

The Convergence of Climate Impacts on Bangladesh and the Need for More Climate Responsive Land Tenure Administration:

Bangladesh: Country Overview Paper

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This country overview paper offers a perspective overview of climate change and land tenure rights in Bangladesh. It provides a review and analysis of how the official climate responses and those of other stakeholders impact on the land tenure, use and rights of people. Lastly, it discusses the emergent impacts/implications of climate change on land tenure rights, land use systems and governance.

In undertaking the above discussions, the paper has brought into particular focus the socio-economic issues of poor, marginalized, and at-risk sectors.

This paper is not based on any comprehensive study, but rather it is a compilation of relevant information gathered through some structured interviews. The results of these interviews have been validated by 26 civil society organization (CSO) activists (four females and 22 males) through an online workshop organized by ALRD on 3 September 2023. This paper incorporates the inputs generated from the rich exchange of ideas by the participants.

Bangladesh – A highly vulnerable country

Bangladesh, which is located in the low-lying Ganges-Brahmaputra-Meghna (GBM) Delta, is high on the list of countries that are most vulnerable to climate change. It ranked seventh on the 2021 World Climate Risk Index (MoEFCC, 2022).¹

Changing climatic patterns, including increased frequency of floods, cyclones, and droughts, threaten the productivity of agriculture, which employs a large portion of the country's labor force. Rising sea levels lead to saltwater intrusion, which damages arable land. Small-scale farmers are particularly vulnerable because they lack the resources to adapt to changing conditions and to recover from income loss due to crop failures (Islam & Uddin, 2020).

River flooding and riverbank erosion are prevalent in various parts of the country (Elahi et al., 1990). Erosion causes the loss of around 8,700 hectares of homestead property and cultivable land and the displacement of about 200,000 persons every year (CEGIS, 2012; GoB, 2010).

Sea-level rise and cyclonic storms regularly threaten Bangladesh's coastal areas. Low-lying coastal regions, such as the Sundarbans mangrove forest, are at risk of erosion and inundation. This poses

¹ ANGOC and Land Watch Asia (2021) in their paper "No Time to Waste: Climate action through secure land rights and sustainable land use" has noted that in an earlier Resolution 7/23, the Human Rights Council had stated that climate change "poses an immediate and far-reaching threat to people and communities around the world and [climate change] has implications for the full enjoyment of human rights." In this context, it is noteworthy to cite the comment made by the renowned Canadian author, social activist, and filmmaker Naomi Klein, who succinctly expressed the idea that "Our economic system and our planetary system are currently engaged in a conflict" (p. 21 in her book "This Changes Everything: Capitalism vs. The Climate").

a threat to local communities, who face displacement, loss of livelihoods, and increased vulnerability to natural disasters. Fisherfolk and marginalized communities living in these areas are particularly susceptible to climate impacts (Kabir & Endlicher, 2012).

The country is crisscrossed by numerous rivers, making it susceptible to both flooding and water scarcity. Climate change exacerbates these challenges by bringing more frequent and intense floods and prolonged dry spells. This impacts on water availability for irrigation, drinking, and sanitation, putting vulnerable communities at risk of waterborne diseases and food insecurity (Ahmed et al., 2018).

Rapid urbanization in Bangladesh has led to increased vulnerability in cities and towns. Poor infrastructure, inadequate housing, and improper waste management exacerbate the impacts of climate change. Urban areas face challenges such as the urban heat island effect, waterlogging during heavy rains, and increased vulnerability to cyclones and storm surges. Slum dwellers and low-income communities are at higher risk due to their limited access to resources and services (Rahman & Huq, 2019).

Impacts of climate change crisis on people

Bangladesh is grappling with the adverse effects of rising sea levels caused by global warming. The country's flat and low-lying geography makes it highly susceptible to tidal surges and storm surges. As a result, coastal erosion and salinization of arable land have become significant concerns. Sea levels are predicted to rise by 1.5 meters by the end of the century and by 2050, about 17 percent of the country could be permanently submerged if global warming continues at its current pace, threatening the livelihoods and homes of millions of people in coastal areas (IPCC, 2019).

Climate change is exacerbating the intensity and frequency of the cyclones experienced by Bangladesh. These cyclones, coupled with rising sea levels, have had devastating effects on coastal communities. In 2020, Cyclone Amphan caused extensive damage to infrastructure, agriculture, and fisheries, displacing millions of people and causing significant loss of life (TIB, 2020).² The impacts of such extreme weather events are projected to worsen in the coming years, further affecting lives and livelihoods.

Rising temperatures contribute to the formation of more intense cyclones, causing widespread devastation in coastal regions. In recent years, the frequency of intense weather events, including floods, has increased, displacing millions of people, damaging infrastructure, and disrupting agricultural activities (Ahmed & Neelormi, 2020).

On the other extreme, climate change also leads to longer dry seasons, which reduce the availability of water for irrigation. This results in lower agricultural productivity, causes crop failures, and worsens food insecurity.

² See Appendix A for the climate stress area coverage and related hazards.

Rising temperatures contribute to the spread of heat-related illnesses as well as waterborne diseases. Increased flooding and stagnant water create breeding grounds for disease-carrying mosquitoes. Displacement and overcrowding resulting from climate-induced events make communities more disposed to respiratory infections and malnutrition. The consequential health crises put a strain on the already overburdened healthcare system, leading to increased mortality and morbidity rates.

Impacts of climate change crisis on land

One of the most visible and alarming impacts of climate change on land are rising sea levels. According to a study conducted by the Intergovernmental Panel on Climate Change (IPCC), a rise of one meter in sea levels could lead to the displacement of around 17 million people in Bangladesh by 2050.

Coastal erosion is another major consequence of climate change in Bangladesh. Rising sea levels intensify the erosive power of waves, leading to the gradual retreat of coastlines. As a result, agricultural lands and human settlements are being lost to the sea at an alarming rate (Nessa & Hasnat, 2017).

In addition to coastal areas, climate change is also impacting the availability and quality of land for agriculture. Unpredictable rainfall patterns, prolonged droughts, and increased frequency of extreme weather events, such as floods and cyclones, have disrupted the agricultural calendar and reduced crop yields. According to a report by the Asian Development Bank (ADB), climate change could reduce Bangladesh's agricultural productivity by up to 30 percent by 2050 (ADB, 2013).

Furthermore, the intrusion of saltwater into freshwater sources, such as rivers and underground aquifers, is a significant concern in Bangladesh. As sea levels rise, saltwater intrusion contaminates freshwater supplies, rendering them unfit for human consumption and agricultural use. This phenomenon not only reduces the availability of clean drinking water but also undermines the sustainability of agricultural practices, exacerbating food insecurity in the country.

The impacts of climate change on land also have far-reaching consequences for biodiversity and ecosystems. Rising sea levels, increased salinity, and extreme weather events pose a severe threat to the unique biodiversity of the fragile ecosystem of the Sundarbans, including endangered species such as the Royal Bengal Tiger and the Irrawaddy Dolphin.

Impacts of climate change crisis on water

Climate change has intensified the occurrence and severity of floods. These floods contaminate water sources, and damage water infrastructure. At the same time, rising sea levels caused by the melting of glaciers and by the thermal expansion of seawater have resulted in the intrusion of saltwater into aquifers and surface water bodies in the coastal regions. Saltwater intrusion contaminates freshwater supplies, rendering them unfit for human consumption and for agricultural

use. This not only reduces the availability of clean drinking water but also undermines the sustainability of agricultural practices, exacerbating food insecurity in the country.

Box 1: Salinity impacts on land

Increased soil salinity is one of the major impacts of climate change on land in Bangladesh. When low-lying coastal areas are submerged, seawater flows into coastal rivers and groundwater aquifers. Over the last five decades, as freshwater flow tapered off on the upper stream of rivers, salinity has intruded into more than 100 rivers and affected over one-fifth of the country's total crop land located in the south-western coastal districts. Salinity affects an average of over 6,200 hectares of farmland every year. In some areas, the salinity level is as high as 25 ppt, which means that there are 25 grams of salt dissolved in one kilogram of soil or water. No crops will grow on such salt intruded land at any time of the year.

In Satkhira district, the mouths of the two distributaries of the Ganges – the Mathabhanga and the Jalangi – have been totally filled up by salt water. Satkhira does not get any freshwater supply from upstream basins. Salinity decreases the terminative energy and germination rate of some plants. Rice production in a village of Satkhira declined by 1,151 metric tons in the period of 1985 to 2003, or a crop loss of 69 percent.

Source: Suhrawardy & Anisha (2022)

Climate change induced droughts and prolonged dry spells have also reduced the availability of water for household and agricultural use. As a result, communities are finding it increasingly difficult to source safe drinking water. Irrigation systems for agriculture cannot be maintained, leading to crop failure (Ahmed et al., 2018).

At the same time, contaminated water sources, poor sanitation, and limited access to clean water are increasing the risk of waterborne illnesses, such as dengue fever. As of 13 September 2023, 767 people have died from dengue fever, and 157,172 persons have been hospitalized because of it.

In addition, the forced migration of people from rural to urban areas is putting a strain on water systems and infrastructure in urban centers, causing a water crisis there (Anisha & Sharif, 2017).

Climate change impacts on displacement and migration

The frequency and intensity of natural disasters have increased over the past few decades and resulted in the displacement of millions of people in the country (UNDP, 2018). For instance, Cyclone Sidr in 2007 affected approximately 8.9 million people and caused the displacement of over two million individuals (WB, 2011). The Stern Review Report on Economics of Climate Change predicts that one in every seven persons of Bangladesh, i.e., about 22.8 million people, will be displaced by 2050 due to the impacts of climate change (Stern, 2007).

Many displaced individuals often end up in overcrowded urban slums or temporary camps, where they have no access to basic services, such as clean water, sanitation, and healthcare (IOM, 2020). They suffer from poverty, food insecurity, and limited access to education and healthcare services (Haque, 2018). The concentration of displaced individuals in urban areas causes increased waste generation, deforestation, and pollution. The strain on urban areas hosting displaced populations can lead to increased competition for limited resources, social tensions, and conflict.

In addition to internal displacement, climate change has also led to cross-border migration from Bangladesh. Unable to sustain themselves in their home regions, many are compelled to migrate to other countries in search of better opportunities. This has led to a rise in irregular migration, with individuals taking risky and often unsafe routes to reach destinations such as Southeast Asia and beyond.

Climate change impacts on land tenure and on groups with vulnerable land tenure

As sea levels rise, coastal areas are being submerged. Communities are either forcibly displaced or opt to leave their homes because their lands have been rendered unfit for cultivation by erosion or salinity intrusion. As displaced people relocate and seek other land to settle in, conflicts over land rights arise in the new settlement areas (Rahman & Sikder, 2021). The existing land tenure systems are ill-equipped to handle such large-scale displacements and land disputes.

Indigenous communities in Bangladesh are often marginalized and face unique challenges related to climate change (Sarker & Alam, 2022). These communities have traditional knowledge and practices that are closely linked to their natural environment. However, changing weather patterns and environmental degradation threaten their way of life, including the loss of traditional livelihoods like agriculture, fishing, and collecting resources from nature, etc. For example, as the Sundarbans are progressively destroyed by salinity, the forest-based livelihoods of the Munda and other indigenous communities are put at risk. Additionally, infrastructure development projects often result in land grabbing of ancestral domains and in the displacement of indigenous communities.

Women in Bangladesh face specific vulnerabilities related to climate change. Traditional gender roles often limit their access to resources and decision-making processes (Suhrawardy et al., 2022). Disasters and climate impacts disproportionately affect women: their water collection responsibilities increase; they are likely to stop going to school; their access to health care is limited; and, their risks for pregnancy and childbirth related complications are compounded. The reduced amount and quality of land following salinity intrusion also narrows access by coastal women, in particular, to inherited land, purchased and leased-in land, *khas* (government-owned) land, community land, etc.

Landless farmers and **agricultural laborers**, who depend on farm work on other people's fields to earn a living are at significant risk. Climate change-induced crop failures and agricultural losses directly impact their income and food security. Landless farmers and agricultural laborers who

are displaced by erosion are constrained to abandon farming. Unfortunately, they often lack access to alternative livelihood options, thus intensifying their vulnerability (Ali & Hossain, 2017).

Climate change impacts on land conflicts and land governance systems

Bangladesh, with its dense population and limited land resources, has long grappled with land disputes and conflicts (Barkat & Suhrawardy, 2018). The country's vulnerability to climate change further intensifies these clashes.

Communities affected by saltwater intrusion, erosion, and inundation migrate inland and compete for scarce resources, including land.

The competition for fertile land among these displaced farmers and local communities often results in conflicts and disputes, further aggravating the already strained land tenure system in the country (Hassan & Uddin, 2018).

Urban areas are also impacted when rural populations migrate to the cities in search of non-farm work following climate change-induced natural disasters and environmental degradation. Informal settlements swell and the incidence of unauthorized land occupation skyrockets. Internal migrants inevitably come into conflict with existing communities and with local authorities (Islam & Takagaki, 2019).

The impacts of climate change on land conflicts in Bangladesh are further exacerbated by inadequate land governance systems and weak institutions. The country's land administration is characterized by complexities, overlapping jurisdictions, and a lack of transparency, all of which create fertile ground for disputes (Barkat et al., 2022). Moreover, corruption and the manipulation of land records add to the challenges faced by those affected by climate change-induced land conflicts. The absence of clear guidelines for land acquisition and resettlement, particularly in the context of climate-induced displacements, further contributes to the land conflict dynamics (Islam & Anik, 2019).

Displaced communities, as well as those who have lost their land due to erosion or salinity intrusion, often face difficulties in reclaiming their rights. The existing land governance systems struggle to address these conflicts, resulting in prolonged legal battles and uncertainty regarding land ownership. The lack of clear and transparent land records and inadequate mechanisms for resolving disputes further compounds the challenges faced by vulnerable populations (Rasheed & Rahman, 2021).

Climate change also brings about changes in land use patterns, as certain areas become unsuitable for agriculture or habitation. In response to these changes, people may engage in adaptive strategies, such as shifting to non-agricultural livelihoods. However, these shifts in land use can disrupt the traditional land governance systems, as new land uses may not be adequately regulated or recognized under existing laws and policies. This poses governance challenges and may lead to conflicts over land use rights and allocation.

Impacts of climate responses of authorities on tenure rights

As the impacts of climate change intensify, various responses and approaches have been implemented by public authorities and key stakeholders to address the challenges faced by communities. The government has developed the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) and established the Bangladesh Climate Change Trust Fund (BCCTF) to implement adaptation and mitigation measures. In the last 12 years (from 2010 to 2022), a total of 468 projects have been implemented under the BCCTF.³ The BCCSAP focuses on areas such as disaster management, agriculture, water resources, and health. Additionally, community-based adaptation projects, such as the Coastal Climate Resilient Infrastructure Project (CCRIP), have been implemented to protect vulnerable communities from climate-related hazards.

In some cases, the implementation of adaptation projects and infrastructure development has led to conflicts over land and resources, potentially undermining the tenure rights of local communities. The construction of embankments and other protective structures may encroach on agricultural lands or restrict access to fisheries, affecting the livelihoods of vulnerable communities. One clear example is the construction of an embankment in Beel Dakatia (situated on the border of Jashore and Khulna), which caused permanent waterlogging and encroachment of adjacent agricultural land, thus affecting the livelihoods of the vulnerable communities (Adnan, 2023). This case demonstrates the need for comprehensive land-use planning which considers the rights and interests of affected communities, particularly those with insecure tenure.

Government initiatives for disaster rehabilitation, such as the Ashrayan project,⁴ distribution of *khas* land, shelter assistance, among others, are not so focused on the tenure security of climate-displaced people. On the other hand, people displaced by climate change emphasize the need to take *dakhal*, or possession of the land as a critical factor in securing land ownership in their new settlement areas (ALRD, 2021).

Other key stakeholders, including civil society organizations (CSOs), non-governmental organizations, and local communities, play a crucial role in shaping climate responses (BCCT, 2023) and influencing tenure rights. Many stakeholders have advocated for participatory decision-making processes that ensure the inclusion of affected communities in climate planning and implementation. These organizations have also facilitated the creation of community-based organizations and platforms that empower local communities to assert their tenure rights and participate in climate adaptation initiatives.

³ In recent disasters, including super cyclone Amphan, 29.5 million coastal people were impacted, resulting in 3,757 deaths and significant property loss. Cyclone Amphan, categorized as a Super Cyclone by the Bangladesh Meteorological Department, struck the coastal areas on 20 May 2020, with wind speeds of 240 to 250 kilometers per hour and 10 to 16 feet (three to 4.8 meters) tidal surges. It was identified as the most devastating cyclone in the past 20 years. The Sundarbans, a natural shield against cyclones, and its ecosystem suffered severe damage. Deficits in governance hinder efforts to reduce disaster losses and ensure disaster preparedness sustainability.

⁴ The Ashrayan Project was first introduced in 1997 by the Sheikh Hasina-led government in Bangladesh, due to the aftermath of a tornado in coastal areas, as a small pilot entirely funded by the State to rehabilitate distressed people. "Ashrayan" stands for "to provide shelter" or "to arrange habitation." This small pilot project gradually turned into a large-scale priority project of the government in order to provide shelter to the homeless and landless people and eventually make them independent to contribute to the national economy.

Impacts of climate responses on changes in legal framework and reforms

To address climate change challenges, Bangladesh has undertaken several climate responses and approaches within its legal framework and reforms. The BCCSAP, launched in 2009, provides a comprehensive framework for climate change adaptation and mitigation in the country. It identifies key sectors that are vulnerable to climate change, such as agriculture, water resources, and infrastructure, and outlines strategies and actions to address the impact of climate change. The BCCSAP has played a crucial role in guiding policy decisions and resource allocation, and has been credited with positive impacts on various fronts (BCCT, 2019).

The BCCT, which was established by the Bangladesh Climate Change Trust Act of 2010, is an autonomous body responsible for financing climate change projects. The BCCT has been instrumental in mobilizing funds for climate change adaptation and mitigation activities. Additionally, the Bangladesh Climate Change Strategy and Action Plan Implementation Project (BCCSAPIP) and the Climate Change Trust Fund (CCTF) have been put in place to support the implementation of climate change projects (GoB, 2021). These legal measures have facilitated the mobilization of resources and the implementation of climate actions.

To address the increasing frequency and intensity of natural disasters events due to climate change, the government has focused on strengthening disaster management capabilities. The Disaster Management Act of 2012 provides a legal framework for disaster risk reduction and emergency response. It establishes the roles and responsibilities of various government agencies and promotes community participation in disaster preparedness and response (GoB, 2012). These efforts have improved early warning systems, evacuation procedures, and emergency response mechanisms. These have reduced to some degree, but not by enough, the loss of life and property during disasters.

The National Adaptation Programme of Action (NAPA) in 2005 and last updated in 2009, encourages the participation of vulnerable communities in identifying and implementing adaptation measures. The government has also initiated the CCTF's Community-Based Adaptation project, which provides financial support to community-led initiatives (GoB, 2020). These community-based adaptation efforts have increased the resilience of vulnerable communities, improved livelihoods, and enhanced local decision-making processes.

To reduce greenhouse gas emissions and dependence on fossil fuels, Bangladesh has prioritized the promotion of renewable energy sources, at least in policy and official statements. The government has, on a limited scale, implemented policies and incentives to encourage the development of solar, wind, and hydropower projects. The Renewable Energy Policy of 2008 and its subsequent amendments have facilitated private sector investments in renewable energy (GoB, 2020); but not to the optimal extent. Meanwhile, the government itself engages in life-nature-destroying coal-based electricity projects in Rampal, Paira, Matar Bari, Bashkhali, etc.



Impacts of climate responses on land administration and management systems

The government has implemented initiatives to address land administration challenges, such as the blurring of boundaries following sea-level rise and coastal erosion. One such initiative is the Coastal Zone Policy, which aims to regulate land use along the coast (MoL, 2019).

The government has also undertaken the construction of embankments and flood shelters, as well as the establishment of the Flood Action Plan (FAP) and the Coastal Embankment Project. Changing climatic conditions have, which led to shifts in agricultural patterns in Bangladesh. Traditional crops are becoming less viable, while new crops and farming practices are being adopted. This transition requires adjustments in land administration systems to accommodate changing land use and to ensure secure land tenure for farmers. Government programs such as the Climate Resilient Agriculture Project and the Crop Diversification Program aim to support farmers in adapting to these changes (MoA, 2020).

The government has acknowledged that integrated land use planning and effective urban governance are essential to address the challenges created by increasing rural to urban migration, such as burgeoning informal settlements and encroachments on public and private land. Thus, it has taken steps to enhance urban land administration systems through initiatives like the Detailed Area Plan (DAP) and the City Region Development Project.

The government recognizes that forests play a crucial role in climate change mitigation by sequestering carbon dioxide. Bangladesh has undertaken afforestation and forest management initiatives, such as the National Forest Policy and the Social Forestry Program, to increase forest cover and enhance ecosystem services (MoEFCC, 2016). Effective land administration and management systems are critical for the success of these initiatives, ensuring sustainable forest management, community participation, and protection of forest land from encroachment.

Just as importantly, community-based adaptation approaches empower local communities to address climate change impacts and enhance their resilience (Rahman & Rahman, 2019). In Bangladesh, community-based approaches have been implemented through projects like the Community Climate Change Project and the Climate Resilient Community Development Program. These initiatives require robust land administration systems (which rarely exist) to support community land rights, manage conflicts, and facilitate collective decision-making.

Emerging debates on key climate responses and approaches

The debates surrounding climate responses and approaches highlight the importance of inclusive decision-making, adequate resource allocation, and innovative solutions. The authorities and key stakeholders in the country have been actively engaging in these debates, striving to strike a balance between adaptation and mitigation, equity, and sustainability.

One of the key debates in Bangladesh revolves around the development of climate-resilient infrastructure. As the country experiences more frequent and intense cyclones and floods, there is a

growing need to construct infrastructure that can withstand these extreme events. The government, in collaboration with international organizations, has launched several initiatives to enhance the resilience of critical infrastructure, including roads, bridges, and buildings. For example, the CCRIP focuses on building climate-resilient infrastructure, including embankments and drainage systems, to protect coastal communities from storm surges and flooding. However, debates have arisen regarding the adequacy of measures taken, the allocation of resources, and the inclusion of vulnerable communities in decision-making processes (ADB, 2020).

Adaptation and resilience-building strategies play a crucial role in reducing the vulnerability of communities and ecosystems to climate change impacts. Bangladesh has been at the forefront of implementing such measures, including early warning systems, community-based adaptation projects, and climate-smart agriculture. Nevertheless, questions remain pertaining to the effectiveness of these approaches and the need for enhanced coordination among stakeholders. Additionally, there is an ongoing discussion on the importance of integrating traditional knowledge systems with modern scientific approaches to ensure sustainable and locally appropriate adaptation measures (Huq et al., 2021).

Bangladesh has been actively engaging with international financial institutions (IFIs) and developed countries to secure adequate funding for its climate initiatives. However, issues such as the fairness of global climate finance mechanisms, the prioritization of adaptation over mitigation, and the allocation of funds among different sectors, are still being debated. The government, alongside key stakeholders, continues to advocate for increased financial support to implement comprehensive climate actions (Rahman et al., 2020).

In a civil society-organized workshop, the activists highly criticized official climate actions because of their inadequacy, ineffectiveness and sometimes anti-people outcomes. The funds for climate actions are not just regarded as “insufficient” but are also reportedly misappropriated. Both the quantity and quality of expenditure on climate actions are sub-optimal and sub-standard, ultimately resulting in a prevalent deficit in climate governance.

To mitigate greenhouse gas emissions and reduce reliance on fossil fuels, Bangladesh has made progress in expanding its renewable energy capacity, particularly through solar home systems and wind power projects. However, debates persist regarding the pace of the transition, policy incentives for renewable energy investments, and the integration of decentralized energy solutions. Stakeholders emphasize the need for a just energy transition that addresses social equity and ensures access to clean energy for all (ADB, 2021).

The urban areas of Bangladesh are particularly vulnerable to climate change impacts due to rapid urbanization and inadequate urban planning. The debates in this context revolve around integrating climate resilience into urban planning processes, ensuring affordable housing for vulnerable communities, and managing urban water resources effectively. Authorities and stakeholders are exploring innovative solutions, such as nature-based urban design and green infrastructure, to enhance urban resilience. However, challenges remain in terms of implementation and institutional coordination (Rahman et al., 2021).

Entry points and opportunities for pursuing discussions on climate change and land tenure issues

Climate change and land tenure issues are intertwined in Bangladesh, and addressing them in an integrated manner is crucial for sustainable development. The policy and legal frameworks, community-based adaptation approaches, gender considerations, knowledge exchange platforms, among others, offer entry points and opportunities for pursuing discussions on climate change and land tenure.

Bangladesh has made significant strides in developing policy and legal frameworks to address climate change and land tenure. The country's National Adaptation Plan (NAP) focuses on building resilience and adaptive capacity to climate change, including the protection of vulnerable communities' land rights. The NAP acknowledges the need for land tenure security as a foundation for climate resilience and emphasizes the involvement of local communities in decision-making processes. The National Land Use Policy emphasizes sustainable land use practices, while the National Land Policy aims to ensure equitable distribution of land resources (GoB, 2017). These policies provide a foundation for integrating climate change considerations into land tenure practices.

Community-based adaptation (CBA) and resilience-building approaches provide entry points for addressing climate change and land tenure issues. CBA initiatives empower local communities to identify their vulnerabilities, develop adaptation strategies, and strengthen their resilience. Land tenure is a crucial aspect of CBA, as secure land rights enable communities to make long-term investments in adaptation measures. The CCRIP incorporates land tenure considerations by ensuring the involvement of local communities in decision-making processes and recognizing their land rights. Such community-led initiatives offer opportunities for engaging in discussions on climate change and land tenure at the grassroots level.

Gender considerations are essential in discussions on climate change and land tenure. Women in Bangladesh are disproportionately affected by climate change impacts, as they often face greater vulnerability due to socio-cultural factors and limited access to resources. Land tenure issues intersect with gender, as women's land rights are often marginalized or overlooked. Engaging women in decision-making processes and strengthening their land rights can contribute to more sustainable and equitable climate change responses. Initiatives such as the Homestead Food Production Program (HFPP) in Bangladesh have recognized the importance of women's land rights and their role in climate adaptation. Integrating gender considerations into climate change and land tenure discussions can unlock opportunities for addressing inequalities and building resilience (UNDP, 2019).

Knowledge exchange and capacity building play a vital role in pursuing discussions on climate change and land tenure in Bangladesh. Stakeholders, including government agencies, CSOs, researchers, and communities, should engage in dialogue to share experiences, lessons learned, and best practices. Platforms for knowledge exchange can foster collaboration and enable the integration of climate change and land tenure considerations into policies and practices. Capacity-

building initiatives should focus on enhancing the understanding of climate change impacts on land tenure, improving land governance, and promoting sustainable land management practices. These initiatives can empower stakeholders to engage in informed discussions and make evidence-based decisions. ■

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Acronyms

ADB	Asian Development Bank
ALRD	Association for Land Reform and Development
ANGOC	Asian NGO Coalition for Agrarian Reform and Rural Development
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BCCSAPIP	Bangladesh Climate Change Strategy and Action Plan Implementation Project
BCCTF	Bangladesh Climate Change Trust Fund
CBA	Community-based Adaptation
CCRIP	Coastal Climate Resilient Infrastructure Project
CfK	Centre for Knowledge
CSO	Civil Society Organization
GoB	Government of Bangladesh
HFPP	Homestead Food Production Program
IDP	Internally Displaced People
IOM	International Organization for Migration
IPCC	Intergovernmental Panel on Climate Change
LWA	Land Watch Asia
MoA	Ministry of Agriculture
MoEFCC	Ministry of Environment, Forest and Climate Change
MoL	Ministry of Land
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NGO	Non-Governmental Organization
SDG	Sustainable Development Goal
UN	United Nations
UNDP	United Nations Development Programme
UNDRR	United Nations Office for Disaster Risk Reduction
US DoS	United States Department of States
WB	World Bank

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Appendix A: Climate stress area coverage and related hazards

Climate stress area	Districts	Area (sq. km.)	Vulnerable population 2020 (millions)	Prominence of climate hazards
South-western coastal area and Sundarbans (SWM)	Satkhira, Khulna, Bagherhat, Pirojpur, Barguna, Barisal, Patukhali, Jhalokhathi, Bhola, Shariatpur, Gopalganj, Jashore, Sundarbans	30,646	13.57	Rainfall variability, river floods, sea level rise, salinity, tropical cyclone, storm surges, drought, extreme heat waves, extreme cold, riverbank erosion and lightning
South-east and eastern coastal area (SEE)	Noakhali, Feni, Laksmipur, Chattogram, Cox's Bazar, Chandpur	13,891	10.93	Rainfall variability, river floods, sea level rise, salinity, tropical cyclone, storm surges, drought, extreme heat waves, extreme cold, riverbank erosion, lightning and land slides
Chattogram Hill Tracts (CHT)	Rangamati, Khagrachari Bandarban	13,294	1.33	Rainfall variability, river floods, tropical cyclone, storm surges, drought, extreme heat waves, extreme cold, lightning and land slides
Rivers, floodplains, and erosion-prone areas (FPE)	Nilphamari, Kurigram, Lalmonirhat, Gaibandha, Rangpur, Bagura, Sirajganj, Pabna, Rajshahi, Jamalpur, Tangail, Manikganj, Dhaka, Munshiganj, Mymensingh, Sunamganj, Netrokona, Habiganj, Kishorganj, Sylhet, Brahmanbaria, Narsingdi, Narayanganj, Rajbari, Faridpur, Gopalganj, Narail, Shariatpur, Barisal,	58,010	12.72	Rainfall variability, river floods, tropical cyclone, tornado, extreme heat waves, extreme cold, riverbank erosion and lightning

Climate stress area	Districts	Area (sq. km.)	Vulnerable population 2020 (millions)	Prominence of climate hazards
	Patukhali, Jhalokhathi, Bhola, Khulna, Chandpur, Cumilla, Noakhali, Laksmipur, Cox's Bazar			
Haor and flash floods areas (HFF)	Sunamganj, Netrokona, Habiganj, Kishorganj, Sylhet, Brahmanbaria, Maulvibazar	19,662	4.02	Rainfall variability, flash floods, tropical cyclone, tornado, extreme heat waves, intense cold, riverbank erosion, lightning and land slides
Drought-prone and <i>barind</i> areas (DBA)	Naogaon, Chapai Nawabganj, Rajshahi, Bogura, Joypurhat, Rangpur, Dinajpur, Meherpur, Chuadanga, Kushtia, Jashore, Magura, Jhenaidah	21,512	3.85	Rainfall variability, tropical cyclone, tornado, drought, extreme heat waves, extreme cold and lightning
Northern, north-western region (NNW)	Panchagar, Thakurgaon, Nilphamari, Kurigram, Lalmonirhat, Rangpur, Dinajpur	9,917	6.32	Rainfall variability, river floods, flash floods, tropical cyclone, tornado, drought, extreme heat waves, extreme cold, riverbank erosion, lightning and land slides
Chalan beel and low-lying area of the north-western region (CBL)	Pabna, Natore, Sirajganj, Naogaon, Rajshahi	5,027	5.70	Rainfall variability, river floods, tropical cyclone, tornado, extreme heat waves, extreme cold, riverbank erosion and lightning
Char and Islands (CHI)	Nilphamari, Kurigram, Lalmonirhat, Sirajganj, Gaibandha, Jamalpur, Manikganj, Munshiganj, Mymensingh, Shariatpur, Chandpur, Bhola,	3,976	8.51	Rainfall variability, river floods, sea-level rise, salinity, tropical cyclone, tornado, storm surges, extreme heat waves, extreme cold, riverbank erosion, lightning, higher

Climate stress area	Districts	Area (sq. km.)	Vulnerable population 2020 (millions)	Prominence of climate hazards
	Bazar, Patukhali, Feni, Noakhali, Laksmipur, Chattogram, Cox's Bazar			sea surface temperature and ocean acidification
Bay of Bengal and ocean (BOB)	Bay of Bengal (Maritime boundary)	1,18,813	1.26	Rainfall variability, sea-level rise, tropical cyclone, tornado, storm surges, extreme heat waves, lightning, higher sea surface temperature, hypoxia and ocean acidification
Urban areas (URB)	43 cities	10,600	32.41	Rainfall variability, urban floods, sea-level rise, salinity, tropical cyclone, drought, storm surges, extreme urban heat waves, extreme cold and lightning

Sources: National Adaptation Plan of Bangladesh; "The Climate Risk Memorandum: Bangladesh" document of "Women-Led Collective Advocacy for Climate Action" project.

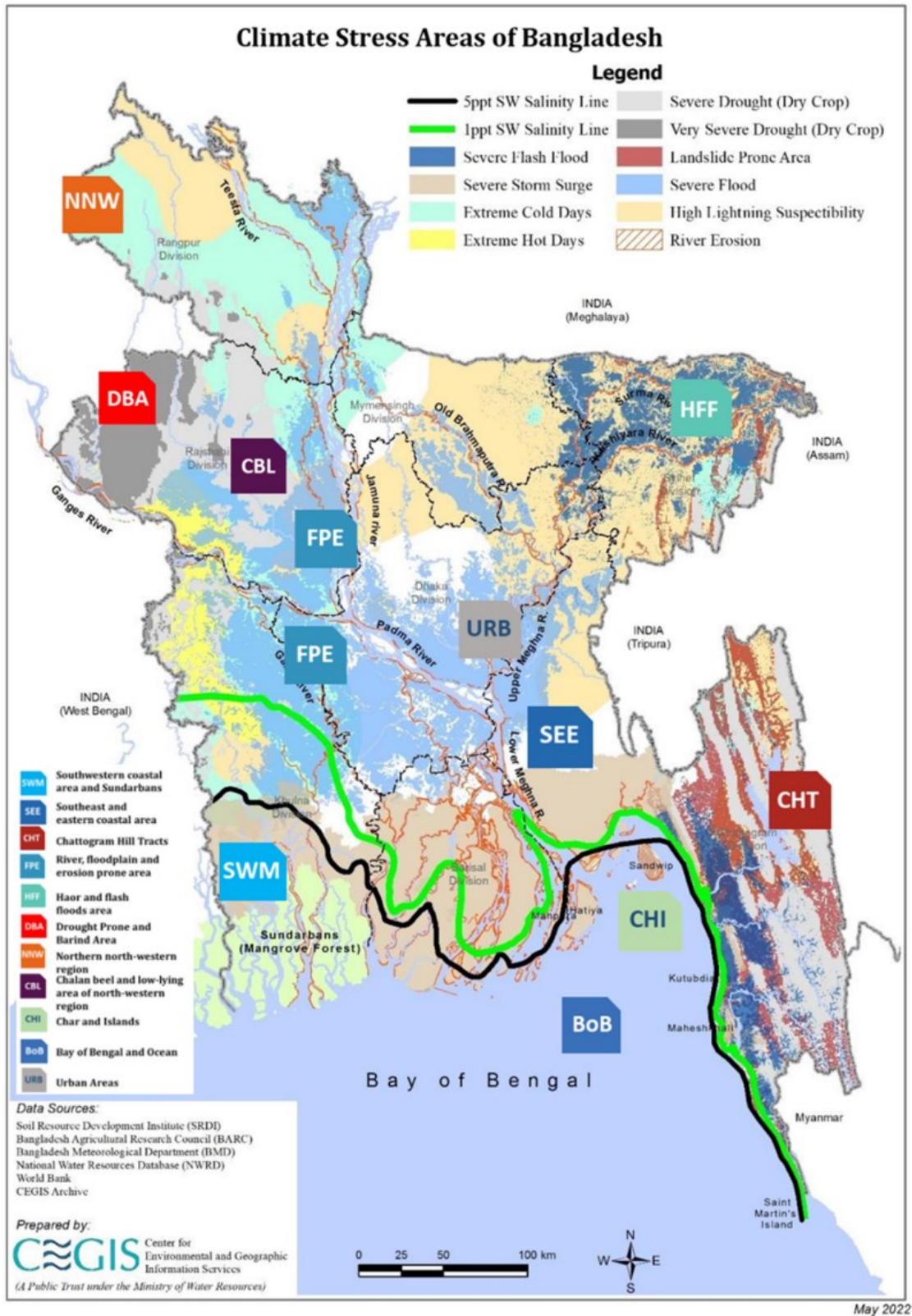


Figure 1. Climate Stress Areas of Bangladesh.

A reproduction of the map on page 34 of the National Adaptation Plan of Bangladesh; derived from "The Climate Risk Memorandum: Bangladesh" document of "Women-Led Collective Advocacy for Climate Action" project.