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■ **CLIMATE RISKS, RESILIENCE
AND ADAPTABILITY**

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PHOTO: UNSPLASH

Effective adaptation for avoiding maladaptation

Khandker Tarin Tahsin and Md Bodrud-Doza

According to the IPCC 6th assessment report, maladaptation refers to actions that may lead to increased risk of adverse climate-related outcomes, including via increased greenhouse gas emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future. Most often, maladaptation is an unintended consequence. Maladaptive responses to climate change can create lock-ins of vulnerability, exposure and risks that are difficult and expensive to change and exacerbate existing inequalities.

IPCC WGII 6th Assessment Report strongly states that adaptation is one of the most essential ways to combat global climate change. However, with adaptation, the question is not anymore about whether we need to adapt but rather how

we actually do it in practice in a way that increases people's well-being and capacity. WGII highlighted multiple examples where use of similar tools and strategies can improve conditions in one region, while diminishing welfare in another region. Factors that can negatively impact on adaptation outcomes are uncertainty and potential path-dependency of decisions that may result in lock-in and maladaptation in the long-term. Additionally, policies and adaptation practices are often focused on short timeframes; what is successful in the near-term is not necessarily successful in the long-term.

One of the most popular and widely used coastal adaptation techniques is afforestation of naturally un-forested lands. Afforestation can generate carbon storage, work as ecosystem based adaptation, and provide multiple ecosystem services at the same time; yet a risk of maladaptation is often associated with such adaptation practices. Research has highlighted that introducing





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plantations in areas which would not naturally support forests, including savannas, natural grasslands and temperate peatlands, or replacing native tropical forests on peat soils, have destroyed local biodiversity and lead to multiple problems, including water supply scarcity, lack of food supply, fire risk and increases in greenhouse gas emissions. In Cambodia, for example, government adaptation strategies have focused on reforestation and conservation measures that in turn have eroded/reduced local biodiversity.

Grey infrastructure and energy intensive market led urbanization, once considered as a predominant adaptation technique, has now been listed as maladaptation practice. As such techniques often disintegrate ecological and social approaches from the plan and result in short-term benefits only, further exacerbating health, ecological and social vulnerability in marginalized communities. Seawalls are one such example; although they effectively reduce flood impacts to people and assets immediately, they can result in lock-ins and increase exposure to climate risks if not integrated into a long-term adaptive plan. Further, specific engineering solutions that might be introduced from other

localities without proper contextual adjustments may lead to maladaptation. Likewise, in climate vulnerable communities, livelihood diversification through male-out migration increases burden on women. Hence, a lack of gender-sensitive analysis before implementing water management projects can lead to maladaptation and increase gender vulnerability.

Examples of maladaptation are visible all over the world, such as in Navarre, Spain, an irrigation project was launched which resulted in many small-scale producers not being able to afford such methods and lost access to communal water rights. Thus, many of the farmers had to sell or rent their lands and look for alternative options. This project increased inequality, land concentration and lowered crop diversity in Navarre, putting the poor at higher risk.

Other maladaptation examples from the agriculture sector include, poor farmers selling firewood for charcoal production as livelihood diversification in Ghana. This shift towards firewood is particularly noticed as failure of crop yield during severe droughts, as frequency of rainfall decreases in Ghana due to climate change. Farmers have also tried intensification of pasture use as a coping response to climate-induced drought; nevertheless, this ended up increasing risks to livestock

reproduction and human life expectancy due to overgrazing; further suggesting, responses to green vulnerability can cross tolerance limits for animals, humans, and food available for foraging. Similarly, in Ethiopia, efforts of adaptation programs to droughts contribute to current unsustainable development trajectories among pastoralist communities, resulting in charcoal production, overgrazing, migration and conflict with other groups and marginalization of livelihood.

Climate and environmental policies often lack assessment, multi-level stakeholder involvement, and ground level research which can exacerbate climate vulnerability. In Central America, such lack of assessments led to unsustainable trajectory to local communities and increased

“ Success of adaptation and maladaptation form the ends of a continuum that represents the balancing of synergies and trade-offs across regions, populations, and sectors ”

risks to maladaptation, as climate variability on crop yield coupled with autonomous local adaptation practices, without any prior involvement of relevant stakeholders. Bangladesh, a flood-prone country, led national and regional-level adaptation plans that resulted in maladaptation, as local poverty context and uncertainties of properties were not carefully considered and disconnected from local autonomous practice. Previously constructed earthen flood control embankments for protecting lives and livelihood of vulnerable communities have failed miserably in Bangladesh, and had rather brought new problems. Studies have effectively pointed to an increase in siltation on floodplains and river beds, creating risky situations for the population within the boundary of embankments. Research also highlights that in future if the country invests in Coastal Climate-Resilient Infrastructure Projects, chances of potential increase in vulnerability of the poor will be associated with it; based on the current cost benefit analysis of previously constructed

coastal infrastructure. To avoid such maladaptation practices the country must consider relevant environmental and social impacts associated with embankments in future for long-term.

Likewise, the Indian government initiated multiple policies to adapt to the agriculture sector with the changing climate. Such policies invested in infrastructure, export production, and synthetic input have undoubtedly set the development pathways but have closed the adaptive options. Albeit their contribution towards increased national food production, such policies have failed to address high levels of malnutrition, worsen regional inequalities, degraded natural resources and led to an agrarian debt.

Nevertheless, maladaptation can be avoided through a focus on building adaptive capacity, community-based management, addressing the drivers of vulnerability and site-specific measures. Cost-benefit analysis should be a prerequisite in adaptation projects to better allocate scarce resources by local and regional decision makers. Additionally, many papers have cited nature-based solutions; chances of maladaptation can be reduced by recognition of land rights and cooperation with Indigenous peoples and local communities who depend on forest resources. Considering the potential unintended consequences of adaptation projects and programs in the planning and design phase can help to reduce maladaptation.

Timely actions that keep options open ensure benefits in multiple sectors and systems, and indicate the available solution space for adapting to long-term climate change, will benefit all. Scientists also suggest integrating adaptation with development as this helps to reduce lock-ins and creates opportunities for more integrated approaches. Compiling existing scientific and local knowledge on the relationships between forest, land cover/use, and hydrological services, is a gap to be filled, in a broader perspective in the region that can contribute to provide recommendations and inform restoration practices and policies. Also, there is a gap of knowledge about financing of climate change adaptation which must be addressed globally. In retrospect, success of adaptation and maladaptation form the ends of a continuum that represents the balancing of synergies and trade-offs across regions, populations, and sectors. ■

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The mud houses of rural Shyamnagar battling climatic hazards

Minoti Rani of Kultoli, Shyamnagar recollected that the water had entered their room during cyclone Aila-2009 despite the elevated plinth height S ANWAR

The context of housing in Bangladesh is shaped by the interaction between people and nature, where nature is beneficial but also presents hazards. While impacts of these hazards may evolve, the risk situation is not new in Bangladesh. From time immemorial, natural disasters have been causing the loss of millions of lives and resulting in colossal damage to the economy of Bangladesh.

For a very long time, local populations have been able to live here and to do so, they have found solutions to adapt to these hazards by solely using locally available resources. Local materials shaped the country's built heritage and still shape most rural houses. Earth, timber, bamboo, cane and reeds are abundantly available throughout the country and have been used for thousands of years in Bangladesh. These building cultures result from local know-how and a collective intelligence improved over generations, through trials, failures and successes.

In Shyamnagar, Satkhira, a district known for its proximity to climatic threats, houses are mostly self-built, usually constructed on an earthen plinth using natural materials such as earth, bamboo and wood and a growing use of iron sheets (CGI) for the roofs nowadays. They are often built over a multi-step earthen plinth with an earthen floor. The roof may be thatch or CGI sheets supported by a bamboo or wooden roof frame. Mud wall is built by mixing earth with water and straw, jute or rice-husk additives to provide strength during drying and shrinkage. The surfaces of earthen walls are plastered with earth mixed with cow dung.

In response to the climate, hazards and cultural needs, different local building cultures have developed and they offer a whole variety of context-specific solutions.

While strolling around the earthen pathways in the villages of Shyamnagar, it is common to see the floor level of the mud houses elevated up to around 5-6ft high in order to avoid submergences due to rainwater and to protect the structure from tidal surges. Extreme care and attention is usually given to construction of the raised floor or plinth, which is often the only remaining trace of a build-form after a cyclone or flood.

Gol pata is another natural commodity interwoven with the identity of the Sundarbans. In the locality nearby, panels of woven leaves gol pata with a bamboo structure are placed on the sides of the houses that are more exposed to rainwater and prevailing winds. The panels protect the earthen walls from erosion and degradation due to direct exposure to rain and strong winds, thereby increasing the lifespan of the mud wall. When needed, these panels can be easily replaced using freely available materials. The gap between the wall and the panels allow for an airflow thus avoiding moisture. The raised plinth is often wrapped with plastic sheets to minimize the erosion of the mud bottom with rainwater. However, buying

“Despite all attempts at a personal and community level, when a calamity strikes, the collective local solutions fall short to stand against nature”

rolls of plastic sheets often becomes a very luxurious solution for the marginal households. To protect the roofs from being blown away, the locals have come up with the method of using taana, an extra rope attachment to keep the roofs firmly anchored to the ground. Another common feature to find around is rolled up plastic sheets around the outer balcony. Whenever there is an incident of torrential and monsoon rain, residents pull off the plastic from the roll and try to save the inner space from the splashes of rain.

Trees planted all around the house cut down wind speed, as do all other kinds of vegetation. However, high and rigid trees are located far enough from the houses to avoid danger in case of fall. Other advantages brought by vegetation are the regulation of temperature and humidity around the house as well as the provision of fruits, vegetables and livelihood for families. All these practices had developed over the years in the face of adverse climatic impacts, which kept on coming back to the lives of the people of coastal areas on a daily basis like an unwanted guest.

Despite the precautionary measures, some characteristic shortcomings of the non-engineered earthen structures remain. The most prominent weakness of the earthen construction is that they are not resistant to moisture. The main causes of damp, humid wall and consequent mould attack are due to absorption of moisture of the rains and constant humidity during the rainy season.



Rabeya Khatun, living in the outskirts of Sundarban in Shyamnagar explains, "I need to re-apply the mud paste every 5 days over the outer surface of my walls, otherwise the mud plaster crumbles and breaks down. It is a very tedious process. Today I am very sick, but I still need to get this job done." **S ANWAR**

Moreover, Shyamnagar being a saline prone region, the problems associated with salt damage of structures also remain vigorously present in this region. The intrusion of saline water causes blistering and cracking of the mud floor, walls as well as the road surfaces. This phenomenon known as salt decay also affects other porous building materials such as limestone, sandstone, mud, concrete, and brick. This effect occurs when salt crystallizes inside of a building material's pores and generates enough force to cause it to break or crumble. The effects of salt decay are very visible as one looks around the villages of Shyamnagar.

The effects of rain, flood, absorption of the salt and even daily wear and tear all result in a continual erosion of structure. Traditionally, the women of the houses shoulder the responsibility of maintaining the mud shelter over their heads. Their role in keeping building exterior crack free by polishing the walls and plinth with a mud paste is very important in reducing the penetrations of rain and insects. Generally, they render the top or the outer wall on every 7-14 day period an additional house chore for them. However, the frequency of this maintenance is increased due to the salinity in the area.

However, despite all attempts at a personal and community level, when a calamity strikes, the collective local solutions fall short to stand against nature. Many houses were repaired or rebuilt four to five times in recent times as frequent cyclones and storm surges ended up swallowing their shelters.

Families needed to live temporarily on shelters for months, even on embankments or boats to save up money for rebuilding their houses. It is a major setback, hindering economic development, impeding improvements of living conditions and adaptive measures of disaster affected families and communities fighting to survive in one of the world's largest mangrove forests.

These communities living along the fringes of Sundarbans hope that they will receive effective advice, training and financial assistance for climate resilient local building practices which will take into consideration the factor of local knowledge and coping mechanisms in order to build back better and leverage people's capacities for self-recovery. ■

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The need of the hour

CHALLENGES AND
THE WAY FORWARD
TO ESTABLISH A
NATIONAL MECHANISM
FOR ADDRESSING
CLIMATE-INDUCED
LOSS AND DAMAGE IN
BANGLADESH

S M Saify Iqbal

The Sixth Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) has reported that the impacts of human-induced climate change have already become a reality and that the world needs to step up its investment for both mitigation and adaptation, while also addressing Loss and Damage.

As the negative effects of climate change, including more intense cyclones, super wildfires, frequent floods, heat waves, and droughts become more and more visible around the world, the issue of Loss and Damage has emerged intensively in recent years.

The IPCC made mention of Bangladesh's economic and non-economic losses this year. Climate-related disasters destroyed about 850,000 homes and 250,000 hectares of arable land and in consequence, this loss of agricultural land also led to crop failure.

Bangladesh has significantly improved its approach to managing its climate risks and related policies over the past several decades. In order to increase its resilience to climate impacts including Loss and Damage and decrease associated vulnerabilities, there are numbers of government ministries are involved: Disaster risk reduction is handled by the Ministry of Disaster Management and Relief (MoDMR), while adaptation to climate change is handled by the Ministry of Environment, Forest and Climate Change (MoEFCC).

Other related ministries, such as the Ministry of Agriculture (MoA), Ministry of Health (MoH), Ministry of Finance (MoF), Ministry of Water Resources (MoWR), Ministry of Foreign Affairs (MoFA), Ministry of Planning (MoP), and the Prime Ministers' Office (PMO), are also crucial for the implementation of related policies in these fields.

“ The government of Bangladesh should take into consideration establishing a national mechanism on Loss and Damage ”

Nevertheless, despite the proficiency and success in managing risks associated with climate change, the current policy and response framework has holes that need to be proactively filled. The key weakness is the lack of a comprehensive national legislative, institutional, and policy-related system that expressly addresses Loss and Damages brought on by climate change and supports those affected,

especially the most marginalized groups and individuals in the countries.

Additionally, there is a lack of integrated guidelines to address Loss and Damage for different tiers of government (local, regional, national, etc), as well as a lack of a framework to assess non-economic Loss and Damages resulting from climatic disasters or quantify slow-onset processes.

Going back to the history, a workshop on Loss and Damage was held by the MoDMR in Dhaka on February 16, 2016, with funding from the Climate and Development Knowledge Network (CDKN), Action Aid Bangladesh, Centre for Climate Change and Environmental Research (C3ER), and Nature Conservation Management (NACOM).

The primary audience for the program was MoDMR officials, with the goal of educating staff on how a national system to address Loss and Damage could be incorporated into a Disaster Risk Reduction (DRR) strategy. In order to begin conversations about how the Warsaw International Mechanism (WIM) may be translated at the national level, the workshop brought together the minister of MoDMR, senior officials, policy-makers, field specialists from MoDMR, together with the civil society, researchers, and experts working on (DRR) and Loss and Damage.

The workshop served as a first step in enlisting important stakeholders who could then understand and support the creation of a national system or mechanism to address Loss and Damages brought on by climate change. The MoL, MoWR, and MoEFCC have all agreed to contribute and support the mechanism's process under the direction of the MoDMR. After that, a number of regional and national consultations were held.

The main proposal that came out of these consultations was that the government of Bangladesh should take into consideration establishing a national mechanism on Loss and Damage through the formation of a new technical team with clear terms of reference. Later a scoping study was undertaken that outlined the steps involved in creating a national framework for Loss and Damages.

Unfortunately, the Department of Disaster Management (DDM) hasn't done much work on the national mechanism since the scoping study was submitted. The absence of a motivating factor within the MoDMR has always hindered the establishment of the national mechanism on Loss and Damage. The MoDMR has been preoccupied in recent years with responding to the Covid-19 outbreak as well as the Rohingya crisis.

The development of the national mechanism has also been hampered by a lack of coordination and interaction between the MoEFCC and the MoDMR. For the National Mechanism to be established, these two major ministries must work together more effectively. It has been suggested that until then, the national mechanism be hosted by a different entity.

Later, a window of opportunity opened up as a result of

the creation of the new Public Private Partnership Authority (PPPA). The proposed national mechanism on Loss and Damage being advanced in Bangladesh as a Public-Private Partnership (PPP) initiative for a two-year action research project involving government ministries and agencies, non-governmental organizations, academics and researchers, as well as the private sector, such as insurance companies, which is one real-world example that other developing countries can look at and possibly learn from. Bangladesh will initially trial this with its own resources.

The goal is for Bangladesh to create mechanisms that are dependable, transparent, and capable of identifying climate change-related Loss and Damages and helping victims not only recover but also become better climate change adapters in the future. If it is successful, other vulnerable countries might follow its lead.

To expedite the process of national mechanism on Loss and Damage, the Multi Actor Partnership (MAP) concept can play a key role. The MAP concept is predicated on the idea that cooperation with a high degree of commitment, going beyond simple consultation of many partners and taking into consideration the complexity of interests of participating and affected actors, results in long-term fixes.

The challenges of addressing Loss and Damage, as they relate to Agenda 2030 and the Global Sustainable Development Goals, as well as the implementation of the Paris Climate Agreement in particular, can only be overcome if actors from civil society, politics, business, and academia collaborate on jointly developed goals at eye level. This is also applicable for the development of the national mechanism of Loss and Damage.

On the other hand, the role of Civil Society Organizations (CSOs) can't be denied in establishing the national mechanism. A number of CSOs formally collaborate with the government to develop policies and plans, such as the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) revision and the National Adaptation Plan (NAP), which are currently under development. Along with institutionalizing cooperation among various CSOs, CSOs can create a bridge between government actors and local communities to develop the national mechanism on Loss and Damage.

Also, building CSO's capacity will significantly improve the effectiveness of efforts to avert, minimize, and address L&D in Bangladesh given how CSOs assist the government in developing policies and strategies. Additionally, CSOs might support continued high-level leadership to make Loss and Damage a top priority for the Bangladeshi government. Representatives of CSOs that interact with the government on a high level could develop this leadership.

Moreover, given how CSOs help the government to formulate policies and strategies, a feasibility study conducted by a Bangladeshi consultant funded by German Watch claims that boosting CSO capacity will improve the

“ The goal is for Bangladesh to create mechanisms that are dependable, transparent, and capable of identifying climate change-related Loss and Damages and helping victims not only recover but also become better climate change adapters in the future ”

efficacy of efforts to address Loss and Damage in Bangladesh.

Additionally, local CSOs that are doing a lot of the work to assist households in addressing Loss and Damage as well as the communities they serve are frequently left out of the process of developing policies, plans, and strategies that affect them. This needs to be changed, and their participation must be guaranteed.

To conclude, the establishment of a sustainable national mechanism depends on the high-level leadership on Loss and Damage, ideally at the political level with the backing of a minister and preferably from the Prime Minister's Office. Additionally, the MoDMR needs a champion to provide government leadership.

One way to develop the political leadership required to drive Loss and Damage is through high-level discussions between representatives of the government, experts, NGOs, CSOs, and other stakeholders. The MAP concept has a great potential in bringing together committed leadership for implementing the nation's Loss and Damage response mechanism. ■

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Progress and problems

FOR A DISASTER-PRONE NATION LIKE BANGLADESH, DISASTER MANAGEMENT NEEDS TO BE MORE WELL-FACILITATED



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Roshni Islam

From time immemorial, cyclones and storm surges have been sweeping the large coastal population of 44 million people in Bangladesh. From historical records, 200,000 lives were lost in the 1876 cyclone, over 500,000 lives in 1970, and more than 138,000 lives in the cyclone of 1991.

Cyclone Sidr took 3,406 lives and destroyed resources worth \$1,675 million. Cyclone Amphan made landfall in May 2020 and claimed 3,500 lives. According to multiple literature reviews, at least one devastating tropical cyclone sweeps through the coastal zone of Bangladesh every three years, affecting millions of people, destroying their homes and livelihoods, and consequently triggering migration in the coastal region.

Conversely, adapting to the disasters has also been a

constant struggle of the people living in these coastal regions, who have had to undergo a complex process of development. Historical records of cyclones and storm surges show that while the lives lost due to these natural disasters have significantly decreased as a result of successful disaster management, economic losses remain high.

In the last 50 years of leadership in disaster management, Bangladesh has upgraded from being the most vulnerable country in South Asia to a resilient one. The major changes in policy and institutional domains, focusing on the decentralization of disaster management of local-level institutions since the 1990s, have contributed to this success.

The shift from relief and rehabilitation measures taken in the past towards a holistic warning based community preparedness and cohesive response efforts have also led to the decrease in the number of lives lost.

Numerous public institutions, along with national and international NGOs as well as volunteer-based organizations, have been implementing a framework that increases the resilience from the community level in the coastal zone where the people are always recovering from increasingly frequent natural disasters.

They have also identified the structural constraints such as poverty, governance, and a history of vulnerability, which has helped to create an effective model that has contributed to the success in disaster management today.

These projects with differing budgets and timeframe usually have a basic goal of creating a more resilient and sustainable community. For example, the International Centre for Climate Change and Development (ICCCAD) led a project spanning from 2013 to 2018 that promoted livelihood resilience and progress in the coastal belt of Bangladesh.

Another project which was primarily funded by the British Red Cross known as “Vulnerability to Resilience” also worked on the community level impacting the overall resilience capacity. Cyclone Preparedness Program (CPP) is another disaster management program by the government and Bangladesh Red Crescent Society under the Ministry of Disaster Management and Relief.

These projects and programs include consulting with the local government and people in the community, providing incentives such as financial support in exchange for development work (constructing/rebuilding roads and dams), financing to kickstart poultry, fishery, vegetable cultivation and entrepreneurship, providing cattle, sewing machines, and other goods, building sanitary latrines and tube-wells, and distributing safety equipments for people with hazardous livelihood. The people in the community also receive training in community mapping, search and rescue, and first aid.

The prevalence of early warning systems, along with construction of cyclone centres in disaster prone areas, has contributed to the current level of success in disaster management in Bangladesh. On top of that, the addition of increased efficiency in communication among people that has developed throughout the years such as widespread use of social media and mobile phones has transformed Bangladesh from a country that is severely vulnerable to natural disasters, to one that is resilient.

These programs have laid down the groundwork and provided notable changes and improvement in disaster management but many areas still remain which require immediate reforms. According to a study assessing the efficiency of disaster management institutions at the local level in the coastal region of Bangladesh, the early warning messages disseminated by the CPP are ignored by many people and they rarely take the decision to seek refuge in cyclone shelters during a disaster. There are many reasons for this lack of willingness to seek refuge in the cyclone centres, which include cyclone centres being inaccessible

“ In the last 50 years of leadership in disaster management, Bangladesh has upgraded from being the most vulnerable country in South Asia to a resilient one ”

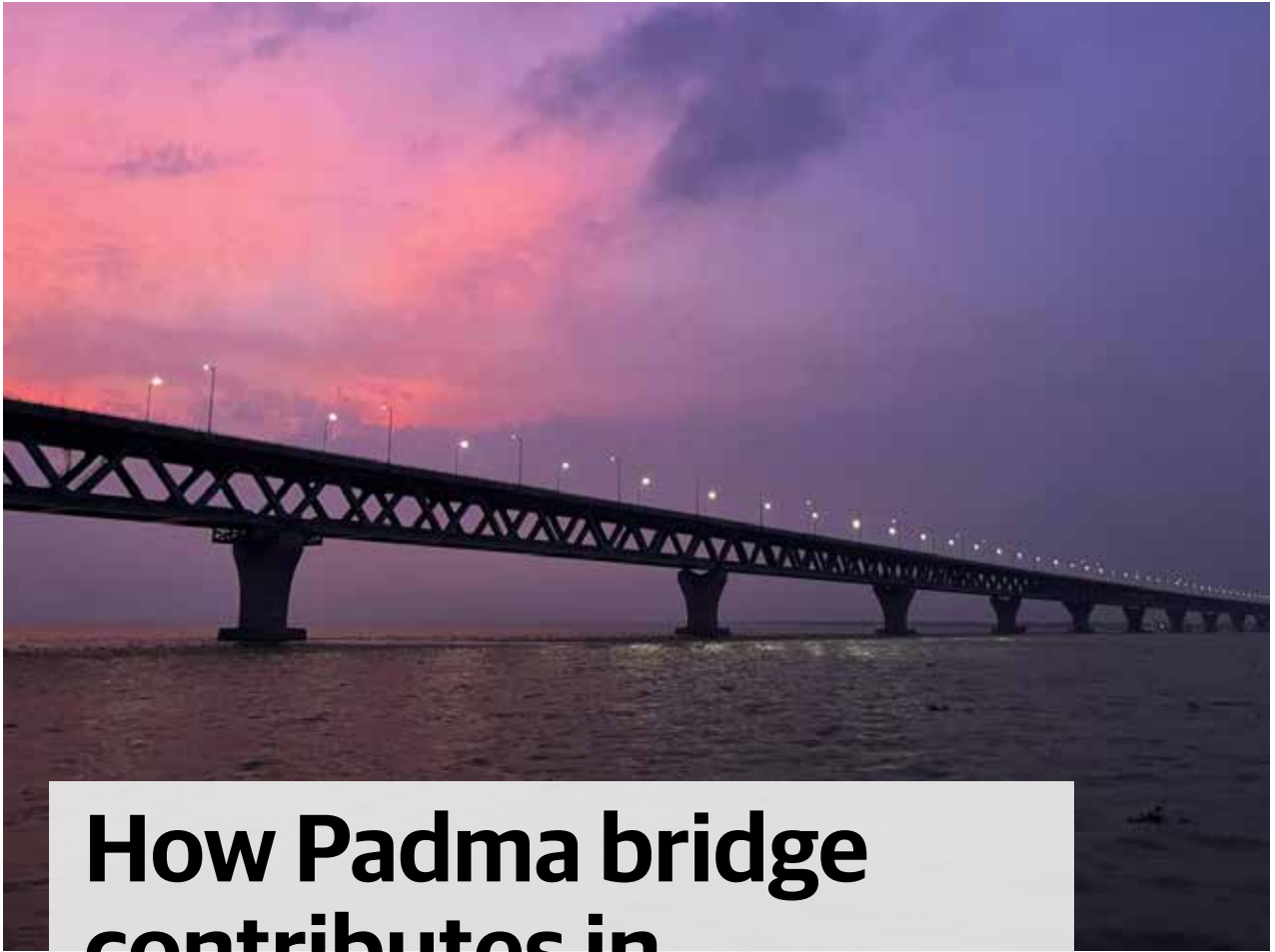
due to broken roads, lack of facilities for children, women, the elderly, and the disabled.

Pregnant and menstruating women face an added layer of difficulties since the cyclone centres often lack hygienic sanitation systems and clean water. There are reports of women’s health being compromised severely as they take birth control pills to delay their menstrual period and suffer from Urinary Tract Infections (UTIs) because of unsanitary water supply. The post-disaster phase in the cyclone centres are also very dangerous as the water goes down, the residual water brings a surge of water-borne diseases.

There are some initiatives being undertaken by NGOs that are working towards improving facilities in cyclone centres. For example, low cost menstrual pads being made available and the accessibility of the centres are being prioritized to increase the number of people responding to the warning promptly. Additionally, many issues are left to be addressed and tackled when it comes to Disaster Risk Reduction (DRR) such as bureaucratic complexities, corruption, and nepotism of the local government often hinder the Union Parishad (UP) and the NGOs to play their appropriate role at the post-disaster stage, access to gender responsive cyclone centres etc.

The improvement in Disaster Risk Reduction over the years can be attributed to the continuous effort made by the institutions and organizations, but it is imperative that we are not complacent to the urgent reformations and additional improvements required to be implemented for a holistic approach going forward in disaster management. ■

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How Padma bridge contributes in strengthening the resilience for the southwestern coastal community of Bangladesh

THE THREAT OF CLIMATE CHANGE LOOMS LARGE. THE PADMA BRIDGE HELPS IN MANY WAYS TO MITIGATE SOME OF THE EFFECTS

Maliha Masfiqua Malek and Gausia Islam Keya

Padma Bridge is not just a single critical infrastructure, but also, it evolves into an entire project integrating a communication system, with a sustainable ecosystem.

The coastal landscape of Bangladesh is predominantly shaped by the confluence of three large rivers: The Ganges-Padma, Brahmaputra-Jamuna, and Meghna (GBM), forming the largest delta in the world and delivering an enormous amount of sediment to the Bay of Bengal. The Padma River divides the southwestern zone from Bangladesh's northern and eastern regions.

It is estimated that the bridge would help grow Bangladesh's gross domestic product (GDP) by 1.3% annually. According to the report of CPD, it is estimated that southwestern districts will add another 2% to the GDP. At 2.5% of the \$450 billion GDP, more than \$10 billion will come from the bridge during its economic life.

“ They can now complete their task more efficiently due to the Padma Bridge ”

As such, the benefits will be at least three and a half times more than the construction cost. The duration of crossing the mighty Padma River reduces significantly and the distance is reduced from the southwest region to Dhaka, the country's capital, by more than 100km. Eventually, it also brings savings in passenger and commodity movement time and costs.

Padma Bridge is a critical infrastructure that acts as a pillar of resilience for 21 districts of the southwestern part of Bangladesh. According to the report of the Nationwide Climate Vulnerability Assessment in Bangladesh, the adaptive capacity of the region is perceived to be low, being highly susceptible to several natural disasters such as tropical cyclones, tidal surges, and coastal floods.

The lack of sustainable transportation facilities by road, with a combination of high-level exposure and sensitivity used to align with a low level of adaptive capacity, made this region at particular risk in the future climate change scenario. With the establishment of the Padma Bridge, the most vulnerable districts to climate change get assurance of aid in the shortest time during any natural calamities.

According to the report on Mainstreaming Climate Change

at BRAC, it noted that Satkhira, Khulna, Bagerhat, and Jashore are classified as Western Coastal Regions; Barguna, Jhalakathi, Patuakhali, Pirojpur, Bhola, and Barisal are classified as Central Coastal Region -- among 41 most vulnerable districts to climate change in Bangladesh.

It is evident that investing in critical infrastructure has been an efficient approach to mitigate mortality, people affected, and overall losses from natural hazards as well as climate change impact.

The first SDG is to remove poverty for sustainable development. Low-income individuals and communities are more exposed to environmental hazards and pollution, and have a harder time recovering from the impacts of climate change.

Due to climate change, salinity has increased in the southwestern part of Bangladesh. Farmers are unable to grow all types of crops but now, they can grow salt-tolerant crops more and get encouraged to trade them easily to the city or other places through the Padma Bridge.

However, their income will be increasing day by day with good transportation networks and the rate of poverty will be decreasing in the long run. Besides this, many other agricultural industries, tourism, etc are going to be developed in a sustainable way due to the Padma Bridge.

SDG 13 is to take urgent action to combat climate change and its impact. Climate change is a real and inevitable threat to our entire civilization, especially the community of the southwestern region of Bangladesh. Through proper education, innovation, and adherence to our climate commitments, we can make the changes toward sustainable development. Padma Bridge can make this path easier.

Providing knowledge and education through NGOs or other organizations becomes easier. They can now complete their task more efficiently due to the Padma Bridge. Therefore, employment opportunities will increase as well. Thus, the first SDG can be achieved in the southwestern part of Bangladesh within a short period.

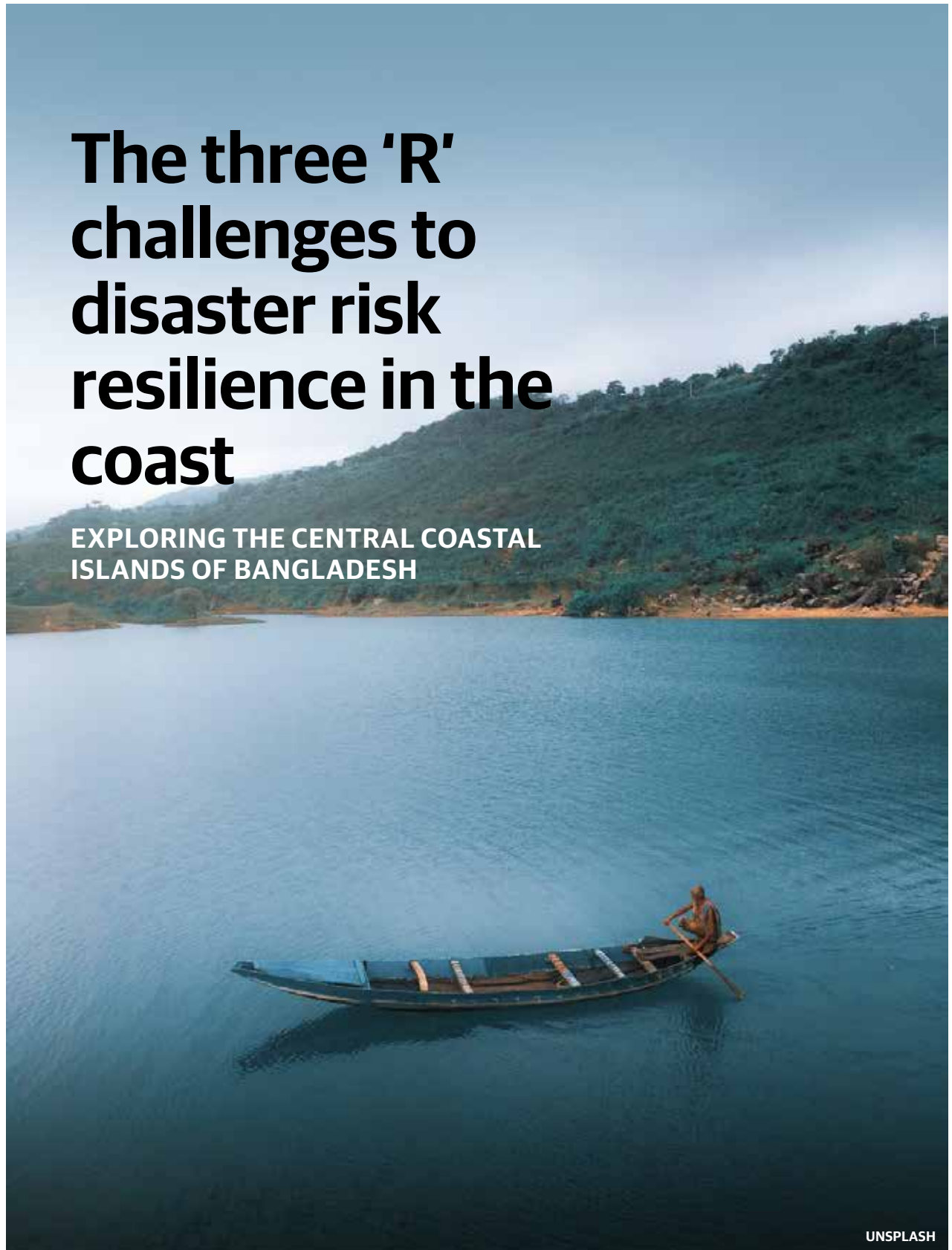
Along with SDGs, Bangladesh Government's Mujib Climate Prosperity Plan will be also in alignment with achieving prosperity through the establishment of Padma Bridge. Padma Bridge is a commitment to strengthening resilience to climate change among one of the most vulnerable communities of the southwestern coastal people of Bangladesh. ■

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The three 'R' challenges to disaster risk resilience in the coast

EXPLORING THE CENTRAL COASTAL
ISLANDS OF BANGLADESH



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The Global Climate Risk Index (CRI) published by Germanwatch in 2021 ranked Bangladesh as the seventh most vulnerable nation to climate change impact. The geographical location, dense population, and socio-economic conditions are the prime factors that make the country susceptible to various natural calamities, and multiple studies report that such natural occurrences are being more intensified and frequent over the last few decades due to the impacts of climate change.

Cyclones and tropical storms take a heavy toll on the coastal regions of Bangladesh, as the funnel shape delta, suitable depth, and temperature (minimum 26.5°C during pre- and post-monsoon season) make the Bay of Bengal an ideal region for cyclone formation and inland landfall. In the last three years, four cyclones hit the coast of the country, claiming lives and causing massive destruction.

The coastal communities are at the frontlines of the cyclones, and they have been dealing with various adversities resulting from such disasters over the years. The situation gets worsened in the remote islands of the central coastline of Bangladesh. From our recent visit to the coastal islands (Bhola, Char Kukri Mukri, Monpura, Hatiya, and Nijhum Dwip) we have preliminarily found three dominating factors that have been hindering the disaster risk resilience to tackle the impacts of climate change.

“Remoteness” is the first and foremost barrier to development in the coastal islands of Bangladesh. The islands and chars found in the central coastal region are situated at a distance from the mainland and are scattered along the estuary of the Meghna basin. The transportation system from the mainland to the major islands such as Bhola are well advanced; however, accessing the char lands and small islands becomes difficult due to the insufficient transportation facilities.

Secondly, the communities living in these small islands and the char lands rely much on solar power and electricity generators as they have no access to the national grid. Besides our visit, we were able to identify a significant number of multi-purpose cyclone shelters, but the number of healthcare facilities in the area were only a small handful. Therefore, during an emergency, especially during disasters, the inhabitants of these small islands and char land face extreme hardship in terms of mobility and health care services.

From our observation, we found that “religious superstitions” still prevail in society in most of the coastal regions. Here, the locals depend much on the preaching of so-called religious leaders and in every step of their lives, they try to obey the commandments. But oftentimes it is noted that the teachings and philosophy of such religious leaders are biased, erroneous, and illogical.

They manipulate and misinterpret the religious teaching

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as per their personal interest and take the advantage of the ignorance of the common folks. Such practices create mass confusion and become a major constraint to ensuring the participation of all the stakeholders, especially the elderly and the women of the community while initiating a development measure and disaster risk resilience.

For instance, an elderly person from our study opines that “it is not certainly necessary to relocate to the cyclone shelter before a cyclone, as his religious leader says it is the Almighty who could have saved them, not man-made infrastructures.”

Hence, “reluctance” to take part in various development initiatives, and life-saving measures can be observed among the community members living in these small islands and char lands. From our study, we also find that in most cases, women are discouraged to move out-doors, which surely

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becomes a major concern while relocating to the cyclone shelters during the pre-disaster period. However, there are multiple reasons for women being “unwilling” to relocate to the cyclone shelters, which include lack of safety and security, menstrual hygiene issues, and sanitation facilities.

Nevertheless, the scenarios are changing day by day in these remote islands and char lands. In the tourist destination sites such as Char Kukri Mukri and Nijhum Dwip, women are observed to run small businesses, which helps them to support their families. Moreover, the society there supports such practices and with the help of the government and different donor NGO women are becoming self-reliant.

The Village Home Stay (VHS) service is one such initiative that has enabled many women to earn their livelihood all by themselves. In other islands and char lands where tourism is

yet to be promoted, the social scenario seems to be completely opposite and more conservative. Hence, the promotion of tourism can be a tool to involve all the stakeholders of the society to ensure overall development.

Undoubtedly the government, along with other developing organizations, has undertaken various development initiatives for the betterment of the coastal inhabitants living in the remote areas. But yet, there are many scopes and opportunities that can be explored and taken into consideration.

First of all, the accessibility to these remote islands and char lands should be improved. Increasing and improving the quantity and quality of water vessels and their services can be an option, which could be operated and maintained by the local government authority in a systematic manner engaging the local community members.

Secondly, the number of healthcare facilities should be increased, and necessary support services should be available. Ensuring quality education should be prioritized in these remote areas and more emphasis should be given to secondary and higher secondary education.

Considering the socio-economic scenario, formal education till secondary classes should be subsidized. Besides, vocational learning and training facilities can be developed and promoted. At the same time, women’s education should be ensured for the well-being of the society.

In the cyclone shelters, women’s protection should be prioritized and a proper mechanism can be introduced to ensure the safety and security. Menstrual hygiene issues and sanitation facilities should also be considered with great importance.

Mass awareness and social campaigns can be organized where religious scholars and community leaders can share their knowledge and experience to redeem the locals from false beliefs, practices, and superstitions over time.

Finally, initiatives can be undertaken to promote tourism in several remote islands and char lands by conserving natural resources, which would draw the attention of many and ultimately influence the entire social system.

These would aid to change the outlook of the society gradually, which would ease the process of development initiatives and could also enhance resilience to disaster risk resilience, ensuring everyone’s participation. ■

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Reproductive health management in the climate change affected areas in Bangladesh

THE IMPORTANCE OF MANAGING SEXUAL REPRODUCTIVE HEALTH IN DISASTER PRONE AREAS



UNSPLASH

Nazneen Khan

Bangladesh is one of the most vulnerable countries to climate change in the world, likely to suffer worse in the future than any other South Asian country. While climate change impacts all genders, girls and

women face heightened vulnerability to the effects of climate change as their reproductive health also gets affected by poor facilities and access to other infrastructure.

The geographical location of Bangladesh shows that flooding, drought, and cyclones are common challenges that the country is facing periodically every year. The UN

has found Bangladesh to be among the five most hazard-prone countries in Asia and the Pacific according to the 2021 Regional Focus Model (RFM) on disaster vulnerability. All these impacts of climate change do not only affect Bangladesh's economic and social aspects, but also seriously makes the women and children vulnerable in terms of sexual and reproductive health and rights (SRHR) aspects.

The fact is environmental crises like drought, heavy rainfall, flood, extreme heat, increased salinity and other climate-related phenomena can increase the risk of maternal and newborn ill health, increased child marriage, and gender-based violence in Bangladesh. Women and children become the most vulnerable during and after the disasters as impacts of climate change. Women are especially vulnerable here due to lack of access or facilities to medical care, services, Sexual and Reproductive Health Rights (SRHR) services, adolescent Sexual and Reproductive Health (SRH) services, and maternity and pregnancy related services. They are also being deprived of security, privacy, safety, and the scarcity of hygiene products such as sanitary napkins and most importantly, also being deprived of the dignity of human life during the crisis period.

It is crucial to identify and establish the linkage between climate change and SRHR in the context of Bangladesh, given the urgent need to understand and establish how gender and SRHR related information and message could provide a positive impact to the huge number of women and young girls living at the risk of climate vulnerability in Bangladesh.

Gender equality, sexual and reproductive health and rights, and climate change issues are inextricably linked. Access to safe and dignified menstruation is a fundamental need for women and girls. A growing evidence base from this country shows that many girls are not able to manage their Menstrual Health (MH) and associated hygiene with ease and dignity. These girls and women cannot practice good menstrual health and hygiene at home, at school, at work, or in other public settings, due to a combination of discriminatory social environments, inaccurate information, poor facilities, and limited choice of absorbent materials. This deprivation is even more acute for girls and women in emergencies especially during any kind of natural disaster. When a climate-related disaster strikes, women and girls are exposed to vulnerabilities that put them at greater risk of women health issues such as maintaining SRHR.

Maintaining menstrual hygiene is not easy in Bangladesh, where people often do not even utter its name because of the associated stigma and taboo. Menstrual myths have a long history in country like Bangladesh but small changes are taking place to help break the taboo and create awareness about the need for hygiene for girls and women.

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Such unhygienic practices can cause serious health issues and may even lead to death. When menstrual health is still taboo in Bangladesh, very few people think of helping women by providing sanitary napkins during their periods and it is beyond expectation in a natural disaster-prone area.

To procure appropriate menstrual hygiene materials for women and girls in both development and emergency contexts, it is important to understand the potential advantages and health benefits of those hygiene products in different contexts. RHM specific education will teach and develop skills of the young girls and females to better respond to their rights and build awareness and confidence.

During any natural disasters related to climate change, health services specifically sexual and reproductive health services -- are often limited and at times not available whereas it is much-needed medical support. In addition, women's and girl's ability to manage their menstruation with dignity is impaired when there is a lack of clean water and menstrual products.

For marginalized and vulnerable groups of people, as well as those with disabilities, the impact of climate change exacerbates their existing challenges and vulnerabilities. When women are not able to realize their SRHR, they cannot live to their full potential, as a result they aren't interested in pursuing education and improving their livelihoods. The



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existing barriers are particularly high for girls and women and those who experience multiple and intersecting forms of discrimination and oppression, such as underprivileged or climate change affected peoples or climate refugees.

On the other hand, when people, especially women would have realized their SRHR, their capacity to engage in climate change adaptation actions would be greater. They can make decisions to better manage risks, pursue new livelihood strategies, and raise their voice for awareness building and collective action. This enables them to be more resilient to the impacts of climate change and active contributors to climate solutions.

Every government needs to understand what is ahead of us in terms of the future. We hope that our government will continue to support specific initiatives for women, particularly encouraging small and medium size manufacturers across the country to promote accessible and affordable hygiene products for women and girls in rural and hard-to-reach regions of the country specially in the disaster-prone area.

It also urged all sanitary napkin manufacturers to immediately apply this tax-exemption on prices, so that women and girls may get benefitted. To ensure healthier communities and protect the wellbeing of all, including women and girls, adaptation and resilience strategies need to be an integral part of the national health plan as well as knowledge and research contributions to the policymakers is badly needed. ■

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