INPUT PAPER

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Addressing Loss and Damage at the National Level

Lessons from Bangladesh

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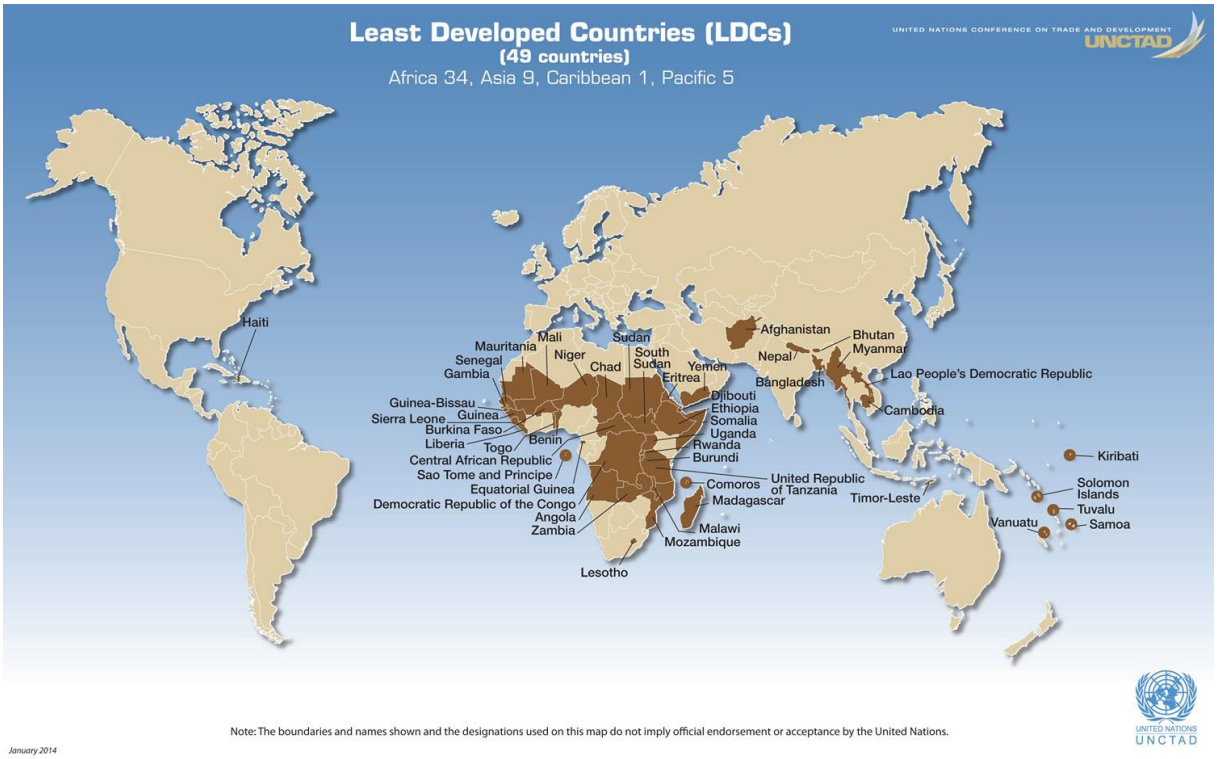
Loss and Damage in Least Developed Countries

There are currenty 48 countries designated by the UN as Least Developed Countries.[1] Status as an LDC is dependent on three factors : (1) Per capita GNP, (2) levels of nutrition, health, education and literacy and (3) economic vulnerability.[2] LDCS have a combined population of 878.2 million, approxmately 12 percent of the world's population, and an aggregate GDP of 704.5 billion USD, less than 1 percent of global income.[3]



Map 1: *LDCs (UNCTAD, n.d.)*

LDCs are among the most vulnerable to the impacts of climate change owing to low levels of development (Huq et al., 2003). While losses and damages from climate change are greater in developed countries in absoute terms, as a percentage of GDP they are more significant in developing countries. Moreover, as a greater percentage of assets and production is not accounted for in the formal economy in developing countries (Morissey and Oliver-Smith, 2013), the effects of non-economic loss and damage promise to be greater.

Placeholder for evidence of loss and damage/impacts of CC in LDCs from AR5

At the World Conference on Disaster Risk Reduction in Yokohama in January of 2005 it was decided that in ten years time there should be a 'substantial reduction of disaster losses, in lives and in the social, economic and environmental assets of communities and countries' (UNISDR, 2005). Approaches to address loss and damage span a spectrum, from mitigation

[1] http://unctad.org/en/Pages/ALDC/Least%20Developed%20Countries/UN-recognition-of-LDCs.aspx (accessed 22 February 2014).

[2] http://unctad.org/en/Pages/ALDC/Least%20Developed%20Countries/UN-recognition-of-LDCs.aspx (accessed 22 February 2014).

[3] http://data.worldbank.org/country/LDC (accessed 22 February 2014).

and adaptation and risk reduction to avoid loss and damage to a suite of risk management strategies – from risk transfer tools like insurance to risk retention tools like contingency funds and social safety nets to address losses and damages that are not avoided (Kreft et al., 2012). Thus, comprehensive strategies are needed to avoid losses and damages to the extent possible and implement policies and plans to help individuals; households and communities cope with those losses and damages that cannot be avoided. This paper will highlight some of the ways in which one least developed country – Bangladesh – is confronting the climate change challenge to both avoid and address loss and damage based on research conducted in 2012/13.

Loss and Damage in Bangladesh

Bangladesh is a low-lying deltaic country with a population of over 150 million.[4] The economy is highly dependent on climate-sensitive sectors. Agriculture contribtes to 21 percent of GDP and is a source of livelihood for 52 percent of the population (IISD, 2012). However, though 79 percent of the population lives in rural areas, Bangladesh has one of the highest population densities in the world (Nachamy et al., 2014). Ranked the fifth most affected country by extreme events, between 1993 and 2012 Bangladesh experienced 242 extreme events with economic losses totalling 1.83 billion USD or 1.16 percent of GDP and an average annual death toll of 816 (Kreft and Eckelstein, 2013). During the monsoon season an average of 80 percent of Bangladesh's land mass is affected by flooding (Nachamy et al., 2014).

Map 2: Bangladesh (UN, n.d.)

With most of its territory less than 12 metres above sea level (Nishat et al., 2013a), Bangladesh is also highly vulnerable to slow onset climatic processes, especially salinization and sea level rise. The International Organization for Migration estimates that – depending on the severity of sea level rise– between 13 million and 40 million people will be displaced in coastal Bangladesh by 2100 (IOM, 2010). Salinization increases the salinity of both soil

[4] http://data.un.org/CountryProfile.aspx?crName=Bangladesh (accessed 22 February 2014).

and freshwater, and has a significant impact on both lives and livelihoods, inflicting both economic and non-economic losses. Increased soil salnity in coastal Bangladesh has left significant areas of land unarable, yielding agricultural losses, threatening food security and resulting in a loss of livelhood for many dependent on agriculture for their income. The salinity of fresh water is already threatening the supply of drinking water and resulting in a number of health-related impacts from skin diseases to an increased incidence of miscarriages in pregnant women (Khan et al., 2011).

Avoiding Loss and Damage

Losses and damages can be avoided through mitigation and adaptation (Verheyen, 2012). In Bangladesh government efforts are guided by the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in its six themes, 45 projects and 144 actions (MoEF, 2009). The BCCSAP addresses mitigation, adaptation and risk reduction needs, though due to low emissions and high vulnerability to both extreme weather events and slow onset climatic processes, the plan emphasises adaptation and risk reduction. The BCCSAP is financed by two funds, the Bangladesh Climate Change Resilience Fund (BCCRF) and the Bangladesh Cliamte Change Trust Fund (BCCTF). The BCCRF was established in 2010 with funds from the EU, Denmark, Sweden and the UK, with Switzerland since contributing funds to bring the total to 170 million USD (Pervin, 2013). A governing council ensures the BCCRF finances projects that are in line with the themes of the BCCSAP while a management council provides technical guidance (World Bank, 2013) and the World Bank will provide fiduciary management through 2014 (TIB, 2013). The BCCRF is made up of by public funds from the non-development budget, totalling 350 million USD (Pervin, 2013). A Board of Trustees sets policies and selects recipients while the Ministry of Environment and Forests's Climate Change Unit (CCU) oversees the implementation of projects (TIB, 2013). Thus far over 100 projects have been funded with the most funding (44 percent) allocated to infrastructural projects and less than two percent allocated to projects aimed at building capacity and strengthening institutions (Pervin, 2013). The World Bank's Pilot Program for Climate Resilience (PPCR) is also providing funding for government agencies to implement projects that increase resilience to climate change (TIB, 2013).

There has been significant progress to mainstream climate change into policies and plans in Bangladesh, driven by considerable political will. The current government stated in its election manifesto that it would integrate policies to better protect citizens from the impacts of climate change (Pervin, 2013). The Climate Change Unit (CCU) places a focal person in each ministry to ensure that climate change concerns are accounted for and incorporated into sectoral policies (Ibid). With support from UNDP and UNEP as part of the Poverty, Environment and Climate Mainstreaming Project, the Planning Commission has incorporated climate change into several policies and plans including the Sixth Five Year Plan, the Perspective Plan and the Annual Development Plan (Ibid). Work is also underway to integrate the climate change adaptation (CCA) and disaster risk reduction (DRR) agendas to address climate change more comprehensively. According to Bangladesh's most recent report on its progress toward achieving the strategic goals of the HFA, the Government of Bangladesh (GoB) reported that CCA and DRR have been integrated in a total of 34 policies and plans (GoB, 2013). However, in order to ensure that development is pro-poor and climate resilient, synnergies between policies and plans need to be further strengthened (Pervin, 2013). In addition the institutional framework to address extreme events is more developed than that to address slow onset climatic processes ; despite the fact that

Bangladesh is highly vulnerable to the incremental impacts of climate change (Shamsuddoha et al., 2013a)

Bangladesh Climate Change Strategy and Action Plan

Theme 1 : Food security, social protection and health

1. Institutional capacity for resarch towards climate resilient cultivars and their dissemination
2. Development of climate resilient cropping systems
3. Adaptation against drought
4. Adaptation in the fisheries sector
5. Adaptation in livestock sector
6. Adaptation in health sector
7. Water and sanitation programs in climate vulnerable areas
8. Livelihood protection in ecologically fragile areas
9. Livelihood protection of vulnerabale socio-economic groups (including women)

Theme 2 : Comprehensive disaster management

1. Infrustructure
2. Research and knowledge management
3. Mitigation and low carbon development
4. Capacity building and institutional strengthening

Theme 3 : Infrastructure

1. Repair and maintenance of existing flood embankments
2. Repair and maintenance of cyclone shelters
3. Repair and maintenance of existing coastal polders
4. Improvement of urban drainage
5. Adaptation against floods
6. Adaptation against tropical cyclones and storm surges
7. Planning and design of river training works
8. Planning, design and implementation of rsuscitation of river and khals through dredging and de-siltation work

Theme 4 : Research and Knowledge Management

1. Establishment of a centre for knowlege management and training on climate change
2. Climate change modelling at national and sub-national levels
3. Preparatory studies for adaptaton against sea level rise
4. Monitoring of ecosystem and biodiversity changes and their impacts
5. Macroeconomic and sectoral economic impacts of climate change
6. Monitoring of internal and external migration of adversely impacted people and providing support to them through capacity building for their rehabiliation in new environment
7. Monitoring of impact on various issues related to management of tourism in Bangladesh and implementation in priority action plan

Theme 5 : Mitigation and Low Carbon Development

1. Improved energy efficiency in production and consumption of energy
2. Gas exploration and reservoir management
3. Development of coal mines and coal fired power stations
4. Renewable energy development
5. Lower emissions from agricultural land
6. Management of urban waste
7. Afforestation and reforstation programme
8. Rapid expansion of energy saving devices
9. Energy and water efficiency in built environment
10. Improvement in energy consumption pattern in transport sector and options for mitigation

Theme 6 : Capacity Building and Institutional Strengthening

1. Revision of sectoral policies for climate resilience
2. Mainstreaming climate change in national, sectoral and spatial development programmes
3. Strengthening human resource capacity
4. Strengthening gender consideration in climate change management
5. Strengthening institutional management in climate change management
6. Mainstreaming climate change in the media

Box 1.1 Bangladesh Strategy and Action Plans Key Themes and Projects (MOEF, 2009)

Mitigation

Globally mitigation choices have the greatest influence on the magntidue of loss and damage (Warner et al., 2012). However, Bangladesh's contribution to global emissions is less than one-fifth of one percent (GPRB, 2008 in IISD, 2012) due to both low consumption and low levels of energy production (IISD, 2012). That said, mitigation and low carbon development is a key theme of the BCCSAP. Programs under the theme include improving energy efficiency in production and consumption of energy, renewable energy development, lower emissions from agricultural land and improvements in the transport sector (MOEF, 2009). To facilitate renewable energy development the proposed actions include investments to scale up solar power programs, research and investment to harness wind energy, feasability studies for tidal and wave energy and research to better understand the barriers to adopting improved biomass stoves and other energy efficient technologies (Ibid).

Bangladesh has yet to formally submit its Nationally Appropriate Mitigation Action (NAMA) but the process is underway and a number of opportunities have been identified including lowering emissions from agricultural land through soil carbon sequestration, more efficient building design , developing the capacity to produce renewable energy and promoting afforestation and reforestation (IISD, 2012). Given that Bangladesh's capital city – Dhaka – is notorious for its traffic conditions improving traffic management, public transportaton and rail networks were also among key recommendations. While Bangladesh's NAMA is still being formally approved, several Clean Development Mechanism (CDM) projects underway including one for increasing access to clean cook stoves[5] and another for enhancing brick kiln efficiency.[6]

Adaptation

Adaptation is a significant focus of the efforts of both government and non-government actors in Bangladesh. In fact, the country has been called a 'living laboratory for adaptation'. Bangladesh was among the first countries to submit its National Adaptation Programme of Action (NAPA), a designed to help LDCs determine their most urgent adaptation needs and prioritize projects to begin addressing them[7]. The first NAPA was submitted in 2005 and identified 15 priority projects with an updated NAPA submitted in 2009 which identified 45 adaptation measures and 18 short and medium term projects, the first nine of which addressed the first four themes of the BCCCSAP, while the latter nine addressed the last two themes (World Bank, 2013). Development of the NAPA was heavily supported by the prime minister's office and developed in consultation with high level policymakers (Pervin, 2013). This process was built upon and the momentum utilized to develop the BCCSAP (MoEF,2009) which is a more comprehensive and long-term assessment of Bangladesh's adaptation needs. However, the BCCSAP does not prioritize or include a costing of projects (Pervin, 2013).

As mentioned abover the government is activitely engaged in adaptation efforts through both the implementation of projects identified in the BCCCSAP and maintreaming climate change into both development and sectoral policies and plans. There is a significant effort to

[5] http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/SE7XIMKF8NYVOTL16BW3U45C9ZDGAP/view (accessed 22 February 2014).

[6] http://cdm.unfccc.int/Projects/DB/DNV-CUK1313585039.34/view (accessed 22 February 2014).

[7] http://unfccc.int/adaptation/workstreams/national_adaptation_programmes_of_action/items/7567.php (28 February 2014).

facilitate adaptation in the agriculture as it employs more than 50 percent of the workforce in Bangladesh. Researchers at the Bangladesh Rice Research Institute (BARRI) have developed rice that is saline-tolerant (Sarwar, 2005 in Nishat et al., 2013) as well as a fast-growing species in an effort to reduce seasonal unemployment in areas prone to drought (Finance Division, 2011 in Nishat et al., 2013). In addition researchers are working to develop species that are more tolerant to drought and floods (Reddy et al., 2009 in Nishat et al., 2013). There is a myriad of other adaptation activity underway in Bangladesh from projects funded by the BCCRF and BCCTF to programs implemented by UN organizations like UNDP and UNICEF to the national and sub-national actions taking place throughout the country with the support of NGOs and CSOs

Community-based Adaptation to Climate Change Through Coastal Afforestation

A project entitled Community-based Adaptation to Climate Change through Coastal Afforestation in Bangladesh was the first of the projects identified in Bangladesh's NAPA to be implemented, with funding from the Least Developed Countries Fund and imlemented through UNDP. The project helped four Upazillas develop community-based adaptation plans for afforestation, livelihoods and early warning systems (Project Management Unit, CBACC-Coastal Afforestation Project, 2010). In addition 2,640 hectares and 95 kilometres of coastline were afforested with both mangrove and non-mangrove species and 5,640 people were trained in mangrove management (Ibid). The project helped 630 people diversify their livelihoods and provided CBA training to 180 district officials (Ibid). According to progress reports the project provided a 'green shield' which will help protect both ecosystems and communities from storm surges, sea level rise and wind damage while providing vulnerable people with more livelihood opportunities and options for income generation.

Box 1.2 : Community-based Adaptation to Climate Change through Afforstation in Bangladesh (Project Management Unit, 2010)

Disaster Risk Reduction

Approaches to reduce the risk of climate change impacts fall along a contiuum of risk management approaches and are best utilized when impacts are less severe, more frequent or when they can be easily managed through cost-effective approaches (UNFCCC, 2012). Prone to extreme weather events, Bangladesh has put a lot of effort into DRR policies and plans. As mentioned above, there significant political behind efforts to integrate or harmonize the CCA and DRR agendas in Bangladesh. Given the way in which climate change has the potential to alter the magnitude and frequency of some extreme weather events (See : IPCC, 2012) these efforts are of great importance.

In 1997 the Standing Order on Disasters (SOD) was established, which outlines the responsibilities of various agencies involved in DRR and post-disaster response and recovery activities (GoB, 2010a). In 2010 the GoB developed its National Plan for Disaster Management, which is based on the Framework for Action established by the South Asian

Association for Regional Cooperation and designed to oversee DRR as well as preparation for, response to and recovery from disasters (Shamsuddoha, 2013a). The NPDM has seven overarching strategic goals and outlines target activities, outcomes and agencies responsible for achieving each target (GoB, 2010b). For example, a key target of the second strategic goal – mainstreaming risk reduction – is mainstreaming DRR issues into all policies and plans – with expected outcomes of reducing sectoral loss and damage and strengthening relevant planning capaicty at all levels (Ibid). This effort is to be led by relevant line ministries with the Ministry of Disaster Management and Relief[8] providing support. The NPDM also provides a road map for how the multiple layers of the disaster government framework should interact with one another. Finally, the NPDM dictates that the District Disaster Management Committee in each of the country's 64 districts should develop its own District Disaster Management Plan and similarly that each Upazilla[9] and Union should also develop its own disaster management plan (Ibid).

In the past few decades disaster risk reduction efforts have reduced the loss of life from extreme events significantly. In 1970 Cyclone Bhola hit Bangladesh, leaving 500,000 people dead (Paul, 2009) while the Cyclones Sidr and Aila, which struck the country in 2007 and 2009 resulted in a loss of 4,234 and 197 lives, respectively (Haque et al., 2012). A number of policies, plans and strategies have been implemented, from hard approaches like infrastructure to soft approaches like educational outreach, to reduce the risk from extreme events, See : Nishat et al., 2013). For example the Comprehensive Disaster Mfanagement Program (CDMP) has conducted 550 local level risk assessments and risk reduction action plans throughout the country (Nishat et al., 2013a). However, those most often credited with reducing loss and damage from exteme events are the construction of cyclone shelters and the provision of early warning systems (See : Paul and Dutt, 2009).

Cyclone Shelters

Programs to build cyclone shelters have been undertaken by the government, NGOs and donor agencies. The GoB established the Multi-purpose Cyclone Shelter Programme, through which shelters have been built that can accomodate both people and their livestock during cyclones and serve as schools and community meeting places at other times (Rahman and Mallick, forthcoming). As of 2011 a total of 2,852 shelters had been built in 16 coastal districts as of 2011 (Zimmerman and Stössel, 2011). While this effort has been successful at reducing lives, some segments of society do not make use of cyclone shelters as much as others. For example, many are reluctant to leave assets and livestock behind to seek refuge in cyclone shelters (MOEF, 2009 in Nishat, 2013a). In addition, women tend to make use of cyclone shelters less than men due the fact that the buildings often lack separate space for men and women (Cutter, 2012 ;GoB, 2010a) as well as the fact that violence against women is sometimes reported in cyclone shelters (Rahman and Mallick, forthcoming). In some families women are required to seek permission from male relatives in order to seek refuge in cyclone shelters which may limit their use of these facilitites (Cannon, 2002). It has also been suggested that cyclone shelters are frequently not maintained properly because of a lack of capacity to do so in rural communities (Rahman and Mallick, forthcoming). The IPCC's Special Report on *Managing the Risks of Extreme Events and Disaster to Advance Climate Change Adaptation* (SREX) maintains that failing to incorporate local knowledge into the

[8] In late 2012 the Ministry of Food and Disaster Management was split into two separate ministries: the Ministry of Food and the Ministry of Disaster Management and Relief.
[9] Bangladesh is made up of 7 divisions, 64 districts, 500 Upazillas and 4,451 Union Parishads.

design and construction is the primary reason why some infrastructural projects at the sub-national level are ineffective or under-used (ActionAid, 2005; Prabhakar et al.,2009 in IPCC, 2012). The GoB has recognized many of the shortcomings of past cyclone shelter construction and proposes that they be addressed in future programs as another 2500 cyclone shelters are needed to provide adequate coverage to populations who could be affected by future cyclones (GoB, 2010a).

Emergency Warning Systems

The Bangladesh Meteorological Department (BMD) is the agency charged with providing weather forecasts and issuing severe weather warnings (Nishat et al., 2013a). The Storm Warning Centre (SWC) receives meteorological data from the BMD, identifies impending threats and informs the National Coordination Committee, which in turn informs the Cyclone Preparendess Programme (CPP) and other relevant agencies and organizations (Shamsuddoha, 2013b). The CPP in turn issues a warning to their six sub-national offices, which in turn dissesminate early warnings to Upazillas and Unions and their corresponding CPP units (Nishat et al., 2013a). The leader of each unit then informs volunteers and together groups of individuals visit nearby villages, disseminating early warnings using megaphones, flags and sirens (Ibid). The media is also informed of immiment threats and early warnings are subsequently issues through radio and television (Shambuddoha, 2013b).

Early warning systems have been very successful at reducing loss of lives and limiting damage. For example, in 2007 just before the onset of Cyclone Sidr, the Red Crescent mobilized 40,000 volunteers to help disseminate early warnings in 15 coastal districts.[10] In teh wake of Sidr early warning systems were credided with saving hundreds of thousands of lives. That said, while – as noted above – emergency warnings have been credited with reducing the loss of life from extreme events their efficacy could be imrpvoed if they were disseminated more widely and communicated in ways that make them mokre easily understood (Nishat et al., 2013a). In particularly these warnings are not adequately reaching communities at the sub-district level (MOEF, 2012). That said, Rahman et al. (2011) report that emergency warning systems have recently been redesigned to increase their efficacy and efficiency by reducing the number of agencies involved in the process. In addition, in 2013 28 million USD from the BCCRF was allocated for a study to improve early warning systems, 4 million USD of which will be allocated for inputs into the Regional Integrated Early Warning Systemfor Africa and Asia, a collaboration of the ESCAP Trust Fund for Tsunami, Disaster and Climate Preparedness and the Asia Disaster Preparedness Centere.[11]

Addressing Loss and Damage

In LDCs like Bangladesh adaptation and risk reduction efforts are integral to avoiding loss and damage. However, evidence has shown (See: Warner and van der Geest, 2013) that loss and damage can overwhelm the ability of individuals and households to cope and adapt. Approaches to address residual losses and damages are integral and must be implemented

[10] http://www.irinnews.org/report/75470/bangladesh-megaphones-save-thousands (accessed 28 February 2014).

[11] http://www.unescap.org/media-centre/impact-story/bangladesh-improves-disaster-early-warning-system-escap-support (accessed 28 February 2014).

as part of comprehensive risk management frameworks. Due to historical emissions a certain amount of climate change impacts will be 'locked-in'. Though some losses and damages can be avoided through adaptation and DRR efforts, there will be residual loss and damage, making it important to adopt and implement a range of other risk management tools which will need to be implemented simultaneously as part of a comprehensive strategies to address loss and damage. Bangladesh has a number of policies in place that – while not specifically aimed at addressing loss and damage – play a role in helping communities maintain resilience in the face of the unavoidable impacts of climate change.

Risk Transfer

Risk transfer shifts the risk of loss and damage from one entity to another and is generally used when the cost of managing a risk is perceived to be too great (UNFCCC, 2012 ; Warner et al., 2013). Risk transfer approaches that can be utilized to address loss and damage include insurance, catastrophe bonds, conditional risk transfers and insurance-credit programs – among other tools (UNFCCC, 2012). These measures can provide protection from the loss of assets and livelihoods, which in turn can protect the economy, promoting economic growth in the wake of disaster events (Warner et al., 2013).

Microinsurance

In many LDCS insurance penetration rates – gross premiums as percentage of GDP – are extremely low due in part to the fact that many people live at a subsistence level (Khan et al., 2013). Bangladesh, with a penetration rate of 0.9 percent,[12] is no different. Between 90 and 94 percent of the population lack access to insurance products, with the 6 to 10 percent of those who are covered primarily from households in the middle to upper income range (ADB, 2009 ; Roth et al., 2007 in Khan et al., 2013). Ahsan et al. (2010) calls the lack of insurance products available to poor Bangladeshis a 'market failure'. Gaps in the regulatory and institutional frameworks will need to be addressed (Khan et al., 2013). For example better regulations are needed to protect consumers. Products should be both flexible enough to incorporate a range of needs and tailored products to climate change-specific risks (Ahsan, 2010; IAIS, 2010 in Khan et al., 2013).

In the 1970s a crop insurance program was launched by the Sadharan Bima Corporation (SBC), a state-owned entity, but was ultimately deemed financially unsustainable and cancelled in 1995 (Islam, 2012 in Khan et al., 2013). However, in recently years there has been a resurgence in interest in index-based crop insurance with several programs either recently launched or planned for the near future (Khan et al., 2013 ; Ahmed, 2013). The Palli Karma-Sahayak Foundation(PKSF) launched the Developing Inclusive Insurance Project in January of 2010 to provide the poor and vulnerable (especially women) with low-cost insurance services to protect them from crop and livelihood losses, death, illness and other impacts that may reduce their income (Khan et al., 2013). In late 2013 PKSF began piloting a project to provide index-based insurance (IBI) against drought in the Bogra district in northern Bangladesh in partnership with the International Food Policy Research Institute (Ahmed, 2013). Four other IBI pilots or programs have been recently implemented in Bangladesh including a project funded by the Asian Development Bank and implemented by SBC to provide coverage against either excess or inadequate rainfall in three districts (Ibid). The project will upgrade weather stations to provide better data, provide training, development and capacity building for relevant issues and address insurance illiteracy (Ibid).

[12] http://siteresources.worldbank.org/INTMICINS/Resources/ Country_Profile_Bangladesh.pdf (28 February 2014).

Tailoring Microinsurance Products to the Specific Needs of Women

1. Market research on gender disaggregation of demand for microinsurance
2. Tailoring distribution channels and employing gender sensitive marketing strategies such as women sales agents and coverage for specific health problems faced by women
3. Providing information to ensure that women understand insurance products and ensuring that it reaches them
4. Tailor premiums and repayment schedules to meet the needs of women who often make less than men
5. Expand female membership base
6. Ensure that insured assets are in a woman's name to prevent seizure of assets by the husband's relatives in the case of his death
7. Provide insurance coverage that benefits children in the case of a woman's death
8. Promote investment in gender-sensitive microinsurance schemes by funding research, consumer education, technical assistance and capacity building

Box 1.4 Tailoring Microinsurance Products to the Specific Needs of Women (Khan et al., 2013)

In order to better address loss and damage microsurance products must be better targeted the poor. The research in Bangladesh suggested that the growth of the microinsurance market could be facilitated by pairing large insurance providiers with smaller MFIs already working with low-income clients (Khan et al., 2013). In addition public-private partnerships could integrate microinsurance products with 'broader social objectives' (Ibid). The GoB could facilitate this process by implementing policies that required insurance companies to enrol a certain number of low-income housheolds (Ibid).

A 2006 study found that in the world's 100 least developed countries only three percent of the poor had access to insurance products (Reinhard, 2008). Many people in the target population are illiterate and do not understand how insurance works (Ibid). The phenomenon of 'insurance illiteracy' can be addressed by ensuring that policies are simple and easily understood (Ibid).

Risk Retention

Risk retention measures allow countries to 'self-insure' against climate change impacts and include tools that build resilience like social protection measures or those that allow populations to cope in the face of climate change impacts and offset the financial burdens of doing so such as contingency funds (UNFCCC, 2012). Two of the most common risk retention policies in Bangladesh are social safety nets and microinsurance programs.

Social safety nets

Social safety nets are especially important in disaster prone areas (World Bank, 2011). According to a recent report by UNDP, in recent years Bangladesh has spent an average of 1.64 billion USD per year or 1.6 percent of GDP on social safety nets (PCCC-UNDP, 2012). The trend of late has been towards cash for work programs rather than the traditional food

for work programs based on the belief that there is less waste and 'leakage' with cash transfers and evidence that these programs are more successful (Ahmed, 2013). That said, social safety nets should be accompanied by robust effforts to strengthen livelihoods and diversify income if they are to contribute to resilience building efforts (World Bank, 2011).

The GoB has also implemented a post-flood program to provide agricultural subsidies to affected farmers. In 2007 the GoB provided 12.7 million USD in relief in the aftermath of two flooding events, 4.6 million USD for recovery from Cyclone Sidr and 2.9 million USD for 'agricultural rehabilitation' (Finance Division, 2008). Compared to 2006/2007 rice production rose by 7 percent in 2007/2008 despite the severity of impacts experienced (Ibid).

Microfinance

As the birthplace of microfinance, Bangladesh is home to a variety of prorgrams aimed at providing loans and other financial services to vulnerable people (Agrawala and Carraro, 2010). There are over 1200 certified microfinance institutions in Bangladesh, which serve 13 million clients (CDF, 2002 in Agrawala and Carraro, 2010). Traditionally microfinance institutions (MFIs) have provided loans to groups of individuals – often women – who together are responsible for replaying loans (Hammil et al., 2008). The most common MFIs are NGOs, though many government sponsored MFIs, banks and other financial institutions offer microfinance products (Agrawala and Carraro, 2010). However, the market is dominated by four MFIs: Grameen Bank, with 7.67 million clients, BRAC, with 6.37 clients, the Association for Social Advancement (ASA), with 7.13 clients, and Proshika, with just under 2 million clients (Ibid). Smaller MFIs tend to service areas within Bangladesh rather than the country as a whole (Ibid). These programs help the poor purchase assets, diversity their income and invest in activities like strengthening their homes. As a result they contribute to efforts to reduce loss and damage, build resilience to climate change and help communities cope when losses and damages are not avoided (Ibid).

In Bangladesh MFIs most commonly offer products that are aimed at income generation or livelihood diversification alongside skill development and training programs (Ibid). BRAC's Targeting Ultra Poor Programme uses poverty maps and survey results to find vulnerable villages and uses participatory rural appraisals to select the poorest households within each village to participate in a two-year programs.[13] Women in the participating households are provided with livelihood assets such as livestock, including shelter and feed and a stipend to provide 'breathing space' until they are able to begin generating income. Skill development training, community support and health care are also provided to target households.

[13] http://www.brac.net/content/targeting-extreme-poverty-programme-components#.UxDBg_3WruY (accessed 28 February 2014).

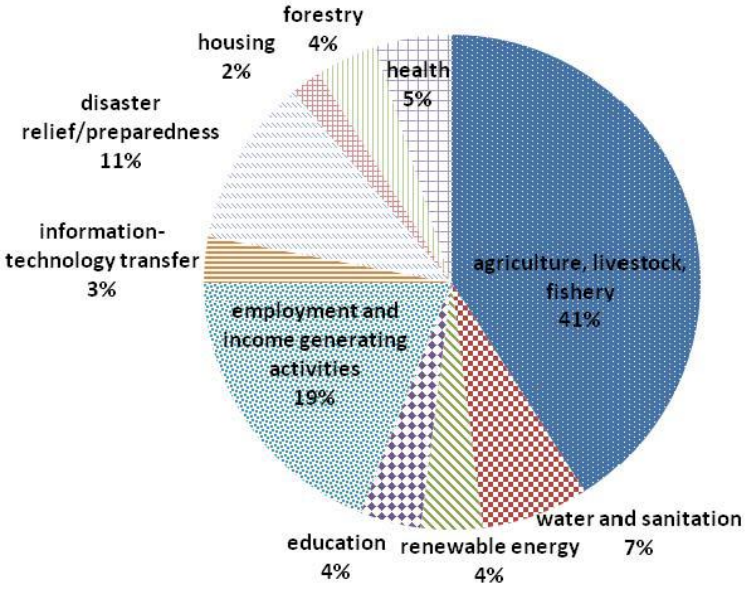


Figure 1.1. Sectoral focus of microfinance programs of 22 MFIs in Bangladesh (Agrawala and Carraro, 2010)

Microfinance programs could be more successful at addressing loss and damage from climate change if they had more flexible repayment terms that allowed clients to temporary suspend during drought, floods or in the onset of other events and if they incorporated programs to promote education and livelihood diversification to a greater extent (Agrawala and Carraro, 2010). MFIs should also diversity the products they offer. For example, by offering secure deposit services, MFIs could encourage savings, which offer a buffer against loss and damage (Rippey, 2009). MFIs could also diversify their portfolios to include programs that facilitate climate resilient and low carbon agriculture, promote clean energy use – among other initiatives (Ibid) to integrate mitigation, adaptation and approaches to address loss and damage. Like any other risk management tool, microfinance programs are not a standalone solution to addressing loss and damage and they can in fact exacerbate vulnerability if the debt burden is increased without increasing income or enhancing livelihood opportunities (Hammil et al., 2008).

Approaches to Address Slow Onset Processes

Losses and damages from the incremental changes which occur with slow onset processes like sea level rise will require some targeted, long-term approaches. For example, sea level rise can be addressed through infrastructure like coastal embankments and climate proofing coastal infrstructure, restoring coastal wetlands and beaches and creating vegetative buffers and zoning measures that limit development in coastal areas (UNFCCC, 2012b). These approaches have utility in Bangladesh, however, sea level rise will also have a significant impact on livelhioods, and will ultimately force millions of people to migrate if current predictions in the IPCC's AR5 are realized.

Migration

Slow onset climatic processes, especially salnization, are already inducing temporary migration in Bangladesh (Nishat et al., 2013b). As impacts of climate change intensify, more people will be forced to relocate permanently (Ibid). The research in Bangladesh suggested that programs and policies should be in place to facilitate migration in a way that reduces both economic and non-economic loss and damage to the extent possible. In addition, support will be needed -including social safety nets - to help these individuals and

households settle in their new homes, which are more likely than not to be located in urban slums (Ibid). The laws governing resettlement and relocation will likely need to be reviewed as the risk of loss and damage intensifies (al Faruque and Khan, 2013). However, the most vulnerable and in need of help will likely be those left behind, without the financial and social capital to move (Foresight, 2011).

Livelihood Diversification

Livelihood options will likely be restricted as the severity of slow onset climatic processes intensifies, espeically for those who rely on climate-dependent livelihoods like agriculture, fisheries and forestry (Nishat et al., 2013). Long-term livelihood diversification programs that incorporate field research and pilot programs that promote cliamte resilient agriculture and provide training in non-climate resilient livelihoods are integral, especially for coastal communities (Ibid).

Lessons Learned

The research to better understand how loss and damage could be better assessed and addressed Bangladesh has yielded a number of lessons.

Understanding the Risk

In order to improve the quality of local-level data more sophisticated modelling technology will ultimately be needed but in the interim assessment methods of a more qualitative nature should be undertaken and investments in capacity building made (Asaduzzaman et al., 2013). Both top-down approaches, driven by science and based on predictions of future climate change, and bottom-up approaches based on vulnerability assessments undertaken at the local level are needed (Ibid). Risk assessments must be communicated in ways that are tailored to end-users and useful to decision-makers (Ibid).

Establishing Comprehensive Risk Management Frameworks

As noted above there are two aspects of addressing loss and damage: avoiding impacts that can be avoided and addressing those that cannot. However, there is significant overlap between the two types of approaches as well as considerable synergy with development, which can address the underlying drivers of vulnerability. Shamsuddoha et al. (2013b) recommends that holistic frameworks need to be in place to address climate change more effectively in Bangladesh.

Even in countries with extremely low emission levels - like Bangladesh - mitigation activities are being undertaken. These activities can have significant development benefits and other positive externalities. For example, clean cook stoves can not only reduce emissions but also improve health and safety, especially for women and children. However, given Bangladesh's vulnerability to climate change, a greater effort is needed to facilitate adaptation and promote disaster risk reduction. There is a movement underway to integrate or harmonize these two agendas and promote more collaboration between sectors. These discussions are integral as is translating talk into cooperative action on the ground.

Ultimately, however, residual loss and damage is unavoidable, especially in LDCs, and thus approaches to address losses and damages are integral to resilience building efforts. Warner et al. (2013) propose an approach of risk layering along a spectrum of climate change impacts. At one end when events are of high frequency and low severity, risk prevention and

reduction activities are implemented. Risk transfer approaches are added when events are of low frequency and medium severity and risk retention is added to that layer when events are of a very low frequency but high severity.

Better harmonizing the CCA and DRR agendas could facilitate the development of more comprehensive risk management frameworks. Shamsuddoha et al. (2013a) propose that establishing a unit within the Ministry of Planning dedicated harmonizing efforts on both avoiding and addressing loss and damage could be an important first step to addressing both overlaps and gaps in climate change policy in Bangladesh. In fact, in consultations on the HFA2 Bangladesh was one of the countries that raised the importance of integrating CCA and DRR, proposing a framework of resilience for integrating DRR, climate change and sustainable development (UNISDR, 2013a).

Targeting the Poor and Most Vulnerable

Risk retention programs like social safety nets can play an important role in addressing loss and damage from both extreme weather events and slow onset climatic processes. However, in order to be effective they must reach those who need it most. Thus policies should be put in place to monitor and evaluate the effectiveness of social safety nets (UNFCCC, 2012 in Nishat et al., 2013a). Microfinance can also be an important tool to address loss and damage, but to adequately tackle climate change concerns repayment schedules should be more flexible and products should be accompanied by capacity building and training programs (Ibid). Those risk retention programs that are successful should be scaled up and out to reach a greater proportion of the climate-vulnerable (Ibid).

Risk transfer approaches like microinsurance also have a role to play in addressing loss and damage but programs and policies need to be tailored those who need them most. The GoB also has a role to play in expanding the market and facilitating public-private partnerships that allow insurance products to reach more people (Khan et al., 2013b).

Reaching the Local Level

Bangladesh has many policies in place to address climate change at the national level and the NDMP reaches the local level by requiring Upazillas and Unions to develop disaster plans. However,local governments could be more empowered to inform the policies they are required to implement (Ayers, 2011 in Nishat et al., 2013b). According to Nishat et al. (2013b) the institutions to develop policies at the local level already exist but there is a lack of capacity to do so. Though Bangladesh has made significant strides in mainstreaming climate change into sectoral policies and plans this effort could be intensified and improved, especially in the case of slow onset processes. In particular there is a need to mainstream slow onset processes into the policies of the Ministry of Rural Development and Cooperatives (Ibid). It is also important that local and indigenous knowledge be incorporated into policies and plans. Bangladesh has recognized the importance of incorporating traditional and indigenous knowledge into its risk management efforts, but this recognition has not yet translated into practice (UNISDR, 2013b). For example, the BCCSAP does not acknowledge the importance of community-based adaptation (Nishat et al., 2013b). Consultations in the Asia Pacific region for the HFA2 also raised the importance of ensuring that efforts reach the local level, particularlly decentralizing authority and enabling local governments to access resources to implement DRR activities, strenthening local risk governance and increasing community awarness and improving access to information (UNISDR, 2013a).

Conclusion

Bangladesh has made significant strides in achieving the strategic goals laid out in the HFA. In priority action 1, ensuring that DRR is a local and national priority with a strong institutional base for implementation, Bangladesh has attained comprehensive achievement according to the recently released progress report on the HFA in the Asia Pacific region (UNISDR, 2013a). Slightly less successful were efforts to address priority action 2, to identify, assess and monitor disaster risks and enhance early warning, which reached a level of substantial achievement (Ibid). Bangladesh reported that international organizations and NGOs have made 'sporadic efforts' to develop multi-hazard risk assessments and loss databases but that these activities only cover parts of the country (Ibid). Similar success was achieved in the third priority action, using knowledge, innovation and education to build a culture of safety and resilience at all levels, the fourth, reducing the underlying risk factors and the fifth, strengthening disaster preparedness for effective response at all levels (Ibid).

In its progress report on the HFA, Bangladesh identified a number of challenges that could impede further progress including limited resources, which it reported as a key contsraint to for interating DRR into sustainable development processes. The report maintained that considerable resources will be needed to protect the lives and livelihioods of vulnerable poulations. The importance of involving these groups in decision making processes was also highlighted. Other challenges identified include sustaining communities' DRR efforts in the long-term, the absence of a means of capturing community-based DRR activities and scaling these approaches up and out. Integration of CCA and DRR was a key component of the progress report with challenges identified including the need to raise awareness of CCA and DRR issues amongst planners and to make adequate budgetary allocations to integrate CCA and DRR at all levels. Further challenges identified including defining resilience to incorporate both climate change and disaster concnerns and addressing challenges at the local level (Wazed, 2013). Clearly progress has been made but there is still far to go to ensure that the concerns of climate chagne are adequately integrated into development planning and DRR efforts and that policies and plans are in place to address both loss and damage from extreme events and slow onset processes from the national to the local level.

References

Agrawala, S. and M. Carraro. 2010. *Assessing the Role of Microfinance in Fostering Adaptation to Climate Change*. Paris, France: Organization for Economic Cooperation and Development.

Ahmed, I. 2013. *Social Safety Nets in Bangladesh*. ISAS Insights No.197 [online] Accessed at:http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.192.6184&rep=rep1&type=pdf.

Ahsan, S.M. 2009. Microinsurance, Poverty and Vulnerability. In: *Micro Finance: Performance Evaluation and Enterprise Development*, Lasar, D and Deo, M., eds. Chennai, India: Allied Publishers.

Al Faruque, A. and M.H.I. Khan. 2013. *Loss and Damage Associated with Climate Change: The Legal and Institutional Context in Bangladesh*. Dhaka, Bangladesh: International Centre for Climate Change and Development.

Asaduzzaman, M., Haque, A.K.E., Islam, K.M.N, Munir, M.Q., Roddick, S., Roberts, E., and A. Hasemann. 2013. *Assessing the Risk of Loss and Damage Associated with the Adverse Effects of Climate Change in Bangladesh. Sustainable Development Networking Foundation*. Dhaka, Bangladesh: ICCCAD.

Baas, S. and S. Ramasamy. 2008. Commuity-based Adaptation in Action : A Case from Bangladesh. Environment and Natural Resources Management Series. Rome, Italy and Dhaka, Bangladesh : Food and Agricultural Organization of the United Nations and Department of Agricultural Extension.

Barrett, C.B., Barnett, B.J., Carter, M.R., Chantarat, S., Hansen, J.W., Mude, A.G., Osgood, D.E., Skees, J.R., Turvey, C.G. and M.N. Ward. 2007. Poverty Traps and Climate Risk: Limitations and Opportunities of Index-Based Risk. IRI Technical Report 07-03 Working Paper. New York, NY: International Institute for Research on Climate and Society.

Cannon, T. 2009. Gender and climate hazards in Bangladesh. In : *Climate Change and Gender Justice*, G. Terry (eds.). Warwickshire, UK : Oxfam.

Cutter, S., Osman- Elasha, B., Campbell, J., Cheong, S- M., McCormick, S., Pulwarty, R., Supratid, S., and G. Zieryogel. 2012. Managing the risks from climate extremes at the local level. In: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change (IPCC). Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.- K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.). Cambridge, UK and New York, NY, USA: Cambridge University Press.

Dion, J., Murphy, D., Harris, M. and D. Sawyer. 2012. *Low-Carbon, Climate-Resilient Development NAMA Concepts for Bangladesh.* Geneva, Switzerland: International Institute for Sustainable Development.

Finance Division. 2008. *Bangladesh Economic Review*. Dhaka, Bangladesh: Finance Division, Ministry of Finance.

Finance Division. 2011. *Bangladesh Economic Review*. Dhaka, Bangladesh: Ministry of Finance.

Foresight. 2011. Migration and Global Environmental Change: Final Project Report. London, UK: The Government Office for Science.

Government of Bangladesh (GOB). 2008. *Cyclone Sidr in Bangladesh: Damage, loss and needs assessment for disaster recovery and reconstruction*. Dhaka, Bangladesh: Government of Bangladesh.

Government of Bangladesh (GoB). 2010a. *Standing Order on Disasters*. Dhaka, Bangladesh: Disaster Management Bureau, Government of Bangladesh.

Government of Bangladesh (GoB). 2010b. *National Plan for Disaster Management 2010 – 2015*. Dhaka, Bangladesh: Disaster Management Bureau.

Hammill, A., Matthew, R. and E. McCarter. 2008. *Microfinance and Climate change adaptation*. IDS Bulletin. Vol. 39, No.4 :113-122.

Haque, U., Hashizume, M., Kolivras, K.N., Overgaard, H.J., Das, B. and T. Yamamoto. 2012. Reduced death rates from cyclones in Bangladesh: what more needs to be done? *Bulletin of the World Health Organization* No. 90:150-156.

Huq, S., Rahman, A., Konate, M., Sokona, Y and H. Reid. 2003. *Mainstreaming Adaptation to Climate Change in Least Developed Countries (LDCs).* London, UK: International Institute for Environment and Development.

International Organization for Migration (IOM). *World Migration Report*. Geneva, Switzerland: IOM.

IPCC. 2012. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change, V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.- K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.). Cambridge, UK: Cambridge University Press.

Khan, A.E., Ireson, A., Kovats, S., Mojumder, S.K., Khusru, A., Rahman, A. and P. Vineis. 2011. Drinking Water Salinity and Maternal Health in Coastal Bangladesh: Implications of Climate Change**.** *Environmental Health Perspectives* Issue Vol. 119, No. 9: 1328-1332.

Khan, M.R., Roddick, S. and E. Roberts. 2013*. Assessing Microinsurance as a Tool to Address Loss and Damage in the National Context of Bangladesh*. Dhaka, Bangladesh: International Centre for Climate Change and Development.

Kreft, S. and D. Eckstein. 2013. Global Climate Risk Index 2014 : Who Suffers Most from Exteme Events ? Weather-Related Loss Events in 2012 and 1993 to 2012. Bonn,

Germany : Germanwatch.

Ministry of Environment and Forests (MoEF). 2005. *National Adaptation Programme of Action*. Dhaka, Bangladesh: International Centre for Climate Change and Development.

Ministry of Environment and Forests (MoEF). 2009. *Bangladesh Climate Change Strategy and Action Plan*. Dhaka, Bangladesh: MoEF.

Ministry of Environment and Forests (MoEF). 2012. S*econd National Communication*. Dhaka, Bangladesh: Ministry of Environment and Forests.

Morissey, J. and A. Oliver-Smith. 2013. *Perspectives on Non-Economic Loss and Damage: Understanding Values at Risk from Climate Change*. Bonn, Germany: Germanwatch.

Morshed, K. 2009. *Social Safety Net Programmes in Bangladesh*. Dhaka, Bangladesh: United Nations Development Program.

Nachmany, M., Fankhauser, S., Townshend, T., Collins, M. Landesman, T., Matthews, A., Pavese, C., Rietig, K., Schleifer, P. and J. Setzer. 2014. *The GLOBE Climate Legislation Study: A Review of Climate Change Legislation in 66 Countries*. Fourth Edition. London, UK: GLOBE International and the Grantham Research Institute, London School of Economics.

Nishat, A., Mukherjee, N., Hasemann, A. and E. Roberts. 2013a. *A Range of Approaches to Address Loss and Damage Impacts from Climate Change in Bangladesh*. Dhaka, Bangladesh: International Centre for Climate Change and Development.

Nishat, A., Mukherjee, N., Roberts, E. and A. Hasemann. 2013b. *Loss and Damage from a Local Perspective in the Context of a Slow Onset Process: The Case of Sea Level Rise in Bangladesh*. Dhaka, Bangladesh: International Centre for Climate Change and Development.

Paul, B.K. 2009. Why relatively fewer people died: The case of Bangladesh's Cyclone Sidr. *Natural Hazards* Vol. 50: 289- 304.

Paul, B.K. and S. Dutt. 2010. Hazard Warnings and Responses to Evacuation Orders: The Case of Bangladesh's Cyclone Sidr. *The Geographical Review* Vol. 100, No. 3: 336-355.

Pervin, M. 2013. *Mainstreaming climate change reislience into development planning in Bangladesh*. IIED country report. London, UK : International Institute for Environment and Development.

Power and Participation Research Centre (PPRC) and United Nations Development Program (UNDP). 2012. *Social Safety Net in Bangladesh*. Dhaka, Bangladesh: United Nations Development Programme.

Project Management Unit, CBACC-Coastal Afforestation Project. 2010. Community Based Adaptation through Climate Change Coastal Afforstation in Bangladesh : Annual Progress Report 2010. Dhaka, Bangladesh : GEF, Government of Bangaldesh and

UNDP.

Rahman, M. A., and F.H. Mallick. Forthcoming. Cyclone and Tornado Risk and Reduction Approaches in Bangladesh. In: *Disaster Risk Reduction Approaches in Bangladesh,* R. Shaw, F. H. Mallick, and A. Islam (eds). Dhaka, Bangladesh: United Nations Development Programme.

Rahman, R., Khan, M. F., Nishat, B., Mukherjee, N. and S. Ahmed. 2011. *Indicators to Assess Impacts on Hydro- Meteorology*. Dhaka, Bangladesh: International Union for Conservation of Nature.

Reinhard, D. 2008. *Cover against poverty : Microinsurance to Cover Climate Risks*. Welt-sichten, 20-22.

Roberts, E., Hasemann, A. and S. Roddick. 2013. *Early lessons from the Loss and Damage Process in Bangladesh*. Dhaka, Bangladesh : International Centre for Climate Change and Development.

Rippey, P. 2009. Microfinance and Climate Change : Threats and Opportunties. Focus Note 52. Washington, DC, USA : Consultative Group to Assist the Poor.

Shamsuddoha, M., Roberts, E., Hasemann, A. and S. Roddick. 2013a. *Establishing Links Between Disaster Risk Reduction and Climate Change Adaptation in the Context of Loss and Damage: Policies and Approaches in Bangladesh*. Dhaka, Bangladesh: International Centre for Climate Change and Development.

Shamsuddoha, M., Islam, M., Haque, M.A., Rahman, M.F., Roberts, E., Hasemann, A. and S. Roddick. 2013b. *Local Perspective on Loss and Damage in the Context of Extreme Events: Insights from Cyclone-affected Communities in Coastal Bangladesh*. Dhaka, Bangladesh: International Centre for Climate Change and Development.

Transparency International Bangladesh (TIB). 2012. *Factsheet on CFG in Bangladesh*. Dhaka, Bangladesh: Transparency International Bangladesh.

UNFCCC. 2012. *A range of approaches to address loss and damage associated with the adverse effects of climate change, including impacts related to extreme weather events and slow onset processes.* FCCC/SBI/2012/INF.14. Bonn, Germany: UNFCCC.

UNISDR. 2005. Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Dsiasters. Geneva, Switzerland: UNISDR.

UNISDR. 2013. Asia Pacific Synthesis Report: Consultations on the Post-2013 Framework for Disaster Risk Reduction (HFA2). Bangkok, Thailand: UNISDR.

UNISDR. 2013. The Hyogo Framework Action in the Asia Pacific 2011-2013. Geneva, Switzerland: UNISDR.

Verheyen, R. 2012. *Tackling loss and damage: A new challenge for the global climate regime?* Bonn, Germany: Germanwatch.

Warner, K., Zissener, M., Kreft, S., Höppe, P., Bals, C., Linnerooth-Bayer, J., Haas, A.,

Gurenko, E., Loster, T. and I. Burton. 2010. Solutions for Vulnerable Countries and People. Bonn, Germany: Munich Climate Insurance Initiative.

Warner, K. Kreft, S., Zissener, M., Höppe, P. Bals, C. Loster, T., Linnerooth-Bayer, J. Tschudi, S., Gurenko, E., Haas, A., Young, S., Kovacs, P., Dlugolecki, A. and A. Oxley. 2012. *Insurance solutions in the context of climate change-related loss and damage : Needs, gaps, and roles of the Convention in addressing loss and damage*. Bonn, Germany : Munich Climate Insurance Initiative.

Warner, K., Yuzva, K., Zissener, M., Gille, S., Voss, J. and S. Wanczeck. 2013*. Innovative Insurance Solutions for Climate Change: How to integrate climate risk insurance into a comprehensive climate risk management approach.* Report No. 12. Bonn, Germany: United Nations University Institute for Environment and Human Security (UNU-EHS).

Warner, K and van der Geest, K. 2013. Loss and damage from climate change: Local-level evidence from nine vulnerable countries. *International Journal of Global Warming* Vol. 5, No. 4: 367-386.

Khandker, S. Khaleque, M. A., and H. A. Samad. 2011. *Can social safety nets alleviate seasonal deprivation? Evidence from northwest Bangladesh*. Policy Research Working Paper Series 5865. Washington D.C., USA: The World Bank Group.

Wazed, M.A. 2013. *Bangladesh: National progress report on the implementation of the Hyogo Framework for Action (2011-2013).* Dhaka, Bangladesh: Ministry of Disaster Management and Relief.

World Bank. 2011. *Bangladesh Climate Change Resilience Fund (BCCRF): An Innovative Governance Framework*. Washington, DC, USA: World Bank.

Zimmerman, M. and F. Stössel. 2011. *Disaster Risk Reduction in International Cooperation: Switzerland's Contribution to the Protection of Lives and Livelihoods*. Bern, Switzerland: Swiss Agency for Development and Cooperation.