

Displacement and Migration from Climate Hot-spots in Bangladesh Causes and Consequences



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Climate Hot-spots
in Bangladesh:
Causes and Consequences

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Foreword

On behalf of the Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, it is my pleasure to write this foreword for the report entitled "Displacement and Migration from Climate Hot-spots in Bangladesh: Causes and Consequences", which is the outcome of an investigative study conducted by the Center for Participatory Research and Development (CPRD) and ActionAid Bangladesh.

Climate change is generally understood as the potential cause of mass migration, especially from areas where low-income and resource-dependent communities live in environments that are already at risk. Links between environment, climate change and migration are gaining importance, especially in climate vulnerable countries like Bangladesh. Predictions suggest alarming numbers of people in Bangladesh are likely to migrate as a consequence of climate change, but few empirical studies investigate the causes and consequences of human displacement and migration in any detail. The site-specific drivers of displacement and migration, including a grounded understanding of relevant local economic, social and environmental issues, are yet to be understood.

Against this backdrop, this report illustrates the primary causes of displacement and migration due to climate change in selected climate hot-spots. It aims to influence national policies and suggests future action to address the issue of displacement and migration within a broader socio-political and environmental context.

I thank CPRD and ActionAid Bangladesh for undertaking research on this important issue, and applaud their initiative in publishing this report to heighten understanding of the topic and advocate for informed policy responses.



Mesbah ul Alam
Secretary
Ministry of Environment and Forests
The People's Republic of the Government of Bangladesh



Foreword

In an ever changing world we probably all feel like migrants. If we could migrate to idyllic places of our choosing and at our own pace it would be no matter for concern. More and more people, however, have to migrate because they are displaced by environmental changes. Nowadays in the vulnerable coastal areas and flood prone areas of Bangladesh, many wake up to find themselves on the receiving end of climatic change impacts and disasters and without shelter or livelihoods.

Against this backdrop it is critical to develop our understanding of displacement and migration as a consequence of climate change. We need to delve deeper into the causes and consequences of loss and damage due to climate change, and where possible study the social, cultural, economic and political components of these issues.

This study on the causes and consequences of displacement and migration from climate hot-spots in Bangladesh is thus important and well timed. It has the potential to generate information, raise awareness and improve evidence-based policy advocacy. I congratulate the researchers involved and hope they share their findings widely, throughout Bangladesh and beyond.



Farah Kabir
Country Director
ActionAid Bangladesh

Executive Summary

This report describes a study conducted in the climate hot-spots of Bangladesh aiming to understand the causes and consequences of displacement and migration, especially those linked to climate change. The report aims to raise awareness about this issue amongst policy makers, development practitioners, academics and other stakeholders. It also aims to influence national policies by suggesting actions to address displacement and migration within broader socio-political, economic and environmental contexts. It highlights the following key findings:

- m The prevalence of slow and sudden onset disaster events is increasing in climate hot-spots in Bangladesh. The nature of these disasters is context specific. Slow onset events occur more frequently due to climate change and are affecting new areas, and sudden onset events are becoming more frequent and intense. For example, in addition to drought, the Northwest region is experiencing new slow and sudden onset events like dense fog, floods and erratic rainfall. With temperature increases of 4°C expected in the future due to climate change, these observed trends are likely to continue.
- m Dramatic onset disasters usually cause mass displacement, while slow onset disasters affect the environment, local ecosystem services and employment opportunities thus forcing people to undergo routine economic migration at first, followed later by permanent migration.
- m Displacement is always triggered by sudden onset disasters, but economic and social factors like resource availability, social networks and livelihood opportunities determine whether or not migration occurs.
- m Chronic, long-term issues emerging from extreme weather events also force people to migrate, especially during the post-disaster response and recovery phase when governance mechanisms often fail to respond adequately to the situation.
- m People with more social and human capital migrate in a planned way. Women, children, the elderly and disabled and the poorest of the poor have fewer options for either planned or forced migration. These people often remain trapped in vulnerable locations.



- m Displaced and trapped people face persistent insecurity of basic needs such as food, water and sanitation. They either starve or struggle with further natural disaster risks and degraded environmental conditions. The gender differences in suffering are clear. Women are the primary victims of disaster events and also bear more of the burdens of ensuing food and water crises.
- m For short- to medium-term migration, people usually move to adjacent chars or embankments, especially when basic services are no longer available.
- m In the case of long distance routine economic migration, people usually settle in large urban slums, or other 'urban poverty pockets', which lack basic services.
- m Government must support both these groups of poverty-stricken people with social safety net programmes.
- m Migration to other such exposed areas does not solve the problem, so Government should develop a rehabilitation/settlement/relocation policy or mechanism to prevent and alleviate the negative impacts of further displacement.
- m Policymakers must consider how best to deal with future migration in a way that can maximize win-win solutions where possible, for example by supporting migration within and out the country, and protecting those who are most vulnerable.
- m Bangladesh must continue to demand better mitigation of greenhouse gas emissions by industrialized countries through the UNFCCC process and other channels to reduce the impacts of climate change.





Introduction

It has been estimated that there is the impending threat of displacement of more than 20 million people in the near future. The settlement of these environmental refugees will pose a serious problem for the densely populated Bangladesh

- Bangladesh Climate Change Strategy and Action Plan 2009

Migration and displacement is not a new issue for Bangladesh. People have been displaced and migrated for many social, political, economic and disaster related reasons since the beginning of recorded history. But the more recent phenomenon of climate change suggests that Bangladesh will have to face the challenge of mass external and internal migration, for which the country is inadequately prepared.

Climate change induced extreme weather events, primarily hydro-meteorological in nature, will significantly affect displacement in three distinct ways in Bangladesh. Firstly, the effects of warming and drying in some regions will reduce agricultural potential and undermine 'ecosystem services' such as the availability of clean water and fertile soil. Secondly, heavy precipitation will cause flash or river floods in tropical regions. And finally, sea-level rise will permanently destroy extensive and highly productive low-lying coastal areas that are home to millions of people who will have to relocate permanently (Morton et al. 2008).

Several estimates of the number of people that are likely to migrate as a consequence of climate change exist and these have attracted significant academic, policy and media attention. But there has been little investigation of the causes and consequences of human displacement and migration. This study was therefore initiated to:

- m** understand the ground level causes of displacement and migration and their links to climate change in particularly badly affected areas,
- m** analyze drivers of migration, particularly in selected climate hot-spots,
- m** identify the consequences of climate-driven displacement and migration, and
- m** help identify appropriate steps to be taken by policy makers.



Study Areas and Methodology

Bangladesh has many different agro-ecological zones, each of which is affected by climate change in different ways (CCC 2009). Five study sites (Figure 1) were selected to cover most of these zones. Additionally, case studies from different parts of Dhaka were collected to understand the problems faced by people who have migrated to cities.

- m** Patuakhali, a coastal district prone to cyclones, saline water intrusion and sea-level rise.
- m** Khulna, a coastal district prone to cyclones, saline water intrusion and sea-level rise. The district was severely affected by Cyclone Sidr in November 2007 and Cyclone Aila in 2009.
- m** Naogaon, in the north of Bangladesh, which is facing slow onset drought.
- m** Sirajgonj, a northern riverine floodplain district, which is prone to monsoon flooding and river erosion.
- m** Faridpur, a central riverine floodplain district, which is prone to monsoon flooding and river erosion.
- m** Dhaka, the nation's capital, which is located in central Bangladesh.

The research process involved information and data gathering, analysis, and documentation of key results. Methodologies included focus group discussions, group assessment, key informant interviews, structured questionnaires, in-depth case studies, analysis to identify the causes of displacement and migration, and a review of relevant policies and literature.



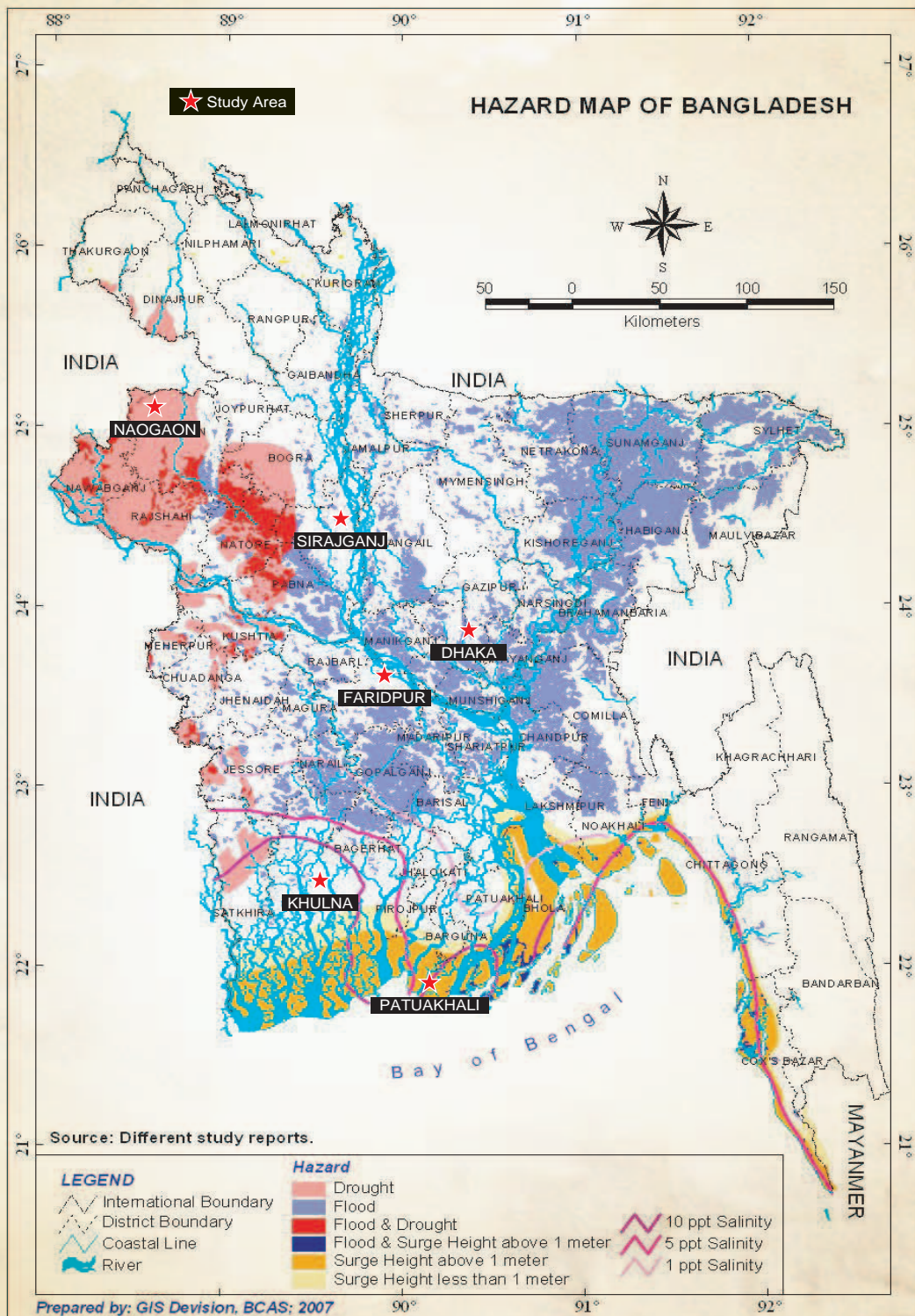


Figure 1: Map of the study areas

Bangladesh: Climate Change Context

Bangladesh has an area of about 147,570 sq. km and is home to about 146.6 million people (BBS 2009). The country is situated in the tropics in South Asia at the interface between two different environments; the Bay of Bengal to the south and the Himalayas to the north. Life-giving monsoons and the catastrophic ravages of natural disasters characterize the country. About 10% of Bangladesh is barely one meter above the mean sea level, and one-third is affected by tides.

At present, more than 50 million people are affected by disaster events every five years. The country's long coastline faces one cyclone roughly every three years. Annually, approximately one-quarter of the country is inundated, while the 1998 flood inundated up to 61% of the country, rendering 45 million people homeless (Alam et al. 2011). People living in coastal areas are particularly vulnerable (Alam and Murray 2005). Figure 1 shows the areas prone to different disaster types.

Climate change is already affecting Bangladesh. Average temperatures increased by about 1°C in May and 0.5°C in November between 1985 and 1998. Annual mean rainfall is also increasing (Mirza and Dixit 1997; Khan et al. 2000; Mirza and Qader 2002).

The intensity of cyclones originating from the Bay of Bengal has increased and declining precipitation and droughts have dried up wetlands and severely degraded ecosystems (Cruz et al. 2007). Salt water from the Bay of Bengal has penetrated 100 km or more inland along tributary channels during dry seasons (Allison et al. 2003).

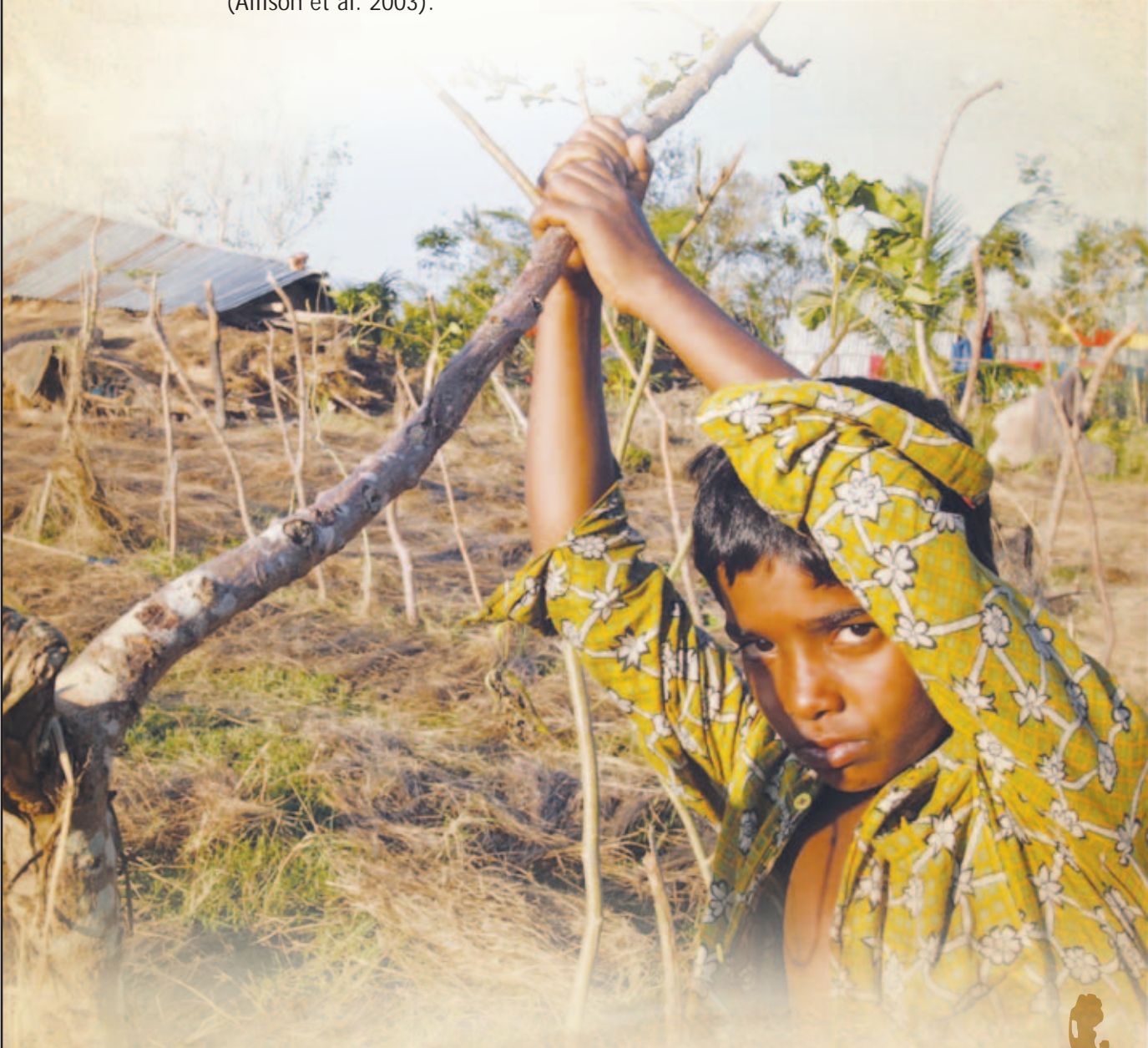
In the future, Bangladesh will likely face more frequent, larger scale and intensified floods, cyclones and droughts. Sea-level rise could inundate 17% of coastal land unless appropriate action is taken (BCCSAP 2009).

Climate change affects Bangladesh in two ways. Firstly, changing temperatures and precipitation patterns threaten agriculture and food security. Secondly, the increase in climate induced disasters such as floods, droughts, saline water intrusion, river bank erosion and tidal surges will destroy infrastructure, crop production, natural resources, livelihoods, human lives and the national economy (Huq et al. 1996; Assaduzzaman et al. 1997; Choudhury et al. 2005). The poor will be worst affected, especially women, children and disabled people.

These impacts will likely intensify in the future and thus continue to disrupt Bangladesh's efforts to achieve economic growth and eradicate poverty. Responding to disasters has already diverted significant parts of the development budget with over US\$10 billion invested by the Government of Bangladesh over the last three decades in making the country more climate resilient and less vulnerable to natural disasters (BCCSAP 2009).



Concern that climate change will affect human rights, such as the right to life, food, adequate living standards and physical and mental health, is growing. The intensity of cyclones originating from the Bay of Bengal has increased and declining precipitation and droughts have dried up wetlands and severely degraded ecosystems (Cruz et al. 2007). Salt water from the Bay of Bengal has penetrated 100 km or more inland along tributary channels during dry seasons (Allison et al. 2003).

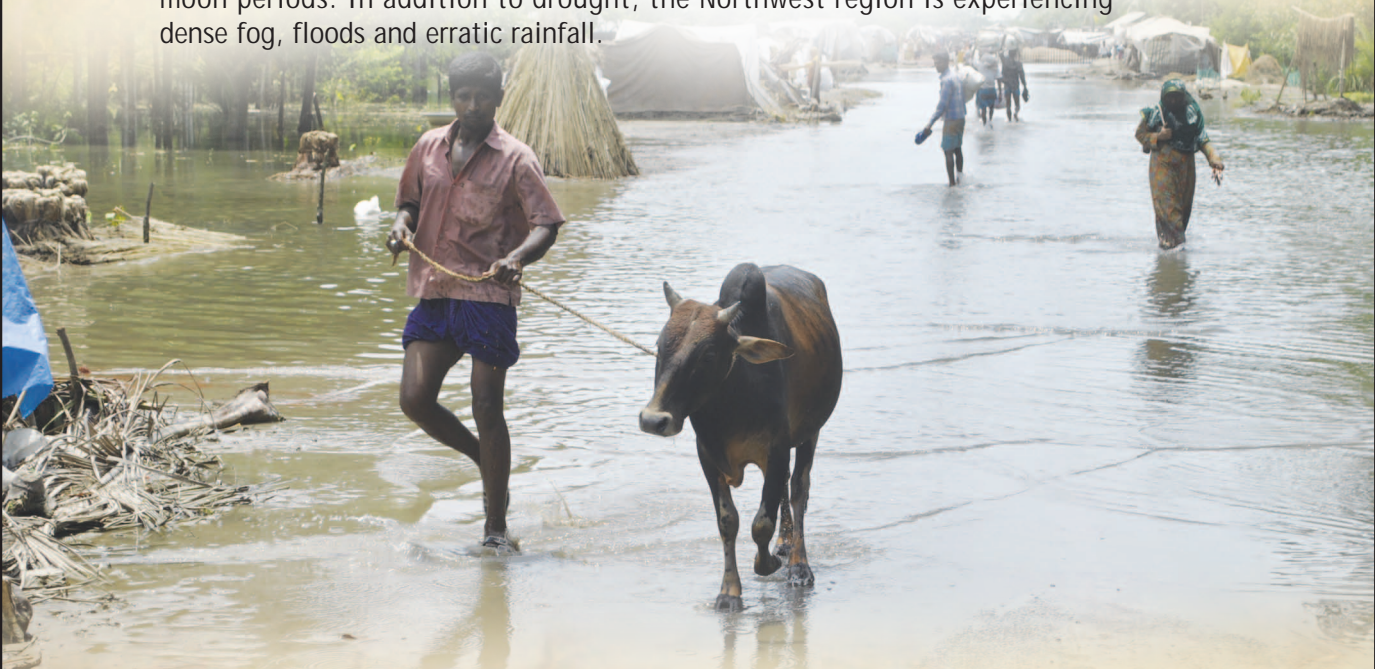


Climate Change: Magnifying Disasters in the Study Sites

Community members in the study areas reported both slow and sudden onset disasters. Slow onset disasters - such as increasing soil and water salinity in coastal areas due to sea-level rise - are affecting new areas. Sudden onset disasters - such as cyclones, tidal water incursion and river erosion in low-lying coastal districts - are becoming more frequent and intense.

People are experiencing changes in the duration of disaster events and also new types of disasters. Droughts are now more severe in drought-prone northern areas, for example, but drought is also affecting new areas such as floodplains in Sirajgonj and Faridpur Districts, which used to be characterized by monsoon floods and river erosion. Fog, a common occurrence in winter in Faridpur and Sirajgonj Districts, has now become a disaster event as its density and duration harms agriculture and local cottage textile factories.

Central river basin floodplain areas are increasingly prone to slow onset disasters like drought and dense fog while other major river floodplains are prone to monsoon flooding and erosion. People living in coastal districts are experiencing regular floods with high tides, especially during new and full-moon periods. In addition to drought, the Northwest region is experiencing dense fog, floods and erratic rainfall.





Displacement and Migration due to Climate Change

In the last 25 years, Bangladesh has experienced six severe floods, with the 1988 and 1998 floods alone causing 2000-6500 and 1100 deaths and displacing as many as 45 and 30 million people respectively (NAPA 2005).

Following Cyclone Aila in May 2009, an estimated 100,000 people were still living on embankments in the early months of 2010 (IOM and other agencies 2010; IRIN 2010)

Definitions

Migrant: Migrants refer to individuals who have changed their place of residence either by crossing an international border (international migration) or by moving within their country of origin to another region, district or municipality (internal migration). People are normally considered 'migrants' if they remain outside their original place of residence for a period of at least three months.

Displacement: Displacement is a particular form of migration, in which individuals are forced to move against their will. Where people are forced to move within their country of origin, this is referred to as internal displacement.

Environmental migrants: There is no international consensus on the appropriate terminology for people who move in response to climate-related factors. The International Organization for Migration (IOM) has proposed a working definition of environmental migrants as "persons or groups of persons who, for reasons of sudden or progressive changes in the environment that adversely affect their lives or living conditions, are obliged to leave their habitual homes, or choose to do so, either temporarily or permanently, and who move either within their country or abroad."

While the term 'climate induced displacement and migration' implies a direct causal link between climate change and displacement and migration, the evidence does not support this (Kniveton et al. 2008). It is therefore important to understand how climate change directly and indirectly influences the drivers of displacement and migration.



In reality, the causes, consequences and types of migration are highly dependent on the social and ecological contexts to and from which people move (Locke et al. 2000). Beddington (2011) describes five categories that drive migration: social, political, economic, environmental and demographic (Figure 3). These five drivers might interact or overlap in different ways in different places. Of these five categories, climate change is generally understood to primarily influence the 'environmental driver' of migration. It will, however, also influence the 'economic driver' by affecting employment opportunities, income, wages and well-being.

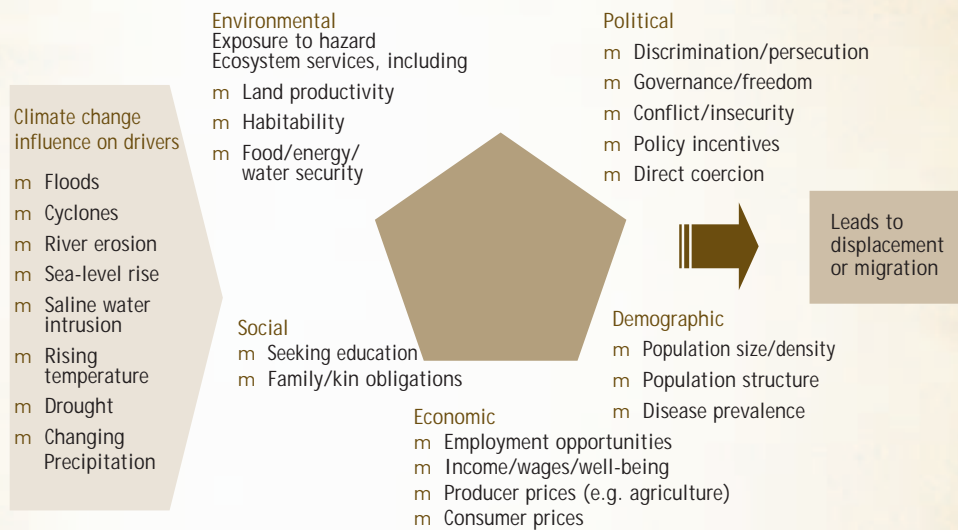


Figure 2: The influence of climate change on the 'drivers' of migration

Experts agree that migration decisions are generally context specific and based upon multiple determinants (Kolmannskog 2008). For example, in areas affected by Cyclone Aila, 'political drivers' including a failure of governance during the post-disaster response, caused 'environmental drivers' in the form of a food and drinking water crisis, forcing people to migrate. Vulnerability to food shortages significantly affected migration levels (Ezra and Kiros 2001).

In Bangladesh as a whole, sea-level rise is most often cited as a primary cause of mass displacement. Projections for population displacement based on a one metre sea-level rise vary from 13 to 40 million (Matthews 2009).

Climate change induced displacement and migration: evidence from the study areas

My sufferings...it's God's will

So is the belief of Kader Hawladar (40) a fisherman from Charipara Village in the coastal region of Patuakhali. There was a time when he owned a fishing boat and net and employed 15 to 20 sailors. Life had its promises and goodness. "But fate had something else in store for me" sighed Hawladar. He and his three children, wife and mother were forced to migrate due to tidal erosion. His house and land plunged in the ocean in May 2010. He is now faced with unemployment and extreme poverty.

His house was about one kilometre away from the sea. During the devastating Cyclone Sidr he took shelter in a cyclone sanctuary. After the wrath of Sidr, Hawladar returned to his land and started reconstruction. But every year the sea kept coming closer. Finally, in May 2010, he left his land and took shelter at the adjoining embankment. Since then, every day has been a struggle for survival. The sea is again approaching his tiny shelter. Then what? He doesn't know. With a blank gaze upon the sea he utters, "it's God's will".

Climate change impacts are not the only factors driving migration from the study sites. When disaster events strike people 'move' somewhere nearby from where they can easily return to where they came from. More permanent migration occurs when economic and social issues 'pull or push' them later. Decisions relating to whether migration is long or short distance, or permanent or temporary, depend on the extent to which livelihoods are affected.

In instances of slow onset disasters, people chose 'routine economic migration' during lean periods to seek employment elsewhere, particularly in urban areas. For example, droughts in Naogaon are affecting agriculture so people are migrating for longer periods.

Increasing salinity in Khulna is leading to migration for economic but also social reasons. Salinity related diseases mean young women remain unmarried and are socially marginalized. This leads the family to move elsewhere, usually to a distant place, where they are unknown and after a while the daughter can get married.

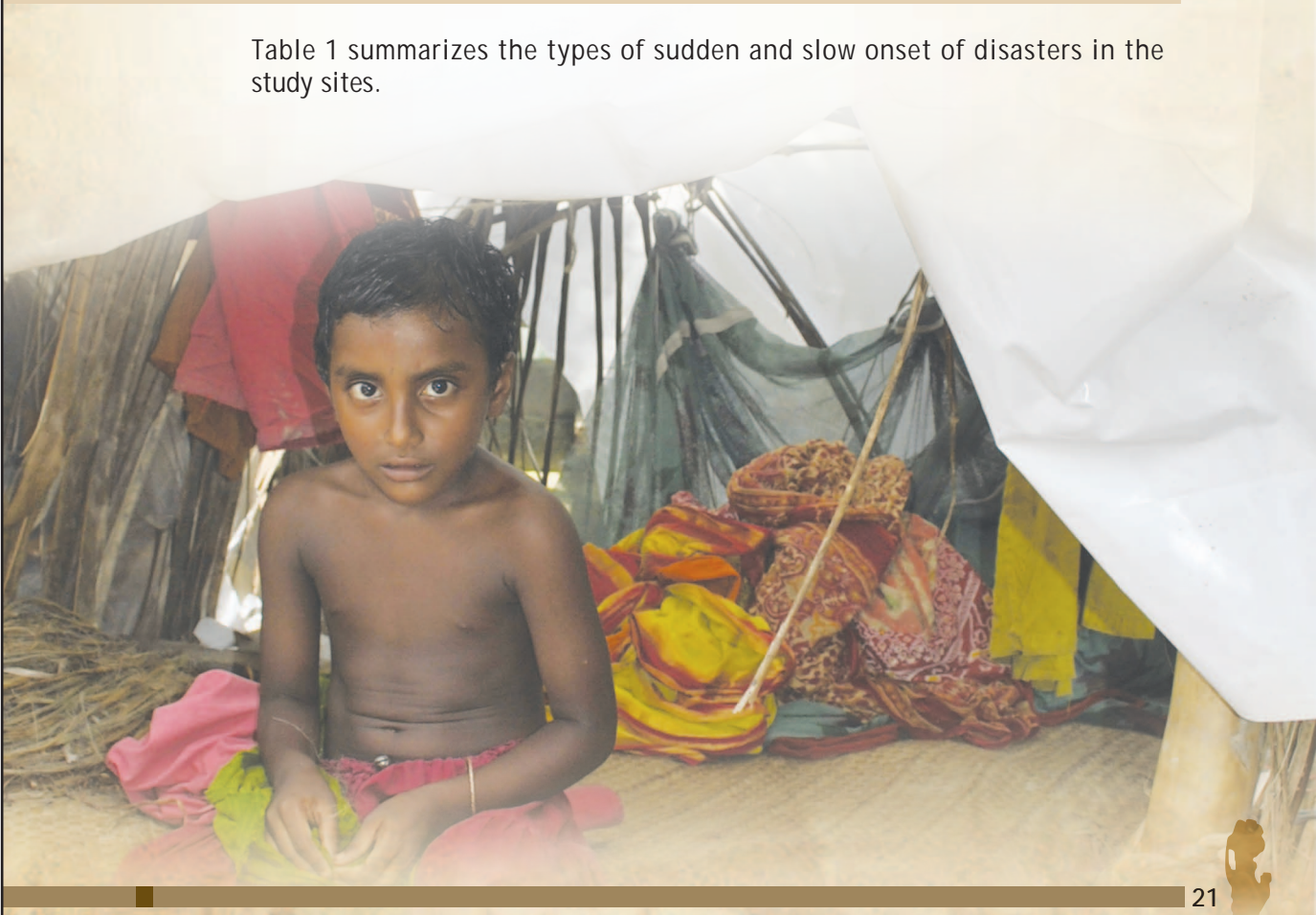


Forced migration following Cyclone Aila

In May 2009, Cyclone Aila, with wind speeds of up to 120 km/hr, hit the same southwest coastal zone areas that were affected by the smaller cyclone Bijli in April 2009 and devastated by cyclone Sidr in November 2007. Aila killed only 193 people, but it displaced more than 297,000, and severely damaged infrastructure, institutions, crops and cultivable land, causing a huge influx of saline water into agricultural land and fresh water areas.

Many displaced people would have returned home if given access to basic services such as fresh water and their preferred livelihoods, but assessments more than two years after Cyclone Aila suggest most have been forced to migrate, particularly to urban areas, due to failed post disaster action such as embankment reconstruction and provision of basic services (Roy and Sultana 2010; ECHO 2009). Although 'cash for work' and 'food for work' schemes initiated by the government and humanitarian organizations helped, the absence of other social, economic and environmental support services forced those displaced by Aila to migrate.

Table 1 summarizes the types of sudden and slow onset of disasters in the study sites.



Disaster event	Impacts	Pattern of displacement and migration	Scale
Dense fog	<ul style="list-style-type: none"> Damages seasonal crops and seedling beds. Reduces cottage textile working hours. 	Routine economic migration, may lead to permanent migration in the long-term.	Small
Drought	<ul style="list-style-type: none"> Makes people jobless for approximately 180 to 220 days each year, forcing them to move to other places. Agricultural land is being converted to mango orchards leaving agricultural labourers jobless. 	Routine economic migration, may lead to permanent migration in the long-term.	Large
Erratic rainfall	<ul style="list-style-type: none"> Damages crops and seed beds, and sometimes delays cultivation due to poor soil moisture content. 	Temporal displacement	Small
Excess rainfall	<ul style="list-style-type: none"> Damages crops and seed beds, and sometimes delays cultivation. Continuous rain for two to three days also leaves agricultural labourers jobless. 	Temporal displacement	Small
Monsoon floods	<ul style="list-style-type: none"> Makes people homeless, landless or both. Damages crops and seed beds. Causes death, injury and waterborne disease outbreaks. Hampers livelihood opportunities. 	Temporal displacement, which sometimes leads to migration	Large
River erosion	<ul style="list-style-type: none"> Makes people landless and homeless and severely affects livelihoods. Causes huge economic losses. 	Displacement Sometimes leads to temporal and permanent migration	Large
Saline water intrusion	<ul style="list-style-type: none"> Soil salinity leaves agricultural land unsuitable for producing crops or fodder. Damages fresh water fisheries. Drinking water scarcity. Leads to conversion of agricultural land to brackish water shrimp farming causing mass unemployment. 	Both temporal and permanent migration	Large
Storm and hail	<ul style="list-style-type: none"> Damages crops resulting in household food insecurity. 	Temporal displacement	Very small
Tidal flood	<ul style="list-style-type: none"> Destroys homes and habitats and severely hampers livelihood opportunities. Damages crops, fisheries and fresh water sources. Creates water logging and increases soil salinity. 	Temporal displacement predominates. Also leads to short-distance permanent migration.	Small
Tropical cyclone	<ul style="list-style-type: none"> Damages and destroys crops and household and domestic assets. Causes many deaths and makes millions of people homeless. 	Causes mass temporal displacement and also forces significant permanent migration.	Large

Table 1: Pattern and scale of displacement and migration by different disaster events



Who migrates and who is trapped?

Following Cyclone Aila, there was a major increase in seasonal migration from affected areas, with an estimated 100,000 people - primarily men looking for work - migrating from four Upazilas alone - Koyra, Paikgacha, Dacope and Batiaghata (ECHO 2009)

There are concerns regarding the risks of trafficking and sexual exploitation of young women and children in the area [Aila-affected Southwest Bangladesh], and women headed households are believed to be particularly vulnerable to this risk (IOM 2010)

Debate regarding whether people are 'forced' to migrate or choose to migrate 'voluntarily' is ongoing. Some argue that migration is always a choice, but in many cases the choice is between staying and starving or migrating with its associated risks (Barnett and Webber 2009). In both the cases women and children are the worst sufferers.

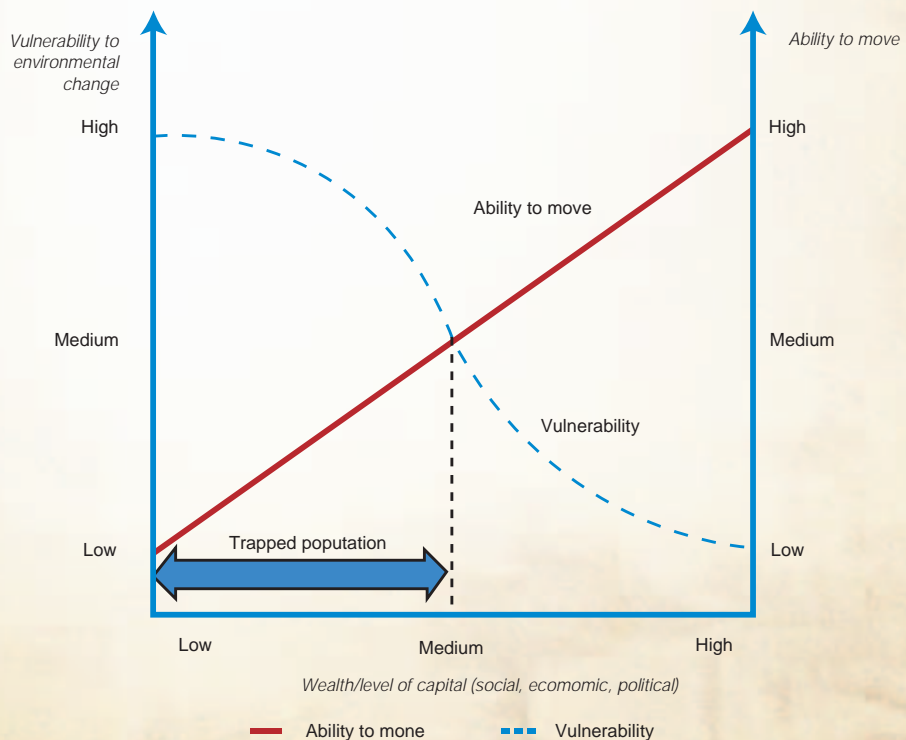


Figure 3: people with less ability to move are trapped. Source: Beddington 2011

Migration, especially in response to slow onset climate change impacts, ideally requires access to money, family networks and contacts in the destination. But after a disaster, government's failure to provide basic services means people often end up in the city without such resources. It is only those with access to more social and human capital who can choose to migrate in a planned way. In the study areas, those who are relatively rich and educated were found to be planning their permanent migration from slow onset disaster areas. Many wealthy people have already left southern parts of Bangladesh where scarce drinking water is becoming a permanent problem. Evidence of planned migration was less common amongst the poor in the study areas, perhaps because these people feel more insecure moving to a new place with no kinship ties or preferred livelihood opportunities. This reflects analysis by Amin (1995) who describes a migration 'hump' whereby the poorest of the poor do not migrate.

The poor and marginalized groups such as smallholders and subsistence farmers, pastoralists and artisanal fisher folk suffer greatly from climate change (Easterling et al. 2007) and are faced with a double dilemma: they are more reliant on ecosystem services and thus more exposed to extreme events, but they are also less able to diversify their incomes when necessary.

Men sometimes migrate to find new work, especially to urban areas. Sometimes they take their whole family with them. Women, children, elderly and disabled people and the poorest of the poor are less able to migrate and thus more likely to be trapped in vulnerable locations (Beddington 2011). Amongst those displaced by Cyclone Aila, the gender differences in who has migrated are clear.





The Consequences of Displacement and Migration due to Climate Change

A survey carried out in 1998 among 230 households in Sirajganj found that 5,500 of the 30,000 slum dwellers there were erosion-affected migrants (Hutton and Haque 2004)

Women become socially and economically vulnerable when the main male household member migrates (Massey 2009). The context and scale of vulnerability varies according to geographical location, governance structures, power relations and access to services, but this study found that young women were especially vulnerable.

Displacement and migration: gender dimensions to suffering

During severe flooding events, women and children often have to live on a Macha (raised platform) and thus risk falling into the water and drowning, especially children.

If displaced, women and children usually take shelter besides a road or embankment, making temporary shelters from grass and wood. These lack sanitation facilities so unless it is an emergency, women do not relieve themselves during daytime.

Women and children suffer more from the drinking water scarcity characterizing life in drought and salinity prone areas in northwest and southern Bangladesh. Here, women must walk long distances to fetch drinking water for household consumption. Sometimes they consume less water themselves to ensure other family members have a greater share.

Due to the unavailability of drinking water and proper sanitation, women and children in areas affected by Cyclone Aila suffer from various diseases like pneumonia (in children), skin diseases and diarrhoea.



As mentioned earlier, migration is not a new issue for Bangladesh; men from rural areas often migrate to urban areas to find work for a few weeks during lean periods. This seasonal migration is particularly common in Naogaon and Patuakhali. Women are left as the sole family 'caretaker' and are burdened with more work including securing food for the family while the man is absent.

With climate change extending lean periods, the men stay away for longer. In most cases men only leave enough money to sustain a family for a couple of weeks, so women must then generate income in addition to doing all the household work. This is not always culturally acceptable. In many cases, the children are pulled out of school and engaged in household and income-generating work.

Karimon Bibi: a life wrecked by floods

In July 2011, the great and unpredictable River Jamuna forced Karimon Bibi to migrate from Hat Gorjan Char to Bhat Dighulia of Kaijuri Union leaving her only asset behind, a tiny piece of land and an even tinier house. But this was not the first time she had been displaced. She migrated a few times from one char (island) to another due to river bank erosion until 2004. "Disaster, migration and increased suffering is all that is left in my life" she said wiping away uncontrollable tears. Her husband died in 2007 and her home on Hat Gorjan Char was devastated by floods a year later forcing her and her children to temporarily take shelter in an adjacent char. On returning to Hat Gorjan, to her anguish she discovered her home in ruins. She had no savings and local livelihood opportunities didn't pay enough to help her feed her family. Against all the odds she started to rebuild her house and search for livelihood opportunities. Her son, Saddam (12) goes fishing while she and her daughter Bahela (15) work as day labourers. Right when the pieces of life were falling into order, the rage of the River Jamuna wrecked it again in 2011.

Short-term displacement following sudden onset events in Bangladesh is associated with significant environmental and public health concerns. Equally, the influx of poor migrants to urban areas is problematic, especially when the entire family migrates. Whether migrants end up in large slums or smaller 'poverty pockets', their houses (and workplaces) are often in environmentally vulnerable locations and characterized by poor sanitation, safe water scarcity and insufficient food supplies and livelihood opportunities.



Ishak Mollah and Alim Uddin: Playing Hide and Seek with the River

Ishak Mollah (62), from Ishak Mollah'r Char at the North Channel of Faridpur District has migrated between chars thirteen times due to river erosion. He now struggles to recall all the names of chars he has shifted to and from over the years.

Alim Uddin Matbor (80) from Tara Majhi'r Dangi of Faridpur District has migrated from one char to another more than five times. Most recently in 2006, he and his family moved to his present village Taramajhir Dangi. He is unsure how long he can reside here. It is as if the River Padma is chasing him from one char to another. Years back, he used to migrate every 10-15 years, but recently, life has become a 'hide and seek game' with the River becoming increasingly unpredictable..

Assessing the economic consequences of climate induced displacement and migration is very hard. Even the total number of migrants in Bangladesh - both those remaining in the country and those leaving - remains unknown.

In some instances migration can be economically beneficial to a country and can be considered a potential adaptation option for individuals. Analysis by the Bangladesh Bank (2012), for example, shows that foreign remittances and ready-made garments are the two highest earning foreign currency sectors in Bangladesh and also the two biggest contributors to the country's annual budget. Interestingly, these two sectors rely significantly on migrant workers from areas badly affected by or prone to disasters. The ready-made garment industry, for example, employs over four million workers, about 70% of whom are migrant women. This industry earned a total of US\$17.9 billion from export in the 2010-11 fiscal year, which is over 78% of the total export revenue for Bangladesh for that period. The respective contribution from remittances for the same period was about US\$12.8 (BGMEA 2012).

What this study makes clear, however, is that whilst migration provides opportunities for some, for the poorest and most vulnerable it just provides more hardship and costs.



Conclusion and Policy Suggestion

Migration is increasing from the climate hot-spots of Bangladesh; not only large scale displacement following sudden onset disasters, but also the routine economic migration and permanent migration resulting from slow onset events. With estimates from Climate Action Tracker (2012) and the International Energy Agency suggesting that the world is heading towards temperature increases of 4°C, this is an issue that is likely to grow in importance. Brown (2008) estimates that by 2050 some 200 million people worldwide will be displaced and will migrate. According to the Government of Bangladesh, climate induced sea-level rise, intensified cyclones and salinity increases could lead to the displacement of 20 million people from coastal areas, and planned migration must be considered as a valid policy option (BCCSAP 2009). Policymakers must therefore consider how best to deal with future migration in a way that can maximize win-win solutions where possible and protect those who are most vulnerable.

Climate change is not the sole factor influencing migration and it is important to understand the interplay between the various local 'drivers of migration' in order to design and develop appropriate local and national level plans. But in a scenario of increasing temperatures, it is possible that the loss and damage experienced due to climate change will become the primary driver of migration in the future.

People do not want to migrate from their locality. A sense of belonging, invested social capital and other cultural factors drive people to stay in hazardous places. Additionally, the poor and marginalized have fewer social networks and economic choices so often choose not to migrate. They rely more on their local economic base, ecosystems and environmental services. From a 'human rights' perspective, every individual has the right to stay where they live. Any action by another human being that forces them to move from their home is violation of their rights. Human-induced climate change, particularly by rich nations, is thus a violation of the rights of others, and policymakers in Bangladesh must continue to demand better mitigation of greenhouse gas emissions by industrialized countries through the UNFCCC process and other channels.



The Bangladesh Climate Change Strategy and Action Plan (BCCSAP 2009) also stresses that the Government of Bangladesh must be prepared for a worst case scenario. While making efforts to keep the local economy functioning by creating employment opportunities and restoring the environment and ecosystem services, investment is also needed to build human capacity and facilitate migration out of the country. This has the advantage of bringing more income into Bangladesh through remittances, and can also help other countries through the provision of skilled labour. Foreign policy in Bangladesh must support such initiatives. This will require considerable coordination at the inter-ministerial level.

Those who are trapped - usually women, children, disabled and elderly people - are particularly vulnerable as they stay and starve in unsafe locations where they face other forms of oppression. Government must support these people with social safety net programmes financed by polluters according to the 'polluter pays' principle.

Proper, healthy rehabilitation is needed to prevent people ending up in slum areas with no safe drinking water, sanitation, shelter or services. The case studies show that migration to other exposed areas does not solve the problem, so a rehabilitation policy or mechanism is needed to stop further displacement.

This study shows that the active floodplains and the Barind Tract of Bangladesh are becoming increasingly vulnerable to slow onset disasters that force people to migrate. Coastal areas are also increasingly vulnerable to sudden onset disaster events leading to migration. These areas require particular policy attention in local and national adaptation plans.

Finally, the study reveals a need for much broader scale research on migration that uses localized scientific data. This study focused primarily on the social impacts of climate-induced migration but there is an urgent need to look further into the economic consequences of migration and to deepen the gender analysis of this and related studies.



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