

Wither Happiness



Sirajul Islam Abed

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By Sirajul Islam Abed

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Women's statements for a change



Social science and politics suggest that peoples' marginalisation is determined by economy. In some cases, other socio-economic factors also contribute to it. But a myriad other natural factors influence the standard of people's life in many countries.

Bangladesh is a no exception. Here, alongside the social and economic factors that contribute to the deprivation, natural causes are no less responsible for marginalisation. Although unbelievable it is true that a huge number of people become marginal and helpless due to river and coastal erosion and cyclones and tidal surges.

It is unfortunate that those actively involved in politics, those at the forefront the process to bring about social change have failed to take appreciate and duly recognise the issue of natural calamity in their political exercise. It is expected that they will rectify their views and change their attitudes and strategies, for the sake of making a positive social and economic change.



The weather-related extreme events and trends, which have been identified as linked to the climatic changes, are rising worldwide. Recent climatic events of erratic rainfall, frequent cyclones in the coastal regions prove that climate change is not an issue of the future. It is present and it is happening now. This change is not only a natural issue, but affects the daily life of people. So, it is not an exception that natural change is hastening marginalization of Bangladesh's masses.

This compilation depicts brief snaps of a larger picture, featuring women, who always take charge of the families, and more so during natural disasters – which in turn are nothing but a result of human activity.



The statements of these very common women at the grassroots are unique and extraordinary, which surpasses their frustration caused by economic and social deprivation. These sometimes may appear like an epic and larger than life.

A note of thanks goes to Sirajul Islam Abed and his colleagues who have collected the testimonies and Khalid Hossain, campaign coordinator of Oxfam and its campaign officer Nuzhat Imam. The effort will be successful if it benefits the readers.

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Words from the Author

Climate change is not an issue of debate anymore now. Emission of greenhouse gases is causing the global warming.

The ever known climate is changing. The planet earth is facing a new challenge; especially the coastal, island and least developed countries, including Bangladesh are bearing the brunt of it the most.



Natural disasters are nothing new here. But continuous global warming has doubled the burden and it has become an undefeatable issue. Even, the natural ability of countrymen in adapting with the changed situation is facing threats.

Very logically, it is the poor and rural people who are facing the first blow of climate change. And, as traditionally the women who do not chiefs in the families, but have to play key role, are the first to face the challenge of climate change.

The country has six seasons, but now it is difficult to find out three, which appear to be aligned with the winter, summer and rainy seasons. The changed climate is causing stronger cyclones, tidal surge, flooding, river erosion, water logging and drought. Melting of the ice in the North Pole and glaciers is causing the sea level rise. Stronger tides are inundating newer coastal areas and salinity intrusion making the land unfertile. In the northern Barind tract, the underground water level has already gone so down that the traditional agriculture system is under threat. River erosion is changing the map of Bangladesh. Turned into climate refugees, million of people now live under the open sky.



The experiences of women and men in facing disasters are not same. Socio-cultural realities have kept the women confined in the houses and made them generally poor in Bangladesh. But, in any disaster it is the women who have to face the calamities in all the steps that are not so easy to do. When the men rush for the safe shelters during river erosion or tidal surge, the women have to take care of the children and protect the assets. Again, as the devastated situation, the women have to take the lead to run the family. When the men go to the towns or cities to earn, the women have to collect drinking water, food, erect a new house and take care of the children.

In the struggle for survival, women use their traditional knowledge and experience for children and families. To do this, the women who usually remain in the houses, came out of their confinement. That, however, always was not very comfortable for them. For lowering of financial status, the women's status has come down, while at the same time, the outgoing women have to face various crises. So, it could be concluded that natural calamities and poverty have made the women more insecure now.



Bangladesh has 30 agro-ecological zones where the effects of climate change are different. They are different in terms of quality and quantity. Women of such 30 zones have talked about their life experiences, which have reflected the affects and dangers of climate change in the country. There are differences in their ways of expression, as they speak local dialects and even languages of the ethnic people. We tried to put their voices intact.

The information on agro-ecological zone, climate change and their effects has been taken from Banglapedia, Dr Ahsan Uddin Ahmed and Ziaul Haque Mukta.

I thank Oxfam to extend its hand in editing the work, especially Ziaul Haque Mukta, who is policy and advocacy manager of Oxfam. Thanks also go to Campaign Coordinator Khalid Hossain and Campaign Officer Nujhat Imam. Also, thanks to those who helped in selecting the interviewees, taking photographs and interviews.

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Zone 1

Old Himalayan Piedmont Plain

in an old Tista alluvial fan extending from the foot of the Himalayas. Most of Panchagarh and Thakurgaon districts and the northwestern part of Dinajpur district are included in this zone.

Characteristic

It has a complex relief pattern. Deep, rapidly permeable sandy loams and sandy clay loams are predominant in this region. Seven general soil types occur in the region, of which non-calcareous brown floodplain soils, black terai soils, and non-calcareous dark grey floodplain soils predominate.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- Drought
- Short lived
- Water logging
- Cold wave

Impact

- Decreased crop production especially rice, wheat and potato
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren which will affect crop production as well as livestock rearing



Burnt paddy

Rawshan Ara (40)

College Para, Boda, Panchagarh

I am a sharecropper and don't have any land of my own. But the contract forces me to give up half my harvest to the landlord. My irri was on the verge of complete destruction because of drought. But we finally saw some rain finally by the grace of Almighty.

The cold was so intense many people saw their irri seedlings 'burnt'. I myself had to sow them twice. This is how we have been living for the past few years.

We don't get good harvests anymore. As a result decent life has become a matter of constant struggle. Earlier, I used to work at home only but now I have to work the fields too. But all these efforts are failing to bring me fortune. We are gradually dying. The weather used to be predictable and we used to harvest crops timely in the past. But nowadays the problem has gotten far worse.

Hard work was never a problem. But the temperature is rising everyday. Nowadays it has become difficult to work the fields due to the heat. We become tired easily. On the other hand the temperature dips in the winters. Thick fog hangs in the air and settles on the rice field lowering production. We cannot say when it will rain anymore.

I recall there had been westerly winds blowing during the summer. But currently it does not. The weird weather is causing different kinds of diseases too.



Hungry Teesta

Rupali Khatun (35)

West Bozrar, Ulipur, Kurigram

My husband was a small farmer. We had two tin-shed rooms, a kitchen, cowshed, and a pond in front of the house. But the Teesta devoured that house. The river began to erode eastward ever since I got married and came to my husband's. One day the river reached right up to my house. Six years into my marriage the river took away everything.

The hungry Teesta took away 150 houses and large tracts of arable land in the blink of an eye. We settled in our new home at Chandni Char.

The river took away my new home within a year. I did not have any place left to settle. Finally we built a makeshift shanty on the slope of the embankment at Bazra Kalirghat. After one year the river became hungry again and began to come towards our house. Once again I had to shift.

But where could we go? At last we took shelter at Dampo intersection in Chilmari. One year later I took shelter in Deoband. But that was also someone else's land.

After taking away all my property the river has calmed down. But floods have become more frequent. The river has dried up now but the flood causes new sufferings. New shoals are emerging in mid-river, shifting course westward. My husband's property is under water now. But I have given up hope of getting any land there. Now I work as a daily labourer. My husband works as a daily farm labourer. I used to get respect for being the housewife of a farmer. But now people humiliate me.

Zone 2

Active Tista Floodplain

floodplains of the Tista, Dharla and Dudhkumar rivers. Most of Kurigram and Lalmonirhat districts are included in this zone.

Region

Characteristic

It has complex patterns of low, generally smooth ridges, inter-ridge depressions, river channels and cut-off channels. The area has irregular patterns of grey stratified sands and silts. Organic matter contents and soil fertility level are low to medium.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- River erosion
- Flood
- Dryness/Drought
- Cold wave

Impact

- Decreased crop production especially rice, wheat and potato
- Livestock will be damaged
- Infrastructure damage
- Continuous sedimentation of sand and clay in river, navigation becomes threatened
- Due to increase in temperature and less rainfall in winter most of the land may become barren which will affect crop production as well as livestock rearing
- Damage to communication system
- Water born diseases increase

Zone 3

Tista Meander Floodplain

of the Tista floodplain as well as the floodplain of the Atrai, Little, Jamuna, Karatoya, Dharla and Dudhkumar rivers. Mainly some parts of Rangpur, Bogra and Naogaon districts are included in this zone.

Characteristic

Most areas have broad floodplain ridges and almost level basins. There is an overall pattern of olive brown, rapidly permeable, loamy soils on the floodplain ridges, and grey or dark grey, slowly permeable, heavy silt loam or salty clay loam soils on the lower land. Eight general soil types occur in the region.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- River erosion
- Flood
- Dryness/Drought
- Cold wave

Impact

- Decreased crop production especially rice, wheat and potato
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren which will affect crop production as well as livestock rearing
- Due to flood and dryness in winter vegetation also decreased



Ominous mist

Marzina Begum (30)

Khalishakuri, Jagannathpur, Naogaon

Flood during the Bengali monsoon months of Ashar and Shrabon does not cause much harm. The harvest would be more or less the same if seeds were planted as soon as the floodwater recedes. The only cost in this case would be seeds. But if it floods during the later months of Ashwin and Kartik it means flooding of vast areas. Several years ago, crops in this entire area were inundated during Kartik.

The flood waters rose as high as the waist and washed away our houses. We found ourselves in a great danger and started working to scrape a living for the family.

I have two daughters and a boy. My elder daughter took her SSC exams this year. My two other younger kids are still in school. But I don't know how long I will be able to keep them there given the circumstances. We are poor and we have a little land of our own. We work on other people's land on contract.

It won't be too worrying if we get proper harvest but it is tough to predict the nature of weather nowadays. On one hand prices of seed, fertilizer and water are increasing and on the other hand natural disasters like drought and flood are coming one after another.

When monsoons go dry, we have to buy water for cultivation. But what is the guarantee that another late flood won't wash away those seeds too? In addition, a new insect called 'current worm' is attacking our fields. This worm destroys crops of an entire area within a few days. They are even immune to insecticides. Only rains can kill it.

Potato grows very well here but rice production has been very bad. I took a loan from a local cooperative last year and cultivated potato. Dense fog destroyed most of the crop. I harvested only five maunds (1 maund ~ 37.3kg) of potato in per bigha (1 bigha ~ 33 decimals). How will we survive?



Metallic land

Aloka Rani Singh (35)

Naogaon, Tarash, Sirajganj

We are from the bank of the Karatoa river. I grew up on the river bank. I was married to a man from the village named Bheduri in the area. At that time I had my husband's house, two kani's of land, vegetable garden and net full of fishes. I would have three meals a day from the rice we grew. My husband could even sell some of the rice after meeting the household demand.

But we are unlucky. Once a housewife of a well-to-do farmer, I have become a day labourer working in fields along with my husband.

One day we had to sell half our land. Misfortune came along as the river died. It was a regular scenario that my husband was returning home everyday with groceries after selling a boat full of fish. But now we don't have any place to fish. The river lies dried round the year. We had to sell our boat and net to manage food for the family seven years back.

The rest of our land did not yield as much crop as it used to in the past. Crops get destroyed due to lack of irrigation as the river has dried up. The land is not fertile anymore.

Nowadays insects destroy our rice production. In 2007 all of our crops were destroyed by an attack of 'Harisha'. We pass our days in sorrow borrowing money from NGOs. Siltation used to help us grow piles of paddy on our land downstream Karatoa. But the land lost its fertility as the river died. Not the land looks like a flat piece of fine metal. How will we survive? How will we care for our children?

Zone 4

Karatoya-Bangali Floodplain

Tista Meander Floodplain in physiography and soil, and comprises a mixture of Tista and Brahmaputra sediments. The eastern half of Bogra and most of Sirajganj districts are included in this zone.

Region

Characteristic

Most areas have smooth, broad, floodplain ridges and almost level basins. The soils are grey silt loams and silty clay loams on ridges and grey or dark grey clays in basins. Five general soil types occur in the region, of which non-calcareous grey floodplain and non-calcareous dark grey floodplain soils predominate.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood (esp. in Shahjadpur)
- Drought
- River erosion
- Cold wave

Impact

- Decreased crop production especially rice, wheat and potato
- Livestock will be damaged
- Infrastructure damage
- Damage to communication system
- Due to increase in temperature and less rainfall in winter most of the land may become barren which will affect crop production as well as livestock rearing
- Due to prolonged flood and dryness in winter vegetation also decreased

Zone 5 Lower Atrai Basin

area between the Barind Tract and the Ganges river floodplain. It includes the Chalan Beel area. Part of Naogaon, Natore, Pabna And, Sirajgonj districts are included in this zone.

Characteristic

Dark grey, heavy, acidic clays are predominate in this smooth low-lying basin land. Seven general soil types occur in the region. Organic matter, and status of other essential nutrients are medium, while level of available Potassium is high. Fertility status of soils is moderate.

Changes in Climatic Variables

- Rainfall Pattern Change
- Temperature Increased
- Increased Humidity

Changes in Physical System

- Flood
- Drought
- Sedimentation
- Dry out of water bodies

Impact

- Decreased crop production
- Livestock will be damaged
- Fisheries damage
- Bio-diversity loss
- Continues sedimentation of sand and clay the area become dry up
- Dry out water bodies/Fisheries



Tears of Chalan Beel

Kadvanu (40)

Naokhada, Saguna, Tarash, Sirajganj

I brought these things from the other side of the river. The farmers harvested maize and we brought the dried maize stems to use as firewood. I can't say my family is passing its days happily but that is how it must be.

Not only mine, but happiness of all those living around the Chalan Beel has faded away with the aman harvest gone. No harvest means no food. The floodplain is filled to the brim and a single bout of rain could trigger the water to overflow and flood the adjacent areas. But then, the entire floodplain dries up in no time when there is no rain.

We used to have floods in the past but those were different. The rain pattern has also changed. It is supposed to rain during Ashar and Shrabon. But it rained very little last year during that time. There was more hailstorm than there was rain. This year, at the end of Shrabon it rained a little but that was too inadequate to wet the paddy field and naturally the aman harvest did not yield much. I remember the aman paddy fields flush with water where we would even fish. Those fish have also disappeared.

We planted rice on a part of the beel on contract but one cannot afford that in the midst of so much unpredictability. I was married off to a man from a nearby village. We had a small piece of land. But incessant floods began kept destroying our rice harvests.

I used to work wherever and whenever I could. I even wove fishing nets although my husband was unwilling to do anything other than what he had inherited as a vocation. To him, taking up someone's employ is debasing. But the irony is that his wife was working as a housemaid. Roaming around the neighbourhood aimlessly he would return by supper. Sometimes, he even beat me if I failed to scrape together something to eat.

At one point I left him and returned to my father's with my son. It has been seven years since. He married again, with dowry. I live alone with my son. I try to work wherever and whenever possible. What else could I do?



We are tired of the backbreaking work

Mainur Hembrong (50)

Manohorpur, Nitpur, Porsha, Naoga

We are poor people, we live on day labour. We are both very tired of working so hard all the time. We collect straw from the meadows, make broom out of it and then carry them on our heads to sell them off at the villages. We sell a pair of broom at Tk 30. Earlier, straw used to be found here and there. We used to find meadows merely walking down the path from our house.

Now there are floods every year and they damage the straw. We have to go far and wide to get straw now. People don't like it when try to cut off straw in unknown places and they often become abusive as we are mere strangers there. But then where to get the straw? These floods have lefts virtually jobless.

We work as day labourer in the fields of Shahu. We sow and harvest rice, we weed the crop fields. I earn between Tk 50 to Tk 80 everyday by harvesting paddy. Earlier, when my husband was healthy, we used to go fishing in the floodplains during the monsoon. We go fishing now too, but only when he feels up to the mark.

However, we don't get as much fish as we used to. Fish have become rarer. We used to get 'Baush', 'Air', 'Gagor', 'Bachha' and 'Pabda' in the past. But now we mostly catch 'Chanda', 'Tengra' and 'Batashi'.

The Beel, which is a floodplain, dries up during droughts. I used to rear pigs. All my pigs died in a sudden outbreak of disease three years ago. What can I do now? I collect straw and make brooms and sell them from door to door.

It is tough selling broom walking barefoot. The earthen path or the roads become too hot during the day and the feet burn.

The situation gets worse during the dry season and the hardest thing at that time is to collect water during the dry spells. I have to bring water from the next village. My husband is bed-ridden and I can't afford to have him see a doctor. I shudder to think what would happen to my four children if I fall sick by any chance.

Zone 6

Lower Punarbhaba Floodplain

and beels separated by low floodplain ridges. The western part of Naogaon and the northern part of Nawabganj districts are included in this AEZ.

Region

Characteristic

In this area, dark grey, mottled red, very strongly acid, heavy CLAYs occupy both ridge and basin sites. Organic matter status is medium to high. General fertility level is medium with high K-bearing minerals.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- Drought
- Sedimentation
- Dry out of water bodies
- Cold wave

Impact

- Decreased crop production
- Livestock will be damaged
- Fisheries damage
- Bio-diversity loss
- Continues sedimentation of sand and clay the area become dry up
- Dry out water bodies/Fisheries

Zone: 7

Active Brahmaputra-Jamuna Floodplain

unstable alluvial land along the Brahmaputra-Jamuna rivers. Mainly some parts of Bogra, Sirajgonj and Kurigram districts are included in this AEZ.

Characteristic

In this region land is constantly being formed and eroded by shifting river channels. It has an irregular relief of broad and narrow ridges and depressions. The area is occupied by sandy and silty alluvium, rich in weatherable K minerals that are slightly alkaline in reaction. Six general soil types occupy the area. Fertility status is low to medium.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- River erosion

Impact

- Due to increase in temperature and less rainfall in winter most of the land may become barren which will affect crop production as well as livestock rearing
- River erosion makes most of the char people shelterless and land less
- Continuous sedimentation of sand and clay in river, navigation becomes threatened
- Damage to communication system
- Most of the people become jobless during flood and migrate to other place for food
- Waterborne diseases increase



Suddenly rose the river

Dukkho Bala (52)

Sardarpara, Chilmari, Kurigram

I was married to Noren Majhi of Hasher Bhita village at Raniganj union in Chilmari. My husband had built a big house in Borobhita village at that time. The village was five to six miles away from the river Brahmaputra. But the river turned voracious and we lost everything in eight to nine years. Suddenly the river rose up against us and began to gulp down village after village. One day it was my turn.

By that time I did not have the ability to purchase a new piece of land. Some of us jointly bought a piece of land at Sutarmari village on the west side of Brahmaputra river and made the area our new home. We lived there for eight years. But the river could not tolerate my happiness and came towards us. It took away 2 to 3 bighas (1 bigha ~ 33 decimals) of land in a single spell of erosion. I have never seen such erosion in my life. The river devoured the entire village in front of our very eyes.

I settled once again in Telipara village, on the western side of Sutarmari village. But that was lost to erosion in three-four years too. My next address was at Sardarpara. Wherever I went, the river followed. Sardarpara was lost to the river the next year. I built another house behind Sardarpara. At this point my husband died. And the same year I lost that home too.

Currently I live on the Sardarpara embankment road. My two sons got married and have gone their ways. And now I have to work wherever I can to manage to manage a single meal. I work at different places. I work as a day labourer or a housemaid.



Hails send tobacco up in smoke

Moriom Begum (60)

Janna, Shaturia, Manikganj

My parents arranged my marriage to a family in Janna village considering their property. My in-laws house was by the side of Dhaleshwari river. They had a good production of various food grains. They also cultivated sweet potato by the riverside. During rainy season, the river filled to the brim. After harvesting aus, they sowed aman and that used to grow almost at the same pace as the rising flood water.

Now there is no water. And water is there, it washes away everything. There are even two floods a year. Nowadays people cultivate tobacco, maize, aubergine, pumpkin and other vegetables. We do it too. What else could we do as the land does not produce rice as it did earlier?

Cultivation of hybrid rice costs much as we have to buy water, pesticides, fertilizer and many other things for cultivating this rice. The boro season production also does not bring us any benefit as it needs more day labourers. Now we cultivate pumpkins and lentils.

Labour has also become costlier. So we have to do many things by ourselves. I go to the field in the morning and carry the maize home myself.

Producing tobacco has become profitable now. The company provides seeds, fertilizer even loans. Price is also good. I have to go to the tobacco field with men and work with them as there are many chores. But this year the hailstorm damaged the entire tobacco crop.

The production of pumpkin was good but not the price. I paid instalments of Tk 15,000 this year by selling these vegetables. In addition I have to buy salt, oil and many other groceries.

I cannot save anything. All my savings are spent on medicine and clothes. Earlier, I did not need to buy fish as those were available in the wetland around my home. People used to catch shrimp and other fish with their traps. But now fish have become so rare that we have to buy them from the market.

Zone: 8

Young Brahmaputra and Jamuna Floodplain

Brahmaputra sediments. Mainly some parts of Pabna, Manikgonj, Tangail, Kishorgonj and Norshingdi districts are included in this AEZ.

Region

Characteristic

It has a complex relief of broad and narrow ridges, inter-ridge depressions, partially in filled cut-off channels and basin. This area is occupied by permeable silt loam to silty clay loam soils on the ridges and impermeable clays in the basins, neutral to slightly acid in reaction. General soil types include predominantly grey floodplain soils. Organic matter content is low in ridges and moderate in basins.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- Drought
- River erosion

Impact

- Decreased crop production especially rice, wheat and potato
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren which will affect crop production as well as livestock rearing
- Damage to communication system
- Due to prolonged flood and dryness in winter vegetation also decreased

Region

Zone: 9

Old Brahmaputra Floodplain

Brahmaputra sediments before the river shifted to its present Jamuna channel about 200 years ago. Parts of Sherpur, Jamalpur, Tangail, Naraiongonj and Norshingdi, Mymensingh, Netrokona, Kishoregonj districts are included in this AEZ.

Characteristic

The region has broad ridges and basins. Relief is irregular, especially near the old and present river channels. Soils of the area are predominantly silt loams to silty clay loams on the ridges and clay in the basins. Organic matter content is low on the ridges and moderate in the basins, topsoils moderately acidic but subsoils neutral in reaction. General fertility level is low.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- Drought

Impact

- Decreased crop production especially rice, wheat and potato
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren which will affect crop production as well as livestock rearing
- Damage to communication system
- Due to prolonged flood and dryness in winter vegetation also decreased



Dried out

Rokhsana Begum (38)

Utrapur, Brahmini, Araihaaz, Narayanganj

Drought has destroyed everything. We cannot say when the rains will come. We are farmers. We decide on the course of action depending on when it rains. It is this rain that decides when to produce rice and when to produce jute. Over the last few years all of our predictions and assumptions have proved wrong. The more days that pass without rain the more difficult it becomes to cultivation without irrigation.

In the past, we used to cultivate jute after a little rain during Falgun and Chaitra. But now irrigation is required for jute cultivation. This year we have not seen rain even past the month of Ashar although it is supposed to kick off monsoon. Finding no solution I sowed rice. But I have no idea how much I might be able to harvest at the end of the season.

The river has also dried up. Deep tube wells are the only source of water now. Such extraction of water is resulting in another problem. It is spreading arsenic. Our area is affected by it.

The tube well water at my home was tested positive three years ago. I bored the tube well in vain. Now we have only one arsenic free tube well in the entire area. I have to bring drinking water from Bhatibalia. The only 'clean' tube well of the area is located there.

This problem worsened with the death of the river (Old Brahmaputra). Even five years ago I used to do all the washing and other household chores, including cooking, with river water. We would also irrigate the fields with river water. The river is dead now and there is hardly any current either. Industrial waste has piled up, polluting the stagnant waters. We cannot use the water.

My husband is a grocer and I am rearing five Australian cows. But unusually high temperatures have lowered the milk production. My husband and I are doing everything possible for our children but it is not making much of a difference.



The last straw

Anwara Begum (48)

Bagha Rajshahi

The river gulped all my property. It was not that the my property fell to river erosion just once but they fell thrice. My parents arranged my marriage considering the wealth and property my husband owned. I was 14 or 15. The Kalidaskhali river began to eat away its banks when my first born was two or three years. What an erosion that was! Large tracts of land would disappear overnight. The river would advance by one mile or a half mile in a single day. The river was far away from here at that moment. We rebuilt our home by the riverside and it was destroyed at the very beginning.

I built home again and lost that too in the erosion once again. All my home, cows and cattle were washed away overnight. All wealth and properties my husband owned had vanished. My husband was a farmer and loosing land meant that he would be reduced to a beggar.

Again a house was built at Koligram. But I could not stay there for long. I built a house at Bagha on two kathas (2.3 deicmals) after losing that home.

I married off my four daughters and two sons. I failed to ensure their education because of my severe financial crisis. My husband hawks different things nowadays. Instead of passing idle time, I stitch wrappers to make some extra money. I have to bear the burden. Once upon a time, I had everything — house and property. I used to have respect in the society. Now I live from hand to mouth. What my husband earns is not enough to run the family. Poverty follows us everywhere.

This is my last straw. If the river advances one more time, I will lose that too.

I bought a cow one and half years back with a loan. But the cow refuses to eat in the harsh heat. The calf does not grow. Finally I managed to sell the cow and recovered some of my debt.

Now my hens are dying one after another from severe heat. There are no eggs either. What is going on?

Zone: 10

Active Ganges Floodplain

alluvial land within and adjoining Ganges river. Mainly Chanpaina-babgonj, Rajshahi and Shariotpur districts are included in this AEZ.

Region

Characteristic

It has irregular relief of broad and narrow ridges and depressions interrupted by cut-off channels and active channels. The area has complex mixtures of calcareous sandy, silty and clayey alluvium. The general soil types, predominantly include, calcareous, alluvium and calcareous brown floodplain soils. Soils are low in organic matter and mildly alkaline in reaction.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- River erosion
- Cold wave

Impact

- Decreased crop production
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren
- River erosion make most of the char people shelter less and landless
- Communication sedimentation of sand and clay in river, navigation becomes threatened
- Due to prolonged flood and dryness in winter vegetation also decreased
- Water bone diseases increase

Zone 11

High Ganges River Floodplain

part of the Ganges river floodplain. Mainly Part of Chapai Nawabgonj, Rajshahi, Pabna, Kustia, Meherpur, Chuadanga, Jhinaidah, Magura and Jessore districts are included in this zone.

Characteristic

Most areas have a complex relief of broad and narrow ridges and inter-ridge depressions. The upper parts of high ridges stand above normal flood level. Lower parts of ridges and basin margins are seasonally shallowly flooded. General soil types predominantly include calcareous dark grey floodplain soils and calcareous brown floodplain soils. Organic matter content in the brown ridge soils is low but higher in the dark grey soils.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- Drought
- River erosion
- Water logging

Impact

- Decreased crop production
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren
- Due to prolonged flood and dryness in winter vegetation also decreased
- Damage to communication system



A case of dying chickens

Morjina Begum (40)

Paligram, Maria, Durgapur, Rajshahi

I lost all my land to river erosion. I cannot carry on with my family under such financial constraint. I pass every moment in unhappiness. God knows who gave the idea of having a poultry farm. I went from door to door to borrow some money but it was all in vain. At last I bought chickens by borrowing money from a cooperative society and had the farm house built from the proceeds from selling a piece of my land I had inherited. I dreamt of a happy future.

I started the farm with two hundred chickens. At first it was going well. But the severe temperature began to kill my growing chickens. I wanted to install some fans but the temperature is so intense that even the fans do not work. One after another 90 of my chickens died. All my chickens weighing over 1.5kg died.

I did not get back the money I had invested. Now I cannot even dare to go for further investment. I could not even pay back the loan I took from the cooperative. The temperature is going up and one of my neighbours, Alam, also experienced the same fate. Alam has reinvested in his farm and bought new species of chicks. But this type of chicken does not grow fast. Alam expects no profit. If there is no profit what is the use of a poultry farm?

Earlier, you could raise chickens without any farm. What you needed was a coop. Now you cannot do it even in a farm. Our days seem to get worse. The temperature is going up and chickens do not like to feed. The temperature also ruins eggs, affecting chicken production very hard.

In the past housewives like me made savings from selling eggs. Now there is no chance of doing that. How much can a man earn from his physical labour. Is there any prestige for women if they do not have any money?



Lost village

Rokeya Banu (36)

Habib Bazar, Sadipur, Aliabad, Faridpur

We are from the bank of Padma river. I grew up there. I got married there. We were not rich but could manage three square meals a day all year round. But the irony is that now, I work as a day labourer and my husband pulls rickshaw. This river has sent us on to the verge. The river used to erode every year but no one imagined it could take such a dangerous turn. Thousands of villagers from Dedu Mollar Hat, Namazer Math, Bishwash Dangi, Taherpur Dangi, Teli Dangi have vanished somewhere nobody knows.

I took shelter on the embankment leaving my chickens, cows and other belongings. Now the embankment is being constructed to resist floods, but flood are happening every year. Last year there were two bouts of floods.

After erosion we passed the first days in unemployment. Later my husband went to Dhaka to become a rickshaw puller. Back on the embankment I passed my days sometimes sleeping on an empty stomach sometimes a half empty stomach. But how long can one carry on like this? I worked in the houses of others but could not earn enough to pay for daily meals.

Seeing my children cry in hunger, I stepped out the house became a day labourer. I earn between Tk 20 and Tk 30 everyday. My husband visits every 20 or 25 days. Once our savings are finished, my husband goes back to the capital. I will have to carry on with working as a labour as long as my body can bear it.

What and irony, a farmers' wife has become a day labour. I will not even be able to marry off my daughter married to respectable families. Shoals are rising in the rivers and those are our lands.

I don't expect to get our land back from there though. It needs muscle power to gain the land from the new shoals. I don't have so much muscle to claim that piece of land.

Zone: 12

Lower Ganges River Floodplain

half of the Ganges river floodplain which is low-lying. Part of Chanpai Natore, Rajshahi, Pabna, Faridpur, Rajbari, Madaripur, Norail, Khulna, Bagerhat, Barishal, Manikgonj and Kushtia districts are included in this zone.

Region

Characteristic

The area has a typical meander floodplain landscape of broad ridges and basins. Soils of this region are silt loams and silty clay loams on the ridges and silty clay loam to heavy clays on lower sites. General soil types predominantly include calcareous dark grey and calcareous brown floodplain soils. Organic matter content is low in ridges and moderate in the basins.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- River erosion

Impact

- Decreased crop production
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren
- Due to prolonged flood and dryness in winter vegetation also decreased
- Damage to communication system

Zone: 13

Ganges Tidal Floodplain

area of tidal floodplain land in the southwest of the country. Part of Barishal, Jhalokathi, Potuakhali, Borguna, Pirojpur, Khulna, Bagerhat, and Satkhira districts are included in this zone.

Characteristic

The greater part of this region has smooth relief having large areas of salinity. Riverbanks generally stand about a metre or less above the level of adjoining basins. Non-calcareous grey floodplain soil is the major component of general soil types. ACID SULPHATE SOIL also occupies a significant part of the area, where it is extremely acidic during the dry season. Most of the topsoils are acidic and subsoils are neutral to mildly alkaline. Soils of the SUNDARBANS area are alkaline.

Changes in Climatic Variables

- Rainfall Pattern Change
- Increased Humidity
- Wind spread
- Temperature increase

Changes in Physical System

- Sea level rise
- Cyclone and tidal surge intensity increased
- Salinity increased
- Soil erosion

Impact

- Coastal area go under saline water
- Decreased crop production
- Most of the settlement, construction, industries will be damaged due to increased salinity
- Scarcity of drinking water and water born disease occurs
- Due to prolonged flood and dryness in winter vegetation also decreased
- Damage to Sundarbans
- Intensity of cyclone and tidal surge affect coastal livelihoods and people are migrate from rural to urban centre



Under the open sky

Farida Begum (30)

Chandipur, Padmapukur, Shyamnagar, Shatkhira

We were already suffering much from salinity and cyclone Aila came as the final nail in the coffin. The cyclone washed all our belongings away including my five goats and chickens. The tidal surge also breached the river embankment. Now my front yard is under neck deep water during the high-tide. The water level goes down to waist level during low tide. I live with my two daughters under a polythene-sheet for a roof in a makeshift home on the embankment. Like me there are several thousands on the embankment living under the open sky.

When it rains at night, we get up and pass the night sitting. Now I live on the money I earned by working as a day labour for the union parishad. Sometimes I go for fishing in the river and sometimes work in the field. Days have become so long. Under the circumstances I married off my eleven year-old daughter.

But the days were not like this always. Earlier, rice grew aplenty even in the places where now we now have shrimp enclosures.

Rice does not grow well since the land began turning salty. No more rice grows on it. This situation saw the rise of shrimp enclosures. And the shrimp farm owners grabbed the little land we had left in hand. Now there are shrimp enclosures everywhere. Salty water submerged the entire area. There are a few ponds in the area from where we have to collect the drinking water.

I was married to a man in Pakhimara village. The same situation prevails there. My husband died six year back from diarrhoea. I have to return here again. Now the salinity is everywhere. I have to bring drinking water from two miles away. How many times can one fetch drinking water from so far away.

Salty water often causes diseases like diarrhoea, scabies and fever. No money, no doctor, no food. My elder brother-in-law died during the Aila, one of his children died a few days ago. Who knows what is awaiting them.



Water, water everywhere

Jarina Begum (50)

Barandali, Trimohoni, Keshabpur, Jessore

In 1988 along with neighbours I went to a distant village to see the flood. Ironically now I am dying under the water. Due to overflow of water from Kapotaksha river, since 2000 we pass most of the time of the year either in school or on a road. Only last year I had the chance to stay at home. But this year I fear I might have move.

I was happy with whatever property I had. But I had to sell my arable land gradually under poverty thanks to the continuous water logging over the years. Now I just have the small yard where my little home stands, I don't have the ability to repair the damaged house.

I had my elder daughter married off to a man at nearby Dharmapur village. But due to severe poverty, mostly because of water logging, the man divorced my daughter and sent her back to me. Though both of my sons work as day labour in the field, I have to add something working as a domestic help to run the family.

The situation worsens during the monsoon. During rainy days we sit unemployed and spend days starving. Sometimes we collect snails from the marshes and sell them off. It becomes the only means to livelihood.

I have never heard of arsenic earlier. We are now in fear as we hear that the problem is found in a nearby village. Once the floodwater recedes, drought begins to haunt us. We cannot even pump up water using the tube well. The whole village suffers for water.

Diseases have become frequent and on the rise due to the Kapotaksha. Often we suffer from headache, fever, abdominal pain, diarrhoea, and scabies. Even adult girls face problems conceiving and suffer from abdominal pain during their periods. It has become very tough to get the girls married.

Zone 14

Gopalganj-Khulna Beels

low-lying areas between the Ganges river floodplain and the Ganges tidal floodplain Part of Bagerhat, Khulna, Norail, Jessore, Madaripur and Gopalganj districts are included in this zone.

Region

Characteristic

Soils of the area are grey, and dark grey, acidic, heavy clays overlay Peat or muck at 25-100 cm. General soil types include mainly peat and non-calcareous dark grey floodplain soils. Organic matter content is medium to high. Fertility level is medium.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Inundation
- Drought
- Sedimentation
- Water logging

Impact

- Decreased crop production
- Livestock will be damaged
- Fisheries damage
- Bio-diversity loss
- Continues sedimentation of sand and clay the area become dry up
- Soil moisture loss
- Dry out water bodies/Fisheries

Zone 15 Ariyal Beel

basin between the Ganges and Dhaleshwari rivers. Part of Munshiganj and Dhaka districts are included in this zone.

Characteristic

It has much in common with the lower Atrai Basin and the Gopalganj-Khulna Beels. The soils of this area are dark grey, acidic heavy clays. Non-calcareous dark grey floodplain soil is the chief general soil type. Organic matter content generally exceeds two percent in the top subsoil. Available moisture holding capacity is inherently low. General fertility level is medium to high.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- Sedimentation

Impact

- Decreased crop production
- Livestock will be damaged
- Fisheries damage
- Bio-diversity loss
- Continues sedimentation of sand and clay the area become dry up
- Soil moisture loss
- Dry out water bodies/Fisheries



Where would the fish come from

Nilufar Begum (35)

Doyahata, Morichbari, Srinagar, Munshiganj

We the people of Ariyal beel, catch fish during the monsoon. We grow pumpkin, bitter gourd, tomato, cucumber and also rice during winter. We have been doing it for generations.

In my childhood, aman rice used to be sowed in Jaistha and we used to harvest in Ashwin or Kartik. Nowadays aman does not grow anymore. Now the cultivation boro starts in Poush or Magh and we harvest it in Baishakh. But everything is messed up in last few years. All the rice in the lowlands is inundated in Baishakh.

We were expecting to harvest at least 150 maunds of rice from three acres of land, but managed to harvest only 20 maunds.

My husband used to work in Singapore. We took three acres of land for three years with the money he sent from there and added to it with loans from Grameen Bank and a money lender. But we could not even get back the money we invested. How will I repay the interest? Now I am depending on my potato yields. If the production is good then we can recover the money we already spent. But who knows what is going to happen if dense fog damages the potato production like it did in the previous year.

The fish are not available in the beel anymore. It was easy to catch fish in the floodwater in the lowland. The Ariyal beel was famous for its fish. We used to sell eels, walking fish, fry fish, snake head, catfish after meeting our family needs.

My husband used to leave 3:00am and came back at noon with fish worth only about Tk 50. What would we do with this money?

The fish spawn in Jaishtha and Ashar when new monsoon water comes. But there is not a drop of water even in Ashar, the month of rainy season. Where would the fish come from?



Zone 16 Middle Meghna River Floodplain

channel of the Brahmaputra River. The region includes areas of old Brahmaputra *chars* within the Meghna River as well as adjoining parts of the mainland. Part of Kishorgonj, Brahmanbaria, Cumilla, Chandpur, Norshingdi and Munshigonj districts are included in this zone.

Characteristic

Soils of the area are grey loam on the ridges and grey to dark grey clays in the basins. The dominant general soil type is non-calcareous grey floodplain soil. Topsoils are strongly acidic and subsoils slightly acidic to slightly alkaline. General fertility level is medium.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- River erosion
- Drought (slight)

Impact

- Decreased crop production especially rice, wheat and potato
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren
- Due to prolonged flood and dryness in winter vegetation also decreased
- Damage to communication system

Down to a boat

Sadhona Rani Barman (47)

Shatnol, Malopara, Matlab, Chandpur

My husband died in 2004 in a ferry accident leaving behind young children. Now I sell fish from village to village to earn my bread and butter. I don't have enough money. So I can't buy Hilsha, which is in much demand.

The wholesaler gives the small fishes on credit in the morning and take his money in the afternoon when I have sold the fish. But the fish trading is not a profitable now as fishes have decreased in the river. The more days are passing, the more fish are disappearing.

Now the fishermen fish for the entire day in the river but don't get a good catch. The water is there, the boats are there but no fish. River erosion has also increased significantly. My site of my house now is in the middle of the river.

The Meghna river has become insane for the last few years. It would not let us survive. The water inundates our yards during high tide. There was a temple here where I am standing now. It had to be shifted from here.

My whole life I saw the river in a character, but now it has changed into another. It appears unknown to me. The storm and rainfall have also increased. The river becomes so choppy during the storm that it looks it will fly away with the gusty wind.

Heat waves have been sweeping the country for the last few years. I feel like it would boil everything. People used to cultivate potato and bitter gourd here, but now they do not. Those vegetables have been rotting in the field for last few years. Only rice grows here. I sowed some pumpkin seeds but they did not grow. Now we have to buy vegetables from Narayanganj.

Zone 17

Lower Meghna River Floodplain

area between the middle Meghna river floodplain and the young Meghna estuarine floodplain. Mainly part of Chandpur, laksmipur and Noakhali districts are included in this zone.

Characteristic

Soils of this area are relatively uniform, silt loams occupy relatively higher areas and silty clay loams occupy the depressions. Non-calcareous dark grey floodplain and calcareous grey floodplain soils are major components of general soil types. Topsoils are moderately acidic and subsoils neutral in reaction. General fertility level is medium to high.

Changes in Climatic Variables

- Rainfall Pattern Change
- Increased Humidity
- Wind spread
- Temperature increase

Changes in Physical System

- Flood
- River erosion
- Salinity increased

Impact

- Decreased crop production
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren
- Due to prolonged flood and dryness in winter vegetation also decreased
- Damage to communication system



A three-prong attack

Rupali Bala Nath (35)

West Charbata, Subarnachar, Noakhali

Salinity increases if there is little rain and that ruins our crops too. Crops die if salinity increases. What can we do now?

Sometimes dense fog envelopes everything while severe cold sweeps the area for quite some time. Our family barely survives cultivating the shoals.

But dense fog, cold and salinity have become our enemy nowadays. We have a big family comprising three daughters, one son and my husband.

We sent our 16 year old son to work in a barber shop. We have only five decimals of land which is not enough. So we have to cultivate other's land with a contract of sharing half the yield with the landowner.

Last year we cultivated peanuts on two acres on crop-sharing basis and got 60 maunds of peanuts in our share. So we cultivated the peanuts this year too anticipating good yield. But this time most of the seeds did not germinate as there was a dense fog during the end of *Poush* and beginning of *Magh*.

So I had to sow the seeds again at the end of *Magh*. But there was no rain during *Falgun* and *Chaitra* which increased salinity and the plants got 'burnt'. Already I have spent around Tk 40,000 on the peanuts this year.

I had to borrow Tk 16,000 from a loan shark under a deal of giving back a maund of rice for every thousand taka as interest. I anticipate I would not be able to harvest more than 20 maunds of peanuts this year.

Now I have to ask for money from my son to pay back the interest.

Now we are praying for rainfall in the *Falgun* and *Chaitra* otherwise we have to count a big loss.

Our skin itch and develop sores when salinity increases. People often suffer from diarrhoea, dysentery, skin diseases and itching.



Rising tide

Zannat Begum (27)

Noler Char, Chanandi, Hatia, Noakhali

Last year, when cyclone Aila hit, I got trapped under our house, along with my children. There was a storm in one hand and a tidal surge on the other. There was no way other than calling the almighty. Our house collapsed as soon as the cyclone started in the morning. After spending a long day in that situation, people rescued us from there.

Then, we took shelter in a relative's house crossing an area under neck-deep water. The tidal surge washed away all my chickens, utensils, clothes and what not.

The standing crops in the fields were damaged by the saline water. It is surprising that the house goes under water during the high tide now. I have never seen anything like that before. Besides, the crops also get damaged. The small children do not understand good or bad effects of saline water. They bathe there, but then that ultimately leads to various illnesses, especially skin diseases. Once they get such diseases, there is no end to sufferings. There is no government doctor here. We have to go to the market across the river to see a doctor. And, if the river remains rough, we cannot do that either.

We have been living here in the char for the last five years since the river devoured our house. My husband went to the town to work. I am here with three children. The storm destroyed the house and I had to repair it. The frequency of storms has gone up. There is no end to fears of cyclone.

I have a small piece of land, but due to salinity it has become difficult to grow crops there. It remains fallow. Rearing some ducks and chickens is now the only option for survival. In other times, I sew together fishing nets.

Zone 18

Young Meghna Estuarine Floodplain

land in and adjoining the Meghna estuary. Mainly part of Feni, laksmipur, Noakhali, Vola and Patuakhali districts are included in this zone.

Region

Characteristic

The major soils are grey to olive, deep calcareous silt loam and silty clay loams, and are stratified either throughout or at shallow depth. Calcareous alluvium and non-calcareous grey floodplain soils are the dominant general soil types. Topsoils and subsoils of the area are mildly alkaline. General fertility is medium but low in N and organic matter.

Changes in Climatic Variables

- Rainfall Pattern Change
- Temperature increase
- Increased Humidity
- Wind spread

Changes in Physical System

- Sea level rise
- Cyclone and tidal surge intensity increased
- Salinity increased
- Soil erosion

Impact

- Costal area go under saline water
- Decreased crop production
- Most of the settlement, construction, industries will be damaged due to increased salinity
- Scarcity of drinking water and water born disease occurs
- Due to prolonged flood and dryness in winter vegetation also decreased
- Intensity of cyclone and tidal surge affect costal livelihoods and people are migrate from rural to urban centre
- New diseases break out

Zone 19

Old Meghna Estuarine Floodplain

mainly low-lying land between the south of the Surma-Kushiyara floodplain and the northern edge of the young Meghna estuarine floodplain. Part of Hobigonj, Brahmanbaria, Cumilla, Chandpur, Feni, Noakhali, Dhaka, Narayan-gonj, Shariatpur, Madaripur and Munshigonj districts are included in this zone.

Characteristic

Silt loam soils predominate on highlands and silty clay to clay on lowlands. Organic matter content of the soils are moderate. Topsoils are moderately acidic, but subsoils neutral in reaction. General fertility level is medium.

Changes in Climatic Variables

- Rainfall Pattern Change
- Increased Humidity
- Temperature increase

Changes in Physical System

- Rainfall Pattern Change
- Increased Humidity
- Temperature increase

Impact

- Decreased crop production
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren
- Due to prolonged flood and dryness in winter vegetation also decreased
- Damage to communication system



Arable land goes dry

Nasima Begum (63)

Azgar Munshir Kandi, Bilashpur, Jazira, Shariatpur

Fishing has never been my livelihood. But, it is the bad fate that has pushed me to get into it. Both my parents and in-laws were farmers. We, the women, used to do household work. But, today we have to do whatever there is. Sometimes we go to the river to catch fish with nets and sometimes work as day labourers. The river devoured our land twice, including our houses. Whatever land we have now has become sandy, which is not fertile enough to grow crops. So, the crop growing there is too little to manage the six-member family. My husband cannot support the family on his own. So, I am forced to work for others in the fields.

Flooding is an annual phenomenon, and in addition to it there are cyclones like Sidr and Aila. River erosion appears to be a perpetual process. Production of crops is very important – be it in our field or others. We try to grow crops as sharecroppers, but when flood inundates and damages the crops, there is no one to help us. It gets truly difficult to survive. After the house was devoured by the river, we built another, but that was also destroyed by cyclone Sidr. We have not been able to repair it yet. How can we bear such pain of losing a shelter, again and again?

I got stomach ache because of poor diet. I feel dizzy when I get the aches, but still cannot go to see the doctor. Where shall I get the money for treatment when there is barely enough for bare survival? Poverty, tension and sickness -- I became very sickly person. I cannot work hard now. I am not sure what the future holds for me.



Killer floods

Nazma Begum (28)

Daudpur, Khalilpur, Moulavibazar

We are homeless. It was devoured by the river Kushiara when heavy flood eroded its banks. Having lost the house, we have been living on a char for the last three years. For six months, starting from Boishakh (the first month of Bangla year), we have to fight the floodwater here. Fearing floods, I sent my children to my father's house. My husband and I live in the house, despite the water. Around 100 families live just like us. It is a matter of fear that snakes could enter anytime. During rain or storm, there is none to save us, except Allah.

A few months back, I bought some ducks and hens of Tk 3,000, hoping that rearing those would bring some money. Only in a few days of the flood, all of them died in some disease. It is double danger. Now, the owner of the land is creating pressuring for rent. We were indebted to the bank and now on top of that we have lost the birds. How do we run the family then?

I cannot send my children to school. To send them to school, they need clothes and then books, notebooks and pencils, which we cannot manage. I planted some vegetables on the yard. I thought we could get some money from there. Alas! All those went under the water too. There is no tube well nearby, so we have to drink the river water. But, that often causes stomach problems. To fetch tube well water, I have to walk more than half a mile and across marshes. But, in that case the clothes get soaked. Where do we get another set of clothes, then?

Zone 20

Eastern Surma-Kushiyara Floodplain

higher parts of the Surma-Kushiyara floodplain formed on Sediments of the rivers draining into the Meghna catchment area from the hills. Part of Sylhet, Moulavibazar, Hobigonj and Sunamgonj districts are included in this zone.

Region

Characteristic

This area is occupied by grey, heavy silty clay loams on the ridges and clays in the basins. Organic matter content of the soil is moderate. Soil reaction ranges from strongly acidic to neutral.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- River erosion

Impact

- Decreased crop production especially rice, wheat and potato
- Livestock will be damaged
- Infrastructure damage
- Due to increase in temperature and less rainfall in winter most of the land may become barren
- Due to prolonged flood and dryness in winter vegetation also decreased
- Damage to communication system

Zone 21 Sylhet Basin

western side of the Surma-Kushiyara floodplain. Part of Sylhet, Hobigonj, Sunamgonj and Netrokona districts are included in this zone.

Characteristic

Relief is locally irregular near rivers. Soils of the area are grey silty clay loams and clay loam on the higher parts that dry out seasonally and grey clays in the wet basins. The soils have a moderate content of organic matter and soil reaction is mainly acidic. Fertility level is medium to high.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- Sedimentation

Impact

- Decreased crop production
- Fisheries damage
- Bio-diversity loss
- Due to increased rainfall in monsoon flood and become submerged a large area
- Soil moisture loss
- Due to prolonged flood and dryness in winter vegetation also decreased
- Dry out water bodies/Fisheries



The perfect storm

Jahera Khatun (50)

Fenarbak, Jamalganj, Sunamganj

What were we deprived of? Everything. We had land, a good stock of rice, livestock and fish -- in a word -- everything. But, after the death of my husband, poverty became a constant companion for the last 16 years. Poverty, tension, flood have made my life very difficult. Flood, storm, hailstorm have been my major concerns because these calamities have been affecting my crops. At time it was so difficult that I had to sell land to manage the family. Yet, there is no release. In some years, flash floods have put the crops of the haors under water and we could not harvest even a bundle of rice.

Had we not gone through such flooding; we had not scarcity of food and other necessities. Despite owning a sizeable piece of land, I have to sell labour. To manage the family, I had to pawn the inherited land including my house with the local moneylender.

Had we not faced flash flood, the crops in the land would be more than enough for us. There is also a lack of embankment and that led to the entrance of the floodwater. Those responsible to construct or repair the embankment did not do their job in time. That is why we are facing troubles now.



Under water

Sufia Begum (30)

Rajendrapur, Durgapur, Netrakona

When there is a need for rain for farming, it will not rain. So, ultimately it causes water shortage. We don't have tube wells to irrigate the fields. Again, when there is no need for rain, it will do so. This again causes damages to whatever farming we do. Is this the fortune of the poor!

The vegetables that we try to produce around the homestead get destroyed due to too much moisture in the soil. We cannot afford to buy vegetables from the bazaars for the children. Again too much sun almost burns the vegetables in the fields. Watering them does not work properly.

We are the people of the upstream where there is not that much flood. However, sometimes the floodwater spills over the river and inundates our crops. If the crops remain under water for some days, it will surely affect the yield. One thing we saw, the yield of crops is better after a flooding.

During the last boro season, I got 2.5 maunds of paddy and 10 kilograms of rice by helping others harvest the crop. I will also get two sets of clothes, which will be of much importance for my family. As long as we have rice in stock, there is no tension. However, everyday I try to work. Whatever I earn is helpful. That is the way I run my family and wait for the day when the children grow up and earn.

Zone 22

**Northern and Eastern
Piedmont Plain**

occurring as a narrow strip of land at the foot of the northern and eastern hills. Part of Sylhet, Moulvibazar, Hobigonj, Sunamgonj, Netrokona, Brahmanbaria, Sherpur and Cumilla districts are included in this zone.

Region

Characteristic

The region comprises merging alluvial fans which slope gently outward from the foot of the northern and eastern hills into smooth, low-lying basins. Grey piedmont soils and non-calcareous grey floodplain soils are the major general soil types of the area. Soils of the area are loams to clays, slightly acidic to strongly acidic in reaction.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flood
- Flash Flood

Impact

- Decreased crop production
- Livestock damaged
- Infrastructure damage
- Damage to communication system
- Due to increase in temperature and less rainfall in winter most of the land may become barren
- Due to prolonged flood and dryness in winter vegetation also decreased

Zone 23

Chittagong Coastal Plain

in greater Chittagong district and the eastern part of Feni district.

Characteristic

It is a compound unit of piedmont, river, tidal and estuarine floodplain landscapes. The major problem in these soils is high salinity during the dry season (October to May). Grey silt loams and silty clay loam soils are predominant. Acid sulphate soils occur in mangrove tidal floodplains. General fertility level of the soils is medium, but N and K are limiting.

Changes in Climatic Variables

- Rainfall Pattern Change
- Increased Humidity
- Temperature increase
- Wind spread

Changes in Physical System

- Sea level rise
- Cyclone and tidal surge intensity increased
- Salinity increased
- Soil erosion

Impact

- Costal area go under saline water
- Crop production decreased due to wider salinity in the surface, ground and soil in the costal zone
- Most of the settlement, construction, industries will be damaged due to increased salinity
- Scarcity of drinking water and water born disease occurs
- Due to prolonged flood and dryness in winter vegetation also decreased
- Intensity of cyclone and tidal surge affect costal livelihoods and people are migrate from rural to urban centre
- Changed land use



The approaching waves

Ferdous Begum (50)

Chakaria, Cox's Bazar

Diarrhoea, cold, cough, fever have become more frequent now. In our early days, we took herbal medicine in such sicknesses, but now those herbs are no more seen in the localities. Not only these leafy small trees, but also water became a scarce resource here. All the water became saline. So, we have to go to other villages to fetch water. Even, the water in the tube or earthen wells is not sweet.

Shortage of rainfall has caused increase in temperature now and the pond dries fast during winter. Even the events of storms also went up. There were six seasons that we witnessed and enjoyed, but now there is no regularity in the seasons. Each month is a different season. Rainy season was Ashar, but now it rains all the year round.

The fish in the rivers and sea have declined. This is because people catch fish with fine net. So, there is a crisis of fish and we have to depend more on vegetables for meals. The trees also bore more fruits before, but now the productivity has come down.

During the tide, the sea moves higher up the coast that forced me to move my house a several times. Repeated floods put the entire coast under water when moving about became very difficult. Then, we have no alternatives to living in the cyclone shelter centres. But, those are also scarce, as many people crowd there.



Tidal water now rises much higher than before

Alema Khatun (40)

Konapara, Saint Martins, Cox's Bazar

We, the people of Saint Martins, did not know what mosquito is. But now, the whole island is full of mosquitoes, bites of which are causing deaths too. I got fever two weeks back with shivering. It continued for quite a while. Finally, I went to Teknaf where the doctor asked me to undergo blood tests. In total, it cost Tk 3,000. How can poor people like us spend that much money for fever? Besides, headache, cough and cold are regular problems we face today.

It appears that curse of the creator is falling on us. We only heard about storms and cyclones, but these are now frequent realities for us. Lows in the Bay hamper our fishing. My husband Rustam went fishing when there was a low pressure only to return dead after two days. In his absence, we cultivate chilli, potato and some rice on a piece of land, which is too little for a six-member family. We collect algae from the sea and sell them.

However, crop yield has declined. The tidal water rises much higher now than before and inundates the land where we used to grow crops regularly. With increasing heat, we get more storm and rain. Two months were fully rainy this year, so the rice could not grow well. In a small piece of land, we planted chilli and potato. If those grow well, the house could be repaired. Two years back cyclone Nargis devastated Burma when my house was destroyed. It could not be repaired.

Zone 24

St. Martin's Coral Island

occupies the whole of St. Martin's Island in the extreme south of the country.

Region

Characteristic

The area has very gently undulating old beach ridges and inter-ridge depressions, surrounded by sandy beaches. The soils are developed entirely on old and young Coral beach sands. Calcareous alluvium is the only general soil type of the area.

Changes in Climatic Variables

- Rainfall Pattern Change
- Increased Humidity
- Temperature increase
- Wind spread

Changes in Physical System

- Sea level rise
- Cyclone and tidal surge intensity increased
- Salinity increased
- Soil erosion

Impact

- Costal area go under saline water
- Crop production decreased due to wider salinity in the surface, ground and soil in the costal zone
- Most of the settlement, construction, industries will be damaged due to increased salinity
- Scarcity of drinking water and water born disease occurs
- Intensity of cyclone and tidal surge affect costal livelihoods and people are migrate from rural to urban centre
- Changed land use
- New diseases break out

Region

Zone 25

Level Barind Tract

Naogaon and Sirajgonj districts are included in this zone.

Characteristic

This region is developed over Modhupur clay. The landscape is almost level. The predominant soils have a grey, silty, puddled topsoil with ploughpan. Shallow grey terrace soil and deep grey terrace soils are the major components of general soil types of the area. The soils are low in available moisture holding capacity and slightly acidic to acidic in reaction.

Changes in Climatic Variables

- Rainfall Pattern Change (increased in monsoon and decreased in winter)
- Less moisture and increase evaporation
- Increased Humidity

Changes in Physical System

- Drought
- Heat stress

Impact

- Decreased crop production especially rice, wheat and potato
- Biodiversity loss
- Livestock damaged
- Decreased fish culture
- Scarcity of drinking water
- Due to increase in temperature and less rainfall in winter more area go under drought
- New disease



Sterile paddy

Lufsy Murmu (65)

Mundumala, Tanore, Rajshahi

Traditionally, one crop grew in this part annually. Now, thanks to the advent of deep tube wells, farmers grow three crops a year. But, with the days going by, rainfall during the monsoon is declining. Crops growing thrice a year are not yielding well. If we fail to recover production cost in farming, if we don't have rice at home, then what is the point of growing three crops a year? It is rather loss of money and physical energy. We get indebted. It seems that the span of the summer has expanded, and the temperature has also increased. This year, farmers faced tremendous trouble in irrigating the monsoon rice aman. Many could not irrigate the paddy field, as the deep tube wells failed to extract water in many areas.

The highland of Barind tract has been dry since long, making it difficult to produce crops. One cannot grow something without irrigation. It appears that intensity of drought has gone up in the last few years. The drought starts in September-October, but no sign of rain is seen in the month of April. The days when it rained could be counted on the fingers of your hand. The total rainfall would be almost half of the last years. As a result, the production cost of paddy went up. Again, the yield was also less than average. The gourds we planted also did not grow due to drought.

Different varieties of arum, which naturally grew in the fields, are not seen anymore. We, as sharecroppers, planted paddy on 330 decimals of land, but it did not do well due to drought. Most of the paddy was sterile and the yield is not even worth the labour cost. This caused a lot of loss. Such was the case almost for the last four years. It appears that we have to quit farming. But, the problem is that we don't have any other skills, except this.



Intense fog

Sumoti Bala (30)

Kishorepara, Sanguria, Porsha, Naogaon

I sometimes think my life will be over fetching water from far away places. The service fee that I get is the only income for my survival. Last year, almost the entire paddy got damaged due to pest attack. What a dangerous pest it is too! They don't die even by strong pesticide. The insects drop from the paddy plants only when there is rain. But, where is the rain? It is gone. This winter, the potatoes did not grow well. Last year the potato yield in 33 decimals (one bigha) was 25 maunds, but this year it is not even five maunds because of the intense fog.

How do we survive with such losses incurred due to erratic and unpredictable weather? I am about to get out on to the street with two children. I supply water to the shops, and my husband works as a day labourer. We have to survive, no? It is very difficult to draw water from the earthen well during the dry season. The water level in the earthen wells goes 40 feet down, which was earlier only 20 feet from the ground. In the deep tube wells, sand comes out with water. And some tube wells have gone completely dry, and so we have to walk miles to fetch water. Only ten to fifteen years back, it rained heavily and ceaselessly for two to three days. But, last year the rain was so light that it could not even soak the soil. Aman paddy had to be irrigated by the deep tube well.

The boro season is approaching and I doubt if some deep tube wells can extract underground water. Monsoon flooding usually does not inundate this area of the northern Bangladesh. Nearly three decades back, water spilled over the local canals after heavy rain. That is the last time I saw abundant water here. For the last three to four years, the underground water level is going down every year. I doubt if we will get drinking water in the upcoming dry season. For the last few years, yield of rice is less than average. I heard new high yielding varieties of rice are now being cultivated. But, these require more water. But, where is water?

Zone 26 High Barind Trac

the Barind Tract. Part of Rajshahi, Chapai Nawabganj and Naogaon districts are included in this zone.

Region

Characteristic

The soils include puddled silt loam to silty clay loam in the topsoils and porous silt with mottled plastic clay at varying depth. Deep grey terrace soils and grey valley soils are major components of the general soil types of the area. General fertility status is low, having low status of organic matter.

Changes in Climatic Variables

- Rainfall Pattern Change
- Temperature increased both in monsoon and winter seasons
- Less moisture and increase evaporation
- Increased Humidity

Changes in Physical System

- Drought
- Heat wave

Impact

- Decreased crop production especially rice, wheat and potato
- Biodiversity loss
- Livestock damaged
- Decreased fish culture
- Scarcity of drinking water
- Due to increase in temperature and less rainfall in winter more area go under drought
- New disease

Zone 27

North-eastern Barind Tract

discontinuous areas on the north-eastern margins of the Barind Tract. Part of Dinajpur, Rangpur, and Bogra districts are included in this zone.

Characteristic

It has silty or loamy topsoil and clay loams to clay subsoil. The soils are strongly acidic in reaction. Organic matter in the soils is low. General fertility is poor.

Changes in Climatic Variables

- Rainfall Pattern Change
- Temperature increased both in monsoon and winter seasons
- Less moisture and increase evaporation
- Increased Humidity

Changes in Physical System

- Drought
- Heat wave

Impact

- Decreased crop production especially rice, wheat and potato
- Biodiversity loss
- Livestock damaged
- Decreased fish culture
- Scarcity of drinking water
- Due to increase in temperature and less rainfall in winter more area go under drought
- New disease



Receding water table

Noorbanu (35)

Mithapukur, Rangpur

We used to be sharecroppers in the past and it went well, but now we cultivate our own land. Yet, we cannot make enough profits. This is because the production cost has gone up much more than before. Earlier, it rained in time and the weather was not so hot as it is now. Now, nothing is regular and timely. The rainfall is erratic, while cold is sometimes too much and sometimes hot and the temperature is also too high at times. It was also difficult to irrigate land, and finally we failed to provide adequate irrigation.

Now the most difficult task for me is irrigating the land during dry season. Day by day, underground water level has gone deeper down. Tube wells fail to get any water from. Earlier, we would set up a shallow tube well machine easily. Now we have to dig a pit several feet below the ground and then set it up so that the pipe gets water. This became a matter of serious trouble. Besides, more irrigation is required for the paddy field.

There are some fruit trees, which bear fruits like litchies, mango and jackfruits, but finally the fruits do not grow to the size as in the past. Now, we are interested in growing crops requiring less water. For example, I prefer producing maize, wheat, ladies' fingers, chilli and vegetables.



Empty pots and green fields

Bobita Mankhin (40)

Nalikhali, Muktagacha, Mymensingh

We are forest people. Forest was the source of almost all of our food. The mangoes and jackfruits of the forest were more than enough for us. Wild potatoes grew aplenty in the hills and the rivers had water all through the year. When there was no food at home, the wild potatoes were the alternative. We could fish in the rivers having various local species. Tortoise, crabs and kuicha fish were available in the haors and other water bodies. But now all these resources are almost gone. The small river flowing beside our village remains dry, except some days during the monsoon. Whatever water remains in the last layer is used for cultivation. Even, the level of underground water went so deep that water cannot be extracted by the shallow tube wells in dry season. To fetch drinking water, we have to go to the deep tube well half a mile away. Fetching water from so long a way, after all-day work, is very trouble - some. But, what can we do!

The influential people have also grabbed most of the forest. Mangoes or other fruits don't grow as they used to. Due to lack of rain, jackfruits don't grow as big as those were earlier. Pest attack also damages fruits. And, the wild potatoes are not seen as before. With the essentials' prices going high, it has become very difficult for us to manage the family.

My husband, Arun, got pain in his waist when he went to the forest to chop trees. Since then, he cannot do heavy work. The eldest daughter has been married off. There is a four-year old son and the two of us -- that is our family. Despite having a small family, the days are becoming difficult. We know the rice production is going up and up, but we don't have food in our house. Seven years back, we sold a piece of land due to illness of my husband. There was a drought. With no crop in the field, there was no employment. We had to borrow money to run the family and then again sold the land to pay the loan. We had no alternative to selling the ancestral land.

Zone 28

Madhupur Tract

Dhaka, Gajipur, Mymensingh and Tangail districts are included in this zone.

Region

Characteristic

The landscape comprises level upland, closely or broadly dissected Terraces associated with either shallow or broad, deep valleys. Eleven general soil types exist in the area of which deep red brown terrace, shallow red brown terrace soils and acid basin clays are the major ones. Soils in the valleys are dark grey heavy clays. They are strongly acidic in reaction with low status of organic matter, low moisture holding capacity and low fertility level.

Changes in Climatic Variables

- Rainfall Pattern Change
- Temperature increased both in monsoon and winter seasons
- Less moisture and increase evaporation
- Increased Humidity

Changes in Physical System

- Drought
- Flood

Impact

- Due to increase in temperature and less rainfall in winter more area go under drought
- Crop cultivation period decrease
- Decreased crop production especially rice, wheat and potato
- Affect Livestock rearing
- Decreased fish culture
- Scarcity of drinking water
- Biodiversity loss

Zone 29

Northern and Eastern Hills

hill areas. Relief is complex. Khagrachari, Rangamati, Bandarban, Chittagong, Cox's Bazar, Grater Sylhet, Feni, Comilla, Brahmanbaria, Sherpur and Mymensingh.

Characteristic

Hills have been dissected to different degrees over different rocks. In general, slopes are very steep and few low hills have flat summits. Brown hill soils are the predominant general soil type of the area. Organic matter content and general fertility level are low.

Changes in Climatic Variables

- Rainfall Pattern Change
- Temperature increased both in monsoon and winter seasons
- Less moisture and increase evaporation
- Increased Humidity

Changes in Physical System

- Soil erosion
- Flash flood

Impact

- Crop cultivation period decrease
- Land slide outburst and people go to take shelter
- Decreased vegetation
- Most of the labour become vulnerable to sell their wages
- New diseases
- Scarcity of drinking water
- Biodiversity loss



The dry monsoon

Tandrabala Tripura (41)

Vaibonchhara, Khagrachari

I live in the hills, having no farmland in the plains. So, I do some *joom* farming along the slope hilly land to produce food. The items grown in the *joom* include rice, oilseeds, ginger, turmeric, chilly and various vegetables. Previously, from the five-acre land, I could produce food that I needed for an eight-member family for a year, but nowadays the yield has declined.

In the first Bangla month of *Boishakh*, it would rain and we could plant seeds of rice and other crops with the rain moisturising the land. But now, there is a lack of rain during *Boishakh*. Sometimes, even the month of heavy monsoon *Asar* does not witness any rain. However, sometimes we find norwesters with stormy rains, which causes subsidence of hills. Again, for inadequate rains, we cannot properly go for plantation that leads to bad harvest. The produce we have are not enough for three months, even.

All are trying to say that this is because of the 'rat flood'. The local headmen said the bamboos have flowers and fruits before they are destroyed. And, these fruits are helping the rats breed more and expand their number. If this year there is a rat flooding, we cannot get a harvest this year either.

The trees in the hills also do not grow as they did a few decades back. Apart from that, people are cutting trees every now and then. As a result, the animals and birds, which used to live in peace in the hilly jungles, are losing their habitation. Besides, soil erosion is increasing day by day because of hill subsidence. The only source of drinking water for the hilly people is the water stored in the ditches at the lowest part of the hills. In the recent times, water in those ditches is drying during the dry season and so we have to walk mile after mile to collect drinking water.



Out of the house on to the streets

Shapnagar Begum (35)

Khalajora, Akhaura, Brahmanbaria

There is a saying – the days past are the good ones, but those ahead are not – which is very true for us. Flooding every year leaves us in the street today. Sudden floods from the upstream devastate us, and then again recede, but in between the crops on the fields get damaged ultimately causing sufferings. The investments made for crops are all gone and we see no way out to survive.

Similar was the case this year. But, we could finally reap some rice. Last year, I planted rice on sixty-six decimals of land as a sharecropper. It was nearly a time for ripening of the paddy. But, suddenly there was flash flood and all the paddy fields were under water. The damaged crop has devastated me so much so that I could not plant rice in November. I borrowed Tk 5,000 to plant paddy, and now it has climbed up to Tk 10,000, including the interests. Therefore, I was in real need of some cash and so could not plant rice. I even had to sell my ancestral house and am now living in a rented house.

My husband has a small tea stall in the local market, but the income he has from that is too little for a family. We cannot manage to rent a better shop. If the shop was in a better location, it could run well. My sufferings are more painful during the monsoon. Neither is there any job at that time nor does the tea shop run well. My husband is a little ashamed of my working in someone else's house. I work as a temporary housemaid in others' houses and somehow run the family. See, for the last two days it has been raining continuously. And, there is no sale in the tea shop. I had eight chickens in the house and sold one of them to buy a jackfruit. That is the only thing for lunch today.

Zone 30

Akhaura Terrace

eastern border of Brahmanbaria, and the southwest corner of Hobiganj district.

Region

Characteristic

The main soils in the uplands have strong brown clay. The valley soils range from silty clay to clays. Deep red brown terrace soils, grey piedmont soils and acid basin clays are the major components of the general soil types of the area. The general fertility including organic matter status is low. The soils are strongly acidic in reaction.

Changes in Climatic Variables

- Rainfall Pattern Change
- Temperature increased both in monsoon and winter
- Increased Humidity

Changes in Physical System

- Flash flood/Flood
- Sedimentation

Impact

- Decreased crop production
- Fisheries damage
- Bio-diversity loss
- Due to increased rainfall in monsoon flood and become submerged a large area
- Soil moisture loss
- Due to prolonged flood and dryness in winter vegetation also decreased
- Dry out water bodies/Fisheries



Annex

Boishakh	= 1st Month of Bangali Calendar [mid April - mid May]
Jaishtho	= 2nd Month of Bangali Calendar [mid May - mid June]
Ashar	= 3rd Month of Bangali Calendar [mid June - mid July]
Sharbon	= 4th Month of Bangali Calendar [mid July - mid August]
Vadro	= 5th Month of Bangali Calendar [mid August - mid September]
Ashwin	= 6th Month of Bangali Calendar [mid September - mid October]
Kartik	= 7th Month of Bangali Calendar [mid October - mid November]
Agrahion	= 8th Month of Bangali Calendar [mid November - mid December]
Poush	= 9th Month of Bangali Calendar [mid December - mid January]
Magh	= 10th Month of Bangali Calendar [mid January - mid February]
Falgun	= 11th Month of Bangali Calendar [mid February - mid March]
Chatra	= 12th Month of Bangali Calendar [mid March - mid April]
Bill	= Water bodies
Char	= Sandy Island of River
Haor	= Larg water bodies
Joom	= Indigenes Cultivation of Hilly people

