioned villages to other urban centres. At Kohuadoloni, the waters broke the road, cutting off all connections with other areas, and restricting the movement of essential services such as ambulances and police vehicles. Even relief material could not be brought in by road and a fragile boat is now being used to cross the Ranganadi to bring in relief material.



Broken pucca road passing through Kohuadoloni cutting off road connectivity to many villages

Effect of Floods in Lakhimpur Block

Bogolijan:

Bogolijan is a larger area consisting of a collection of hamlets and is situated in the Lakhimpur block of Lakhimpur district. This is another spot where the Ranganadi in its rage breached its embankment. The breach flooded almost the entire Bogolijan region, killing two people, affecting more than a thousand lives, and displacing hundreds. A young mother and her small daughter were swept away, but because their bodies have not been found for over three weeks now, they have been presumed to be dead.

The river water has not entirely left Bogolijan yet, but it has receded a little, allowing some people to move back into their houses. However, most residents still remain on

the streets in temporary camps. A few hamlets that were located on higher ground were spared the brunt of the flood.

There has also been some discontent among the residents over the distribution of relief material. People who lost their houses have been accusing the others of unfairly taking relief material without genuine need. Those who were severely affected blame the less affected for taking more than their actual share. Although the beneficiaries are thankful to the NGOs and state for helping them, they have expressed displeasure that the relief material was distributed indiscriminately without any no proper assessment, which, they say, created a scarcity for the people who needed it the most.

Several families lived on the banks of the Ranganadi in *kutcha* houses. The team spoke to some of these people, including 26-year-old Diwakar Borah, who lives with his wife and 2-year-old son, and one Bina Borah, who lives with her two children and husband, to determine why those chose to live in such an unsafe area. They explained that they were landless people who did not have any other place to stay. Other villages did not let them stay in safer spots, they said, and so they were forced to settle on the banks. They had been living there for many years, they said, and in the earlier years, when the floods came, they would relocate to safer ground, but never before had they seen the river strike with such rage. On all other occasions, their houses had survived, but this time, everything they owned was lost, because of the sudden influx of water. Diwakar Borah worked as a daily wage labourer while Bina Borah had a little farm which is under water now. In the floods, she lost a pig, two goats, a calf, and 15 ducks. Diwakar Borah and his family too lost three goats and a pig.

About 27 or 28 families lived near the bank where the embankment broke. These families now continue to live on the embankment, surviving on relief material in camps built out of bamboo, tarpaulin and tin sheets. Donations included food grains, clothes, utensils and water filters. A local political leader, Utpal Dutta, has helped them as well through food donations and providing them with water filters. The Deputy Commissioner and one Akhil Gogoi of the Krishak Mukti Sangram Samiti had also visited them to check the situation.

At present, the people here have no work. A couple of families – including Bina Borah's -- have set up their small shops selling cooked food. "It is not possible to survive without money and we have no income now. So I am trying to sell food and earn some money. People here need what I'm selling but most do not have the money to buy it. It's not very profitable but I'm trying to survive and feed my children", Bina Borah said.

The team visited another part of Bogolijan where nine families from the Adivasi community had set up camp on a road. Their homes were about half a kilometer from these camps, and are still almost half sunk in the water, forcing them to evacuate. Some people from this community have moved into a local school building for the time being. The main occupation of these people is farming, but their crops have been completely damaged and their farmlands are presently under about three feet of water. Speaking to the team, these families said that they would only be able to assess the extent of damage to their land once the water recedes, but that presently, they have no income and are dependent completely on donations. These families also lost a lot of animals.

The floods brought along a lot of diseases, of which the most common are fever, vomiting and skin diseases. The dirty water that has pooled everywhere has caused the skin diseases and is a breeding ground for pathogens. Doctors have visited the area thrice till date.

One Carlos Induwar told the team that he got itchy skin rashes that started after he walked through stagnant water while making trips to his house to salvage his belongings. He said that the doctors gave him some medicines a week back, but the itching and rashes had still not subsided, which is why his family fears that his condition could get worse. He is the only earning member in the family.

Sanitation has become a very pressing issue in the area. Most of the displaced residents of Bogolijan had toilets in their houses, but after the floods, they are forced to defecate in the open. Adding to their woes, presently, there is no private space to defecate. There is very little space that is not inundated and people have flocked to them. Moreover, there is the problem of the lack of availability of clean water. People have received some packaged water that they are utilizing thriftily. But otherwise, there

is no water for other uses. There are some tube wells that were set up by the government a few years ago, but none of them work.

A different perspective to floods

Nowboicha Revenue Circle

One article¹⁷ focused on flooding being caused for a slightly different reason: two dykes constructed by gaon panchayats which became the cause of unprecedented inundation of around 14 villages in the Nowboicha Revenue Circle of Lakhimpur district.

The dykes had been constructed in different rural development blocks to block the natural cause of the Singra Rivers and mitigate the onslaught of floodwaters on agriculture lands and human settlement. River Singra is known for causing annual flooding in the Nowboicha region of Lakhimpur. It had been in spate since early May due to heavy rain in the neighbouring Arunachal Pradesh and has inundated a wide area of Rowdang Pathar, Rohali, Gelahati and Goshaneebari. The Goshanee Pathar area has been marooned in floodwaters for more than a month now.

One dyke had been constructed by the Barchala-Mahghuli-Paandhowagaon panchyat near number-1 Barchala village with the supervision of Karunabari Developmental Block earlier this year. The second was constructed by Ranganadigaon panchayat through Nowboicha Development Block, some distance up on the river in Singra village.

We found that both the Rural Development Blocks had allowed the respective gaon panchayats to construct the dykes without consulting the districts' Water Resources Department, which had already constructed an embankment on the other side of the river. As the river swelled during the monsoons, these dykes prevented it from flowing in its original course. As a result, the waters slammed against the left hand bank, flooding the entire area.

¹⁷Farhan Ahmed, 'Wrong construction of two dykes causes inundation of 14 villages in Lakhimpur'.

On public demand, the Lakhimpur district administration pulled down the dyke constructed by the Barchala-Mahghuli-Paandhowagaon panchayat last week after brief resistance by locals. However, the existence of the other dyke, constructed by Ranganadigaon panchayat is still blocking the flow of the river and, hence, causing flood in the Goshaneebari area.

Though the district authorities sent a team to remove the Singra dyke, they were resisted by local villages fearing a similar flood in their village. The villagers of Singra sought two days' time to decide on the removal of the dyke following a public meeting held at the office of Nowboicha Revenue Circle recently.¹⁸

Gelahati is a village located in Nowboicha block of Lakhimpur district. It was one of the clusters of villages that had been affected by the diversion of the Singra River. Gelahati villagers claimed that there had never been flooding in the area before, but the situation had changed in the last 25 years, with the building of dykes, because of which there were floods every monsoon. The dykes had caused the Singra to flow much closer to their village than it originally used to, they said.

Gelahati is affected by floods every monsoon, and its effects last the whole year. The village is located in a low-lying area, relative to other nearby villages. Due to its topography, the floodwaters stay stuck in Gelahati. Consequently, parts of the village remain inundated throughout the year. Some villagers manage by building their houses at higher spots in the village, but their agricultural fields are no longer usable. Consequently, there is no economic work available here. A lot of men from this village move out to different cities and towns for work, leaving their families behind. Here too, a lot of men become security guards outside the state. The few who remain find work as daily wage labourers in neighboring villages.

The villagers are used to the floods now, since they live with it for roughly four months a year. However, their lives are made infinitely more difficult and messy for this problem. They build their houses on a raised platform, but even these get inundated during the

¹⁸Farhana Ahmed, 'Wrong construction of dykes causes inundation of 14 villages in Lakhimpur'.

flood season. To deal with the problem, they place their beds as close to the roof as possible. But there is no proper place to cook in their houses. Even though they have been getting adequate food grains as relief material, there is a scarcity of firewood to cook with, so they are forced to resort to community cooking.

They also face a scarcity of drinking water. The village has two tubewells placed strategically at a height that the villagers have to use boats to reach. The villagers say that they rarely bathe and even when they do, it is often the floodwaters that they bath in. Toilets are also rendered useless. Villagers sometimes defecate from the roofs of their houses; other times, they take their boats to find a secluded place. There is also the issue of health, because doctor visits to the village are very rare. Animals die too.

This year, the villagers have staged multiple protests in front of the Deputy Commissioner's office, where they placed a charter of six demands. These included a redirection of the river to its original course, payment of adequate compensation to the flood-affected and waiver of farmers' loans. Their village has received attention from the media too. Consequently, the Additional Deputy Commissioner sent a team to survey the area to conduct a survey. The villagers are now hoping for positive action. The administration gave the protestors a written assurance that a solution would be found within 15 days, but not much has been done yet. Only time will tell if the lives of Gelahati residents will improve.

Meeting with the District Project Officer (DPO), District Disaster Management Authority, Lakhimpur:

The DPO acknowledged that the condition this year was much worse compared to other years. The last time things were this bad was in 2008. The DPO mentioned the two embankment breaches at Bogolijan and Jainpur, and said that the North Lakhimpur bypass on NH-52 had prevented further damage. Being on a raised location, the highway prevented spilling of water into the main Lakhimpur town, she said.

As a preventive measure, the DPO claimed, the movement of big vehicles on the NH-52 was stopped on the evening of July 9 when rainfall got particularly bad. She also said that villages likely to be affected by the Ranganadi's rising waters had been warned. The warning system consisted of information given to the circle officer who informed the local Mandal, who in turn passed on the warning to the local village headmen (*gaonbura*). Each village headman looks after 4-5 villages. The DPO acknowledged that the gap in communication was significant.

According to the DDMA's estimate, as of August 2, 2017, about 3 lakh people in 460 to 500 villages have been affected by the floods in Lakhimpur. The government has set up 21 relief camps and 457 health camps in 7 circles. Six people had died because of the floods in Lakhimpur, and their families had been paid a compensation of Rs 4 lakhs each.

The DPO also said that the release of water by NEEPCO from its dam at Yazali had a major role to play in the floods. On July 9, 13,000 mm of water had been released from the dam's three gates. This was a huge quantity because even 4,000-5,000mm of water is dangerous and can cause significant damage.

Repair work on embankments had started, the DPO said, and it was expected to be completed soon. She said that residents would be paid compensation for their losses and infrastructural damages as per the norms of the State Disaster Relief Fund and National Disaster Relief Fund. According to these, people who lost their houses are liable to be paid Rs 95,100, while those who suffered partial damages have to be paid Rs 3,200 and Rs 5,200 for *kutchha* and *pucca* houses respectively.

The DPO said that the department was in the process of carrying out an assessment of the damages. The Agriculture Department too assessing the deposit of silt on farmlands and a decision on compensation and resuscitation would be arrived at shortly.

Interaction with NGOs

Relief poured in after the floods. Several NGOs and individuals took up the role of messiahs during these trying times and provided relief to the affected people. We spoke with some NGO personnel – such as those from the People’s Action for Development (PAD), which is a Lakhimpur-based organization with sturdy local connections, and more prominent NGOs such as OXFAM and Americares which brought in large amounts of relief material. The other organisations took PAD’s help in delivering the material to the affected. PAD also worked with the European Union Commission and the Tata Trust. The villagers we met spoke highly of the work of these groups.

Americares flew in two of their own doctors and staff members. One doctor worked in Lakhimpur district while the other went to Majuli (another nearby island-district ravaged by the floods). At Lakhimpur, the doctor and a staff member from Americares with the support of PAD regularly visited flood-affected regions and set up health camps. They had also brought with their own stock of medicines. In July, Americares had conducted 16 health camps in Lakhimpur, Telahi and Nowboicha blocks of Lakhimpur.

Americares provides emergency response services and has had years of experience in this field. Therefore, they were prepared for dealing with the diseases that emerge after such disasters, bringing along medication for health problems such as diarrhea, fever, cough, skin infections, and gastrointestinal problems, among others.

Along with medicines, Americares also gave out hygiene kits and shelter kits; in all, they handed relief material to about 1,500 families. OXFAM too provided wide support. Till the point of this fact-finding, OXFAM had distributed relief materials to about a thousand families and was bringing in more material for another thousand families. An Americares member said that they are trying to make arrangements with health department officials in the district so leftover medication could be used in the local health centres or in their own health camps.

The total effect of the floods of 2017:

The damage is enormous, and while not all of it can be assessed in economic terms, the sheer numbers associated with this disaster are staggering. According to government figures, 31 out of 33 districts in the state were affected by the floods. The crop-affected area is 3,97,910.25 hectares. 62,073 people had to be evacuated in 26 districts. 956 relief camps had to be set up which housed 4,51,946 people.¹⁹ The information publicly released by the state government on the website of the State Disaster Management Authority bluntly throws these numbers without elaborating. There is district-wise information on the amount of foodgrains distributed, but there is no available data on other significant questions -- how much longer will cultivation be stalled on lands with silt deposit? Will there be any compensation to these landowners? How many people have been compensated for losses so far?

157 lives have been lost this year.²⁰ The count of animal lives will easily go up to multiple lakhs. In Kaziranga National Park, reportedly 398 animals died.²¹

OXFAM India says the total number of people affected by the floods in Assam is 33.5 Lakhs.²²

There were breaches in the river embankment in 26 places in 15 districts. 7,000 schools were washed away and 3,500 houses were damaged. Some 14,000 roads were also broken.²³

These floods have resulted in a loss of over Rs 2,939 crores.²⁴ In 2016, the Water Resource Department in Assam submitted a flood memorandum to the Centre following the flood, seeking Rs 5,038 crores for the repair of embankments, damage to river

¹⁹ Assam Disaster Management Authority, Flood Report, Flood Situation as on 15th September, 2017.

²⁰ Debasree Purkayastha (September 6, 2017), All you need to know about Assam floods; The Hindu.

²¹ Ibid.

²² www.oxfamindia.org/Assam-Floods-2017.

²³ Mubina Akhtar (August 25, 2017), Dam Worsens Flood Devastation in Assam.

²⁴ Ibid.

banks and building flood control structures. This year, the state government has allotted 2,723.34 crores to the water resource department.²⁵

Some can justify the damages, calling it the fury of nature, but the same story repeats itself every year. Each year, there is some noise on social media, with a lot of it calling for national attention. But to what end is this national attention? Does the central government not know about the money being spent from its coffers for floods? Information sourced from the Central Water Commission in an article²⁶ shows the following figures:

Particulars	Annual Average (between 1953-2016)	Maximum
No. of people affected	26 lakhs	1.2 crores (in 2004)
Value of damage to homes	7 crores	104 crores (in 1998)
Loss of cattle	10,961	1,18,772 (in 2004)
Loss of Human Lives	47	497 (in 2004)
Total damage	128 crores	3200 crores (in 2012)

²⁵DebasreePurkayastha (September 06, 2017), All you need to know about Assam floods; The Hindu.

²⁶ShantanuNandan Sharma (July 16, 2017), Assam Floods, an annual tragedy: A detailed Report; The Economic Times.

Conclusion:

The problem of floods in Assam is an enormous issue that deserves the world's attention and immediate mitigation efforts. It recurs annually, but there still seems to be no permanent solution in sight. Can there even be a permanent solution to such a problem?

Compensation for flood victims is essential, of course, but the process of actually fixing the problem will take some time. Damage needs to be assessed so authorities can decide the appropriate quantum of relief. At last count, 11 Jainpur families whose houses were completely destroyed were paid compensation of Rs 95,100 each. But those in Majgaon have still not been paid any compensation. Compensation is paid as per norms of assistance from the State Disaster Relief Fund and the National Disaster Relief Fund. The families of people who lost their lives were paid a compensation of Rs 4 Lakhs each.

Nayan Sharma, a specialist in hydraulic structures, river engineering and irrigation and a professor in IIT-Roorkee, said that there can be no permanent solution to Assam's floods but one should aim to find a durable solution instead.²⁷ Himanshu Thakkar, a water activist, was quoted as saying it is 'not possible to flood-proof the whole of Assam.'²⁸

The Prime Minister has visited the state and announced a relief package for those affected. Newspapers reports said that finding a permanent solution to the problem was one of the purposes behind the visit. The government announced the allocation of Rs 100 crores to fund a study on the course of Brahmaputra river and its effects.²⁹

Another solution that has been proposed is the dredging of the Brahmaputra, and this project is scheduled to commence soon. The dredging is also meant to facilitate the upgradation of the Brahmaputra into an 'International Waterway'. A tripartite agreement for dredging the Brahmaputra was signed between the Assam government and the

²⁷PrabinKalita (August 2, 2017), 'Permanent Solution to floods in Assam not feasible'; The Times of India.

²⁸DebasreePurkayastha (September 06, 2017), All you need to know about Assam floods; The Hindu.

²⁹PrabinKalita (August 1, 2017), 'Northeast Floods: PM announces Rs. 2000 crore relief'; The Times of India.

Indian Inland Waterways and National Highways authorities at the closing ceremony of the Namami Brahmaputra Festival in Guwahati in April.

Nitin Gadkari, India's Union Minister of Road Transport, Highways and Shipping, had said that he hoped the project would change the economic condition of Assam residents and announced that the national government would provide Rs 400 billion (US\$ 6.2 billion) for the construction of the ambitious Brahmaputra Express Highways on both banks of the river. The World Bank has given Rs 98 million (US\$ 1.5 million) to the Inland Water Transport infrastructure development project to support its work in dredging the river. The material needed to build the highway would be provided through the dredging activities.

“Dredging of the Brahmaputra and Barak rivers will not only help to deal with the problem of floods, which affects Assam and Bangladesh, but also improve the navigation facilities in the rivers, which can strengthen trade and commerce between India and its neighbour through riverine routes,” said Sarbananda Sonowal, chief minister of Assam, at the inaugural session of the 8th India-Bangladesh Friendship Dialogue on July 2, 2017. However, no Detailed Project Report (DPR) is available for this project.³⁰

Should the efficacy of this project in dealing with the floods be trusted? “During British rule, dredging was done as a protective measure from floods,” says PK Dutta, an engineer who submitted the dredging plans to Prime Minister Modi.³¹ But did it work? Apprehension has been expressed about these plans. “It is impossible to make the river bed free from silt deposition by dredging, unless a suitable mechanism is applied to capture and dispose of the silt load flowing into the main stream from its tributaries. Otherwise, the dredged portion of the river bed will be filled up with fresh silt immediately. Dredging along a particular width of a channel along the Brahmaputra for navigational purposes will not support a permanent solution to the recurring floods and erosion of the Brahmaputra basin” says Pradip Puzari, a project manager at M/S Patel Engineering Ltd.

³⁰MubinaAkhtar (August 29, 2017), Dredging the Brahmaputra.

³¹ Ibid.

Numerous environmental concerns associated with dredging the Brahmaputra also need to be addressed, but the government is ignoring some of the most critical ones. There are questions over how the construction of the expressways on both banks of the river is possible without disturbing the river connections with other channels and water bodies. A one key question still remains: how can the Assam government continue with such a massive project, without conducting the necessary environment impact assessment?³²

Nayan Sharma also shares similar apprehensions over the dredging plans. “The sediment generated per year in the Brahmaputra is alarmingly high at about 1 billion tonnes -- five times as much as in China’s Huang He (Yellow River). The Rs 400 crore that the Centre has sanctioned for dredging the Brahmaputra will go down the drain unless the catchment area treatment is first done, as in the Yellow River,” says Sharma. He added, “You can’t put the cart before the horse. Dredging is the second step. Unless sedimentation is controlled by catchment area treatments, including massive afforestation, dredging will be meaningless. The more you dredge, the more sediment will be collected,”³³

No sane person would be against a proper executable and feasible plan to stop the destruction caused by the floods in Assam. But one should be wary of a plan that is to be executed without any proper assessment. When so much public money is to be spent, it must be strongly assured that the project will be fruitful. But in this case, if the concerns expressed by experts are to be believed, it would seem that the plan will not work as expected to prevent floods. Dredging will be futile if the dredged silt gets rapidly restored by its tributaries. Moreover, there has not even been an Environment Impact Assessment (EIA) done.

What are the other options? The planned 1,300 km long highway along the Brahmaputra, if built earnestly and with genuine intention, could be embraced despite its whopping cost (Rs 400 billion). But environmentalists say that this road-cum-

³²MubinaAkhtar (August 29, 2017), Dredging the Brahmaputra.

³³ShantanuNandan Sharma (July 30, 2017), Standalone Dredging in the Brahmaputra will be futile.

embankment will also be ineffective.³⁴ If that's true, the highway and the dredging efforts offered as permanent solutions to the problem of flooding are lies.

The embankments in the state are worn out. Breaches are common and can be anticipated. The annual floods are disasters waiting to happen while state residents sit helplessly in their anticipation and while the state government allots hundreds of crores for repair of embankments every year. More than Rs 33,000 crore has been spent in the name of flood prevention since the 1950s in Assam.³⁵ Despite this, breaches continue. There are allegedly 26 breaches in 15 districts in 2017.

The embankments on the Brahmaputra and its 103 tributaries in Assam were built based on 15- to 20-year-old flood data.³⁶ 82% of the state's embankments and dykes have already crossed the lifespan for which they were supposed to be effective.³⁷ What is the purpose of rebuilding these embankments every year when they will be breached again? Could it be money that causes successive Governments to depend on embankments as a solution for flooding problems? Himangshu Thakkar says, "A lot of money keeps getting spent on embankments because it's a lot of money, mostly unaccountable money. Money keeps getting spent without really helping the local people and helping from the flood problem."³⁸

In 2008, after Lakhimpur was ravaged by a particularly catastrophic wave of floods, a project worth Rs 362 crores was announced to rebuild and repair embankments along the Ranganadi river. The cost was to be borne by the central and state government, with the former paying 70% of the total expenditure. The project remains incomplete till date. The district administration and the contractors are blaming each other.³⁹

If embankments are the solution, we need stronger ones. Instead of solely focusing and annually spending huge amounts of money on repair, research teams can be convened

³⁴Zarir Hussain, Rina Chandra (July 27, 2017), India plans 800-mile highway embankment to curb floods in Northeast.

³⁵Saurabh Gupta (August 6, 2016), Assam's Embankments: Crores Washed Away.

³⁶Mubina Akhtar, August 25, 2017, Dam Worsens Flood Devastation in Assam.

³⁷Samudra Gupta Kashyap (March 29, 2013), 82% embankments in Assam have outlived their utility.

³⁸Saurabh Gupta (August 6, 2016), Assam's Embankments: Crores Washed Away.

³⁹Arunabh Saikia (July 20, 2017), Assam floods: How an embankment in Lakhimpur failed, leaving villages devastated and people dead.

and assigned the task of finding solutions to the embankment breach problem and to come up with permanent or long-term solutions to strengthen them. And if solutions are found, they must be acted upon promptly. In modern times, building stronger embankments shouldn't be such a time-consuming and seemingly impossible issue.

Just as important is the existence of a proper warning system. We found, after interacting with villagers and the District Disaster Management Authority, that there was no proper warning before the floods of July 2017. Whatever warning was sent out did not reach its intended recipients. Consequently, villagers got very little time to salvage valuable items. The quantum of their loss could have been significantly reduced had a proper warning system been in place.

The North Eastern Space Application System (NESAC) had taken the responsibility for developing a model of flood-forecasting and issuing early warnings. Now, the Flood Early Warning System (FLEWS) extends to 14 districts of Assam. The first strategy in the establishment of FLEWS is the consideration of the flood-prone districts on a basin or catchment. The early warning system has been viewed in the context of a river basin approach where upstream, midstream and downstream activities affect the time of concentration and volume of runoff as reflected in the shape of the hydrograph. Given the fact that most flood-prone communities are aware that heavy rainfall intensities upstream may result to flooding in the downstream area, the FLEWS will systematize or enhance the existing coping mechanisms of communities. The second strategy adopted in FLEWS is providing location-specific early warning advisory bulletins. The third strategy is the involvement of all the stakeholders under FLEWS.⁴⁰

The question now is why, when India uses state-of-the-art satellites and local stations for weather forecasting, and when there is the pre-deployment of teams along hazard zones identified through mapping and marking, are the casualty numbers so alarmingly high.⁴¹ India has accused China of not sharing information regarding the Brahmaputra since May, 2017. Under a bilateral agreement between the countries, China provides

⁴⁰ Flood Early Warning System, Official website of the Assam State Disaster Management Authority, http://asdma.gov.in/project_flood_warning.html

⁴¹GauravVivekBhatnagar (August 2, 2017), Heavy Flooding and Casualties Raise Questions on India's Disaster Preparedness,

water-flow information to India, twice a day, during the monsoon season to help with flood forecasting.⁴²

The lacuna in the flood-warning system became evident after interaction with the villagers who did not get information about the impending disaster despite information having been disseminated by the Disaster Management Authority. It lies in the channel through which the information passes -- the flow is not smooth and the information gets lost somewhere in the middle. In Assam where floods are an annual affair, a strong warning system is imperative.

The impact of dams on the floods in Assam requires intensive research. Simply building hundreds of dams without a clear assessment of their effects could be potentially catastrophic for all stakeholders. But the general public always suffers the most. Moreover, it is not clear how beneficial the dams in providing locals with electricity supply either.

The floods bring unimaginable grief to Assam every year. It is difficult to fathom its full effect, because even if we succeed in assessing all economic losses, we may never know the emotional impact of such a disaster. Lakhs of people are affected, directly or indirectly and thousands are displaced from their houses every year. Families are destroyed. Domestic animals and crops are lost. Relief and compensation to affected people is definitely appreciable, but one has to think beyond the short-term as well, and start working for a future where these disasters lose their power. Resource-intensive but ultimately inefficient efforts such as dredging of the Brahmaputra can be like throwing dust in the eyes of the people, when we see there has been so much logical concerns expressed against it. We earnestly request the government to invest public resources into genuine and long-lasting solutions to the problem rather than in projects which are least likely to have lasting impacts.

⁴²MubinaAkhtar(August 25, 2017), Dam Worsens Flood Devastation in Assam.

Gallery

Pictures from Jainpur:







Pictures from Gopalpur:



A school campus in Gopalpur



Pictures from Majgaon:



Silt deposited at the door of a classroom in the primary school at Majgaon



Silt deposited in and around the local Anganwadi at Majgaon



A damaged tractor



A villager in front of his fishery that used to be





A broken culvert





A destroyed bhorai