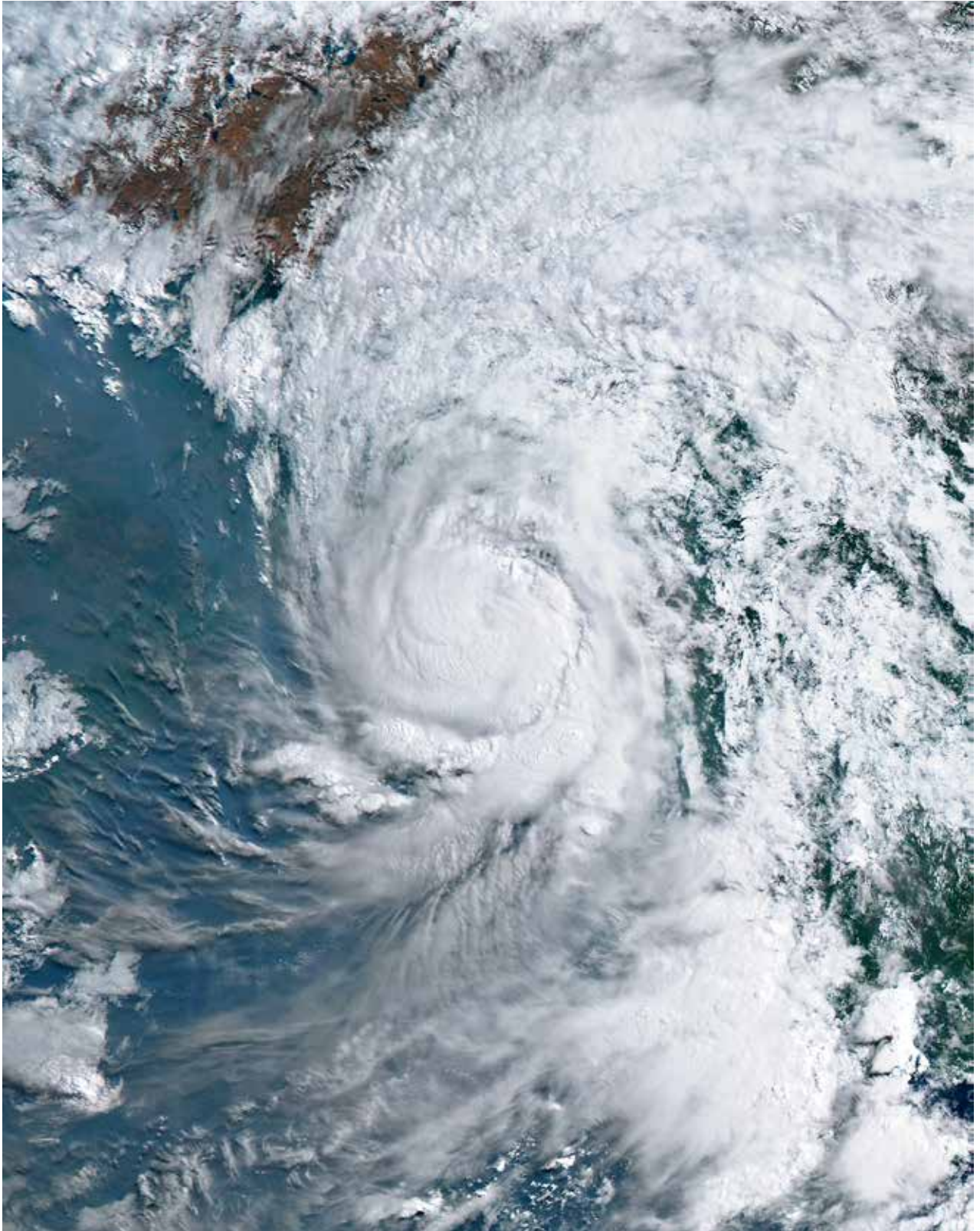


WEDNESDAY, JUNE 30, 2021

Climate Tribune



EDITOR'S NOTE

Dear Readers

Last month's issue reported stories based around Cyclone Amphan's aftermath, which continues to have a significant impact on the affected people. This month's issue has a thematic similarity and looks at the various ways cyclones disrupt the lives of people in the coastal regions.

Their impacts are often violent, as we see in these stories. We also see that they do not simply devastate houses and livestock – the archetype image of cyclone-aftermath – but cause much deeper disasters.

The after-effects create migrants and catapult their feeble victims into the spirals of poverty. We learn that simple infrastructure can help, and we do not necessarily have to wait for world leaders to stop emission for that to happen.

One such infrastructure is the embankment. The coastal people, who know these climate calamities intimately, keep demanding for stronger embankments to keep the saline flood water off their lands; but to no avail.

We also look at cyclone damage in terms of pure financial cost. The image these numbers draw, while not unexpected, still manages to amaze. But we can actually reduce, even minimize, the tremendous loss that the country endures so frequently. And that's why we also talk about the solutions. ■

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ON THE COVER

**Severe Cyclonic Storm Mora making landfall
near Chittagong, Bangladesh at peak
intensity on May 30, 2017**

**PHOTO: SSEC/CIMSS, UNIVERSITY OF
WISCONSIN-MADISON**



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Datinakhali village battles climate crisis

With rising seas and storm surges due to frequent cyclones swallowing up their land and destroying livelihood options, families scraping a living through farming crab and shrimp in one of the world's largest mangrove forests are fighting to survive



Barren land of Datinikhali along the river bank

PHOTOS: SUMAIYA ANWAR

Sumaiya Binte Anwar

Datinakhali rests on the edge of the Bangladeshi Sundarbans in the town of Shyamnagar, Satkhira. The small village is a gateway towards the great Sundarbans – one of the most beautiful places on earth, but the families eking out a living in its waters are buffeted by one problem after another.

Being on the frontline of the climate crisis, rising sea levels and erosion due to the hungry storm surges claim more and more land each year in Datinakhali. Salt infiltrates the drinking water and imbues the vegetables with a sharp tang. There was no one in this village whose houses and properties didn't wash away in the cyclones like Aila and Amphan in the past decade.

Around Datinakhali, the aquaculture industry dominates the landscape, surrounded by an earthen patchwork of shrimp ponds and soft-shell crab farms. Livestock, goats and chicken-common in almost every household in rural Bangladesh is also a rare sight here. The smell of crab and fish waste

permeates the hot and humid air as children run barefoot through the barren area just alongside the river.

Mosammet Asma Khatun from DatinaKhali has watched the river swallow up 20 bigha (0.6 acre) chunks of ancestral land in the past decade as an aftermath of Cyclone Aila in 2009 and Amphan in 2020. Her family struggled to survive after a crumbling riverbank forced them to abandon their home and move to a new part of the river bank. She now lives on rented land in a makeshift shed pieced together with iron sheeting with a constant fear of her remaining shelter being washed away. As she does not have a piece of land to call home, thereby cannot afford the luxury to raise livestock due to not having a safe space to rear them.

Every year, Asma faces climate-induced natural disasters in the form of cyclones, river erosion, flood, tidal surges, and sea-level rise, bringing countless overbearing socio-economic challenges, increased risk of poverty and emotional stress for her family. She broke into tears when recollecting the memories from Amphan last year, which took everything she had.

TROUBLED WATERS



Asma Khatun showing the part of the river where her home and her parents' home used to be before the tidal waves inundated their lands

“The tide took everything from us”, says Asma Khatun as she points to a missing arc of land from the muddy embankment. “We build our properties with hard-earned money, but all is lost.”

On May 20, 2020, a strong cyclone Amphan hit coastal Bangladesh destroying a total of 440 kilometres of road and 76 kilometres of embankment in the coastal area, affecting many families like Asma's. The tidal water entered the village unhindered through the collapsed embankment inundating the roads and people's houses on its way-tearing down the village into pieces. More than 55,600 homes were completely destroyed, and at least 162,000 homes were partially damaged. Amphan displaced over 100,000 people – with more than half still sheltering with friends and relatives at the end of May.

When the storm subsided and Asma returned along with her family, it was already too late. She found nothing but waist-high water. Not even the remnants of her old house. Persistent erosion by the hungry tides had gobbled up huge chunks of land and washed away several houses situated along the river bank. All she could see was river water, under which all her savings, belongings and shelter went away. “I have no soil beneath my feet,” she said. “My relatives' homes are now under water too.” Asma said.

Road communication in the area had been weakened after the cyclone. The paved road was broken into pieces, the brick soling road had been washed away by the tidal waters. In many places there were no roads left at all. The whole area



“I had a crab farm where I earned a monthly wage of taka 10,000 by selling them, the pandemic followed by the cyclone, has left us with nothing and I am struggling to provide three meals to my family,” Shahjahan told the research team of ICCCAD

seemed to have become a remote village further hampering the relief and rescue missions.

Furthermore, surface water, the main source of water in the coastal region of Satkhira became contaminated by saline water intrusion from the river. Collecting drinking water seemed to have become as difficult as collecting three meals a day. Displaced locals struggled to manage roofs over them.

Many people of the area had to live temporarily in different places for the next six months after the cyclone. Some in cyclone shelters, some in school or madrasa buildings. Asma's brother still lives temporarily near the road embankment and her father lives in the school building losing all his land. Others were not lucky enough. After losing their houses to the river, the boats have become their last refuge. They managed their cooking in temporary stoves and a gas burner attached to a propane tank in the corner of their boats.

Apart from making people homeless, the dual attack of Amphan and the impact of Covid 19 had triggered the livelihood crisis of low-income people in the area. Two crops were hit hard. Shrimp farmers suffered major losses. Exportable items like crab and shrimp with high demand on foreign markets remained in a stand-still. Locally they had to be sold at half prices. "I had a crab farm where I earned a monthly wage of taka 10,000 by selling them, the pandemic followed by the cyclone, has left us with nothing and I am struggling to provide three meals to my family," Shahjahan told the research team of ICCCAD.

Despite major damage, very little relief has come to support the locals. Many had to buy their necessities or repair their broken homes by borrowing money from shops. Eleven months later, the embankment was repaired. Local authorities have

placed sandbags to reinforce riverbanks near Datinakhali village. But the embankment is still very weak, not adequately strong against high tides- let alone severe cyclones.

Locals feel that the authorities need to better prepare for erosion and embankment protection, rather than reacting to disasters as they happen. "If the Embankment was strong enough, then such damage could have been avoided" Asma added. The houses that were far away from the river are now very close to the river. The remaining families whose land survived the erosion are living in a constant wait and fear.

Asma Khatun is just one example among thousands. There are many similar stories of people who cannot accumulate their strength to withstand those big waves due to a tormented everyday life that mostly remain unnoticed. Every year in Bangladesh, tidal surges and storms swallow hectares of land and homes. Living on the edge, these cyclone and erosion-affected people are now looking toward the authorities with the hope that serious steps will be taken by the government to stop their lands from being eaten away by the water. ●

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Impacts of cyclones on women and girls and the way forward

How much women are actually impacted and what can be done to improve the situation

Afsara Binte Mirza and Adeeba Nuraina Risha

In Bangladesh, the negative impacts of climate change are mainly experienced by women and girls residing in the disaster-prone areas of haors (flood-prone) and coastal areas (cyclone and tidal surge prevalent). The intergenerational cycle of imposing patriarchal-rigid gender norms, limited financial independence, finite access to decision-making opportunities, and limited economic empowerment pathways are some of the barriers that make women and girls vulnerable.

The cyclones and consequent tidal surge such as Mora, Sidr, Alia, Amphan, etc exhibit a higher degree of commonality when it comes to the detrimental impacts on the lives of women and girls. During these uncertain times, the burden of unpaid care work on women and girls escalates. Unpaid care work involves cooking, cleaning, childcare, elderly care, fuel and water collection, etc.

All these household chores multiply for women and girls, during disasters and leave less or no time for their leisure. This undermines their capacity to harness inner creativity and implement them. Usually, food insecurity is exacerbated due to women's prioritization in feeding their family members (son, daughters, husbands, etc) before themselves during food shortages. Hence, it leads to malnutrition and re-

duced energy levels in women.

In cyclone and disaster-prone areas of Bangladesh, women and girls are constantly impacted by gender-based violence. For instance, if women are late to serve meals, they suffer serious verbal and physical abuse from their husbands. They are also the inevitable victims of domestic violence.

Similarly, male-out migration is another issue that undermines women's autonomy and their ability to take financial decisions without the commands of men. Then, women tend to borrow money at a higher interest rate, raising their debt burden and pushing them towards poverty. Therefore, women are forced to seek jobs outside without their male counterpart's presence; and are exposed to gender-based violence (such as, physical, verbal, and sexual harassment) by their new employers and co-workers.

The most perceivable and dreadful impact of cyclones is when women and girls are evacuated to cyclone shelters. These shelters are usually overcrowded, with inadequate personal space, privacy, separate toilets, and menstrual facilities. Moreover, the relentless social taboos around menstruation and the female body worsens the opportunity to access sexual and reproductive health and rights (SRHR).

It is crucial to acknowledge that cyclone-prone areas lack access to services like contraception, safe abortion care, safe water during pregnancy and childbirth and proper sanitation.

In addition to this, the overcrowded shelters increase the chances of women becoming victims of theft, harassment, rape, and physical, sexual, and emotional violence.

In Bangladesh, child marriage rates show an upsurge during cyclones due to economic insecurity and school closures. Unfortunately, marriage is seen as a financial transaction and dowry payments as means of capital accumulation. Surprisingly, dowries are affordable and less costly for a girl child during floods and cyclones.

This encourages poor families to arrange marriages fast without taking any consent from girls. Thus, the unfair burden of unpaid care work, gender-based violence, male-out migration, non-gender-responsive infrastructure and child marriage hampers women and girl's mental health and well-being. The upshot is constant fear, panic, post-traumatic stress disorder, profound melancholy, nightmares, loss of self-worth and happiness, etc.

However, women residing in coastal areas are better equipped to overcome these daily barriers to disaster response and preparedness. In 10 of the most climate-vulnerable districts of Bangladesh, more than 19,100 women have built better support mechanisms to cope with the ongoing effects and aftermath of cyclones (UNWomen, 2015).

While 1,600 women were successful in expanding their local business after receiving livelihood skills training. Most importantly, it was a common scenario to witness community-based women's organizations and local women leaders conducting locally-led adaptation by managing the dual crisis of Amphan



Women and girls are active local agents of change for climate change adaptation and mitigation

and COVID-19. An example of this is Bindu, a Satkhira-based local women development organisation that extends emergency response services, and free food relief packages to coastal vulnerable communities, particularly women and young girls.

The organization also mobilized its resources strategically by a model called "The Wall of Humanity", where it encourages community members to leave their surpluses for the vulnerable people affected during cyclones or disasters. Another community-based women's organization, Prerona works with vulnerable women by strengthening their livelihood opportunities and raising awareness for disasters' early warning systems. Inspiringly, the Prerona team aided to evacuate 150 people during Amphan.

Women and girls are active local agents of change for cli-

mate change adaptation and mitigation. Their local and traditional knowledge, management skills, empathetic nature, boldness, leadership roles make them empowering actors during cyclones or disasters.

Nonetheless, to eliminate the adverse impacts of climate change on women and girls, 'boys and men' have to step up and show solidarity. They can begin this journey if the nation's education systems capacitate them well enough by disseminating information in easily understandable local languages. The content can range from the perks of sharing the burden of care work at homes; dismantling rigid gender norms; spreading awareness about boycotting rape culture/sexual harassment/gender-based violence.

It is vital to establish gender-responsive cyclone shelters which comprise facilities that protect SRHR and uplift women's agency, not undermine it. Mental health and well-being support be part of cyclone shelters to curtail PTSD, trauma, self-isolation for women.

Adequate and regular monitoring, evaluation and reporting provisions will facilitate the successful operation of these shelters. Additionally, enhanced collaboration between the climate change, health, and women's rights advocacy communities can be influential for bolstering SRHR. Community-based women's organizations like Prerona and Bindu can be beneficial for mobilizing resources for this.

At the upcoming COP26, new mandates could be established, which will involve multidisciplinary and multi-sectoral stakeholders to strengthen the roles of women in decision-making processes; and halting gender-based violence during climate change calamities and make them locally-led adaptation leaders. Gender-responsive climate action can only be achieved by creating significant political empowerment opportunities for women residing in coastal areas.

Hence, forming coalitions can be crucial. The coalition can be comprised of diverse stakeholders (such as civil societies, local and national governments, academicians, researchers, private sector, citizens, etc) who can facilitate capacity building opportunities, draw climate finance, leverage climate policies and above all form connections between individuals to make real differences in the lives of vulnerable women and girls.

The National Adaptation process can be an important policy document to incorporate all of these mechanisms for women and girls to make Bangladesh more resilient towards climate change. This can all start now and we can pave the pathway to #BuildBackBetter for nature and vulnerable women. ●

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How climate change exacerbates sanitation problems in the rural areas

And why you should give a crap

Adnan Qader

I had been tracking cyclone Yaas with anxiety as it formed as a low depression in the Andaman seas, with the hope that it won't make landfall in Bangladesh. It gave me anxiety for good reasons. The people in the coast are yet to recover from Amphan, with places in Assasuni, and Satkhira still waterlogged. Cyclone Yaas proved not much forgiving either. It ended up directly affecting 1.5 million people and destroyed 26,000 houses in different districts of Bangladesh.

Working with WaterAid showed me how vulnerable people of the coastal belt really are. Inadequate water supply, not enough latrines and overall despair are the daily reality of the people living below the poverty line. So, amidst these numerous problems why worry about sanitation?

Over 50% of the population in Bangladesh do not have access to basic sanitation which is over 85 million people and 2,000 children under five die from diarrhoea which is caused by dirty water and poor toilets (WaterAid, 2020). This means several thousand tonnes of faeces are unsafely dumped into the environment each day.

Climate change is now widely recognized as a major global health risk multiplier and frequent disasters add to the problem. The burden share is not proportionate. This enormous health burdens and economic costs are disproportionately borne by the world's poorest and most vulnerable people, particularly women and girls. On a global scale that is 2 billion people around the world who don't have access to toilets or 673 million people around the world who have no choice but defecate in the open (WHO/UNICEF, 2019) and climate change is definitely not helping the numbers.

Environmental Issues

Unfortunately, the effects of sewage and faeces on the environment are largely negative. It needs to be properly treated before it can be disposed of - usually into the ocean. There are two problems, however. If sewage is only partially treated before it is disposed of, it can contaminate water and harm huge amounts of wildlife.

Alternatively, leaking or flooding can cause completely untreated sewage to enter rivers and other water sources, causing them to become polluted. The most recent example of this crisis is being faced in Turkey in the form of sea snout. Unmanned treatment plays a huge role however experts argue that the rise in sea temperatures are incubating this sewage. These consequences aren't great. Especially on health.

Health Issues

Unmanaged sewage poses a huge health burden on the vulnerable communities, especially women and children. If you have access to this article, most likely your child is safe. Unfortunately, access to safe drinking water or a latrine are a luxury good for most marginalized communities. In marginalized communities (comprising around 800 children) one child dies every two minutes due to diarrhoeal diseases (WaterAid's calculation is based on Pruss-Ustun et al 2014 and 2018).

Safeguarding Issues

Frequent cyclones have the capability to hamper infrastructures, especially latrines. This creates a multitude of problems for women and adolescent girls who have to travel through waist deep water or long distances to find a safe place. With increasing storm surges that were seen during cyclone Yass, it is evident the coastal infrastructures will continue to be damaged by cyclonic storms, which includes local households, water sources and latrines.

Affordable infrastructures

Climate Resilient infrastructures have become a necessity in the climate prone areas. Storm surges, frequent flooding and salinity intrusion creates multiple challenges for the vulnerable people. So, what are climate resilient infrastructures? Something fancy? Not really. Interventions are as simple as raising the latrines platform a few feet above the flood /storm surge level. However, why do we continue to see people suffer? As frequency and intensity of unpredictable storm surges increases so does the resiliency of these interventions. Secondly, most communities in hard to reach areas are still not getting support.

How can you help?

Your communities need support! WaterAid has successfully implemented the Shakipur Co-Composting Plant and have promoted how to safely manage faeces.

However, we can do more. And we want you to get involved. Do you have a brilliant sustainable solution to solving the water, sanitation, and health crisis? Do you have a fancy idea for a toilet design? Do you have an idea that can empower our economy? Then, it is time for you to put your creative knowledge to use. ●

Adnan Qader is working as Advocacy Officer at WaterAid Bangladesh

Regional cities: A space for planned urban development in Bangladesh

Proper bottom-up planning backed by holistic research will help the country develop climate-resilient and liveable regional cities and take the burden away from major cities

Istiakh Ahmed

Bangladesh is a lower-middle-income country located in the South Asian region with a population of 160 million. The country is split into eight divisions and sixty-four districts to help with the administrative process. Like other developing countries, Bangladesh is also going through rapid urban growth over the last few decades. According to the Planning Commission report 2013, the level of urbanization in this country is increasing at an expeditious rate of 23.30 (2011), which was only 8.78 in the year 1974.



Currently, the country has four large metropolitans, 58 medium and more than four hundred small urban areas which have one-quarter of the total population in the country

It is anticipated that the growth rate will be 38 by 2021. With the increasing urbanisation, the growth of the urban population also has increased to a ratio of 5.83 compared to the national growth rate, which is 1.99. As a result, 21 new cities emerged in 2011.

According to the Pourashava Ordinance-1977, the area that has more than fifty thousand population with a density of more than 1500 persons per square kilometre and three-

fourth population engaged in a non-agriculture activity, is called urban area (Rahman and Islam, 2013). Currently, the country has four large metropolitans, 58 medium and more than four hundred small urban areas which have one-quarter of the total population in the country.

It is identified that urbanization imposes a negative externality on the environment when three quarters of the country's population starts to reside in the urban areas (Murshed and Saadat, 2018). With that said, how is Bangladesh planning to mediate the existential cost of urbanization?

The process of urbanization in Bangladesh has been rapid and uneven, it always has been centred around the largest cities, especially Dhaka. Large cities have disproportionately received all the investments and infrastructures compared to other cities. Most major industrial activities and auxiliary business have been concentrated in cities like Dhaka, Chittagong, Khulna and Rajshahi.

For example, Dhaka city alone has 80% of the garment factories that are in Bangladesh. And with this aspect, these four cities have 63.87% of the country's urban population (Sawgat and Roy, 2019). Urban population depends on various factors including work opportunities and socio-economic conditions, which cause overpopulation in these major cities.

However, rapid urbanisation often lacks formal urban governance and effective development control. These create corruption, which creates a process to continuous informal urban development and informal governance resulting in worsening living condition, poor urban quality of living.

The urban development in Bangladesh also has major policy biases towards major cities, especially in terms of brazen favouritism. While decentralization of administration and government process to the local level has been done to have a better planning process, much of the local municipalities do not get to contribute to that process. Often they receive the plan after its being developed and finalized where they have little or no contribution. Additionally, these municipalities do not have enough logistics to implement those plans and feel reluctant to accept that plan as it came from outside and without their participation.

Cities like Dhaka has almost reached their peak with scope for any further growth diminishing. The medium cities, on the other hand, have a lot of potential and scope to grow further but very little research has been carried out on that. Even within these few conducted research, it was done most-

URBAN DEVELOPMENT



Currently, the country has four large metropolitans, 58 medium and more than four hundred small urban areas which have one-quarter of the total population in the country

ly with a focus on economic development with limited scope to understand how urbanization impacts climate change.

Also, Bangladesh is considered one of the most climate-vulnerable countries in the world and will face different layers of negative impacts from it. This will surely force people to take different coping strategies including internal migration.

While Dhaka has already become suffocating with its dense population, regional medium cities with work opportunities such as Mongla are becoming a popular destination for internal migrants. With all these aspects, there is an urgent need to look into the medium cities for better planning of urban development as these cities are also going through a rapid transformation. Proper bottom-up planning backed by holistic research will help the country to develop climate-resilient and liveable regional cities and take the burden away from major cities. ●

Istiakh Ahmed is working at the International Centre for Climate Change and Development as a Programme Coordinator. His research interest lies in the areas of climate change adaptation, Loss and Damage, climate migration. Istiakh can be reached at istiakh.ahmed@iccad.org

Cyclone prediction and preparedness by coastal communities in Bangladesh

Exploring the linkages between indigenous knowledge systems and modern weather forecasting

Savio Rousseau Rozario and Mahmuda Akter

In today's time receiving weather information is as simple as turning on the news channel or listening to the radio or even using the weather applications in smartphones. Advancement in scientific knowledge and the availability of remote sensing data, and cutting edge technologies enabled us to observe, generate and predict weather patterns or other natural calamities well ahead of the occurrence, more precisely than ever before.

But do all the communities especially the fishermen communities living on the coast have access to such modern devices and technology to apply in their day-to-day life?

The relation between coastal fishermen communities and the changing weather is significant, as a minimal and sudden change in the weather makes the communities vulnerable and pose threat for deep-sea fishing activities. In terms of tropical storms, studies reveal that many of these communities do not have the fullest access to devices that make them aware of the changing situation or the intensity of the storm.

Multiple studies also indicate that even if the communities have access to such devices they do not understand the warning signals well, and in some cases refuse the signals considering them be 'false alarm.' However, they tend to rely much on their ancestral believes, and nature induced weather forecasting practices in such adverse situations.

A recent study conducted in the surrounding areas of Lake Victoria highlighted that the fishermen communities did not have any access to receive early warnings before a storm, but they predicted the storm by observing the appearance of the rainbow (Venton, 2018), a knowledge that they have inherited.

In the early civilizations, seafarers observed the natural entities closely and predicted the weather before going for a voyage. They even worshipped natural entities, celestial objects as deities and offered sacrifices; mentioned in Greek, Egyptian, Mayan, Inka, Indian, and Norse mythology.

These legacies and practices have been passed from generation to generation in form of rituals, folklore, myths and are still practised in some communities around the world. But with the passage of time and the advancement of modern science, many of such nature-based ancient knowledge and practices are on being replaced.

Sailors and fishermen are now encouraged to observe the



In terms of tropical storms, studies reveal that many of these communities do not have the fullest access to devices that make them aware of the changing situation or the intensity of the storm

signs of nature, in addition to noting scientific data, to predict the weather more accurately.

The practice of forecasting weather based on observing natural entities is also common among the fishermen communities of Bangladesh. Owing to the geographical location along with a conical southern region directly exposed to the Bay of Bengal, many severe cyclones make landfall on the coast of Bangladesh and the local fishermen communities and seafarers are among the first victims of such natural events.

Based on available data and statistical analysis it is estimated that from the year 1978 to 2016, 131 cyclones formed in the Bay of Bengal and 33 made landfall, with an average of 1.15 cyclone hitting Bangladesh every year (Chowdhury, 2018). These cyclones have devastating impacts on the overall livelihood of the coastal population, especially the fishermen and seafarer's communities as their livelihood depends much on deep-sea fishing activities.

Moreover, it also signifies the importance of generating

FORECASTING

effective and advance cyclone warnings, so that the communities can take necessary preparedness measures to mitigate or to evacuate in such disastrous time. In this regard, the government of Bangladesh has taken many major initiatives to reduce the risk of cyclone vulnerability in the coastal region and has set an example to the world with actions like Cyclone Preparedness Program (CPP), Coastal Embankment Project, construction of more than 2500 cyclone shelters, improving the early warning system, afforestation measures in the coastal belt and many more.

Besides, the Bangladesh Metrological Department (BMD) has also developed CWS (Cyclone Warning System) and generates awareness signals depending on the position and intensity of the approaching storm through radio, television and other mass media platforms.

However, studies conducted among the coastal fishermen communities in the South and South-Western region of Bangladesh reveals that such alarms are not well received and accepted by many of the communities as they lack to understand the warnings, lack to access necessary devices (radio, television), and consider the signals to be 'false alarms' (Howell, 2003; Ubydul Haque et al, 2011; Mahed-Ul-Islam Choudhury et al 2021).

The communities also state that, the alarms do not incorporate the intensity and preparedness information. For example- they receive the cyclone warning information only 2 days or less before the impact, with limited time to take necessary preparation. Then again the change of cyclone warning signals (corresponding to the intensity of the cyclone) is also very rapid; in the morning it is classified as signal 3 or 4 and during noon it is reclassified as a signal 7 rating (Islam et al., 2013).

'False alarm' is also another reason for communities to mistrust the warning signals. For instance, BMD issued an awareness signal at least a month ahead before the occurrence of the catastrophic cyclone 'Sidr' in 2007. However, the storm did not appear then and this false alarm led many coastal communities to ignore the awareness signals later during the actual occurrence (Mahed-Ul-Islam Choudhury et al 2021).

In such circumstances, nature-based cyclone prediction measures and traditional knowledge becomes an important asset for unprivileged coastal communities beside the modern CWS, as studies report that many of these communities predict storms and bad weather well ahead by only observing natural entities, and techniques which they adopt from their day to day experience and ancestral knowledge.

Some of these observation relates to increase of seawater temperature, change of colour of seawater, increase of wind flow from the East or South-Eastern direction (locally known as Eshan kon or pubal batash), movement of seabirds and ducks towards the shore, Churi (*Eupleurogrammus muticus*) and Loittia fish (*Harpadon nehereus*) moving and



Fishing trawlers moored at Chittagong Fishery Ghat FOCUS BANGLA

jumping quickly in the sea, movement of insects towards the higher ground (Hasan, 2008; Mahed-Ul-Islam Choudhury et al, 2021). These interventions are well accepted among the locals and based on such observations the fishermen and seafarers, consult with their elders and undertake precautionary measures.

However, the importance of such nature induced, traditional storm prediction practices are often overlooked and the practices are termed as 'unscientific', no matter how valuable they are to the poor, unprivileged communities residing on the coast. Hence, for the comprehensive development and enhancing the resilience of these vulnerable communities; such nature-based prediction measures should be recognized and be aligned with the existing scientific understanding, and methods of prediction the storms.

In this regard, the government, non-government organizations, research institution, local government bodies, scientific communities can play a vital role to evaluate such practices and create a bridge between scientific-technical knowledge and nature base learning to generate effective storm prediction framework which will be more effective, viable and realistic for the communities. ●

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When photography commodifies poverty

While it is essential to illustrate the challenges of a population, one must strive to tell stories that honours the subjects' circumstances, preserves the agency and dignity

M Feisal Rahman, Danielle Falzon and Md Nadiruzzaman

You have surely seen this woman: coming out of a pit latrine, walking toward her makeshift house that looks like it might collapse at any moment. You must have seen this child: covered in dirt and lifting a meagre handful of food toward his mouth with flies in his eyes.

Maybe you have photographed these subjects. With the intention to show the world their sufferings, and to direct aid and attention their way. Perhaps you have asked for consent, and printed these photos in a research paper, report, or news article, alongside a story about the needs of the poor and vulnerable. But have you ever thought about what purpose your photograph serves? And at what cost to the persons depicted? Do we as development campaigners (ie researchers and development practitioners) need to reconsider how we depict these subjects beyond our organizations' existing standards? Being a part of this community, we argue that we have a moral responsibility to ensure the subject's dignity.

Let's turn to the moment of capturing such a photo. When travelling to communities at the development or climate adaptation project implementation sites, we document our projects' needs and accomplishments. This may include photographing an element of the subject that often represents an outsider view of what the community or the situation is like. However, such an image might have significant appeal to the viewers, particularly donors and potential benefactors.

Even if we, the visitors, ask permission before taking a photo, we have to consider the power relations between "us" and "them", the prospective subject. The person will likely agree to be photographed because we have more power in the social hierarchy than they do. We may be more educated, a foreigner, or we may be the one bringing resources to the person and their community. Thus, they may feel obligated to say "yes", whether out of respect, hospitality, or powerlessness. However, they do not know how their image will eventually be used or how they will be depicted.

Once the photograph is taken, the image becomes an object, disconnected from its subject. Its meaning is shaped by the agenda of the person or organization displaying the picture, the words that contextualize it, and the gaze of those who look upon it. In different contexts, the photo can mean different things. The subject can be characterized as resilient or destitute.



Organizations often use such images to tell stories for their marketing. They help portray the organisation in a positive light and may help them with fundraising. But in the process, consciously or unconsciously, this storytelling may exploit its subject's plight. While organizations adhere to visual ethical standards, there are morally grey areas in which we should tread cautiously.

In many instances, as outsiders, we approach a rural community or an informal settlement in the Global South with a deficit mindset that focuses on subjects' deficiencies and failures. Such a framing ignores local resources and knowledge. Hence, the locale is perceived as a problem laden space that needs to be rescued. Such discourse thus undermines and nullifies local efficacy, agency, and local people's autonomous problem-solving capacity, which could hamper locals' creativity and capabilities in the long run. Moreover, commodifying individuals' sufferings might bring support to a cause, but at the cost of compromised dignity of the subject. Such an act is deplorable and ethically intolerable.

Such commodification of an issue is often referred to as 'poverty pornography' of sufferings, stress and vulnerabilities. Because, through triggering specific elements of organic excitement, this could distort local practicalities of the problem and thereby cultivating a culture of paternalism. While it is essential to illustrate the challenges of a population, one must strive to tell stories that honours the subjects' circumstances, preserves the agency and dignity of all, and (ideally) illustrates hope for their plight.

The imaging policies (typically available online) from major donors and development agencies articulate very simplistic notions of privacy, consent and political sensitivity. They outline checkboxes that must be ticked. They fall short of the

MORAL DILEMMAS

critical aspects of power relations and recipients' dependence on resources. These policies ensure development agencies' freedom to photograph their project beneficiaries without invoking empathy.

Thus, careful ethical consideration should be given to the various stages of the photography supply chain from its planning to distribution. Ethical practices need critical reflection on the content, empathy for the cause and clarity in understanding the problem. However, these cannot be used as excuses to remain oblivious to the rigour of ethical practices; instead, as researchers and practitioners, we are morally responsible for ensuring the dignity of everyone unanimously.

Photos understandably can inform hardships of a particular community to the world and thereby indirectly contribute to empowering them to address the challenges. But the hardships that people face in difficult circumstances should not define who they are and how they are seen.

So, should we not be using photos to share stories of communities or locales? Of course, we can. But we should do so with empathy to celebrate people and preserve their dignity.

Towards that end, organizations need to train staff to handle ethical nuances, make sound ethical decisions based on the information at hand, and understand how context can

change the ethics of a situation. At the same time, development campaigners should communicate with employers and seek their cooperation to improve ethical practices in development photography.

Photos help us convey stories and understand those who are different from us. As those in a position of privilege in development contexts, we must recognize our power to represent those with less privilege in a way that visualizes their capacity, represents their full humanity, and ensures their dignity. ●

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CLIMATE FINANCE

Democratization and other needs in climate finance for adaptation capacity

Both national and international climate funds need to be facilitated in such a way that they can address the priority actions in the adaptation scenario

Mahmuda Akter and Samina Islam

Adaptive Capacity is a crucial initiative for extreme climate-vulnerable countries like Bangladesh. The adaptive capacity has been made improved by the scenario of high climate change uncertainty. (Eakin, 2006). An immediate and strategic response to the climate crisis is 'financing' for adaptation measure, and the developed country governments are the main facilitators of the climate finance mechanisms (Chowdhury, 2012).

In Bangladesh, the financing of adaptive capacity to climate change gets established institutionally and starts implementation work on the ground (Eakin, 2006). Adaptation Fund under the Kyoto Protocol (KPAF), Amazon Fund, Environmental Transformation Fund (ETF), Global Environmen-

tal Facility (GEF) Trust Fund, Global Climate Change Alliance (GCCA), Hatoyama Initiative, International Climate Initiative (ICI), Least Developed Countries Fund (LDCF), Special Climate Change Fund (SCCF), Strategic Climate Fund (SCF) are some of the sources of available climate fund in Bangladesh focusing on adaptation arena (Chowdhury, 2012).

However, it has been suggested that externally funded adaptation can increase climate vulnerability by creating reliance and subsequently reducing governance capacity (Piggott-McKellar, et al 2020). Besides, there is still uncertainty about how funding for adaptation should be done in general. (Forsyth, 2013).

According to the former finance minister Abul Mal Abdull Muhith, climate change should be incorporated in the normal development programs and adaptation funds should be

grant basis. Emphasizing this issue, it was expected that there will be a learning-by-doing experience between the funding mechanisms by 2020 (Hedger, 2011).

To face this expectation, one of the main challenges for governments and donors is the lack of political clout to effectively lead and coordinate (Hedger, 2011). There is no overall capacity development plan, so donor support is often very narrowly focused on project-based, fragmented capacity development initiatives with little impact on overall capacity development (Chowdhury, 2012; Hedger, 2011).

Centralised project activity, neglecting the needs of the most vulnerable communities, lack of local-level planning mechanism, limited role of the local government to the development process and lack of capacity to monitor climate financing system are causes of failure of implementing sustainable climate fund (Hussain, & Ahmad, 2020; and Chowdhury, 2012).

While channelling adaptation finance, it is extremely important to identify the priority needs of the communities. Otherwise, money will land in places where it may not be necessary, thus reducing the accountability of adaptation finance and increasing the vulnerability of communities. To ensure that money flows in the right direction and to the right people, the Readiness Program of Adaptation Fund for

example, provides readiness grants to implementing entities to cover scoping at both the national level and the local level, through consultation with communities to understand their conditions and priorities - which was the case in Adaptation Fund Programme in Costa Rica (Adaptation Fund, 2020).

In the proposal preparation phase, the implementing entity was given the readiness grant that covered consultation with communities, desktop climate vulnerability assessment as well as translating all the documents from Spanish into English (Adaptation Fund, 2020).

Both national and international climate funds need to be facilitated in such a way that they can address the priority actions in the adaptation scenario. Consultation and participation from the communities; not just their elite representatives; but the ground level people are highly needed.

The vulnerable people need to be properly engaged so that they can understand and participate in the decision-making process as to where the money needs to be invested. Local needs should be prioritized when acquiring funding for adaptation projects - and the monitoring for this needs to be done both from the donor and the recipient.

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PIXABAY

Cyclone Yaas: A double blow to livelihood in the coastal areas

After more than a year of trying to cope with the after-effects of cyclone Amphan, another cyclone means that they again have to start from scratch

Faizah Jaheen Ahmed

When cyclone Yaas made landfall in Bangladesh on May 26, 2021, it devastated the people of the Southwest coastal area. After more than a year of trying to cope with the after-effects of cyclone Amphan, another cyclone means that they again have to start from scratch. This includes them trying to repair their homes and recover their livelihood sources to get back to normal. However, not everyone can afford to do that, since many have entirely lost their lands and other resources in cyclone Amphan. As a result, earning livelihood may not be that simple after cyclone Yaas.

Among the Southwest coastal regions, Satkhira district is one of the most affected by cyclone Yaas. The TAPESTRY

project at ICCCAD is working at Shyamnagar Upazila in the district to find out the impacts the cyclone has caused on the people and their livelihood and has provided an insight into some unfortunate events as a result of the cyclone.

Most of the people in the area, especially those who depend on shrimp farming for their livelihood, are under constant threat due to the erosion of the Kholpetua river flowing through the Durgabati village of Burigoalini union in Shyamnagar. This year too, thousands of shrimp enclosures, or Ghers, have been completely inundated because of the river erosion caused by cyclone Yaas.

In addition, the salinity of agricultural lands and houses in the Padmapukur union has also increased due to the river erosion during cyclone Yaas. Similarly, important sources of livelihood like rice farming, livestock rearing and vegetable culti-



Inundated Shrimp Ghers in Durgabati Village, Burigoalini Union, Shyamnagar

vation have been severely impacted. To add to these woes, the drinking water crisis that already existed in these areas after cyclone Amphan has worsened with Yaas since the freshwater sources have been damaged. It is still unpredictable how long it will take to rebuild and go back to normal after the cyclone.

One thing that has been common during both cyclone Amphan and Yaas is the presence of unsustainable embankments in different coastal regions. In the case of Durgabati village, its embankment had deep cracks for a long time with no steps taken to repair it, hence it collapsed and the Ghers went underwater.

On the other hand, villagers in Patakhali village of Padmapukur union have been demanding a sustainable embankment for a while now to no avail. After the cyclone Amphan, a villager from Shyamnagar said, “I would like to ask NGOs to improve our embankments since the water entering this area causes serious damage to the fishes in Ghers and the livestock as their food gets spoiled, and because the Water Development Board takes a long time to reach out to us.”

It is clear that even after more than a year since cyclone Amphan, no proper steps have been taken to repair the embankments, while the local peoples’ livelihood options are being constantly jeopardized by cyclones and their impact.

Despite these unfavourable situations, there is a silver lin-



Most of the people in the area, especially those who depend on shrimp farming for their livelihood, are under constant threat due to the erosion of the Kholpetua river

ing. Since the villagers at Shyamnagar have noticed that help to make them resilient against disasters and to protect their livelihood either doesn’t come at all or comes much later, they have started taking matters into their own hands.

It is worth mentioning that when the villagers at Patakhali village of Padmapukur union got to know about cyclone Yaas approaching, they immediately took the initiative to start repairing the embankment on their own to protect themselves and their livelihood. Because of previous cyclones, villagers have realized that only men cannot be depended upon financially, so now women also work in Ghers, raise livestock and cultivate vegetables to become self-reliant.

This enabled women to repair the embankments in different villages including Patakhali before the cyclone made landfall. Moreover, the villagers can now understand warning signals given before cyclones, which helped them to take steps accordingly. Though these are small steps, it is important to note that villagers are now more conscious about disaster preparedness to protect their lives and livelihood.

The villagers are eager to do whatever is needed to protect their livelihood or shift to other livelihood options. But after cyclone Yaas, it can be seen that they alone cannot solve all their problems. In this case, the co-operation of the government agencies and the NGOs is crucial.

Lack of sustainable embankments during this cyclone has destroyed various peoples’ livelihood options, and many people may not even be able to do any work after everything goes back to normal. A big part of this issue can be resolved by ensuring sustainable embankments, which can be possible with a quick response from government agencies like the Water Development Board and various NGOs. Thus, we can help to preserve the livelihood options of villagers and help them adapt without having to start all over again. ●

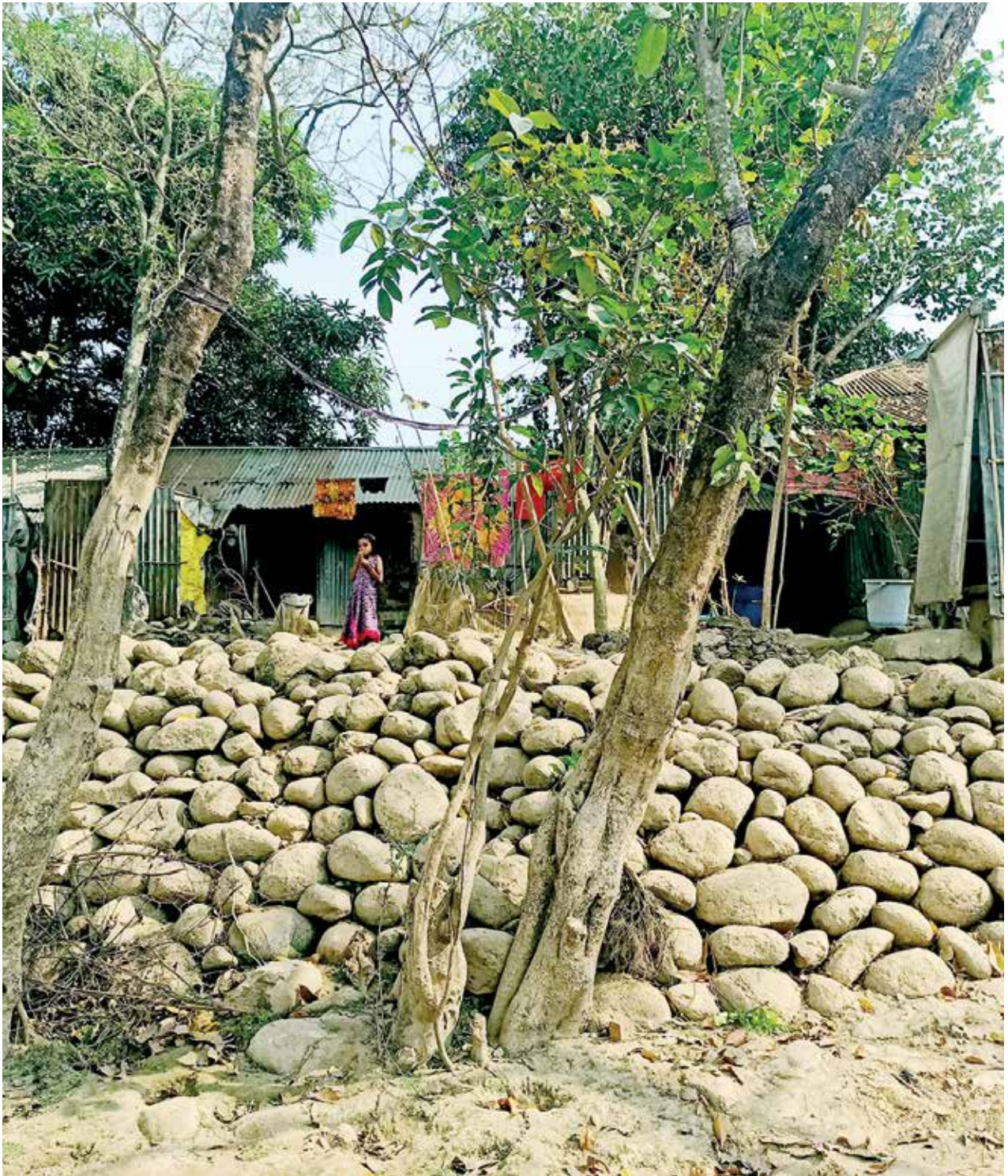


VASKAR MONDAL

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EFFECTIVE ADAPTATION

Local adaptation techniques bringing small effective changes



House elevated by stones to block flood water

The story of a farmer from South Bardal, Sunamganj shows how native knowledge can contribute to effective adaptation

Tabia Tasnim Anika

Sunamganj, the land of folk music and immensely beautiful haors, attracts thousands of tourists every year. Despite its natural beauties, the people of haors are not living a decent life. Flash floods and pre-monsoon floods have become a common natural hazard in Sunamganj, making it a new normal for the people of Sunamganj.

Due to heavy rainfall at the Indian hill range, a huge amount of water inundated the haors as the region is low-ly-



Many factors are responsible for the flash flood, but climate change is speeding up the process

ing and flat with gentle slopes. Upstream water flow comes from bordering steep upland area of Assam. In 2020, a record level of water was observed, and people said it was one of the worst floods they have seen in the last 10 years.

Recently, a scientific report by Hossein Taberi, published in Nature Research stated that the hydrological cycle is changing its pattern with global warming, which likely is increasing the intensity of extreme precipitation and the risk of flooding.

Sudden onset disasters like flash floods are the result of environmental conditions caused by climate change. Many factors are responsible for the flash flood, but climate change is speeding up the process. The major rivers of Sylhet areas receive so much water that they overflow every year in the monsoon. Roads get submerged and daily lives are hampered.

People deal with so many problems every year that they have developed some local adaptation techniques.

Although the resources are not enough to fight climate change, they are using their techniques to face the challenge. The villages in the haors are faced with countless adversities. Houses of thousands go underwater and so the croplands.

South Bardal is one of the affected villages and the story starts with an old strong farmer, named Mohammad Delowar.

Delowar lives in South Bardal with his family of five children, three of them are girls. His poorly built house could not stand strong when the tides of flash flood hit. Watching his own house go underwater is hard.

Recently, he has elevated his house by piling up stones and bags of sand to keep it dry as much as possible. Delowar said, “Every year is a new challenge. Survival is getting tougher than ever. I may take some measures to protect my house, but nothing stops my crops from flooding during a flash flood. Living with all the uncertainty during this time is unbearable. Every year I have to send my two sons to relatives’ houses. But to continue the daily household work, I had to keep my daughters at home even if the situation was not in their favour”.

He has also planted swamp trees in front of his house like other villagers did in Bardal. It has been seven years since he did so, and many of them have now grown big. The belt of trees are protecting the houses in the area from flooding by slowing down the tidal waves.

Another big problem is the scarcity of pure water. Many of the villagers are keeping their water tank high from the ground. “I have plans to make a water tank out of cement and place it at a significant height so that my wife does not have to go far to collect pure water,” said Delowar.

Floods have always been a frequent occurrence in the north-eastern part of Bangladesh. Flood water stays on average for about six months. But the alarming issue is, the magnitude and frequencies of flash floods in most of the haor regions are increasing every year.

The people of Sunamganj have evolved quite a number of strategies and techniques to adapt to all the adversities. All these adaptation techniques are saving them somehow. With ICCCAD and YCL I have been exploring the adaptation techniques being adopted by communities in the haor region and my local research project has been trying to expand on how women of this region are coping and adapting to floods. ●

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Driven away by storm

Stories of climate migrants in Khulna city

Md Tahseen Ahmed

What thought comes to your mind when you hear the word ‘migrant’? A simple Google search would reveal that a migrant is a person who moves from one place to another, especially in order to find work or better living conditions. Here it can be understood that the inspiration behind migration is the hope of finding better jobs and living conditions.

But it takes a whole new form when severe climatic conditions start becoming the dominant driver of human migration. When that happens, finding jobs or better living conditions become a lesser concern for the migrant and survival becomes a vital priority.

Since the 90s horrific severe cyclonic storms have resulted in many families from the southernmost districts of the Khulna division to migrate to Khulna City. But the irreparable havoc caused by the 2007 Cyclone Sidr and 2009 Cyclone Aila, gave the term “horrific” a whole new meaning for these people. These cyclones together destroyed millions of households, killed people in thousands, and their oceanic surges made thousands of acres of fertile crop fields practically barren to a large extent.

How the urge of survival triggers the necessity of permanent migration becomes more apparent when concentration is given towards the horrifying stories of the migrant people. Rawshan Ara (35), a climate migrant currently living in one of the slums near Khulna Railway Station had the misfortune of facing the devastations of Cyclone Aila on May 25, 2009, first-hand at Shyamnagar, Satkhira.

She and her family helplessly watched their homes and properties getting destroyed by the cyclone and washed away by its tidal surges. Her family of eight floated for kilometres on broken tree branches for about a day before getting rescued and taken into a cyclone shelter. Having lost all of their properties, they migrated permanently to Khulna City and took shelter in one of the slums along the Khulna Railway Station; and since then, they never managed to get out of extreme poverty.

The same cyclone destroyed the dreams of Aminul Islam (37), another climate migrant currently living in the same slum as Rawshan Ara. He and his family faced the destruction of Cyclone Aila in Dacope, Khulna as the cyclone washed his house and farm animals away to annihilation while submerging his 1.3-acre crop field in saline oceanic water, making it mostly barren. Though he had dreams of buying more crop-field but had to spend every last penny of his savings to per-

manently relocate his family to Khulna City.

Jahanara Begum (50), another climate migrant of the same slum area, also saw how Cyclone Aila destroyed her ancestral home back in Koyra, Khulna. She had to manage her family of seven to permanently migrate to Khulna City all by herself as her husband was away working as a migrant worker in Khulna City.

Her settlement process in Khulna City was a little bit easier than most other migrant families as her husband was already living in the city but the horrifying journey of migration, the fear of having her children getting lost during the journey,



Finding better living conditions become a lesser concern for the migrant and survival becomes the vital priority

and the memory of her home getting washed away by the cyclone still haunts her constantly. Many other families had to bear the same ill fate as they also were forced to migrate to Khulna City from its surrounding districts due to the impacts of the cyclone.

The horrors of these migrant families do not end with them just being relocated to Khulna City as a 2018 study reveals that these displaced people are at increased risk of health issues from unhygienic and overcrowded living conditions with water and sanitation-related problems (Rahaman, Rahman, Bahauddin, Khan, and Hassan, 2018).

A few Nongovernmental Organization (NGOs) have helped build small sanitation facilities for the slum dwellers but the inhabitants live in constant fear of eviction as the slum land legally belongs to the Khulna Railway Station authority.

The migrant issue in Khulna City was not that acute during the early 90s. But with its increasing population, rising



Cyclone Aila destroyed Rawshan Ara's home back at Shyamnagar, Satkhira, which forced her family to migrate to one of the railway station slums in Khulna City, where they now live in a squalid environment

frequency of intense cyclones at the Bay of Bengal due to climate change, and the flock of additional incoming migrants due to the impacts of those cyclonic events are making the overall migrant situation a legitimate crisis in the city, and the recent cyclones like Fani, Bulbul and Yaas are only making the situation worse.

The ongoing migrant related crisis in Khulna City and the horrifying stories of thousands of migrant families living within the city show how deep, complicated and over-reaching the impacts of climate change can be. The migrant community cannot be pushed back to their ancestral lands as those are still getting affected by intense cyclones annually due to the impacts of climate change.

On the other hand, the city barely can provide appropriate accommodation and necessary opportunities to these migrants to lead decent lives. Perhaps more voluntary private initiatives are necessary to mitigate this crisis. Small land donations, scholarships for the migrant children, extensive employment workshops and the introduction of small quotas at certain sectors for the migrants may bring particular effective changes to their decade-long predicaments. ●

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Cyclone Sidr: The picture of devastation in numbers

Loss and damage from Cyclone Sidr

Md Mahatab Uddin

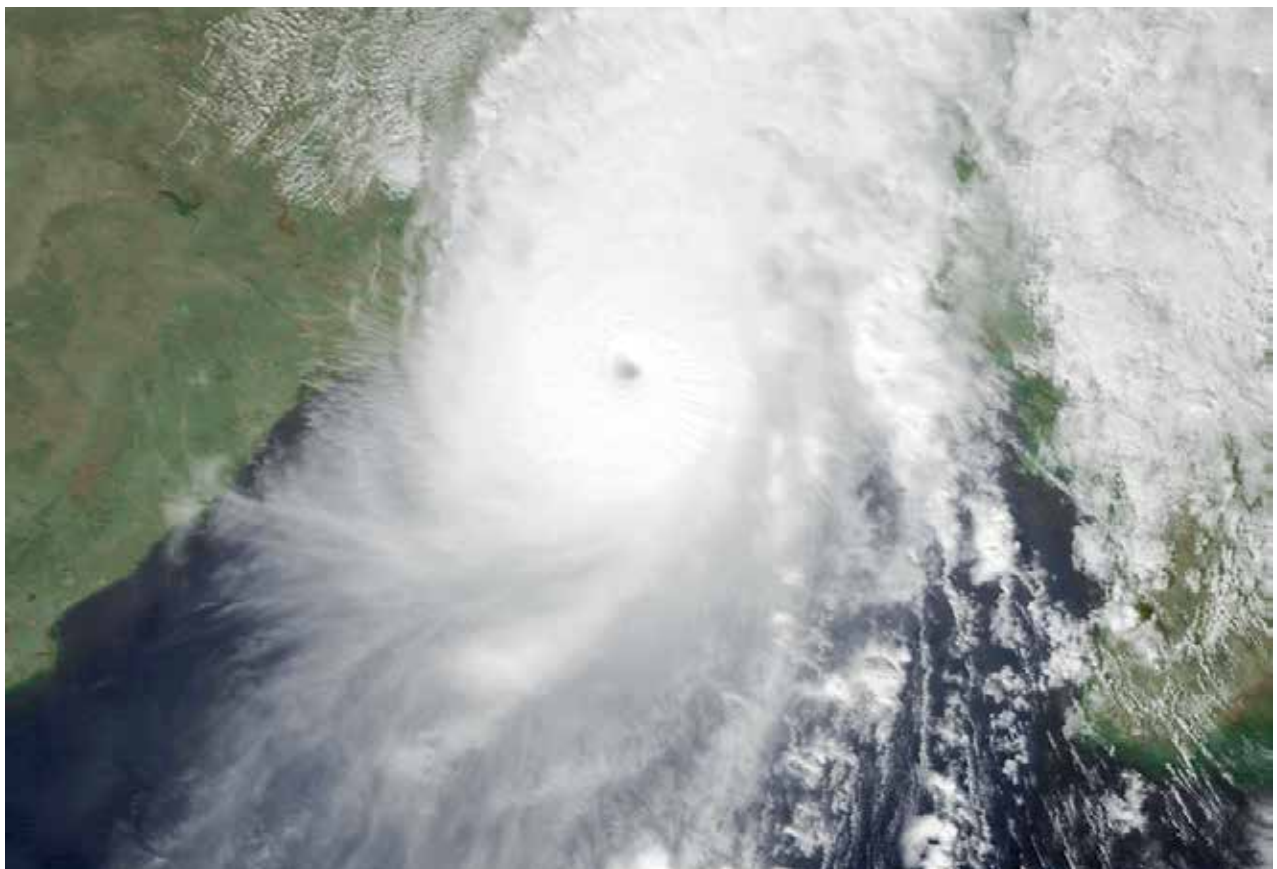
Being a natural disaster-prone country, every year Bangladesh experiences a diverse range of natural disasters like floods, erosion, torrential rains, or cyclones. Statistics show that during the last 100 years more than 500 cyclones originated from the Bay of Bengal, 17% of which ended up hitting Bangladesh.

As a result, in the last 100 years, on average Bangladesh experienced at least one drastic cyclone every three years. More than half of these cyclones caused the death of at least five thousand lives on each occasion. The deadliest cyclone Bangladesh experienced during the last twenty years was Sidr which, with winds up to 240 kilometers per hour, hit the

southwest coastal region of the country in 2007.

The cyclone was accompanied by tidal waves (up to five meters high and surges up to six meters in some areas), breaking coastal and river dams/embankments, flooding low-lying coastal areas, and causing widespread physical damage. The total losses and damages caused by Sidr were estimated to Tk115.6 billion (\$1.7 billion). Besides, 3,500 people died and more than 1,000 people were never found. The cyclone caused physical injuries to more than 50,000 people.

A study conducted by the Bangladesh Government in 2008, divided the losses and damages caused by Sidr into the following sectors: Loss of fixed assets and infrastructure, social sectors; industry, commerce, and tourism; cross-cutting issues like environment and ecosystem.



Cyclone Sidr at peak intensity in the Bay of Bengal on November 15, 2007

UNITED STATES NAVAL RESEARCH LABORATORY

Loss of Fixed assets and infrastructure include damages to housing, transport, power, telecommunications, water supply and sanitation, urban and municipal infrastructure, embankments, and water control structures. As for the loss of housing, it was found that 34% of the total affected households completely lost their primary residences, and 17% of households were partially damaged. In monetary value, households related total losses were accrued as \$839 million. This amount equals almost 80% of total monetary value of infrastructure related damages caused by the cyclone.

Sidr caused damage to around 8,075km of roads in 11 districts of the country. This damage was estimated to be Tk8 billion (\$115 million). The damage to the power sector was estimated to be Tk576 million (\$ 8.2 million), 90% of which was borne by the Rural Electrification Board (REB).

The total estimated loss and damage that took place to the infrastructures of telecommunication in 11 districts was about Tk2 billion (\$29.5 million). The Department of Public Health Engineering (DPHE) reported that Sidr damaged 11,612 tube wells, 7,155 ponds and over 55,000 latrines.

Damages caused by Sidr to water supply and sanitation of the coastal areas of Bangladesh totaled Tk157 million (\$ 2.28 million) and total loss was estimated to be Tk46 million (\$0.67 million). Sidr also affected 50 municipalities in 15 districts through damaging infrastructures. The cost for reconstruction or rehabilitation of the damaged structures were accrued as Tk1.7 billion (\$24.6 million). The total damages to over 2000km of embankments and other critical water control structures severely affected by Sidr amounted to about Tk4.9 billion (\$71 million).

The damages to social sectors caused by Sidr include damages to the education department as well as damages to the health and nutrition department. The cyclone partially or fully damaged 5,927 educational institutions, which resulted in a total value of damage and losses of Tk4.7 billion. At the same time, it also affected the health, nutrition, and family planning department in the nine districts. The total value of damage and losses to this department was determined to be Tk1,206 billion (\$17.5 million).

Impact of Sidr over the productive sectors includes agriculture (crops, livestock, and fisheries) as well as industry, commerce, and tourism. Around 2.2 million farmer-families were affected by Sidr. As for the loss of standing crops, it was found that 95% of direct losses were caused by high winds and storm surges destroying more than 6400 sq km of cropland.

Accordingly, the total damages and losses caused by Sidr for the crops were accrued as about Tk28.4 billion (\$412 million). The damages to the fishery sub sector include damage to infrastructures such as ponds, dighis, and gheris; and damage to private fishing equipment such as boats and nets, etc. Such damages in the ten most affected districts were estimated to be Tk463 million (\$6.7 million). At the same time, the



In the last 100 years, on average Bangladesh experienced at least one drastic cyclone every three years

estimated value of the damage caused by Sidr to the livestock was Tk1.3 billion (\$19.33 million).

As for effects of Sidr over the industry, commerce, and tourism, Sidr caused blocking roads, stopping electricity supply, destroying premises and equipment, washing away inventories. Total damage and losses to non agriculture productive sectors was estimated to be Tk3.6 billion (\$ 52.5 million). 92% of these damages were derived from production losses and seven percent were derived from physical damage. At the same time, the damages caused to small industries were accrued as Tk2.3 billion (\$33.2 million).

In addition to the above-stated direct loss and damages on some sectors of the southwest coastal zone of Bangladesh, the adversities posed by Sidr have created losses to ecosystem services, livelihoods opportunities as well as local market and economy.

Ecosystems like mangrove forests and wetlands and the concerned ecosystem services are vital to sustain livelihoods. Over 70 livelihood-related activities are supported by these activities. Besides, mangrove forests protect coastal people from cyclones by reducing storm surge velocity and stabilizing sedimentation.

Unfortunately, the cyclone Sidr damaged about 1330 sq km or 22% of the total area of the Sundarban mangrove forest. It further damaged local livelihood opportunities by reducing the earnings of day labourers, which constitute more than 80% of the local labour market of the Sidr affected coastal region. Above all, Sidr distorted the local market and economy by creating loss of local production and localized supply shortages of many goods.

Finally, it is possible to remark that the people of the south-west coastal region whose livelihoods were damaged by cyclone Sidr in 2007 are still struggling to recover from the loss they suffered. ●

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