

# Gibika End Report



## Gibika final research report

An overview of research findings from the 2013 to 2018 Gibika project. Understanding how environmental stress and climatic changes influence people's livelihood resilience and lives in Bangladesh.

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*Two men on an evening walking in Dalbanga South (© Sonja Ayeb-Karlsson).*

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# Introduction

A climate-resilient and sustainable future for people in vulnerable countries starts with resilient livelihoods. There is an urgent need to turn knowledge around livelihood threats, shocks, trajectories and opportunities into operable solutions.

Gibika is a five-year research-to-action project between United Nations University - Institute for Environment and Human Security (UNU-EHS), International Centre for Climate Change and Development (ICCCAD) and Munich Re-Foundation (MRF) that aims to advance the scientific understanding of livelihood resilience in Bangladesh, and to apply conclusions towards community-led solutions that improve the living conditions of vulnerable people.

When livelihood systems are not resilient, environmental shocks will have long-term impacts on human wellbeing and development goals. By using the analytical concept of resilience, the project brings researchers, practitioners and the community-members in the study sites together to debate and develop solutions that can improve the living conditions of extremely vulnerable people. Therefore, the project promotes livelihood resilience and sustainable development within Bangladesh and beyond.

To accomplish these aims, the following key goals have been formulated:

1. Generate rigorous scientific knowledge on resilience in livelihood systems;
2. Empower people in climate action design, decision-making and implementation;
3. Transform livelihoods of people in Bangladesh to make them more resilient to environmental stress and shocks;
4. Disseminate findings, insights, and experiences to influence national policy and facilitate wider use. Replicate action and lessons learned both on a national and international level.

The project investigates the following four central questions:

1. What combination of factors force (abrupt) changes in livelihood systems within environmentally stressed areas of Bangladesh?
2. What combination of practical actions and policies can create more resilient livelihood systems in the face of severe environmental threats?

3. Is community-led implementation of interventions to increase livelihood resilience an effective way to improve living conditions?
4. At the end of five years, has the Gibika project started to improve living conditions in the focus areas?



*Some children returning from school in one of the coastal study sites (© Sonja Ayeb-Karlsson).*

### Why research livelihood resilience in Bangladesh?

Understanding resilience in livelihood systems of vulnerable people (through research) and protecting those livelihood systems (through transformational action) must be a normative priority. Livelihood resilience, as it is defined here, means not just cushioning against environmental shocks both preventatively and in recovery, but also improving living conditions, expanding opportunities and access to resources, and most importantly promoting human development (Tanner et al. 2015). To meet these criteria, transformational adaptation is necessary, and Gibika is built around science and implementation of tools in selected communities that can lead toward transformational action. Global environmental change presents a fundamental challenge to Bangladesh's present and future development prospects (Huq et al. 1999; Agrawala et al. 2003; Pouliotte et al. 2009). Bangladeshi society has developed amidst the fertile delta at the confluence of massive Himalayan river systems, the Meghna, Ganges and Brahmaputra. Life on the

delta brings abundant possibilities for agriculture, but also comes with perennial difficulties during monsoon seasons and when tropical storms sweep up the Bay of Bengal. A large extent of the country is characterised by extremely dynamic hydrologic conditions (Mirza 2002). Along the massive flood plains, people and the livelihood systems that sustain them are subject to extended floods and riverbank erosion (Mutton and Haque 2004), and nearer the coast, to cyclones, storm surges, coastal inundation, soil salinity, and erosion (Agrawala et al. 2003). While Bangladeshi culture and livelihood systems have adapted to these stressors, in recent decades, climate boundary forcing for tropical weather extremes (namely sea-surface temperature and prevailing winds) has intensified in the Bay of Bengal (Mandal et al. 2004). Meanwhile, attempts to manage flood risk within Bangladesh's river systems have ultimately exacerbated lateral erosion (Paul 1995). Furthermore, in the late 1990s, a new climate-linked stress emerged: persistent droughts in the country's North West (Shahid and Behrawan 2008). Bangladesh has experienced rapid rates of economic growth. However, growth is highly uneven or inequitable, and environmental stresses undermines the livelihood systems of Bangladesh's most vulnerable populations – subsistence farmers and fishermen – exacerbating the development gap. Bangladeshi society is not a passive victim of environmental extremes. Rather, from a position of severe adversity, it can learn and teach important lessons about livelihood resilience and transformation, which can be extended to other contexts through Gibika, and beyond the life of the project.



*The only harbour on Mazer Char finally collapsed due to the riverbank erosion (© Sonja Ayeb-Karlsson).*



## Research questions

The aim of the research was to acquire a good, mainly *qualitative*, understanding of people's livelihoods, the forces that drive livelihood change, and the role of environmental and other shocks that undermine resilience. As such, the data gathered was collected under the umbrella of the following research questions listed below.

Question 1: (Abrupt) changes in livelihoods

1. What combination of factors force (abrupt) changes in livelihood systems in environmentally stressed areas of Bangladesh?
  - 1.1. What are the normal sources of food and income of the population in the study sites, and how have these changed over time?
    - 1.1.1. What are the seasonal patterns of different livelihood activities?
    - 1.1.2. To what extent do people's normal sources of food and income allow them to attain their well-being objectives and development goals?
    - 1.1.3. What changes in people's livelihoods are discernible over the past 10-20 years?
    - 1.1.4. To what extent are these changes adaptation to environmental change?
    - 1.1.5. What do people do to cope with impacts of livelihood shocks?
    - 1.1.6. What is the role of human mobility in local livelihood systems?
  - 1.2. What are the key forcing mechanisms in livelihood activities?
    - 1.2.1. What are the key factors that in combination lead to (abrupt) change in livelihood systems?
    - 1.2.2. How do environmental shocks and slow-onset environmental processes lead to (abrupt) change in livelihoods?
    - 1.2.3. What factors make livelihood systems, households and individuals more vulnerable to impacts of environmental changes and events?
    - 1.2.4. What factors make livelihood systems, households and individuals more resilient to impacts of environmental changes and events (meaning abrupt changes are absent)?
    - 1.2.5. Can we characterize positive/chosen and negative/forced livelihood change?

Question 2: Action to build resilience

2. What combination of practical actions and policies can create more resilient livelihood systems in the face of severe environmental threats?
  - 2.1. [*Institutional landscaping*] What interventions and policies by which organizations have been introduced in the communities to adapt to environmental changes and increase resilience so far?
    - 2.1.1. To what extent have these interventions been successful?
    - 2.1.2. What were factors contributing to success and failure of these interventions?



- 2.1.3. Do these interventions reach the most vulnerable segments of the population?
- 2.2. [*Needs assessment*] What are, according to the population and experts in the study areas, desirable interventions that are not yet or not sufficiently present in the study?
- 2.3. [*Feasibility*] What are feasible interventions, given Gibika's constraints and opportunities? (i.e. human resources, institutional arrangements, project financing, networks, and the search for additional resources)



*A bunch of kids playing football next to the cyclone shelter in Dalbanga South (©Sonja Ayeb-Karlsson).*

#### Livelihood shocks

Livelihood shocks are the primary explanatory variables in the research. We distinguish different types of shocks that often interact:

1. Environmental shocks: e.g. riverbank erosion, cyclones, storm surge, drought, flood
2. Asset shocks: e.g. land loss, death of livestock, loss and damage to houses
3. Income shocks: e.g. crop failure, loss of jobs, market failures (e.g. sudden drop in prices of cash crops)
4. Demographic shocks: e.g. death/disease of a family member
5. Expenditure shocks: e.g. sudden high cost of productive inputs or spiking food prices
6. Secondary shocks (erosive coping; maladaptation): e.g. indebtedness, sale of land, migration/displacement

These shocks interact with social vulnerability, which has different dimensions:

1. Exposure: e.g. location of house, land and economic activities; dependence on ecosystem services
2. Lack of coping capacity: e.g. assets, social relations, poverty level, human capital, and migration options.



*A boy in Dalbanga South comes up to join our conversation as we arrive (© Sonja Ayeb-Karlsson).*

Some hypotheses based on literature and scoping visits

**Main hypothesis:** Specific combinations of environmental stressors and social vulnerability can push livelihood systems toward abrupt change.

**Stressors:** Environmental stressors vary from region to region and depend on local circumstances. Forcing mechanisms include changing rainfall patterns, flooding, king tides, storm surges, cyclones, salinity intrusion, drought, embankment breaches and riverbank erosion.

**Landlessness:** Environmental stress drives landlessness directly (e.g. catastrophic erosion) and indirectly (e.g. crop failure and the sale of land to pay debts). Once people become landless, they have much less access to adaptation resources. Landlessness circumscribes livelihood alternatives.

**Indebtedness:** People are much less able to adapt livelihoods (in situ) when they are heavily indebted, and debt combined with environmental stress often results in landlessness.



**Social capital:** People are better able to adapt livelihoods when they have a beneficial relationship with a wealthy or influential power broker, which often marginalises others who fail to establish similar networks.

**Mobility:** People are better able to adapt livelihoods when they have potential wage earning opportunities elsewhere. However, for many people in rural Bangladesh, migration is not a desirable option.

**Rural-urban:** The future of severely stressed rural populations often lies in urban areas, particularly slums in Dhaka. While urban income sources are less dependent on natural resources and less vulnerable to climatic shocks, urban populations, and especially those in slum areas, are vulnerable to other environmental stressors, e.g. poor sanitation and flooding.



*Some fishermen pull up their nets before going to bed (© Sonja Ayeb-Karlsson).*

## Research tools

Over the years, a broad variation of research tools based on a mixed-method or quant-qualitative research approach were applied by the research teams. The ambition has always been to take on the research questions from an open and experimental point of view. To summarize the research tools<sup>1</sup> applied over the years we chose to list them in two groups, those that were aimed to capture overall structural socio-environmental context, and those that were subjectively aimed to reach deeper understanding of the socio-

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<sup>1</sup> For more information on a specific research tool applied throughout the Gibika project please see Gibika Field Reports I-IV and Ayeb-Karlsson et al. 2016 as well as Ayeb-Karlsson 2018.



psychological processes active in people's decision-making while dealing with climate change impacts and environmental shocks.



*The riverbank erosion slowly eats its way into the village (© Sonja Ayeb-Karlsson).*

The structurally aimed methods included:

- PRA sessions:
  - Transect walk
  - Village timeline (Kumar 2002)
  - Contextual change exercise (Dietz et al. 2013)
  - Livelihood seasonal calendar (Kumar 2002)
  - Livelihood shocks (Tschakert et al. 2013)
- Institutional Landscaping
- Survey questionnaire (Ayeb-Karlsson 2018)

The subjectively aimed methods included:

- Storytelling methodology and games (Ayeb-Karlsson et al. 2016; Ayeb-Karlsson 2018)



- Livelihood Histories (Ayeb-Karlsson et al. 2016)
- Key expert interviews
- Focus group discussions
- Key experience interviews (Ayeb-Karlsson 2018)
- Resettlement choice exercise (Ayeb-Karlsson 2018)
- Collective storytelling sessions
- Q-methodology (Ayeb-Karlsson 2018)



*A bunch of boys are joking around at the harbour on Mazer Char (© Sonja Ayeb-Karlsson).*

The earlier stages of fieldwork included visits to all the seven project sites to un-veal a deeper understanding of the diverse impacts of environmental stress on people’s livelihood resilience in each study site. Later, follow up studies were made to clarify what solutions and community-led actions were advised by the people as well as where the Gibika action was to be initiated. After it was decided that the action was to focus on improving the disaster preparedness in the coastal and cyclone affected south, and the action and research team divided up their work-plans, the research came to focus more on people’s (im)mobility decision-making while dealing with climate change impacts and environmental shocks.

# Research context

Bangladesh is a country with a broad variety of environmental stressors. The fact that people are struggling with different stressors in different regions also makes their needs and responses very location specific. There are clear differences between the northern, central and southern study sites. People in the southern and central study sites expressed more urgency and failure to cope with the stress, while many respondents in the northern study sites were quite able to deal with the stressors they faced. Changes in their livelihoods were often in response to opportunities as well as the different environmental stressors in their region. For example, in the northern study sites people are facing drought and shifting rainy seasons, while in the southern and rurally located central study sites people are dealing with stressors such as riverbank erosion and floods.

Before moving onto our actual findings, this section will provide an overview of our selection process while deciding on the places to research as well as an overview of the study sites.

## Study site selection

In the site selection process, efforts were made to include a diverse set of livelihood systems and ecosystems that are experiencing extreme environmental adversity.

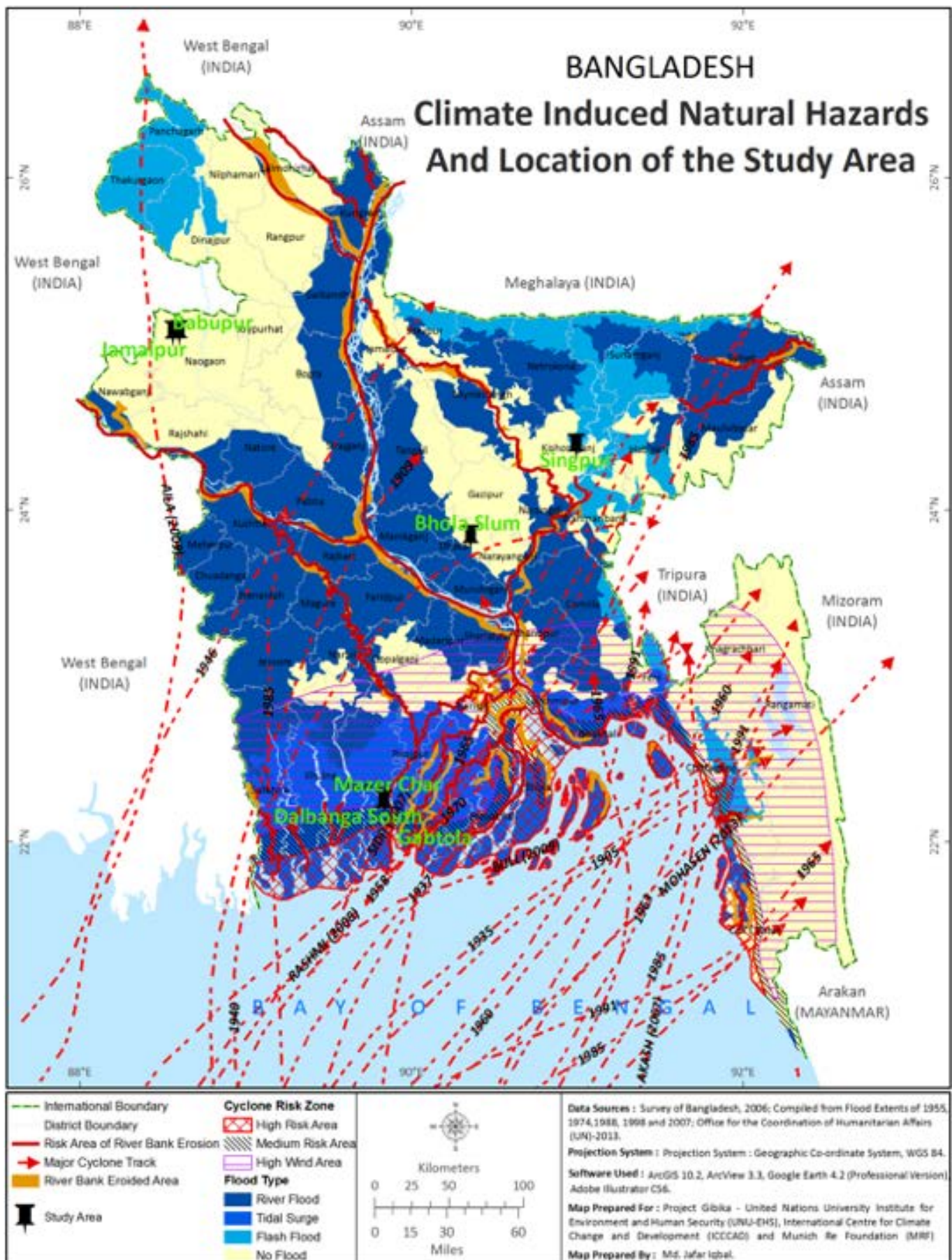
The objective was to include the three principal stress clusters affecting the country:

- Cyclones on the coast
- River bank erosion in flood plains
- Drought in water-stressed areas in north-western Bangladesh

The research team conducted multi-methodological fieldwork visits in the seven study sites to identify how people are affected by and adapt to these stressors, with or without support from the government and NGOs. The rationale for choosing these seven study sites in Bangladesh was that places with long historical experience of climate-related stress could provide valuable insights about confronting climatic challenges to other communities around the world that have to deal with similar stress now or in the nearby future.



Three threat clusters were defined: 1) coastal threats 2) riverbank erosion and 3) drought. Additional factors for selection included long versus short historical exposure to stress, and the high versus low inputs for adaptation. Regions were identified where these threat clusters could be found. After identifying regions,



local government administrators and stakeholders in CBOs as well as key NGOs, it became clear who could designate specific areas. After specific villages were located, visits were planned with four key methods aiming to determine if the site met the identified criteria. These were 1) interviews with experts at regional level (at least one per site), 2) semi-structured focus group discussions (one to two per site), 3) semi-structured interviews with a local expert (one to two per site), and 4) transect walks (one per site). Once potential sites had been identified, the team made visits accompanied by local informants to determine whether the sites met the selection criteria and whether they were suitable for both research and action.

Site Name	Union, District, Division	Criteria 1. Threats	Livelihood impact focus	Criteria 2. Historical Experience with threats	Criteria 3. Inputs to adaptation
<b>Threat Cluster A: Cyclone-related threats on the coast</b>					
1. Dalbanga South	Barguna Upazila, Barguna District, Barisal Division	Riverbank erosion, king tides, standing water, water logging, saline intrusion	Rice and cash crop production, fisheries and fish ponds	Recent (the king tides began occurring with Cyclone Mahasen)	Low (Dalbanga benefits from quasi-feudal patrons but not particularly from NGOs or government)
2. Mazer Char	Mothbaria Upazila, Pirozpur District, Barisal Division	Riverbank erosion, storm surge, saline intrusion	Cash crop production, fisheries and fish ponds	Recent (storm surges with Cyclone Aila increased salinity in the soil for the first time since its settlement)	Low (Because land tenure is disputed, NGOs and government do not invest here. They do not have government representation.)
3. Gabtola	Sarankhola Upazila, Bagherhat District, Khulna Division	Riverbank erosion, saline intrusion	Rice and cash crop production, fisheries and fish ponds	Historical (a series of embankment breaches beginning in the 1990s)	High (Gabtola has received NGO and government support since Sidr)
<b>Threat Cluster B: Erosion-related threats in the flood plains</b>					
4. Singpur	Nikli Upazila, Kishoreganj District, Dhaka Division	Riverbank erosion, land loss	Rice and cash crop production, loss and damage to houses and properties	Historical (this char has been stable for a long time, but river meanders are a fact of life in Kishoreganj)	High (Many programmes have invested in embankments here, including CARE and DfID)
<b>Threat Cluster C: Drought-related threats in the dry lands</b>					
5. Babupur	Shapahar Upazila, Naogaon District, Rajshahi Division	Dry spells, shifting rainy seasons, drought	Rice and cash crop production, drinking water and sanitation	Recent (rainfall began shifting in ways that affected crop production since the late 1990s)	High (several programmes have invested in pumps, rainwater-harvesting pools, mangos, etc.)
6. Jamalpur	Shapahar Unizila, Naogaon District, Rajshahi Division	Dry spells, shifting rainy seasons, drought	Rice and cash crop production, drinking water and sanitation	Recent (same as above)	Low (no investment, and the Hindu portion of the village has been ignored by local government)
<b>Threat Cluster D: Urban slums composed of environmentally-stressed populations</b>					
7. Bhola Slum	Dhaka City, Dhaka District, Dhaka Division	Flooding, standing water, public health	Drinking water and sanitation, service sector livelihoods		High (long-standing community organisation)

*Table illustrating how the seven study sites can be divided into three different threat clusters.*

The logic of including Bhola Slum was that Gibika did not include any urban locations, despite the fact that Bangladesh is a rapidly urbanizing country, in part due to environmental push factors in migrants' home regions. Bhola Slum is home to environmental migrants from the riverbank erosion and cyclone affected Bhola Island in the southern coast. In many ways, livelihoods in Bhola Slum provide a portrait of the future



of livelihoods for environmentally stressed and displaced populations in Bangladesh, and an ideal place to consider.

### Study sites

Three of the study sites (*Dalbanga South, Mazer Char* and *Gabtola*) are located in the southern coastal delta, and deal mainly with riverbank erosion, cyclones and flood. Two other sites (*Babupur* and *Jamalpur*) are in the northwestern, drought affected, side of the country. The last two (*Singpur* and *Bhola Slum*) are centrally located. The Singpur community is facing riverbank erosion, land loss and floods, while Bhola Slum, in the capital Dhaka, was added to investigate what happens to people after they leave their home areas due to environmental stress. The slum is named after Bhola Island because most slum dwellers migrated from there after cyclones and abrupt riverbank erosion.



*Some farmers bring home their livestock before it gets dark (©Sonja Ayeb-Karlsson).*

#### Dalbanga south

Dalbanga South is a village located in Barguna District, Barisal Division on the southeast coast of Bangladesh, along the Bishkhali River. According to the latest census report (2011) the population was estimated to 6,371 citizens (3,166 men and 3,205 women). A majority of the population is Muslim; only one Hindu household was registered during our visit. Infrastructure is problematic in Dalbanga South; there is

no electricity other than just a few households with solar panels. The 6-kilo meter long road, and only way in and out of the village, is made of mud and therefore becomes unusable during the monsoon. The one and only cyclone shelter in the village has a capacity of taking 400-500 people according to the informants. This results in most of them having to find shelter elsewhere during the cyclone strikes. The cyclone shelter is also used as a primary and secondary school. The village also has a mosque and a health clinic.

Its close location to the Bay of Bengal provides the people with valuable ecosystem services, such as fish, shrimp and mangroves, but it also exposes the village to a number of environmental stressors such as riverbank erosion, flood, cyclones and saline intrusion. Most cyclones generated in the Bay of Bengal pass through this community, which suffered hard when Cyclone Sidr struck in 2007. Riverbank erosion is another stressor affecting people's livelihood, as many have lost agricultural land and/or homes to the river.



*It is a long and tiresome journey to get to Dhaka from the coastal south (©Sonja Ayeb-Karlsson).*

#### Mazer Char

Mazer Char is an island in Pirojpur District (Khulna Division), which is located along the Baleshwari River. The estimated population on the island at the time of visiting was 180 households and 800 people. There is only one Hindu household, while the rest identify themselves as Muslim. Except a few households with solar panels, there is no electricity on the island. People are cut off from hospitals, health centres, secondary and high schools, shops and markets as it takes a few hours by boat to reach mainland. The village has a mosque, a primary school, a smaller marketplace located at the harbour but no health clinic. This is critical as people



facing injuries or health related emergencies are unable to get medical attention in a timely manner. A 'char' is an island generated by land sediments brought down through the river-delta from the Himalayan Mountains. During the monsoon period the amount of mud and sand increases in these rivers. In places where sediments are deposited, typically in areas of reduced river flow, chars are created. Over time, as river currents change, they tend to disappear again through riverbank erosion. The environmental stress on these islands is highest during the rainy season as the water level goes up. It is common for massive chunks of land to be pulled down into the river during this season (Dutt 2014). Most households in Mazer Char engage in fishing and farming for their livelihood. They cast out their nets early in the morning, they harvest the fish late afternoon or evening, and they spend the rest of the day occupied with agricultural work. This diversified livelihood makes them more resilient; in the case of crop failure, they can fall back on the income from fishing, and in the case of low fish catches, they can rely on their agricultural produce. Access to ecosystem services is a key determinant of people's livelihood security on the char, and when these services are interrupted, people suffer income losses and food insecurity. Crop failure due to tidal flood is common. Mud embankments are constantly built to protect against riverbank erosion. Cyclones, such as Sidr (2007) and Aila (2009), strike the island hard. The results of the cyclones include saline intrusion, loss and damage to infrastructure, houses, properties and crops, and human casualties.



*Sharing a smile with one of the informants in between the research sessions (© Sonja Ayeb-Karlsson).*

## Gabtola

Gabtola is a coastal study site in Bagerhat district, Khulna division, just across the river from Mazer Char. According to the latest available census report, the village has 661 households or 2,525 people. Similar to the other two coastal study sites, there is no electricity in Gabtola except for the limited households with solar panels. Gabtola is the only Gibika site that has a concrete embankment (also used as road) protecting the village from the riverbank erosion. The other embankments are made of mud. Even though this embankment is more resistant than the mud-embankments towards erosion, flooding and standing water, it usually breaks down during the cyclone strikes and has already been rebuilt a couple of times. There are motorbike and three-wheeler taxis running from Gabtola to the nearest town. Some of these taxi drivers are from the village. The village has two cyclone shelters, one mosque and a primary school.



*Calm before the storm (©Sonja Ayeb-Karlsson).*

Despite their geographical proximity, and the fact that they experience the same environmental stressors, the two sites are very different. On Gabtola's riverbank there is a massive concrete block embankment. Riverbank erosion therefore is no longer a major threat to the community. The concrete embankment also protects the village from tidal flood. However, recurrent cyclones are a constant threat to this otherwise successful adaptation measure. Cyclones have already destroyed the expensive embankment several times in the recent past. Cyclonic stress is considered the main problem in Gabtola. While in neighbouring Mazer Char, 'only' four people lost their life in Sidr (2007); in Gabtola around 25-30% of the community (about 450



people) died in the cyclone. Poor disaster preparedness and awareness were some of the reasons for the high death toll in Gabtola.

### Singpur

In the village of Singpur in the Kishoreganj District (Dhaka Division), flooding and riverbank erosion are the main environmental stressors. Singpur's population is estimated at 1,444 households and 5,749 people, according to the latest census registration. There is no electricity in the village but large amounts of the households, about 70-80%, have installed solar panels in their homes. During the monsoon, Singpur turns into an island that sometimes gets flooded. People then need to go by boat to the nearest marketplace, hospital and high school. The village has a madrasa (Islamic Koran school), two primary schools and a mosque.



*Last time I met Bonna her story turned into an article appearing in [OurWorld](#) (© Sonja Ayeb-Karlsson).*

An impressive concrete wall protects one side of the village, but the other side is fully exposed to wave impact, and riverbank erosion continues to eat up land. As a large part of the village territory has already been lost to the river, it gets more and more densely populated. During the rainy season, the village is often flooded and the combination of standing water and overcrowding increases the incidence of diarrhoea, cholera and other diseases. Annual flooding of the fields surrounding the village also prevents people from doing agricultural work for up to four months a year. A common adaptation strategy during this period is

seasonal migration in quest of alternative sources of income. Most seasonal migrants work in brickfields, garment factories, rickshaw pulling, and construction.



*The riverbank erosion finally pulled half of the school building into the water (© Sonja Ayeb-Karlsson).*

## Babupur

Babupur in the Naogaon District (Rajshahi Division) is one of the two drought affected study sites located in northeastern Bangladesh, close to the Indian border. The total population of Babupur is 969 people divided into 244 households according to the latest census control. Babupur is divided into three different settlements, one Muslim, one Paharia and one Orao. The Paharia and Orao settlements practice Hinduism, but belong to different ethnic groups that speak different languages. There is no electricity in Babupur. A smaller mud road connects a larger asphalt road leading to the nearest town. There are three-wheel taxis, and some people living in the village even go there by bicycle. The village has two primary schools whereof one is NGO-led. There is also an madrasa (Islamic Koran school) and two mosques. Instead of the more common tin-houses in Bangladesh, people in Babupur live in traditional mud houses that are cooler during the dry season.

Most people in this village are farmers, cultivating mainly rice paddies, wheat, vegetables and fruits. Access to natural resources such as water and soil is therefore crucial for their livelihood. Droughts, shifts in rainfall patterns and dry spells affect harvest levels. When droughts strike, farmers do not only lose their crops, but also their investment in seeds, fertilizers, pesticides and labour. Over the years, farmers in this study site



have adopted a large number of measures to adapt to climatic stress. Agricultural adaptations include irrigation - using water from ponds, the river and a deep tube-well – harvest in grain water, switching to more drought-tolerant seeds and crops, and converting paddy land into mango plantations. The construction of the deep tube-well has enabled farmers in Babupur to harvest twice a year. Besides these agricultural adaptations, landless people engage in seasonal migration and non-farm income activities to diversify risk and make full use of their labour potential. Adaptation in this community has been quite successful and most people are able to cope with droughts when they occur.



*A fisherman in the middle of repairing his boat (©Sonja Ayeb-Karlsson).*

#### Jamalpur

Jamalpur in the Naogaon District, (Rajshahi Division), located next to Babupur, is the second drought affected study site. The population of Jamalpur was estimated to 979 people, living in 256 households for the last census report. As the village is located just next to Babupur, one will come through the same mud-road to reach the larger asphalt road leading toward the nearest town. There is also no electricity in Jamalpura and people live in similar traditional mud-houses as in Babupur. The village has one NGO led primary school and one Mondir (religious Hindi school).

While the people in Babupur have managed to readjust quite well to the environmental conditions, the people in Jamalpur have not. There are no deep tube wells in Jamalpur and the community struggles to provide all its members with fresh drinking water due to the limited number of tube wells. During the dry



season, people are forced to walk long distances to collect drinking water from other villages. In drought years, farmers suffer severe crop losses. As most farmers have to take loans for investments in seeds, fertilizer, pesticides and labour, a crop failure often results in indebtedness. Several respondents have lost their land because they were not able to pay back loans. The big difference in adaptation levels between the two neighbouring sites may stem, to a large extent, from political marginalisation. While people in Babupur are Muslim, the majority religion in Bangladesh, people in Jamalpur are Hindus who migrated from India several generations back, but are still regarded as immigrants. Their lack of political capital may reduce their ability to attract governmental and non-governmental development projects and support.



*A few goats having an afternoon snooze under a couple of trees (© Sonja Ayeb-Karlsson).*

#### Bhola slum

Bhola Slum, located in the southern part of Bangladesh's capital Dhaka is the only urban study site of Gibika. The population in Bhola Slum has been estimated to about 4,500 people (McNamara et al. 2015). There is high movement in and out of the urban settlement and therefore hard to estimate the exact amount of dwellers. The settlement is located in Mirpur 12, northeastern Dhaka, nearby plenty of other slum areas. There is an asphalt road next to the settlement entrances but the actual settlement area is built on mud. There is a mosque and two NGO-led day-care centres located on this 'main-road'; the governmental primary and secondary school is located about 50 meters from here.

People living in the settlement report facing difficulties with flooding, standing water, fires and storms, especially during the monsoon. Most of the slum dwellers migrated there from Bhola Island after losing their land due to riverbank erosion or after incurring in severe losses and damages to houses and property due to cyclones. Findings from this research site shed light on what happens to people when they are displaced in the aftermath of environmental disasters. Health problems due to standing water, poor sanitation, difficult living conditions and labour-related injuries put additional pressure on their livelihood security. Most women work in the garment factories, and most men earn an income from rickshaw pulling, work with construction or in local shops.

### Voices from the people

*When the riverbank erosion started we lost happiness in life. When I was a child we used to eat rice from our own fields. After the riverbank erosion we never got to eat rice from our fields again. /.../ There used to be three roads, three villages and three wells by the riverside but they all went under water, into the river. The food scarcity came with the riverbank erosion.*

- Bhokul, 59-year-old woman living in Dalbanga South



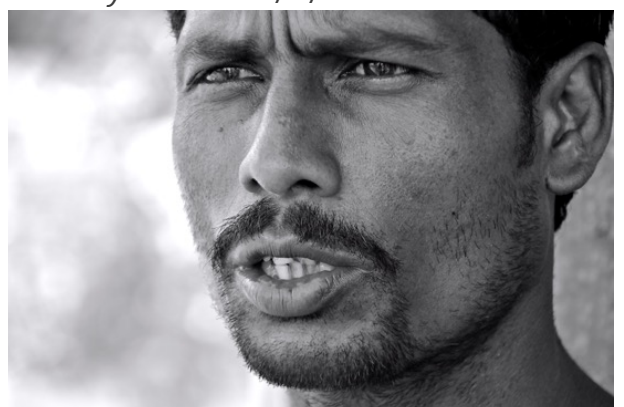
*We were doing quite well until Sidr /... / with 19 cows producing milk that I could sell for 50 taka/litre, and combining it with selling the fish that I managed to catch each day. I was pretty well off financially. /... / Then it was that day that changed my life, the day when 10 out of 19 of my cows died, the day I lost my wife.*



- Nurmia, 78-year-old man living in Mazer Char

*I think I am more vulnerable because my house is located next to the embankment. If I could manage to get some money, I would try to find a safe place. I would go there and buy some land. /.../ I would work so hard to pay back that money - every single cent of it. I just want to put my family in safety, in a place where I do not have to worry about them dying in a cyclone strike.*

- Kabir, 46-year-old man living in Gabtola





*I went there because we did not have any money left in our family to survive. So I was almost forced to go and work for a living. /.../ In this village, if you as a woman work outside the house you end up losing your honour.*



*/.../ After watching us some people said: 'The women out there are working! What do they know about work?' We see and hear those people, but we cannot afford to fear their words. We work to survive.*

- Sahia, 30-year-old woman living in Singpur

*I have a pond here. It is a very old pond and I have no idea when it was made or who dug it. The landless people living around the pond use it. However, powerful men in the village claim it is theirs. There is a police case running in the local court. Together with the landless people, we are defending our rights in court. Seven years ago, people came here and started planting trees next to my house. I told them that this is governmental land and that we are living here. The chairman has given it to us. /.../ I told him there is a case running in court. If you win you get the land, I said but for now I will not allow you to plant trees on my land. You can plant your trees elsewhere. /.../ They did not listen and kept planting trees. After a while I went over and pulled away his hand. He stood up and hit me with the front side of his spade. I tried to protect myself with one hand but my hand was cut into. The spade hit my face, here, next to my eye.,*



- Muzaffar, 55-year-old man living in Babupur

*Sometimes I sell my pond water and sometimes I only rent the pump. I do not sell my pond water when I need it myself. The hourly rent for my water pump is 120 taka and the total price for pond water and water pump rental is 400 taka/h.*



- Bhalo Debi, 65-year-old woman living in Jamalpur



*We lived so much better. We would grow rice and lived in a large house surrounded by trees. We were a happy family with plenty of crops and land but then all went into the river. I am from Bhola Island. That is where I come from. /.../ Home is Bhola. If someone asks me where my house is located, I say Dhaka. I then say that it is located here at the slope of Pallabi, but if someone asks me about my home I say I am from Bhola.*

- Belkis, 39-year-old woman living in Bhola Slum



To hear more from Bhokul, Nurmia, Kabir, Sahia, Muzaffar,

Bhalo Debi and Belkis, watch their [Gibika photo films](#)

on the UNU-EHS YouTube channel

[https://www.youtube.com/playlist?list=PLmqI2xc4rFB1ZThHj3jvEv37OW\\_GCV4LN](https://www.youtube.com/playlist?list=PLmqI2xc4rFB1ZThHj3jvEv37OW_GCV4LN)

### Dalbanga south: Bhokul's story

Bhokul means flower in Bengali, but not just any flower. It is the traditional flower of decoration, the small white flower people in Bangladesh use to decorate their homes and body to look nice. It is a resistant flower; a flower that keeps its good shape and smell for a couple of days without really needing any water or nutrition. This is also how I remember her. She conveyed a strength similar to the resilient flowers growing in the coastal delta of Bangladesh.

Bhokul's life took a major change in the 1960s when her family lost a large part of the family land because of riverbank erosion. She describes how the family never had to worry about how to put food on the table, but as a result of the riverbank erosion, the family became poor. The family's livelihood security depended on what was produced in the fields but with the loss of their land, this security was also lost:

Our family's financial problems came with the riverbank erosion. If the riverbank erosion wouldn't have taken place, our fathers and grandfathers would have continued living their lives with enough food and everything else needed, instead our family is facing scarcity (Bhokul (1955), Dalbanga South, 2014.05.18<sup>2</sup>).

In Bhokul's case, the riverbank erosion first shocked the family's livelihood situation and forced the family into debt. Their livelihood became unsustainable, as the family wasn't making enough money from the rice harvest to pay for the land taxes. The debts later took away the family's last piece of land:

My father couldn't pay the taxes on our land. There was rain and storms. We couldn't maintain the crops on our land, our cattle died. We couldn't pay the taxes for 8 years. After that they took our land away and sold it at an auction. Other people bought our land and we became poor (Bhokul (1955), Dalbanga South, 2014.05.18).

As the riverbank erosion kept eating up the family land and her father could no longer support the family through the yearly rice crop, he had to shift to fishing and Bhokul had to go out and start working:

After the riverbank erosion, we lost the happiness in our lives. When I was a child, we used to eat rice from our own field (Bhokul (1955), Dalbanga South, 2014.05.18).

Dalbanga South (Barguna district, Barisal division) the village where Bhokul and her family have lived for generations is located in the southern coastal area of Bangladesh. Here floods and cyclones are another common event in the community. Cyclone Sidr hit the community hard in 2007 and left a strong mark on Bhokul's family. Fishing was the family's main income source at that time, and they owned a fishing boat that they had struggled to pay for after losing their land. When the cyclone hit, Bhokul's brother went out and tried to save the boat that was tied up on a tree on the riverbank. His effort was in vain and fatal in the

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<sup>2</sup> Livelihood History Interview: Bhokul (Female: 1955), Gibika field data, Dalbanga South, 2014.05.18: 12.45–14.25/2014.05.19: 12.00–14.05.



end. The boat was lost, a couple of days later the brother fell ill and passed away. The fact that he was willing to risk his life for the fishing boat shows how important this asset was. It represented their livelihood security and without it, they had nothing. Bhokul describes Sidr in the following way:

The wind was incredibly strong. The trees started breaking and falling on top of the houses. The children started to scream. After that, the water came flowing into the house. When the water came in, my soul ran away from me. It doesn't matter if there is a heavy storm and it breaks my house. We can take shelter under a tree if we need to but the water? What can we do? Where are we supposed to go? We could try to swim but I don't have that much strength to swim (Bhokul (1955), Dalbanga South, 2014.05.18).

This is the livelihood situation for Bhokul's family and many other families in Bangladesh. She was forced to go from rice farming to fishing, and then in the end shift into a day labour-based source of living. We hope that her story will give you a better understanding the challenges that people living in these extremely vulnerable locations of the world are facing<sup>3</sup>.

Mazer char: Nurmia's story

As we arrive on the Mazer Char Island curious faces greet us at the harbour. They want to know who we are and why we have come. We tell them about our research and they instantly connect it back to their livelihood struggles.



<sup>3</sup>To hear more from Bhokul, watch her photo film '[The day my soul ran away](https://www.youtube.com/watch?v=CruDSB5_6xA)' ([https://www.youtube.com/watch?v=CruDSB5\\_6xA](https://www.youtube.com/watch?v=CruDSB5_6xA)) or read the article published in the Conversation '[This Bangladeshi woman can tell you how real climate change is](https://theconversation.com/this-bangladeshi-woman-can-tell-you-how-real-climate-change-is-68212)' (<https://theconversation.com/this-bangladeshi-woman-can-tell-you-how-real-climate-change-is-68212>) based on her story.

"Four people died in this village during Sidr", a woman leading the transect walk tells me. A man passes by carrying wood for the stove in his kitchen. "He lost his wife", the woman whispers. The man stops. "I lost almost all my cows and my wife", he clarifies. We decide to meet him at his house a couple of hours later. When we get there, he has put on a new blue shirt and combed his hair to the side. He complains a bit about his sister and new wife not getting along and nagging each other. "What are they arguing about?" I ask. "Oh, who knows", he responds. "There are always so many reasons", he says with a smile.

We sit down on the bamboo carpet on the floor of his house. I ask him about his age and where he was born:

I am known as Nuru-Mia. I was born in Ogolbadi about 70 years ago. I left my parents' house and came to Mazer Char after a land dispute with my brothers, following the death of my father (Nurmia (1936), Mazer Char, 2014.05.24<sup>4</sup>).

"The question of land was particularly sensitive back then", he explains. As the family household had already lost plenty of land to riverbank erosion. An everyday struggle that followed Nurmia across the river and all the way to his life on Mazer Char.

Nurmia continues on telling us about his life on the island. He normally spends the afternoons fishing, "when the tide is up you can catch more fish", he explains. However, his boat has is currently broken so he hasn't been able to fish for about a week. "I will have to repair it", he says. "The wood here on the island is not very good so I end up repairing it every year", he moans. In the meantime, he tries to catch fish from shore using a fishing-net:

I am a fisherman. I catch fish with my net or I head out with my boat. That is how I earn a living. That's my livelihood. [...] Since I don't have any land, I really don't have any other options. Buying land implies additional costs like taxes and registration fees. I can't afford that at the moment. During the time that my boat is broken, I will have to remain unemployed (Nurmia (1936), Mazer Char, 2014.05.24).

Throughout the interview, Nurmia keeps coming back to the 2007 cyclone Sidr strike:

We were doing quite well until Sidr, we lost 10 out of the 19 cows [in the cyclone]. Before Sidr I was even planning to send my youngest son to Saudi Arabia to work (Nurmia (1936), Mazer Char, 2014.05.24).

Before Sidr Nurmia had 19 cows from which he could sell the milk. Adding onto the income he made from fishing, he was considered a well-off man. Few people on Mazer Char managed to save up enough money to be able to send their sons to Saudi Arabia. The cows were the family's most valuable income source, so when they found out that the cyclone was approaching, they ended up staying behind trying to protect them. They didn't evacuate to the cyclone shelter in time:

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<sup>4</sup> Livelihood History Interview: Nurmia (Male: 1936), Gibika field data, Mazer Char, 2014.05.24: 15.58–17.18.



I told my wife to go to the cyclone shelter but she wouldn't reason with me. /.../ Even when the storm started increasing and things turned from bad to worse my main worry was still the cows. /.../ As the water level was increasing, we didn't have much time /.../ my son filled a bag of money, 30.000 taka or so, and attached it to the inside of his lungi [traditional male clothing]. We headed off to the cyclone shelter my wife, my two sons - and - me but as we got outside we realized that we would never be able to make it. It was too far away and the water was flooding in with an enormous force. /.../ At one point the stream caught the moneybag so my son let go of his mother's hand to try to save the money that got pulled away by the water. When he let go of her hand the force was too much for my younger son to handle by himself - so he lost the grip of her hand (Nurmia (1936), Mazer Char, 2014.05.24).

Nurmia's wife was pulled away in the flood waves; she never made it to the shelter. After reaching the shelter and putting their father in safety, her sons headed out again in the storm to find her. They never did. Until the next morning, when her lifeless body was recovered by the shelter. They never knew if she made it that far swimming or if it was the flood that had brought her there.

Nurmia tell us how he had to learn an expensive lesson. He emphasises the urgency for a functioning early warning system and disaster preparedness in communities like his, but he also points out important differences in vulnerability. Differences between those who may be able to afford to leave their valuables and livelihoods behind, and those who feel like they cannot and end up putting their lives in danger:

If we would not have tried to save the cows maybe she would be alive today. It took us some time to release the cows, and maybe by that time we would have made it to the cyclone shelter. Maybe the water level would have been lower



when we left the house. /.../ Now I plan in time for the possibility of a cyclone. I buy food for 1-2 weeks and I leave my cows behind. /.../ Nobody really wants to go to the cyclone shelter and leave their house and cattle behind but we have no other option. We survived the cyclone once so this is what it has taught us. This is what we have to do when it strikes (Nurmia (1936), Mazer Char, 2014.05.24)<sup>5</sup>.

#### Gabtola: Kabir's story

For generations, Kabir's family has worked in the Sunderbans. A UNESCO World Heritage site spread out between southern Bangladesh and India. As the village is located just across the river from the protected area, his grandfather used to head over, cut wood and sell it in the local market. However, over the years, the Sunderbans became a restricted area, and cutting down trees there became a crime for which the forest department and local authorities can send you to jail for committing. To cut down wood in the Sunderbans today, you need a permit, and those are not only rare but also very expensive. Kabir faced a tremendous loss on Sidr, a loss from which he never managed to recover. He ended up in debt, and as the debt grew and the fish decreased in the river, he followed in his grandfather's steps. He found no other way out than to carry out illegal livelihood activity and by doing so, he would put himself and his family in danger:

Five days ago I was in the Sunderbans. I stayed there alone for 2 days to collect wood. /.../ On my way home, and when I expected it the least, a motorboat from the forest department appeared and spotted my boat. I somehow managed to jump off the boat and swim across the river back to the Gabtola village. I ran to my house so that they would not find me and bring me in front of the forest department officer. The forest officer brought the boat and the wood back with them (Kabir (1968), Gabtola, 2014.05.26<sup>6</sup>).

As if that wasn't bad enough, the boat that Kabir is referring to was borrowed. He had borrowed the boat, and put himself in great danger to get himself out of a debt, only to find himself in deeper debt to the boat owner:

That boat is gone now. It is stuck with the forest department. So, I will have to give the owner 15.000 taka [€150] for losing his boat. At the same time, I might get a police case raised against me as I went to the Sunderbans to cut down wood without notifying the forest department. That is illegal. As if that was not bad enough, I have another 30.000-35.000 taka [€300-€350] in debt to people in the village that I borrowed money from to manage my losses in Sidr and from the riverbank erosion (Kabir (1968), Gabtola, 2014.05.26).

The season that we visit the cyclone affected study sites are difficult days for our informants. The monsoon is on its way. It is raining and blowing in from the bay. We can feel how people are getting nervous as their

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<sup>5</sup> To hear more from Nurmia, watch his photo film '[if we had left earlier](https://www.youtube.com/watch?v=dlekNZmWJT4&list=PLmq12xc4rFB1ZThHj3jvEv37OW_GCV4LN&index=3)' ([https://www.youtube.com/watch?v=dlekNZmWJT4&list=PLmq12xc4rFB1ZThHj3jvEv37OW\\_GCV4LN&index=3](https://www.youtube.com/watch?v=dlekNZmWJT4&list=PLmq12xc4rFB1ZThHj3jvEv37OW_GCV4LN&index=3)) or read the article published in the Conversation '[Facing disasters: Lessons from a Bangladeshi island](https://theconversation.com/facing-disasters-lessons-from-a-bangladeshi-island-80706)' (<https://theconversation.com/facing-disasters-lessons-from-a-bangladeshi-island-80706>) based on his story.

<sup>6</sup> Livelihood History Interview: Kabir (Male: 1968), Gibika field data, Gabtola, 2014.05.26: 09.47-12.03.



memories from Aila and Sidr come alive. The cyclone presence is strong in the room that day I speak to Kabir. He has been through a lot. He already lost his family once and he is under a lot of economical pressure. He stares out into the empty space and constantly rubs his thumb hard against his hand as we speak. He notices that I am observing him and suddenly tells me:

After Sidr I have become anxious. I cannot seem to relax. Especially during days like this /.../. I feel the wild breeze come in from the sea and it forces me to remember. I cannot stand that breeze anymore. /.../ I had a wife, two sons and two daughters. They were my family. All died in the Sidr except me. My current wife also had a husband, a son and a daughter. They also died in the Sidr. I couldn't see any of my family members. It was dark and wet. /.../ I somehow managed to break the roof of my house. I do not know where I got the strength from but I remember my hand going through the roof and out of the house. /.../ I lost the grip of my son's hand. He got pulled away from me together with the rest of my family (Kabir (1968), Gabtola, 2014.05.26).

Kabir managed to grab onto a tree as the flood pulled him away from the house. He climbed up that tree and held on for his life as he was waiting for the storm to pass. When the water level started to go down, Kabir climbed down the tree to look for his family. He found them one by one, but none of them alive.

This is Kabir's life as we meet him. Just before we arrive, the loss of the boat has thrown him even deeper into an unbearable livelihood situation. There is no sustainable solution out of the debt-trap. When I ask him what he thinks could help him bounce back, he talks of leaving the village:

I think I am more vulnerable because my house is located at the first line of houses after the embankment. If I could manage to get some money, I would try to find a safe place. I would go there and buy some land. .../ I would work so



hard to pay back that money - every single cent of it. I just want to put my family in safety, in a place where I don't have to worry about them dying in a cyclone or flood (Kabir (1968), Gabtola, 2014.05.26).

After losing his whole family, watching the riverbank erosion eat its way closer toward his house and putting himself in danger to pay back his debts, Kabir is broken. *'I have fallen apart'*, he says trying to hold back the tears.

Singpur: Sahia's story

Sahia got married when she was 15 years old. She saw her husband for the first time on their wedding day. Her sense of humour pierced through our conversation as soon as we met: *"He is a good husband. I was lucky, but at the same time he must have overestimated himself a bit to my parents"* she says laughing. *"His market value was put a slight bit over what he actually was."*

After the wedding, Sahia and her husband moved in with her father-in-law in Singpur. A riverside village in central Bangladesh located a couple of hundred kilometres from Dhaka. They had been living there for about a year when their home was dragged into the river by the erosion:

One day we found cracks on the mud-floor as the land had started to get pulled into the water. We knew already then that it was a bad sign. The cracks kept growing more and more for every day that passed (Sahia (1984), Singpur, 2014.06.02<sup>7</sup>).

Riverbank erosion is usually a slow onset event, but from time to time, it turns into a sudden onset event when a larger chunk of land falls into the water. This is what happened that day when Sahia lost her first house. As soon as she noticed that the cracks were growing, she started carrying out all of their belongings to place them into safety. A few hours later, the house was gone.

Sahia and her family moved in with her husband's uncle for a while. However, it didn't take long until this house also got eaten up by the river. They thereafter moved into an abandoned house, but also this location is too close to the river, Sahia tells me worried.

Her husband used to be a fisherman and the family got by on the fish he managed to catch. Until one day when it all changed:

My husband used to catch fish but when the fish got some disease, he had to stop fishing. /.../ Nowadays, there is [hardly] no fish in the river. /.../ There used to be a lot of fish, but as the fish started dying from the disease, people stopped eating them. /.../ all the big and good fish disappeared (Sahia (1984), Singpur, 2014.06.02).

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<sup>7</sup> Livelihood History Interview: Sahia (Female: 1984), Gibika field data, Singpur, 2014.06.02: 13.30–14.59.



As the main income source couldn't sustain them, the family was forced to change their livelihood. They decided to start migrating seasonally to a brick factory in Aliganj, up by the river. Now, they leave the village for six months every year during the rainy season to avoid the flooding:

The man who brought us there gave us some money and with that money, we managed to survive the first six months. What we earn now, we use to feed our family. They usually pay us on weekly basis, around 2,000-4,000 taka [€20-40]. After feeding my family, consisting of six family members, we manage to save about 1,000 taka [€10] or so per week. That amount is our family's whole income per week (Sahia (1984), Singpur, 2014.06.02).

When the family returns to Singpur, they live on the savings from the brick factory in Aliganj. The work is hard and dangerous. The children also miss school as they also have to join the work in the factory. It may very well just be a question of time before someone in the family gets injured or sick from the hard work.

The savings will then be far from enough to sustain the wellbeing of the whole family.

The shift in livelihood activity has not only been hard on Sahia physically. Before the factory work, she was a housewife like the rest of the women in the village. Working outside of the house as a woman in her village does not come without social stigmas:

In this village, if you [as a woman] work outside you lose your honour. /.../ After watching us some people say: 'The women out there are working! What do they know about work?' We see and hear those people, but we do not fear their words anymore. We work to survive (Sahia (1984), Singpur, 2014.06.02).



I can see that she is observing me, how I tied up my hair and the clothes I wear. We are two women not that different from one and another, but yet living two completely different lives in different parts of the world. She must have realised our similarities too as she says:

I am actually not that old. It is the hard work that made me look like this. Did you not see my husband? Nobody thinks I am his wife after looking at him (Sahia (1984), Singpur, 2014.06.02).

Her husband is young, in his late twenties - early thirties. When I first met Sahia I thought she was about a decade older than me, in her forties, but turns out we are about the same age. She had to make the necessary sacrifices in her life to sustain her family. When I return to the village one year later, I immediately go to try and find her. I ask the people I met on my way, but without any luck. I reach the place where her house used to be standing. It is gone. It has fallen into the river. I ask the neighbours if they know where the family went. They tell me that they have no idea.

#### Babupur: Muzaffar's story

Muzaffar, a 55-year-old man that we met in Babupur, starts his story by telling us about his past and hard times. He started working at young age, so he never had a chance to go to school. When he got a family of his own, managing to put food on the table was his primary struggle.

Food was scarce at the time and money difficult to make in the village so he was forced to leave his wife and eight children and go to Dhaka. He worked as a day labourer here, mainly by carrying sand and stones:

My experience in Dhaka was very tough. I could not afford to live in a house. We lived in a dormitory made of tin. It was full of mosquitos and ants. I suffered a lot. We were about 50-60 people stuck into that same place. /.../ I had no educational background so I couldn't change my profession, but I had to make sure to care for my family. That is what kept me going when I was carrying the heavy sand bags on my head from 3 am in the morning until 6pm in the evening. /.../ I raised my children by through hard work. I know how painful it was so I don't want to send my children to work like that. They will not be able to work that hard (Muzaffar (1959), Babupur, 2014.06.04<sup>8</sup>).

After returning to Babupur, Muzaffar settled down close to a pond on government owned land. However, even though it was assured to him that he could stay there, powerful men came to chase him away. They tried to plant trees on the land next to his house. A land grabbing strategy commonly used as they later could claim their investment in the land, he explains:

I have a pond here. It is a very old pond and I have no idea when or who dug it. The indigenous and landless people living around the pond use it. However, /.../ [powerful men in the village] claim it is theirs. There is a police case running in the local Naogaon court. Together with the indigenous people, we are defending our rights in court.

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<sup>8</sup> Livelihood History Interview: Muzaffar (Male: 1959), Gibika field data, Babupur, 2014.06.04: 15.27–18.10.



Seven years ago, /.../ people came here and started planting trees next to my house. I told them that it was a governmental Khas land and that we are living here. The chairman has given it to us. /.../ I told him there is a case running in court. If you win you get the land but for now I will not allow you to plant trees on my land. You can plant [your trees] in the open land. /.../ They did not listen and kept planting trees. After sometime I went over pulled away his hand. He stood up and hit me with the front side of a spade he was using. I tried to protect myself with my hand but my hand also was cut. It hit my face here next to my eye (Muzaffar (1959), Babupur, 2014.06.04).

Muzaffar fainted when the spade hit his head. The neighbours, landless and indigenous people, carried him away and tried to get him to the hospital to be able to save his life. As they tried to get him into the taxi, the men who attacked him tried to stop them from doing so. They didn't allow the taxi to leave until Muzaffar's uncle screamed "*if you want him dead you better kill him now*". The police came to the village to investigate what had happened, but he who is poor can not afford to pay for justice, Muzaffar clarifies:

After the conflict the police did come here, but they did not really do anything. We are poor people so we were not able to give to the police any money. The police case is still today running in the Naogaon high court (Muzaffar (1959), Babupur, 2014.06.04).

Muzaffar's life took a sudden positive change. He may not have gotten justice in court, but some local NGOs helped him to get wind under his wings. He was given some livestock, sold them, took a loan, bought a harvester machine, and managed to build up a small business:

I think the time that I am living in now in is the best time of my life. It started about 4 or 5 years ago when Dabi [a local NGO] gave me goats and a sheep. BRAC also gave me a cow. After that I managed to change my condition around.



I bought a harvester machine that separates the paddy from the rice by taking a loan. 14,000 take (€140) from Grameen Bank. I have to pay back the money within two years through smaller instalments. I also took a 20,000 (€200) loan from BRAC and another from Karitash on 18,000 (€180).

I use this machine with my children to separate our rice. I also use it to separate other people's rice. When doing so I take out rice as payment [for the work] (Muzaffar (1959), Babupur, 2014.06.04).

Today he not only harvests other people's land and rents out the machine but he also does share cropping and keeps some livestock. He started to pay back the loans. The hard time in Dhaka is now his past and so is his near death experience, standing up for his land. Muzzafar has succeeded; he managed to bounce back. I can see how he struggles to focus his eye after the injury from the attack. Still, his eyes are full of pride. He gives me a warm and proud smile and says "*my youngest daughter just finished her Bachelor degree*".

Jamalpur: Bhalo Debi's story

Bhalo Debi is a survivor. She is the only one out of six children who survived. "*My mother did not have enough breast milk to feed me when I was born so she would give me food supplement*", she explained. That is why she is named Bhalo, which means 'good' in Bengali. "*I was strong enough to survive on food supplement already by birth*" she says with a smile. As she was her father's only child, she inherited the family land. A woman inheriting the family land doesn't happen often in Bangladesh:

Nowadays women go outside [of the village] and do all kinds of work. Back in our days there was no such thing. I was the only child of my father, but he still did not allow me to do any kind of work. He would never let me go outside of the village (Bhalo Debi (1949), Jamalpur, 2014.06.08<sup>9</sup>).

She later divided the family land up in between her five sons. It is clear that the external circumstances have shaped her into the extraordinary woman she is today. She speaks like a businesswoman. She twists and turns the numbers - elaborates on how to get the highest profit out of all that she does. On her land, there is a pond and in a village like Jamalpur; water is a valuable asset, especially during the dry seasons or dry spells. She has therefore managed to turn her luck into a profit; she made a business out of the pond. During the dry season, people in the village need water to irrigate their crops. Bhalo Debi invested in a water-pump and started renting out either the pump alone for those who have a pond, or the pump and access to her pond for those who are not as lucky:

We have a pond that is on about the size of 1 bigha land. I don't know who dug the pond. It was here even before my grandfather's time. /.../ I rent out my pond water. Sometimes I rent out my pond water and sometimes I rent out my water pump. The hourly rent for the water pump only is 120taka [€1.20], and the hourly rent for the pond water [and pump] is 400taka [€4] (Bhalo Debi (1949), Jamalpur, 2014.06.08).

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<sup>9</sup> Livelihood History Interview: Bhalo Debi (Female: 1949), Gibika field data, Jamalpur, 2014.06.08: 14.38–19.00.

Bhalo Debi's sons have followed in her father's footsteps and grow rice. Not to be deceived by her age, she quickly calculates how much more money they can make by growing the more expensive rice and by using the right fertilizer:

As it is more profitable to cultivate the Chikonful rice, I told my sons to cultivate it all year long but they do not always listen to me.

If you have land, you are less vulnerable to the drought. I have some land, but during a drought, you can also become more or less vulnerable depending on how clever you are. If you are clever, you can make money out of any condition – even drought (Bhalo Debi (1949), Jamalpur, 2014.06.08).

The drought and dry spells in the area do not affect everybody equally, she explains. In the neighbouring Muslim village, they have installed deep tube wells that ensure the people at least some water throughout most times. From a long-term perspective, they may have serious impacts on the groundwater levels, but in the short term, they provide people with clean drinking water immediately. The neighbouring village also has seven regular tube-wells. When we visit the Jamalpur village, they only have one and it is broken. Jamalpur is the only Hindu village around. Bhalo Debi is certain that the differences in infrastructure, governmental and NGO support is due to religious discrimination:

If we would get a deep tube well here, we could live well, also during the drought. If we get two or three tube wells in the village, then our living standards would be better. We only have one tube well in our village and everybody in this area is using the same tube well.





I do not know why we only have one tube well while the Muslim neighbourhoods have more. We live under the same administrative area, but I do not know why we do not receive the same support as them (Bhalo Debi (1949), Jamalpur, 2014.06.08).

Bhalo Debi explains how when the tube wells go dry, they are forced to go and search for water elsewhere. While doing so, they get shouted at and asked to leave. We notice that some people even lock up their tube wells with padlocks to make sure that they aren't used by others. Social disturbances and conflicts over reduced natural resources are common in environmentally stressed areas. Social identity or social status can then become as important as having land and being clever.

Bhola slum: Belkis

When entering the narrow lanes of Bhola Slum in Dhaka, the heat and smell hit me straight in the face. I remember stopping, as I felt like I was about to faint. The temperature seemed to increase for every second as most dwellers had started preparing lunch on their fire stoves. It was hard to differentiate the humidity from the smells of food, garbage and sluice water.

I made it to Belkis' house with my colleague. She had expressed an interest to take part in the interview. As she came down the stairs to greet us, I smiled and took her hand hoping that my smile would cover up my pale face. She studied me from top to toe, looked deep into my eyes and said worriedly: "*Yesterday you looked better. What is wrong?*". I assured her that I was just a bit tired, that I was fine and that she shouldn't worry.

As we balanced up the long stairs to her house, she told me with a proud voice that her family was the only one in the slum living on the third floor. "*It is good when there is a flood because the water will not make it up to the third floor, but it can become a death trap if there is a fire*", she explained.

We sat down on her wooden floor. I pulled out my notebook and audio recorder. She started her story by telling me how life changed after her family was forced to leave Bhola Island and move to Dhaka:

[When we moved to Dhaka] my father couldn't work as he was too old, so my brother would support us economically. /.../ After he died my parents suffered and I had to start begging from door to door. /.../ [If we would have stayed] I would have been able to take care of my health. We would have our land to cultivate so our living conditions would be better. We used to have our own land so we didn't have to run after people. The way of living there was good (Belkis (1975), Bhola Slum, 2014.06.15<sup>10</sup>).

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<sup>10</sup> Livelihood History Interview: Belkis Begum (Female: 1975), Gibika field data, Bhola Slum, 2014.06.15: 12.27-16.35

Belkis never lived with her family on Bhola Island. She was born in another slum in Dhaka. Her family migrated here due to the riverbank erosion and cyclone strikes. After having lost three houses to the erosion, and two sons in the cyclones, the family saw no other way out.

The question is how much better did life get after they moved to Dhaka?

Belkis' family watched their house get smashed into pieces as they were evicted due to illegal settlement. This was the fourth house the family lost. They lived in a temporary house made of cardboard until her mother got sick and nearly died from the cold. Belkis got married at the age of 12 due to economic pressure. When her brother, the main income earner in the family, passed away, she had to start begging to support her parents.

As if that wasn't enough, she faced an additional loss due to the dangerous working conditions in the city:

My husband cannot work properly as he had an accident. While cutting mud on a hill he was struck by a sudden landslide. There was a pipe inside the hill and it broke, creating a landslide, and he fell down in a hole and was buried. The other workers removed the mud and managed to save him. They took my husband to the hospital. Now when trying to work he faces many problems. He has pain coming from two sides of his belly and sometimes when he coughs, blood comes out of his mouth (Ayeb-Karlsson et al. 2016: Quote 28).



The hard work and difficult living conditions in the slum resulted in both Belkis and her husband getting severely sick. A large amount of their income is therefore spent on medicine and hospital visits. From time to time, their critical health conditions end up putting the family in debt. Belkis' tells me how her husband went as far as trying to sell his blood to gain money for medicine when her kidneys started failing.

Our conversation started with Belkis being worried about me looking a bit pale. By the time she pulls out all the pills she takes every day my dizziness is completely gone. I struggle to smile back at her when as she tells me that they are managing. I glimpse over at her two boys playing on the floor and her husband sleeping in the bed next to us. He hasn't moved or made a single sound during the whole interview. Belkis notices my worry and tells me: "*He worked yesterday. If he works one day, he will have to rest the next*".

Belkis' story is a one that may happen to a family after they migrate from rural to urban Bangladesh. A story that does not end at "we decided to migrate" or "we had to migrate". Belkis' life story begins when her family arrived in Dhaka, but she tells it differently. During the interview, she talks as if she was there. She describes it as if she went through the losses, as if she watched her house fall into the river, as if she moved, and as if she had to start all over again after reaching the capital. This is her story. Even though she was born in Dhaka, her story does not start there.

I think to myself that she must have spent a lot of time on Bhola Island. I ask how often she goes back there. It turns out that she has only been there twice, and for about three-four days each time. Belkis spent her whole life in Dhaka but she transmits a feeling of belonging somewhere else.

Before I leave, I have to ask, "*Where do you say you are from when people ask?*"

I say Bhola. I am from Bhola. That is where I come from. /.../ Home is Bhola. If someone asks me where my house is located, I say Dhaka. I then say that it is located at the slope of Pallabi, but if someone asks me about my home district I say I am from Bhola (Belkis (1975), Bhola Slum, 2014.06.15).



## Advice from the people

During the institutional landscape activities, a need assessment was carried out in each study site. This was an attempt to let the people share their knowledge in terms of what they saw as the most important that ought to be addressed in their own living environments. The following section will present a summary of their conclusions.

### Dalbanga south

Dalbanga South is situated by the riverbank of the Paira river. The riverbank erosion is also the environmental stressor that the people express having the most difficulty to confront. A mud-embankment, which also serves as the village road, was built on top of the riverbank to protect the village temporarily against erosion. However, as the erosion eats its way into the embankment, another mud-embankment is usually constructed further into the village dividing safe houses from the ones in direct risk to fall into the river. This adds on social stress and pressure as a line is drawn, most of the time without consulting the people. This results in some of the people's houses or land unexpectedly ending up on the wrong side of the embankment. Most people report having lost a family house or land at some point. A concrete embankment, like the ones built by the government in many neighbouring villages, would protect the village better and for a longer period of time.



*Transporting coconuts over to mainland (© Sonja Ayeb-Karlsson).*

People also expressed worries around the dysfunctional early warning system and the only cyclone shelter, which was reported to be falling apart and does not fit more than about a third or fourth of the people. Additionally, some of them have to walk up to an hour to reach the shelter, putting their lives at risk especially if they receive the warning messages too late. On top of that they might not even be able fit into the shelter if it is already at full capacity. Efforts to improve the effectiveness and range of the early warning system, as well as disaster preparedness training, are crucial for people's survival, and the protection of livelihood and belongings.

#### Mazer char

Mazer Char is gradually eroding, and people are losing their land and house due to the riverbank erosion. They therefore emphasise that their most important need is a concrete embankment to protect the village from the erosion. The erosion is said to have rapidly increased lately and a large part of the island has disappeared into the river. People's future depends on slowing down, stopping the erosion or moving elsewhere, which is not an option for most as they are landless. Other needs to improve their living conditions are healthcare and educational facilities such as health centres, hospital and a high school. There is currently only one primary school in the village and for medical care, people put their lives in risk while trying to reach the hospital on the mainland a couple of hours away. They also mention access to a speedboat for medical emergencies. People lack necessary public infrastructure such as tube-wells or access to clean drinking water, solar panels to get electricity, as well as agricultural machinery.

An interesting observation by the people is the value in the location of the island next to the Sunderbans. Tourist boats on their way to the Sundarbans restricted area stop on the island for food and rest. Therefore, tourism related activity such as hotel service and restaurants could serve as alternative livelihood source for people here. The women mostly emphasise household oriented needs such as sustainable housing, food security, clean water supply, solar panels and latrines, while men focus more on alternative livelihood opportunities and public infrastructure.

#### Gabtola

The concrete block embankment built to protect the riverbank from erosion has clearly taken away some of the worries about the environmental stressors in the area. People mention the embankment being an important improvement to the village. Not only does it slow down the riverbank erosion but it also protects the village from flooding and standing water during high-tide. This may be a reason why people focus more on increased job opportunities and improved living conditions (water, electricity, latrines, health and educational related infrastructure) instead of protection towards environmental stress. The men emphasised how important new job opportunities are, while women rather pointed out how investment funds could support the village. In the female focus group discussion, the embankment or riverbank erosion

were not brought up at all. Nevertheless, each time a cyclone strikes the village, the embankment is partly damaged or completely destroyed. This is a clear example of how adaptation sometimes is not enough, and that there may be constraints to the adaptive approach. The need for improved and more effective early warning system in the village is mentioned. There is an early warning system and training programmes in place, but they do not seem to be effective. A better early warning system could have helped avoid the death of almost a third of the people during 2007 cyclone Sidr.

#### Singpur

Singpur is a remote village, located far away from larger cities. The village turns into a flooded island during the rainy season, which is why many depend on seasonal migration. People cannot tend to agricultural livelihoods due the flooded agricultural land, and the standing water sometimes results in fish and livestock dying due to waterborne diseases. Riverbank erosion is another severe problem for people, as most of them have lost at least one home into the river. They therefore do their best to install any embankment solution that can help saving their village from disappearing completely into the river. This include covering the riverbanks with bamboo nets. A concrete wall has been built to protect half of the village from flood surges, but it is also said to protect the land from eroding. However, as only one side of the village is protected, people living on the other side of the village claim that their land continues to disappear into the water. People think that the only way to save the place is to continue the concrete wall around the whole village. However, it is not certain that this would be architecturally possible due to the changing course of the river and the natural movement of soil in delta areas. Additionally, the lack of education is a big problem in the village as children are taken out of school to join their parents during the seasonal migration, and since the village neither has a high school nor a college.

#### Babupur

In the northern study sites, people do not fear water through cyclones and floods or build embankments to save their land from water like in the south. Instead, people here pray for water to be able to save their land and crops. Most people in Babupur ask for more deep tube wells so that they can continue on cultivating their lands. The area has a couple deep tube wells already, but people state that they need more. Currently, several areas of the village, and the people living here, do not have access to water. However, from a longer perspective, the deep tube wells will have serious impacts on the groundwater levels. The men push hard for the instalment of more deep tube wells than the women.

People also express a need for safe drinking water, and water to wash their cloths and maintain their hygiene all year around. In the past, mainly before the tube wells were installed, people were forced to consume water from the ponds during drought or dry spells. The tube wells also sometimes dry out or cannot provide enough water for everybody in the village. After the installation of the deep tube wells, the



water is usually just enough for what is needed to provide people with drinking water, even during dry spells, but people say that they still are being forced to use pond water to wash dishes, cloths, livestock and care for their hygiene which increases the risk for waterborne disease. People therefore suggest installing more deep- but also shallow tube wells, dig more ponds, and ensure water supply through central water tanks. Lack of access to electricity and public infrastructure, such as concrete roads, also influence their access to school and hospitals as well as makes it harder for those who try to work outside of the village.

#### Jamalpur

Jamalpur is a village located just around the corner from Babupur, but the two villages do not have much in common in terms of living conditions and adaptive responses to the lack of rainfall. People in Jamalpur report sometimes still having to struggle with sanitation, water-borne diseases and health issues due to the lack of fresh water. Deep tube wells are suggested, not only to ensure drinking water and water for hygiene purposes, but also to keep livestock and crops safe. However, installing deep tube wells to start irrigation groundwater may have severe impacts on the water supply in the future.

The village currently does not have any deep tube wells, only shallow tube wells, and when we visit only one in the whole village is able to provide people with water. People explain that the reason why they are being left unattended is because of religious discrimination. According to people, there is a lack of governmental- and NGO support in the village, while neighbouring Babupur has at least seven tube wells as well as deep tube wells. People explain that the difference in tube wells a result of Jamalpur being a Hindu village while Babupur is Muslim. As a result, no land can be used for cultivation during the dry season. People also struggle to ensure water for personal use. Conflicts arise around the little water that is left. In addition, those who leave the village to seek water in neighbouring villages run into conflicts as they are accused of stealing water that is not theirs. Some people, mostly women as they are responsible for cooking and cleaning, report having to travel by bus for half a day to a day to be able to bring back a couple of litres. The only tube well in the village cannot provide everyone with water and therefore dries out. People then use pond water for everything except cooking and drinking, but as the ponds are used for multiple purposes such as washing cloths, livestock and more, it increases the risk for water-borne diseases. The ponds also dry out during dry spells or droughts.

There is no electricity in the village and people point out that the only road is made of mud while concrete would be better. During the rainy season, the village is partly cut off from important public infrastructures such as schools and hospitals due to the muddy road conditions. A high school within the village would therefore be useful, or a concrete road could be used throughout the year. The main concern for women is the need for improved educational and religious facilities, as well as the savings and sustainable housing. Currently, the houses do not withstand storms and the household latrines and sanitation systems are poor.

## Bhola slum

In Bhola Slum, the men were very specific in terms of what was needed. They stated three things: (1) an improved drainage system so that the slum stops getting flooded, (2) a concrete road throughout the slum so that people can get around in the settlement during the rainy season, and (3) safe and clean water supply.

The women articulated more needs and talked about them in more detail. This also differs from the other study sites. They mention how more collaboration between the NGOs and people are important for the settlements improvement. It appeared as if women were more engaged in the NGO-led development initiatives and more aware of the details around them. They expressed how education can help people escape poverty, and how it is important to have health-care centres close by. Improved sanitation, increased safety in the slum as well as more income opportunities were other things mentioned. The women also said that there is a lack of space as the slum has been squeezed together after repeated evictions. In the future people will need to secure land elsewhere as they most likely will face more evictions. The earliest evictions in Dhaka took place already in January 1975. About 200,000 people were evicted then, but only 75,000 of them re-located to the Mirpur area, which is where Bhola Slum is located today. Between the years of 1989 and 1998, twenty slums were demolished in Dhaka (COHRE and ACHR 2000; Mohit 2012). Bhola slum alone has faced three evacuations already.



*A boy in Bhola Slum proudly shows us the drawing of the Bangladeshi flag that he made in school (© Sonja Ayeb-Karlsson).*

# Research results

## People's adaptive strategies can increase their vulnerability in other ways

Our study found that the way people responded to the environmental stress in the study sites sometimes ended up making them more vulnerable to other climatic and non-climatic threats, such as dangerous and unhealthy living or working conditions. A total of 28 Livelihood History interviews were conducted to better understand people's decision-making process while dealing with environmental risks.

The findings showed that the three core adaptive strategies people tended to turn to, (1) agricultural adaptation, (2) diversifying livelihood sources, and (3) migration, sometimes ended up being unsuccessful. As floods, cyclones, riverbank erosion, and droughts tend to damage agricultural land and crops, people generally responded by either modifying their agricultural practices, switching to alternative livelihoods, or by trying to migrate away from the stressors. The respondents in Bhola Slum, in Dhaka, however, responded that migration led to them being more vulnerable to urban threats, such as dangerous working environments.

The people interviewed in Bhola Slum migrated there to escape the impacts of the riverbank erosion and cyclones back on Bhola Island, but once arrived in Dhaka they found themselves having to engage in dangerous construction work or living under unhealthy conditions to be able to survive.

*My husband cannot work properly as he had an accident. While cutting mud on a hill he was struck by a sudden landslide. There was a pipe inside the hill and it broke, creating a landslide, and he fell down in a hole and was buried. The other workers removed the mud and managed to save him. They took my husband to the hospital. Now when trying to work he faces many problems. He has pain coming from two sides of his belly and sometimes when he coughs, blood comes out of his mouth*

*(Ayeb-Karlsson et al. 2016: Quote 28).*

To learn more, see:

Ayeb-Karlsson, Sonja, Van der Geest, Kees, Ahmed, Istiak, Huq, Saleemul, and Warner, Koko (2016).

[A people-centred perspective on climate change, environmental stress, and livelihood resilience in Bangladesh. Sustainability Science 11 \(4\):1-16. https://link.springer.com/article/10.1007/s11625-016-0379-z](https://link.springer.com/article/10.1007/s11625-016-0379-z)





*A woman with a baby in Gabtola stops for a chat. The village lost a third of its population during the 2007 cyclone Sidr strike (© Sonja Ayeb-Karlsson).*

If climate policy is to protect those who do not manage to escape environmental risks, we must first textually examine the concept of Trapped Populations

First mooted in 2011, the concept of Trapped Populations generally referred to people who had a desire to move but found themselves unable to escape environmental high risk areas. In this respect, the concept's focus on immobility helped to broaden the study of human responses to environmental change. While a seemingly straightforward concept, the underlying discourses around the reasons for being 'trapped', and the language describing the concept have profound influences on the way in which policy and practice approach the needs of populations that are at risk from environmental stresses and shocks. *The potential effects on vulnerable populations of using a language that describe them as 'trapped' cannot not be neglected.*

To investigate the values surrounding the concept, a critical discourse analysis was carried out on the academic literature referring to 'trapped' within environmental migration studies to understand why the concept appeared when it did, how it has been shaped to date and if there is a risk that the concept could be misused.



*A few fishermen are pulling up their net close to Singpur. At times the fish is reported to get sick and ruined here due to the floods and standing water (© Sonja Ayeb-Karlsson).*

The power effects of language are of particular importance within policy. Proactive forms of climate action and policy recommendations must therefore require extreme caution to ensure that they preserve the autonomy of affected people. In situations where immobility is involuntary, assisted migration may be welcomed; however, where immobility is voluntary it will represent an imposition into people's lives and their choices to stay in seemingly risky locations. Climate policy recommending relocation or resettlement must incorporate the incredibly complex and sensitive nature of the process and acknowledge the power that may underlie its use. The power contained within language should therefore not be overlooked, and especially not in relation to describing someone as 'trapped'. Labelling a person as 'trapped' has a similar potential as labelling someone as 'sick' – such a label may reduce or remove an individual's agency and independence in determining their own destiny.

For the complete textual analysis, see:

Ayeb-Karlsson, Sonja, Smith, Christopher D. and Kniveton, Dominic (2018).

[A discursive review of the textual use of 'trapped' in environmental migration studies: The conceptual birth and troubled teenage years of Trapped Population. \*Ambio\* 47\(5\): 557-573. <https://doi.org/10.1007/s13280-017-1007-6>](https://doi.org/10.1007/s13280-017-1007-6)





*Heavy rain and storm moves over the island of Mazer Char (© Sonja Ayeb-Karlsson).*

People who manage to migrate away from environmental threats in rural areas may instead end up mentally trapped by socio-psychological constraints in urban settlements. Since the Trapped Populations concept was introduced by the Foresight report in 2011, various migration scholars have aimed to expand the concept. However, the general definition still refers to people 'trapped' in environmentally high-risk rural areas due to economic constraints. To widen the understanding of the concept, Q-methodology and a Foucauldian inspired discourse analysis were used to elaborate around the emotional and psychological aspects of immobility in an urban unofficial settlement in Dhaka, Bangladesh. The study revealed crucial insights in how socio-psychological constraints may influence people's (im)mobility decision-making process, while most other studies referring to 'trapped' examine rural places, and emphasise the economic factors of immobility. This urban population managed to migrate from a rural area where they were dealing with riverbank erosion and cyclones to an urban slum in Bangladesh. However, many of the people identified themselves as 'trapped' after arriving in the urban settlement. This notion was explained by them as feeling unable to move back home, and unable to move to a better part of Dhaka. Rather than depending mainly on economic explanations of being 'trapped', people focused on a combination of processes, which included gender and psychosocial factors to provide an explanation of immobility in Bhola Slum.





*A bicycle wheel makes a superb toy in Bhola Slum (© Sonja Ayeb-Karlsson).*

Gender roles, health, and emotional place-attachment played crucial roles in how people defined themselves as ‘trapped’ and unable to escape the slum. The findings also showed how power and knowledge may affect their (im)mobility, and how socio-psychological constraints are factors in people’s decision-making. These constraints ended up paralyzing some people, trapping them mentally as well as geographically.

*Life on Bhola Island is more peaceful. I think that is better. I have been in Dhaka for more than 10 years now but I do not like it here. Dhaka is not my place. I want to go back. I want to live in my village. For me that life is better. The village environment is way better than here. In the village you do not realize when six months have passed, but here it is difficult to pass each day (KES BSM20 2016).*

For complete analysis, see:

Ayeb-Karlsson, Sonja, Kniveton, Dominic and Cannon, Terry (2018). Trapped in the prison of their minds: Understanding the notion of ‘trapped’ populations through an urban settlement in Bangladesh. *Population, Space and Place*. Under review.





*Bhole Slum from above (© Sonja Ayeb-Karlsson).*

### Gender-roles are important factors to better understand disaster immobility and climatic vulnerability

Another study aimed at expanding the concept of Trapped Populations investigated in which ways gender influences people's immobility during cyclone strikes in Bangladesh. The study investigated whether gender roles and gender relations can help to explain why some people, and especially women, fail to evacuate to the cyclone shelters when a cyclone strikes. The discourse analysis carried out on a mixed-method dataset, conducted through Q-methodology, survey questionnaires and storytelling sessions, showed that gender roles do play an important role in people's evacuation decisions.

The social roles allow as well as constrain people's mobility when the disaster strikes. The findings showed that the identified discourses within which people socialise ended up 'trapping' people differently. What is accepted social behaviour, or an accepted social space for a man, was not 'acceptable' for a woman. The discourse groups interactively described what it meant to be 'trapped', as well as how women in particular were emotionally or mentally constrained in their decisions to move or evacuate to the shelter(s). In other words, when the disaster strikes, not all have the same ability to escape.

Nevertheless, women here wear sarees most of the time. The sarees are usually 10-12 feet long, so they cannot swim wearing this long piece of cloth. Men, on the other hand, might be wearing simple piece of clothes like a lungi. They can pull their lungi up if needed and therefore swim or stay in the water longer, they can even take shelter in the trees (KEI MCM30 2016).

It is not right [for unmarried women to go to the shelter] because it could create problems. /.../ I do not like women going to the shelter. It just does not feel right. Wherever they go, things happen (LHI GBM38 2016).



*A girl attends school in one of the cyclone shelters (© Sonja Ayeb-Karlsson).*

To read more on this topic, see:

Ayeb-Karlsson, Sonja (2018). Chapter 6 When the disaster strikes: A gender-analysis of Trapped Populations and non-evacuation behaviour during cyclones in Bangladesh. In *Doctoral thesis DPhil When the disaster strikes: Immobility Decision-Making in the context of Environmental Shocks and Climate Change Impacts*, School of Global Studies. Brighton: University of Sussex and IDS.

Ayeb-Karlsson, Sonja, Van der Geest, Kees, Khanom, Tanzinia, Ahmed, Istaikh, Huq, Saleemul,



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*Rice harvested in one the the northern study sites struggling with droughts (© Sonja Ayeb-Karlsson).*

### There is an urgent need to deepen the understanding of social and cultural limits to disaster preparedness

Even though much work has gone into the technical and economic grounds for disaster preparedness less effort has been directed at understanding the social and cultural challenges and opportunities to reduce disaster risk. In line with the climate action carried out through the project, research was also focused on local insights into the social and cultural contexts of disaster preparedness. In many cases, an early warning system is in place to warn people of environmental shocks, but the system sometimes fails due to social or cultural limits.

The knowledge-sharing platform of the Resilience Academy revealed that research investigations all over the world had come to similar conclusions. Although there were geographical and disaster typological differences in the locations and situations, the considerations that limited the system efficacy were fairly similar.



*Some fishermen manage to turn their boats into taxis during the floods (© Sonja Ayeb-Karlsson).*

*No one can save us but Allah. The NGOs cannot do anything. If Allah does not want you to survive, all your efforts will be in vain and you will die. We must follow Allah. /.../ During a cyclone, it is Allah's wish that will determine if my house is protected. It is first when my house collapses that I will come out (Interview 2014.05.19).*

For complete analysis, see:

Ayeb-Karlsson, Sonja, Kniveton, Dominic, Cannon, Terry, Van der Geest, Kees, Ahmed, Istaikh, Derrington, Erin M., Florano, Ebinezer and Opiyo Opondo, Denis (2018). I will not go. I cannot go: Cultural and social limits to disaster preparedness in Asia, Africa and Oceania. Disasters. Forthcoming.





*A girl watches as her father is struggling to use the broken harbour on Mazer Char (© Sonja Ayeb-Karlsson).*

### The health impacts of climate change and environmental shocks are still poorly known

The mental aspect of people's immobility in relation to how people struggled to deal with environmental shocks and climate change impacts in the urban and coastal study sites were portrayed as crucial issues in need of urgent solutions. People also emphasized how illness, physical as well as psychological, was strongly linked to the loss of livelihood security. In Bhola Slum, people sometimes fell ill due to the dangerous living or working environments which pushed them deeper into poverty, while the lack of clean water in the northern and drought-affected study sites ended up spreading water borne diseases that otherwise could have been avoided. In the coastal study sites, people spoke of 'internal damages and aches' that could not be eased with pain killers, or how children kept burying their toys after having witnessed how people buried the bodies of their neighbours who died in the cyclone strikes. More research investigating the mental after-effects of disasters, such as people dealing with PTSD and depression, is required in the future.

Until now, the research insights coming out of this project have been channelled into the Lancet Countdown, a collaborative global research initiative tracking progress on health and climate change while providing an independent assessment of the health effects of climate change, the implementation of the



Paris Agreement, and the health implications of these actions. The collaboration follows on from the work of the 2015 Lancet Commission on Health and Climate Change, which concluded that anthropogenic climate change threatens to undermine the past 50 years of gains in public health. The Lancet Countdown



*Many struggled with depression, anxiety and other mental health issues after losing their family members in the cyclones (© Sonja Ayeb-Karlsson).*

is a collaboration between 24 academic institutions and intergovernmental organisations based in every continent, with representation from a wide range of disciplines.

*After Sidr I have become anxious. I cannot seem to relax. Especially during days like this /.../. I feel the breeze coming in from the sea and it forces me to remember. I cannot stand that breeze anymore. /.../ I had a wife, two sons and two daughters. They were my family. All died in the Sidr, all except me. My current wife also had a husband, a son and a daughter. They also died in the Sidr. /.../ I am the only one who survived out of my family. I survived but my head and my mental state did not. I am not stable. If a person in a household faces such a tremendous loss, he gets frustrated. All my four children and my wife died, I am the only person alive. How could I possibly be mentally stable? I have fallen apart (LHI GBM38 2014).*

*During the cyclone some people got injured internally, in such an important organ that he or she may face complication afterwards. They may approach doctors for treatment in secret but some losses*



*cannot be healed by doctors. /.../ People face mental problems because of these traumas. Family problems arise as a result, and they grow larger by each day. When we talk about floods, it is the economy that receives most importance. /.../ The only doctors that came to see us [after the cyclone] were medical specialists. They were not able to give either mental or psychological support to the victims here (KEI GBM6o 2016).*



*People end up losing home after home to the riverbank erosion in Singpur (© Sonja Ayeb-Karlsson).*

To read more on this topic, see:

Watts, Nick, Amann, Markus, Ayeb-Karlsson, Sonja, Belesova, Kristine, Bouley, Timothy, Boykoff, Maxwell, Byass, Peter, Cai, Wenjia, Campbell-Lendrum, Diarnid, Chambers, Johnathan, Cox, Peter M, Daly, Meaghan, Dasandi, Niheer, Davies, Michael, Depledge, Michael, Depoux, Anneliese, Dominguez-Salas, Paula, Drummond, Paul, Ekins, Paul, Flahault, Antoine, Frumkin, Howard, Georgeson, Lucien, Ghanei, Mostafa, Grace, Delia, Graham, Hilary, Grojsman, Rébecca, Haines, Andy, Hamilton, Ian, Hartinger, Stella, Johnson, Anne, Kelman, Ilan, Kiesewetter, Gregor, Kniveton, Dominic, Liang, Lu, Lott, Melissa, Lowe, Robert, Mace, Georgina, Sewe, Maquins Odiambo, Maslin, Mark, Mikhaylov, Slava, Milner, James, Latifi, Ali Mohammad, Moradi-Lakeh, Maziar, Morrissey, Karyn, Murray, Kris, Neville, Tara, Nilsson, Maria, Oreszczyn, Tadj, Owfi, Fereidoon, Pencheon, David, Pye, Steve, Rabhaniha, Mahnaz, Robinson, Elizabeth, Rocklöv, Joacim, Schütte,



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*Waterborne diseases were common in the northern study site dealing with lack of clean water during dry spells and droughts (© Sonja Ayeb-Karlsson).*

Watts, Nick, Adger, W Neil, Ayeb-Karlsson, Sonja, Bai, Yuqi, Byass, Peter, Campbell-Lendrum, Diarmid, Colbourn, Tim, Cox, Peter, Davies, Michael, Depledge, Michael, Depoux, Anneliese, Dominguez-Salas, Paula, Drummond, Paul, Ekins, Paul, Flahault, Antoine, Grace, Delia, Graham, Hilary, Haines, Andy, Hamilton, Ian, Johnson, Anne, Kelman, Ilan, Kovats, Sari, Liang, Lu, Lott, Melissa, Lowe, Robert, Luo, Yong, Mace, Georgina, Maslin, Mark, Morrissey, Karyn, Murray, Kris, Neville, Tara, Nilsson, Maria, Oreszczyn, Tadj, Parthemore, Christine, Pencheon, David, Robinson, Elizabeth, Schütte, Stefanie, Shumake-Guillemot, Joy, Vineis, Paolo, Wilkinson, Paul, Wheeler, Nicola, Xu, Bing, Yang, Jun, Yin, Yongyuan, Yu, Chaoqing, Gong, Peng, Montgomery, Hugh and Costello, Anthony (2017). [The Lancet countdown: tracking progress on health and climate change](#). *The Lancet*, 389 (10074). pp. 1151-1164. ISSN 0140-6736



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Ayeb-Karlsson, S. (2018). *When the disaster strikes: Immobility Decision-Making in the context of Environmental Shocks and Climate Change Impacts*. Doctoral thesis DPhil in International Development. School of Global Studies. Brighton: University of Sussex and IDS. Forthcoming.

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