

# Understanding Climate Change Risks and Their Implications for Bangladesh

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## **Bangladesh has always been vulnerable to climate variability. Why?**

Geographic location (within regional setting) & physical features

Highly influenced by monsoon and regional flow patterns

‘Too much water in monsoon’ & ‘too little water in the dry season’

Hydraulic and hydrological realities

Socioeconomic realities

Population density

Equity and deprivation

Poverty & per capita resource endowment

Development practices and malpractices

.....

Since climate variability and change will significantly affect the hydrology, overall impacts of climate change will also be significant

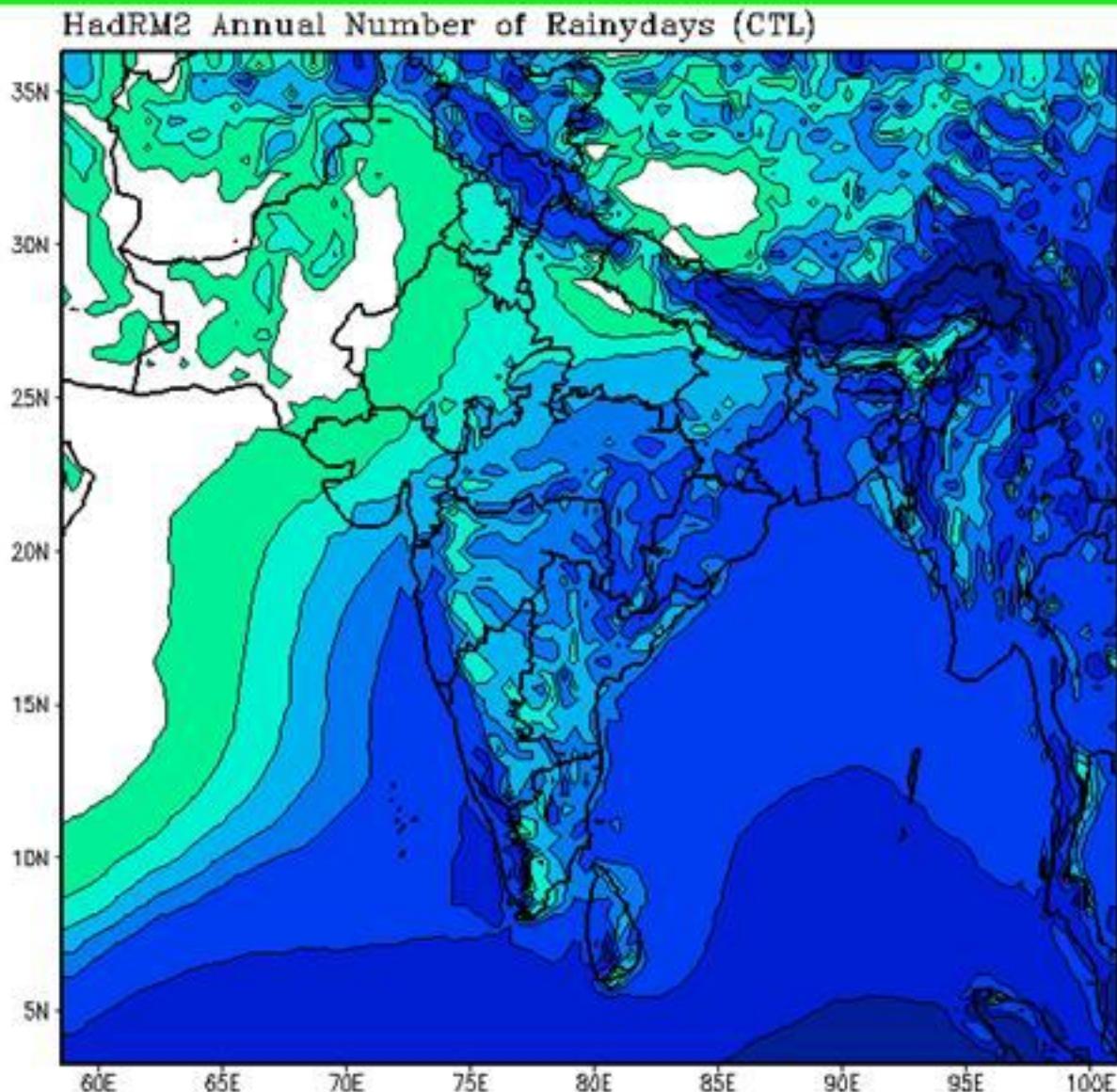


## **Extent of Change:**

**There will be a general rise in surface average temperature:  $1.3^{\circ}\text{C}$  by 2030s (Mod CCS);  $2.6^{\circ}\text{C}$  by 2070s (Severe CCS).**

**Monsoon rainfall will increase by 11% by 2030s and 27% by 2070s.**

**Number of rainy days in Bangladesh will increase by about 20 days.**



## FLOODS

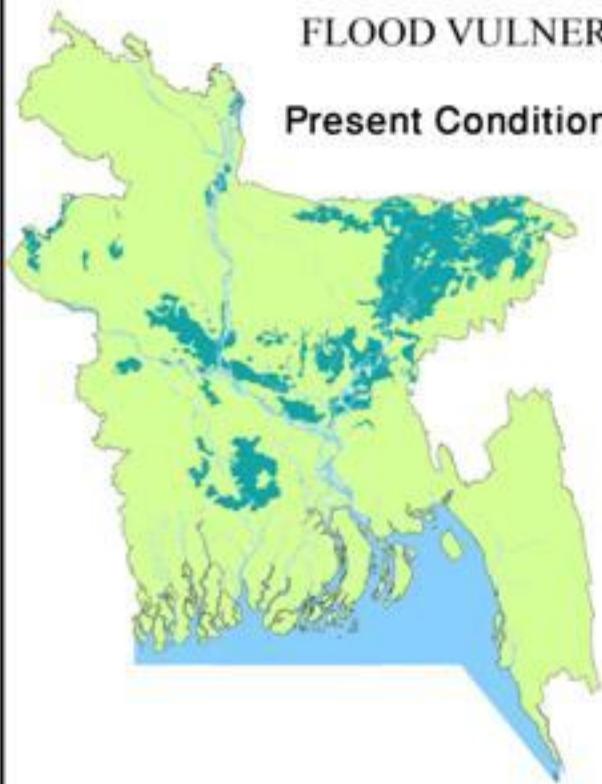
On an average about a quarter of the country's landmass is currently **flood prone** in a normal hydrological year, which may increase to **39 per cent**, while the **frequency** of a **catastrophic flood** (engulfing about two-thirds of the landmass of the country) could be increased under climate change scenarios.

Urban flood is an emerging problem.

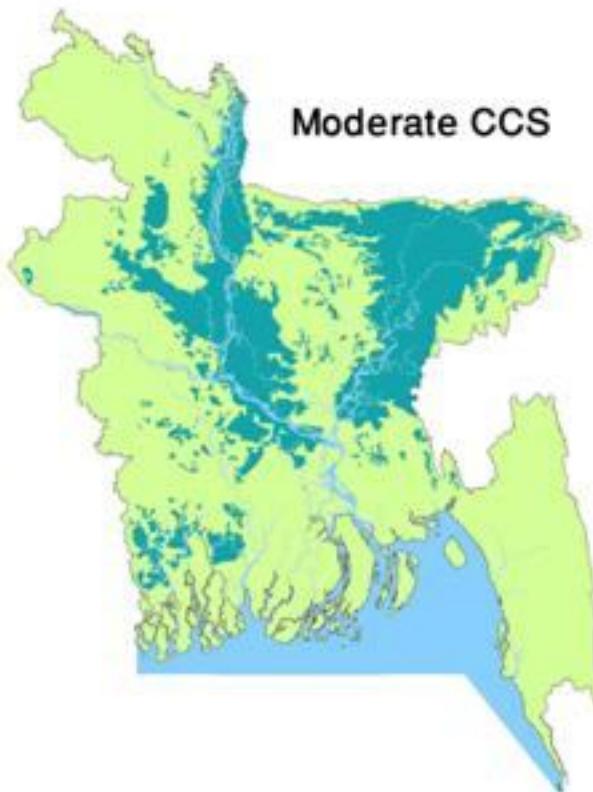


## FLOOD VULNERABLE AREAS IN FUTURE CLIMATE SCENARIOS

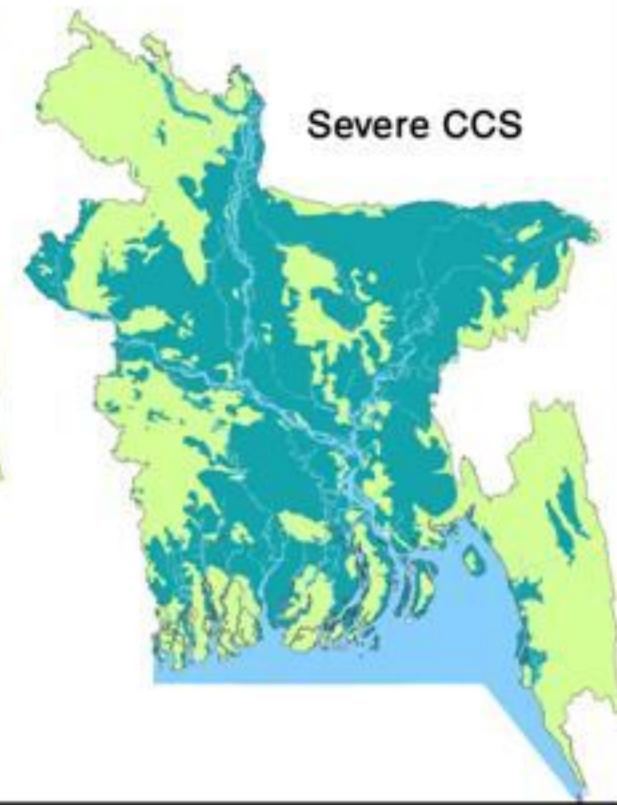
Present Condition



Moderate CCS

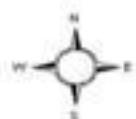


Severe CCS

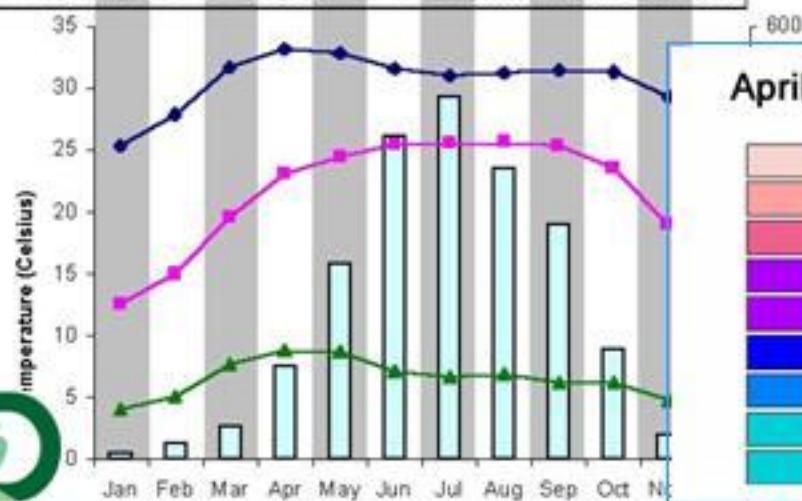
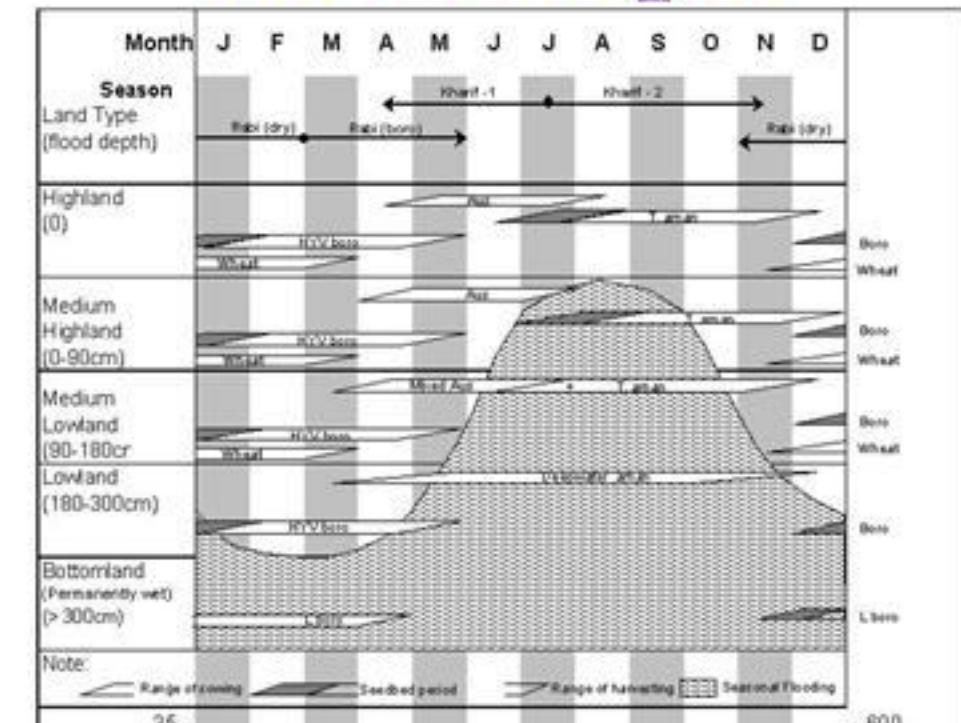


### LEGEND

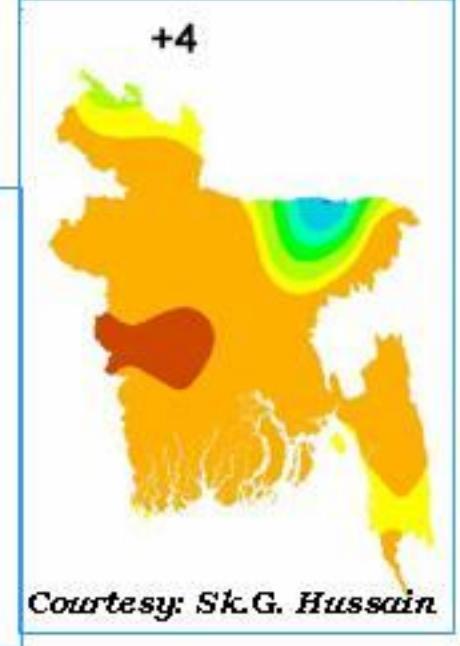
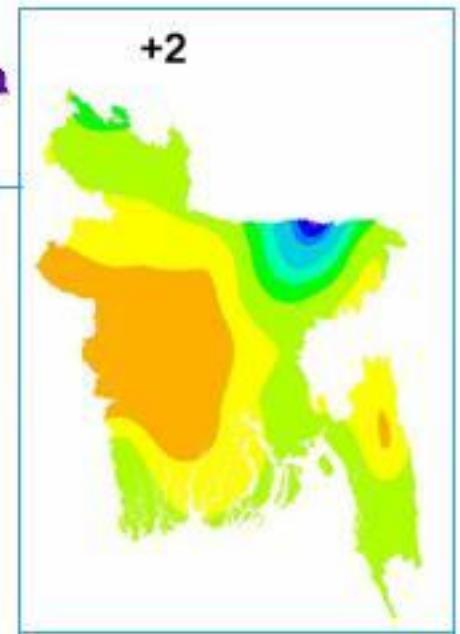
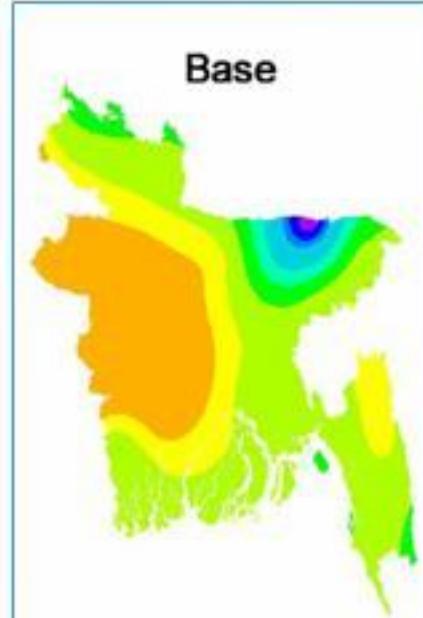
- Flood
- No Flood
- Waterbodies
- International Boundary
- National Boundary



# Rabi Drought



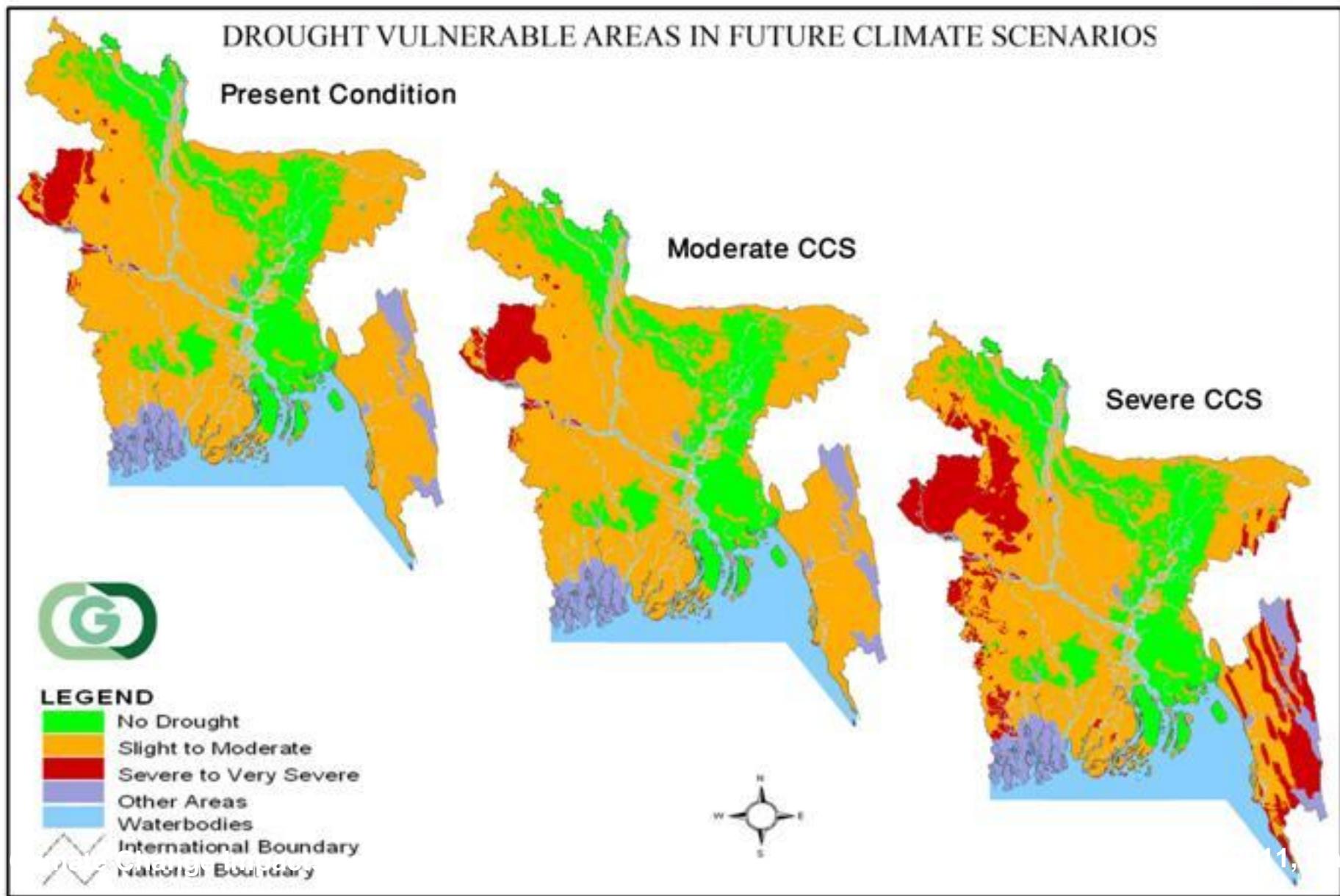
## Δ April Maximum Temperature

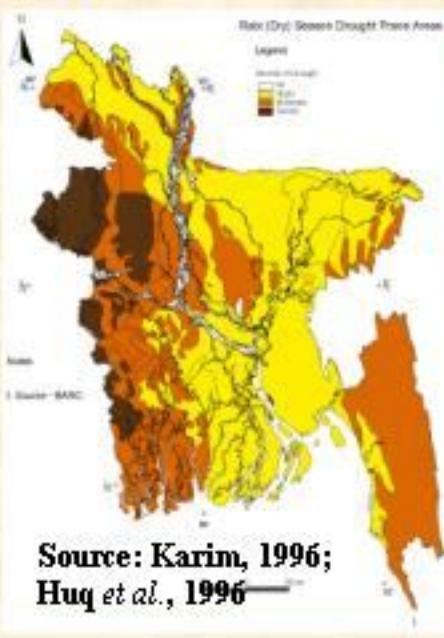


April Maximum Temperature (°C)



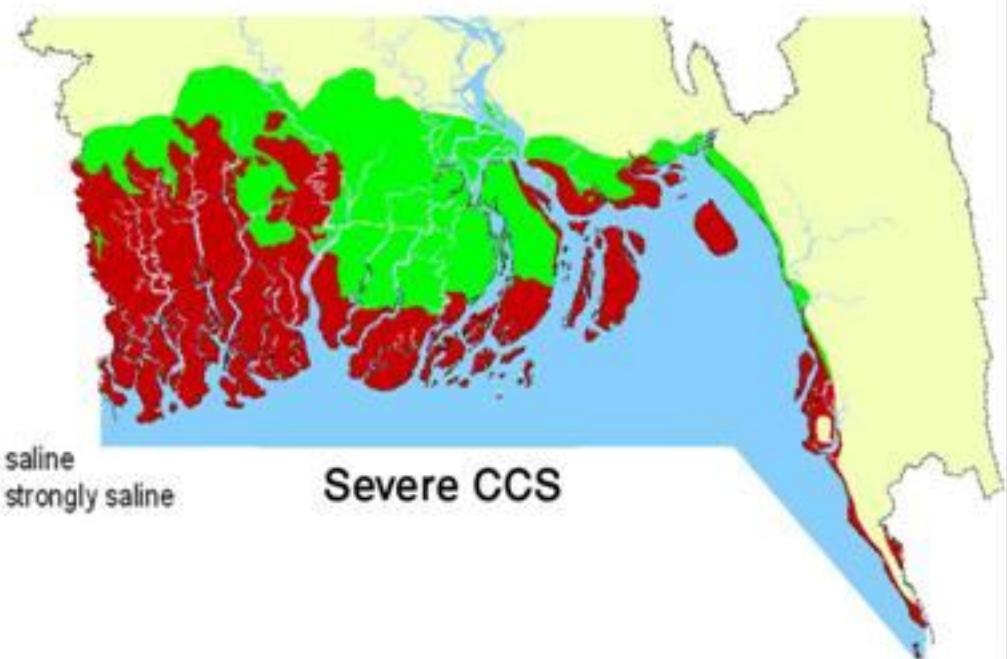
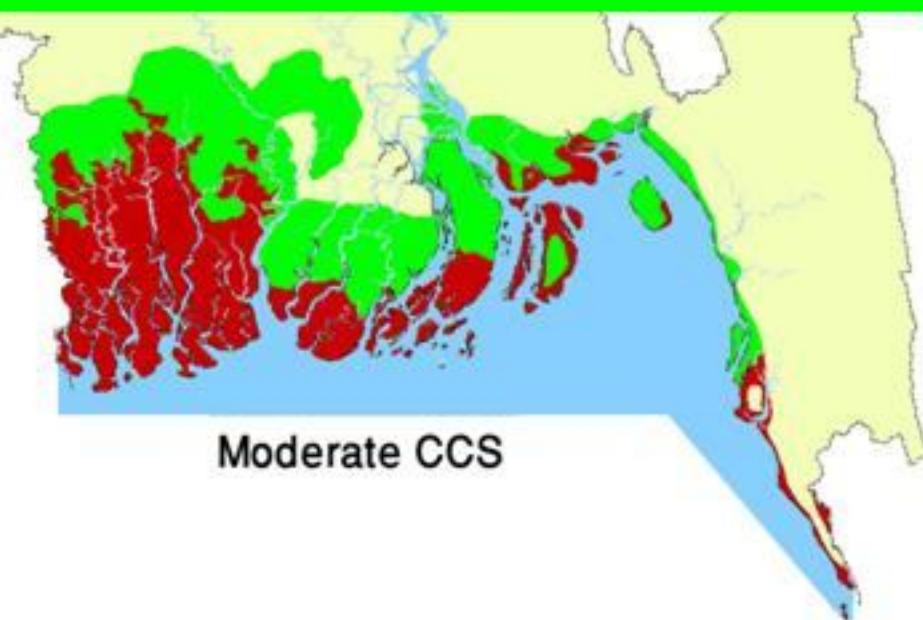
Courtesy: Sk.G. Hussain





**Increased water logging (as in Jessore-Khulna-Satkhira & Noakhali) and salinity intrusion (as in the SW region) will further reduce crop production potential.**



**LEGEND**

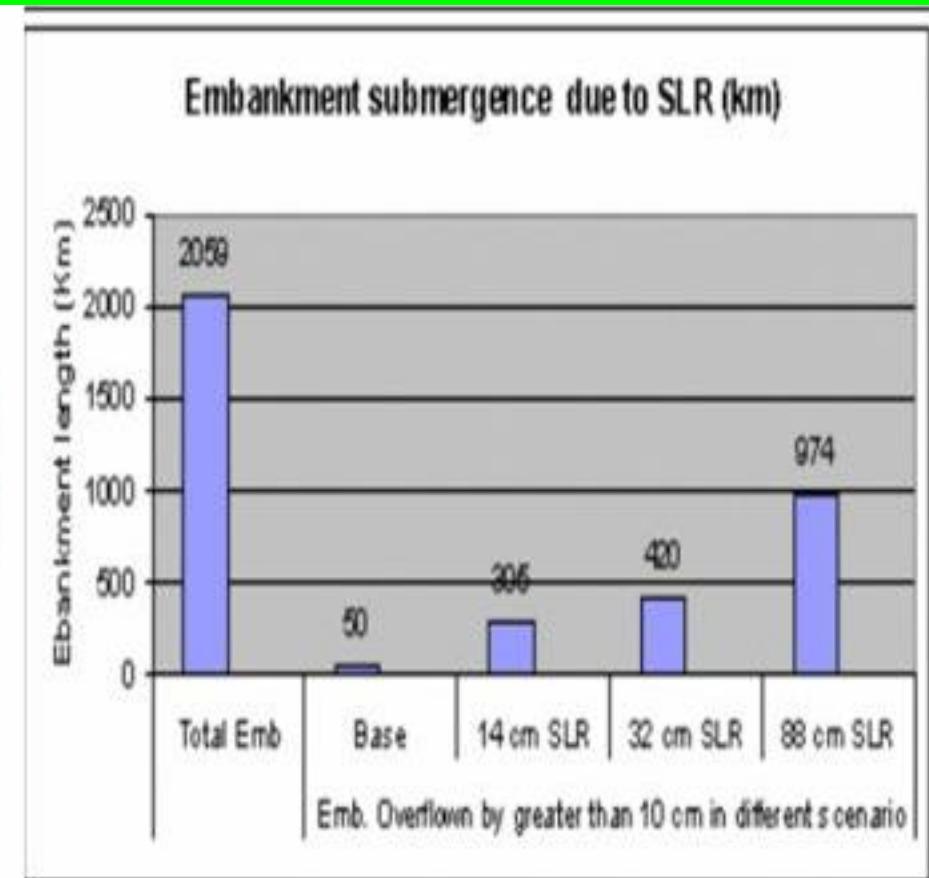
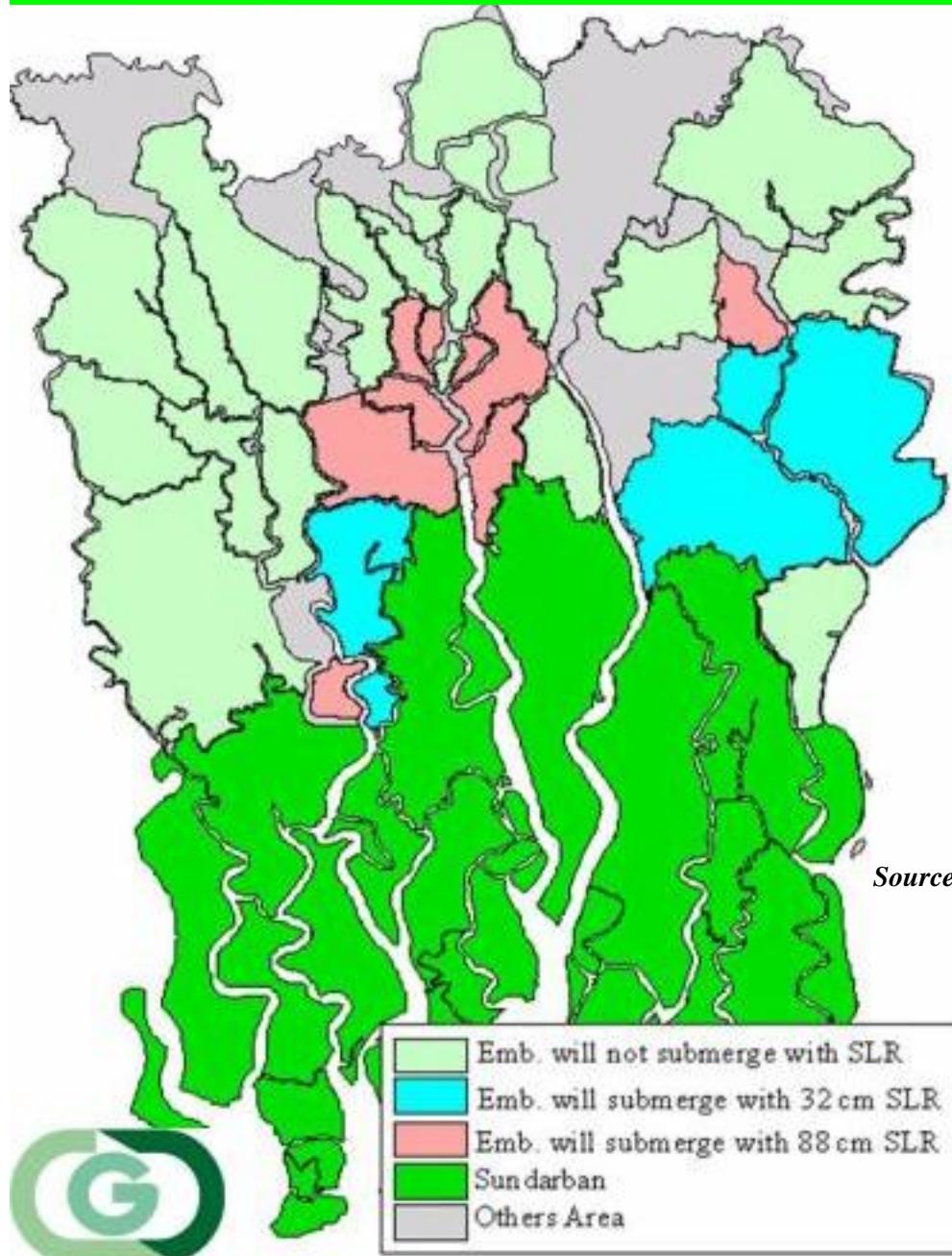
- Non-saline
- Non-saline to moderately saline
- Moderately saline to very strongly saline
- Waterbodies
- International Boundary
- National Boundary

## SST- SLR – WIND - STORM SURGE

Temp →	Present	$2^{\circ}\text{C}$ Rise	$4^{\circ}\text{C}$ Rise
Max Wind (kmph) →	225 (1991 cyclone)	248 (10% rise)	275 (22% rise)
Storm surge height (m)			
SLR=0.0	7.6	9.2	11.3
SLR=0.3	7.4	9.1	11.1
SLR=1.0	7.1	8.6	10.6



Courtesy: A Ali



Source: CEGIS, 2006

## Human health

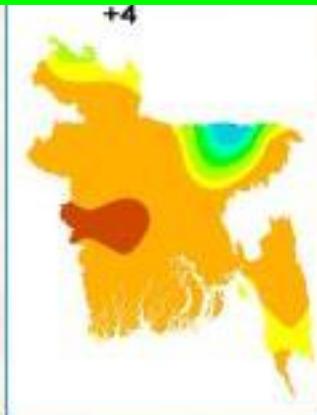
High salinity in water, in both surface and groundwater sources, in the Southwestern areas of Bangladesh is **affecting human health**. What will happen if salinity penetrates further inland under climate change?

Rise in temperature will favour **pest/pathogen activities and human health** will be at higher risk.

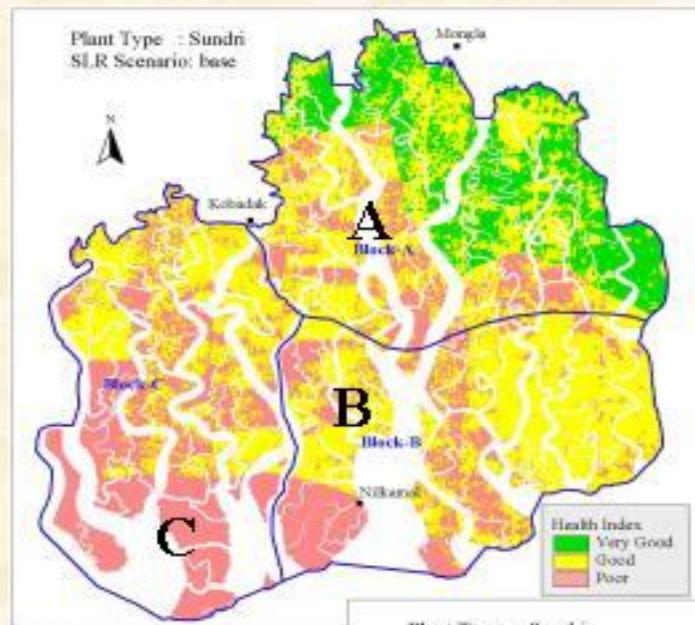
**Increased risk of dengue, malaria, diarrhea, ...**

Floodwaters would tend to destroy the poor sanitation facilities. Cyclones with increased vigour will have similar adverse effects.

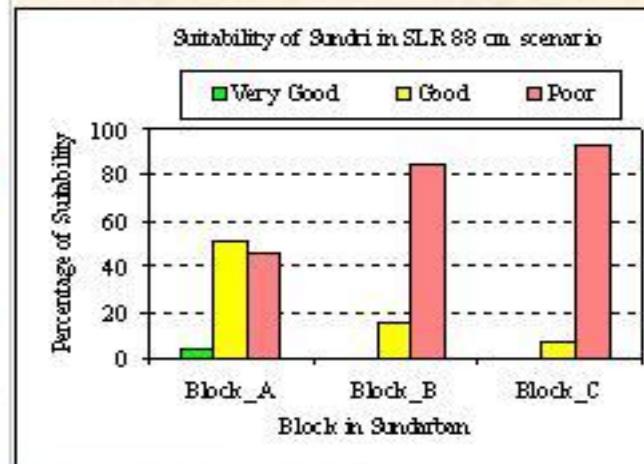
**Reaching the MDG targets will be extremely difficult under climate change.**



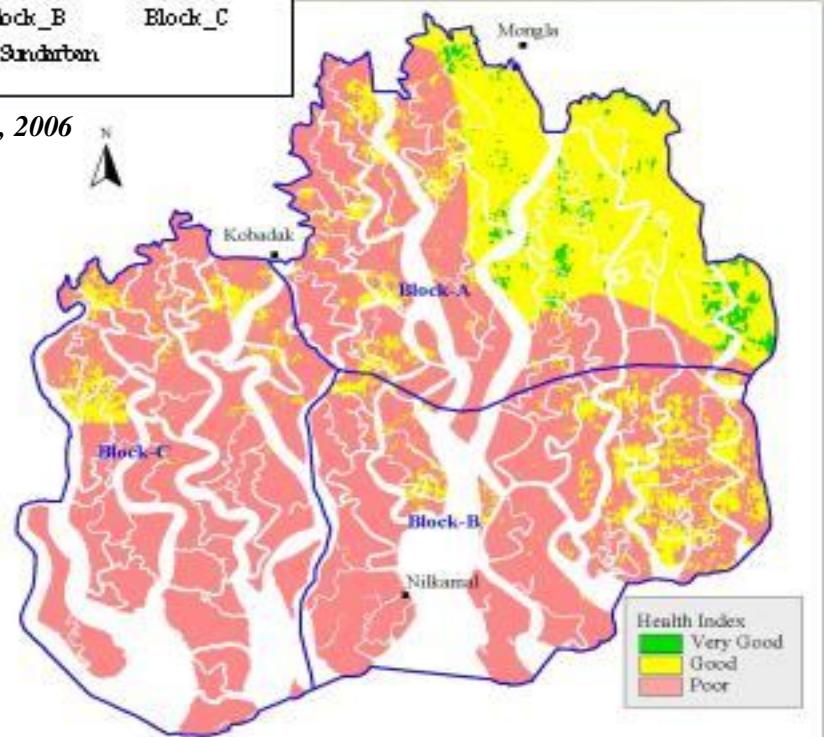
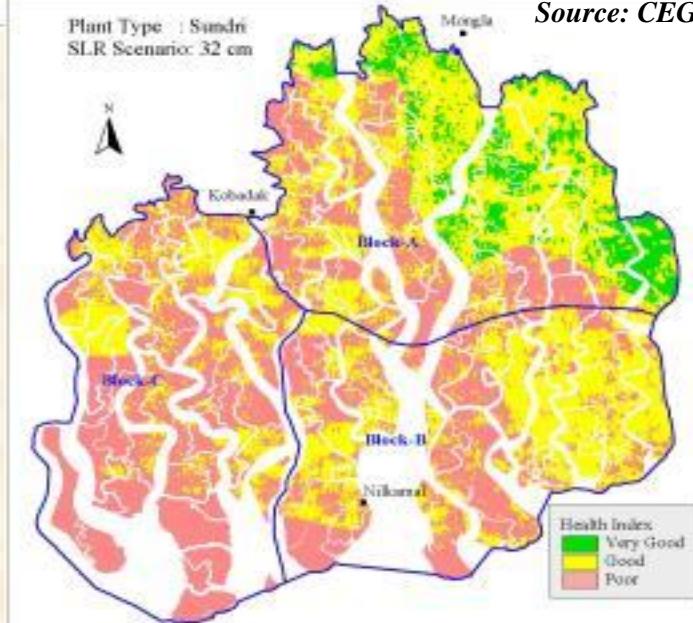
*Slide courtesy: CCG*



## Adverse effect on natural forest biodiversity



**Degradation of forest vegetation due to SLR induced salinity (88cm SLR)**



## Gender issues

Vulnerability has a gender face! Women are certainly the worst affected amongst all the groups.

Their vulnerability to climate driven events is compounded by a number of prevailing problems and societal shortcomings towards understanding their plight.

Gender sensitive responses are necessary to address these shortcomings.



Food Security will be at risk.

National food security will not only be dependent on local production.

Import will play a major role towards maintaining FS.  
Market?

Industrial zones at risk.

Where should you be placing your investment?

What precautionary measure business community  
can think of?









# Reduction of Vulnerability: A theoretical perspective

Vulnerability is a state .....

Vulnerability<sup>cc</sup> (V) may be reduced by either reducing exposure (E) to the agent(s) of change (i.e., climate perturbation-induced hazards & extremes), or reducing sensitivity (S) of the system, or enhancing/increasing adaptive capacity (R) to better deal with or even defy vulnerability

$$V \propto f_E * S * 1/R$$

(Modified from Metzger et al., 2006)

E is the measure of severity of the change

S is the sensitivity of the system (or the subject) to the exposure

R is the strength of the system to respond, defy and even take advantage of the imminent condition(s)



$$V \propto f E * S * 1/R$$

In human systems

R is a measure of capital that are enjoyed by the human system

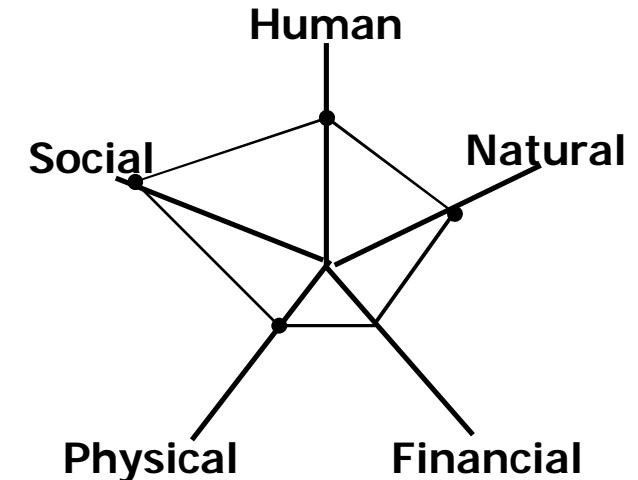
$R \propto f (Social\ capital, Human\ capital, Physical\ capital,$   
 $Financial\ capital, Natural\ capital)$

Livelihood  
Capital Assets

The higher is the value of R, therefore

the higher is the value of any  
of these capitals (or assets)  
enjoyed by a human system,  
the lower is the vulnerability

.....



Source: Chambers, 1989



# INTERNATIONAL NEGOTIATION & CLIMATE JUSTICE

# Why negotiation is necessary?

# Assuming responsibility can become costly

Major costs will have to be borne by the poor countries (them, not us)

# Miopic decisions

# Lack of leadership

**Leadership must come from Annex-1 countries.**

Historically, A1 countries are responsible for the crisis.

# Historical responsibility

