Bangladesh is critically vulnerable to climate induced hazards, but the core elements of its vulnerability are primarily contextual. It is probably the only country in the world with most of its territory lying on the deltaic flood-plain of three major rivers and their numerous tributaries. Between thirty to seventy per cent of the country is normally flooded each year. The huge sediment loads brought by these Himalayan Rivers, coupled with a negligible flow gradient add to drainage congestion problems and exacerbate the extent of flooding. The low coastal topography contributes to coastal inundation and saline intrusion inland. Bangladesh also lies in a very active cyclone corridor that transects the Bay of Bengal. The societal exposure to such risks is further enhanced by its very high population and population density, with close to 800 persons per square kilometer in vulnerable areas such as the coastal zones. Very low levels of development and high levels of poverty (between 33 and 40%) add to the social sensitivity to any external hazards. Meanwhile traditional adaptation via seasonal migration to less vulnerable areas within the Indian subcontinent was probably curtailed significantly half a century ago with the creation of a discrete geopolitical entity (East Pakistan), which subsequently became Bangladesh. The internationalization of the region probably also contributed to water sharing conflicts, most notably the building of the Farakka barrage in India that led to the diversion of dry season flows, which exacerbated salinity concerns in the Bangladesh Sundarbans.

Many projected climate change impacts including sea level rise, higher temperatures and evapotranspiration losses, enhanced monsoon precipitation and run-off, potentially reduced dry season precipitation, and increase in cyclone intensity would in fact reinforce many of these baseline stresses that already pose a serious impediment to the economic development of Bangladesh. By the same token, many actions undertaken to address the baseline or contextual risks in Bangladesh are also synergistic with the so called adaptations that might be required as climate change impacts manifest themselves. There is therefore a need to clearly address whether climate change impacts are simply one more reason to lower contextual vulnerability via business as usual economic development activity, or whether adaptation to climate change might require suitable modifications in such projects or highlight the need for entirely new activities, and if so, what such activities might be. Thus far there has been no clear articulation on this important issue,

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Figure 4. Historical flood extents in Bangladesh

Pierre Frankel in Moscow (A): Unfreezing Change

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- Food
- Decli
- Effec
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World Sea

- Will continue to raise
  - Thermal expansion
- Melting of ice
- Includes frequent and
  of coastal land.

TheCaseSol

Oceans and Seas

- Reduces sea-ice cover
- Alters ocean circulation patterns
- Affects biological productivity, availability of nutrients, , ecological structure and functions of marine ecosystems

TheCaseSolutions.com

http://media.treehugger.com/assets/images/2011/10/20090324-bangladesh-flooding.jp

Biodiversity

- Environmental, economic, and cultural value are threatened
- Habitats degrade and fragment
- Species will not adapt and become extinct
- Deforestation, slash and-burn farming, soil loss or damage, road building and urban growth

Climate policies

- No national policy addresses such risks.
- Formulation of a Climate Change Policy for Bangladesh was recommended
- National Adaptation Plan of Action (NAPA) is underway
- Bangladesh is a party to international environmental conventions

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Change in Agriculture

- Food production decreases (temperature and rainfall patterns)
- Declines in cereal (e.g. rice, wheat) production
- Effects on crops such as drought, flooding, in soils
- Increase in pests and diseases

Model used and ambient CO_2 levels	Percent change in mean potential rice yield in Asia resulting from surface air temperature increment of			
	0°C	+1°C	+2°C	+4°C
ORYZA1 Model				
340 ppm	0.00	-7.25	-14.18	-31.00
1.5×CO_2	23.31	12.29	5.60	-15.66
2×CO_2	36.39	26.42	16.76	-6.99
SIMRIW Model				
340 ppm	0.00	-4.58	-9.81	-26.15
1.5×CO_2	12.99	7.81	1.89	-16.58
2×CO_2	23.92	18.23	11.74	-8.54
Source: Matthews et al., 1995, as reproduced in Lal et al., 2001.				

Table 3. Change in rice yields in Asia under increments of temperature and CO2 level

World Sea Level Rises

- Will continue to raise sea level
  - Thermal expansion of the oceans
- Melting of ice
- Includes frequent and devastating flooding and loss of coastal land.

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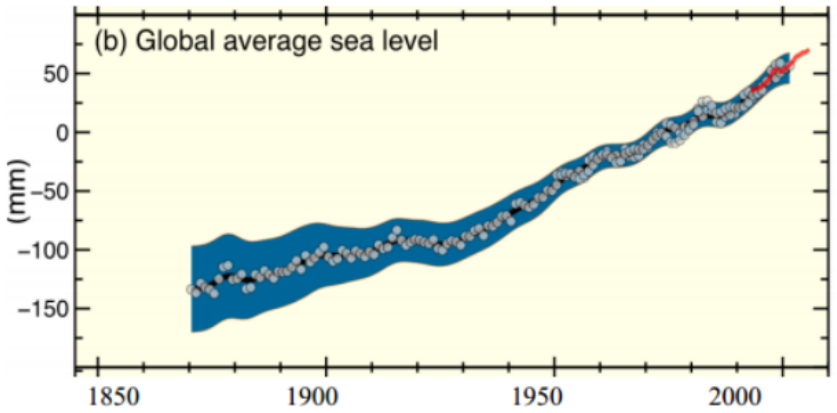

Figure 3. World Sea Level Rises (Alley et al, 2007).

Economic cost

- By 2100 , there is loss of global GDP as high as 3%
- Economic losses rose from $131 billion in the 1970s to $629 billion in the 1990s. (La Trobe, 2002).