

What does the IPCC say about Bangladesh?

ICCCAD Briefing¹

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“Along the coasts of developing countries, weather and climate extremes impact on a wide range of economic activities supporting coastal communities and pose an additional risk to many of the fastest-growing low-lying urban areas, such as in Bangladesh” (AR5, WG2, Chapter 5)

“The Bangladesh Government initiated construction of cyclone shelters in the late 1980s, yet a cyclone in 1991 revealed that too few shelters were available. This prompted collaboration between the government of Bangladesh, the United Nations Development Programme, and the World Bank to launch the Multipurpose Cyclone Shelter Program. That program characterized shelter needs along the coast and provided resources for their construction” (AR5, WG2, Chapter 16)

IPCC Key Findings on Bangladesh: An Introduction

The Intergovernmental Panel on Climate Change (IPCC) is a scientific body established to provide a scientific view on the current state of knowledge in climate change and its impacts. The IPCC was first established in 1988 by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). The IPCC is the leading international body for the assessment of climate change, and thousands of scientists and other experts contribute to the reports which are then reviewed by governments.

The Fifth Assessment Report (AR5) (2014), is the fifth in the series of IPCC assessment reports and provides an update of knowledge on the scientific, technical and socio-economic aspects of climate change. Working Group I covers the Physical Science Basis, Working Group II is on Impacts, Adaptation and Vulnerability, and Working Group III is on Mitigation of Climate Change.

In this report, we have focused on Working Group II (WG2) of the Fifth Assessment Report (AR5) for relevance for Bangladesh and we will now present our findings. The objective of this report is to provide a guide for stakeholders and decision makers in Bangladesh.

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Which chapters are relevant to Bangladesh?

Particularly relevant chapters for Bangladesh are the chapters on [Coastal Systems and Low-lying areas](#), [Food Security](#), [Urban Areas](#), [Rural Areas](#) and [Health](#). The full list of chapters is available at: <http://ipcc-wg2.gov/AR5/>

Vulnerability to sea level rise and cyclones

- Bangladesh is identified as being at specific risk from climate change due to its exposure to sea-level rise and extreme events and concentrated multidimensional povertyⁱ.
- Bangladesh's population at risk of sea level rise is predicted to grow to 27 million by 2050ⁱⁱ.
- Vulnerability to cyclones is also expected to increase, but multiple opportunities can converge to facilitate adaptationⁱⁱⁱ.
- Bangladesh lost an estimated 5.9% of GDP to storms from 1998-2009^{iv}.
- Bangladesh and India account for 86% of mortality from tropical cyclones, mainly due to having the rarest and most severe storm categories^v.
- World Bank estimates the adaptation deficit with respect to cyclones is USD 25 Billion^{vi}.

Food Insecurity

- In the Indo-Gangetic Plains of South Asia, there could be a decrease of about 50% in the most favorable and high yielding wheat area due to heat stress if CO2 levels are doubled^{vii}.
- In terms of risks of increasing heat stress, current temperatures are already approaching critical levels during the susceptible stages of the rice plant in Bangladesh in March-June^{viii}.
- Seawater inundation has also become a major problem for traditional agriculture^{ix}.
- In a low crop productivity scenario, Bangladesh would experience a net increase in poverty of 15% by 2030^x.

Human Health

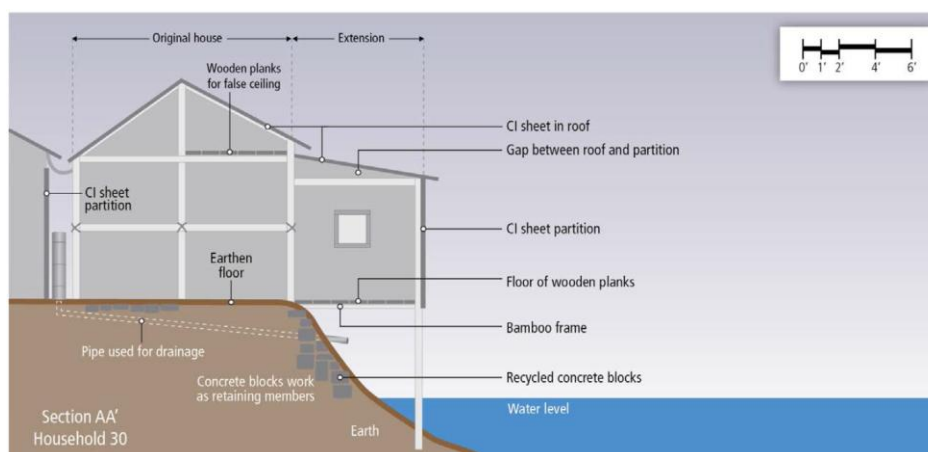
- Where cholera is endemic, outbreaks are correlated with warming^{xi}.
- Based on an 18-year climate record there have been outbreaks at ENSO events (El Niño Southern Oscillation events) and the intensity of these events is likely to increase under climate change^{xii}.
- A study in Dhaka reported increased rates of hospital due to dengue with both high and low river levels^{xiii}.
- Increasing temperature, rainfall and humidity can all increase the time to infection for diseases like diarrhea^{xiv}.
- Salinity intrusion can cause various impacts. Increase in hypertension has been identified in pregnant women at the coasts compared to those inland^{xv}.

Gender

- Women do not learn to swim and so are vulnerable when exposed to flooding. Restricted mobility keeps women waiting in risk-prone houses during floods^{xvi}.
- In cases of male outmigration in Bangladesh due to unsustainable rural livelihoods, women face unsafe working conditions, exploitation, and loss of respect^{xvii}.
- Increased gender-based violence within households is an indirect social consequence of climate-related disasters, as well as slow-onset climate events, due to greater stress and tension, loss and grief^{xviii}.

Adaptation and Resilience

- A study in Korail, one of Dhaka's largest informal settlements, showed a range of household responses to flood risk, including placing barriers across door fronts, increasing height of furniture, building floors or shelves above the flood line, using portable cookers^{xix} as well as provision for ventilation, creepers on roofs and false ceilings to keep down temperatures.
- However, even where there are early warnings, lack of trust in the security of property and the right to return, along with fears for personal safety in shelters, are deterrents against evacuation^{xx}.



Household adaptation - a cross section of a shelter in an informal settlement in Dhaka (Korail) showing measures to cope with flooding and high temperatures^{xxi}

Community Based Adaptation

- CBA is a bottom-up approach to adaptation involving all relevant stakeholders including communities^{xxii}.
- CBA emphasizes the importance of understanding a community's unique perceptions of their adaptive capacities in order to identify useful solutions^{xxiii}.
- The table below lists many different examples of community-based adaptation, many of which are from Bangladesh.

Examples of community based adaptation measures^{xxiv}

Salinity	Salinity-tolerant crop cultivation Keora cultivation Crab fattening Homestead protection
Flooding/waterlogging	Disaster management committees Early flood warning systems Aquaculture Embankment cropping Hydroponics
Cyclones/storm surges	Homestead reinforcement Homestead ecosystem protection Underground bunker construction
Sea level rise	Risk insurance mechanisms
Multi-coastal impacts	Integrating climate change into education systems

What are the limits to adaptation?

- There are various constraints to adaptation including knowledge, awareness, physical, biological, economic, financial, human resource and social, cultural, and institutional constraints^{xxv}.
- Some of these barriers include limited access of local governments to resources^{xxvi}, preferences for retreat in coastal areas^{xxvii}, access to credit^{xxviii} and intellectual property protection^{xxix}.

Climate-resilient pathways

- Climate-resilient pathways integrate climate change adaptation and mitigation for sustainable risk management^{xxx}.
- Integrating adaptation and mitigation with development can contribute to multiple objectives. For example in Bangladesh, waste-to-compost projects contribute to mitigation through reducing methane emissions; to adaptation through soil improvement; and sustainable development through preservation of ecosystem services^{xxxi}.

References:

- ⁱ Eastham *et al.*, 2008; Wassmann *et al.*, 2009; Chapter 13
- ⁱⁱ Wheeler, 2011; Chapter 13
- ⁱⁱⁱ Box 16-2; Chapter 16
- ^{iv} Table 29-2; Chapter 29
- ^v Murray *et al.*, 2012; Chapter 5
- ^{vi} World Bank, 2011; Chapter 5
- ^{vii} Ortiz *et al.*, 2008; Chapter 24
- ^{viii} Wassmann *et al.*, 2009a; 2009b; Chapter 24
- ^{ix} Rahman *et al.*, 2009; Chapter 5
- ^x Hertel *et al.*, 2010; Chapter 24
- ^{xi} Lobitz *et al.*, 2000; Lipp *et al.*, 2002; Chapter 6
- ^{xii} Pascual *et al.*, 2000; Chapter 6
- ^{xiii} Hashizume and Dewan, 2012; Chapter 11
- ^{xiv} Hashizume *et al.*, 2007; Chapter 24
- ^{xv} Khan *et al.*, 2008; Chapter 5
- ^{xvi} Box 13-1; Chapter 13
- ^{xvii} Pouliotte *et al.*, 2009; Chapter 13
- ^{xviii} Box 13-1, Chapter 13
- ^{xix} Jabeen *et al.*, 2010; Chapter 8
- ^{xx} Hardoy *et al.*, 2011; Jabeen *et al.*, 2010; Chapter 8
- ^{xxi} Figure 8-5; Chapter 8
- ^{xxii} Ayers and Huq, 2009; UNDP, 2010, Riadh *et al.*, 2012; Chapter 5
- ^{xxiii} Parvin *et al.*, 2008; Paul and Routray, 2010; Chapter 5
- ^{xxiv} Table 5-4, Chapter 5
- ^{xxv} Section 16.3.2, Chapter 16
- ^{xxvi} Christensen *et al.*, 2012; Chapter 14
- ^{xxvii} Saraor and Routray, 2010; Chapter 5
- ^{xxviii} Islam *et al.*, 2014; Chapter 16
- ^{xxix} Christiansen *et al.*, 2011, Chapter 17
- ^{xxx} Section 20.2.3, Chapter 20
- ^{xxxi} Ayers and Huq, 2009; Chapter 20