



Climate Change Issues in Bangladesh & Need for Adaptation to Climate Change



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Bangladesh: Country context and vulnerability

Recognized globally as most vulnerable to Climate Change

- The IPCC has identified Bangladesh, a land of low-lying alluvial plain, as one of the most vulnerable least developed countries.
- According to the Mortality Risk Index of the UN, Bangladesh is one the top of the vulnerable countries due to flood and cyclone.
- A recently published report of the Maple Craft of the UK, which has conducted a survey on 170 countries with using 42 indicators, revealed that Bangladesh is on the top of among 16 countries that are most vulnerable to climate change in next 30 years.
- Reports published by 'German Watch' and 'Climate Vulnerability Monitor 2010: The State of the Climate Crisis' have also found Bangladesh as one of the most vulnerable countries.

So Bangladesh needs extensive adaptive measures to survive and to sustain



Bangladesh: Country context and vulnerability (contd.)

- South Asian least developed country
- Youngest and most active Deltaic landscape, 80% floodplain
- Population density very high (1045/km²), sixth largest densely populated country in the world
- High level of Poverty (less than \$1 a day 29%, less than \$2 a day 84%), more than 35% live below the poverty line
- Disaster prone, people are exposed to hazards
- Natural resources based (predominantly agrarian) economy



CLIMATE CHANGE IMPACT: OBSERVED IN BANGLADESH

- ❑ Temperature extremes
- ❑ Erratic rainfall
- ❑ Increased number of severe flood
- ❑ Increased frequency of cyclone and salinity intrusion
- ❑ More river bank and coastal erosion
- ❑ Population Vulnerable to Impact of Climate Change
 - ❑ Barind Tract: Drought
5.038 million people under threat
 - ❑ Haor Basin: Flash Flood
20 million population



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CLIMATE CHANGE IMPACT: BANGLADESH

□ Population Vulnerable to Impact of Climate Change

□ Coastal Zone: SLR, Cyclone, Salinity

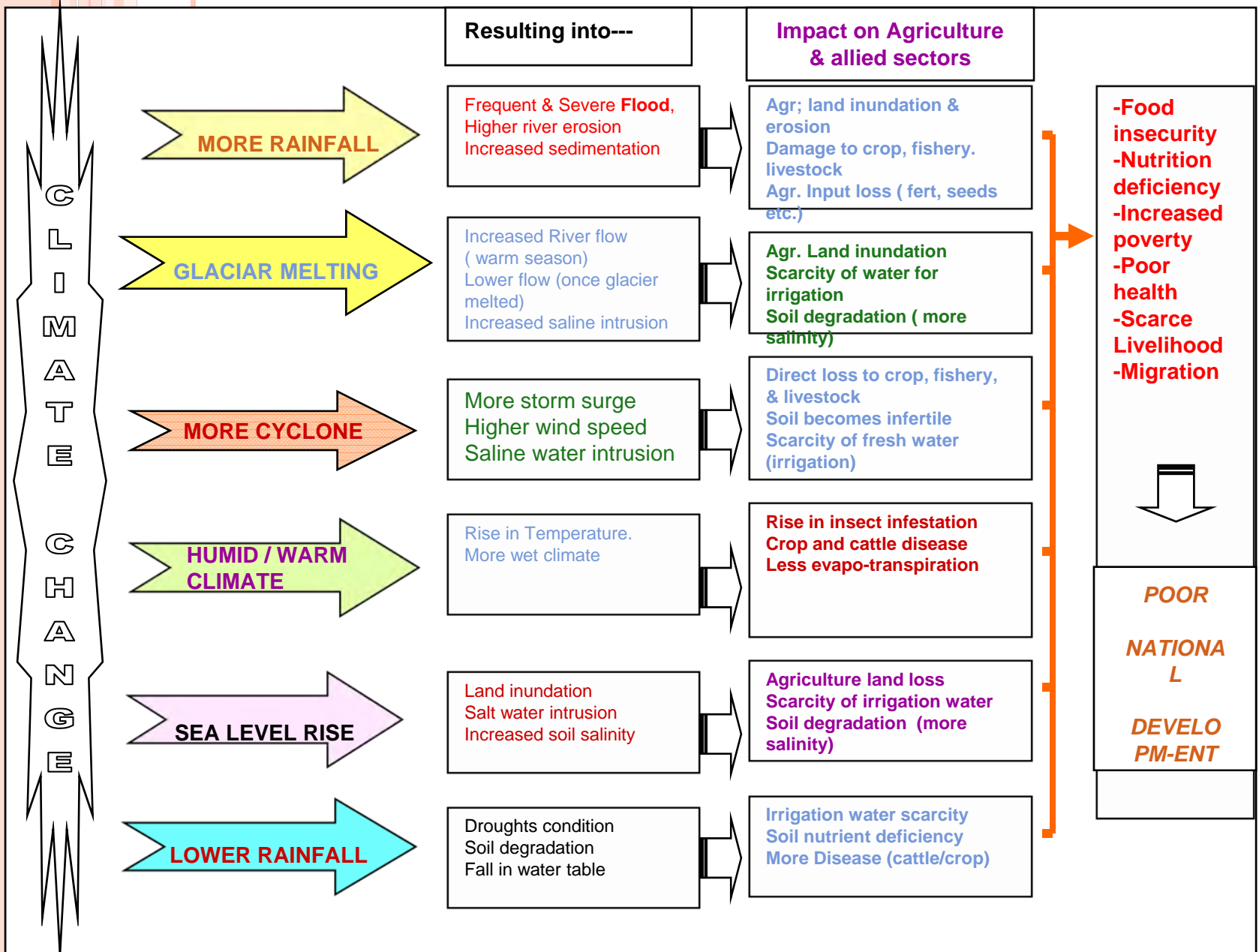
35.8 million (28% of total population), among these

- ⇒ 72 offshore islands with an area of 4200 km² and over 3 million people are extremely vulnerable
- ⇒ About 18 percent households of the Sundarban impact zone are dependent on Sundarban resources (shrimp fry collectors, honey collectors, golpata collectors, shell/crab collectors and medicinal plant collectors.
- ⇒ Around 0.5 million household's (family members 2.7 million) primary income source is fishing (losing working days because of rough weather in the Bay).

Over 160,000 coastal fishermen and estimated 185,000 shrimp fry collector are involved in marine fisheries.



Impact on Agriculture



Climate Change Impacts on Human Health

Types of Health Impacts

- **Direct health consequences**
 - ✓ mortality, morbidity by extreme events like Cyclone and storm surges
- **Infectious/pathogenic disorders**
 - ✓ diarrhea , cholera, dengue, vector borne diseases.....
- **Nutritional disorders**
 - ✓ Malnutrition
- **Psychological disorders**
 - ✓ Mental and behavioral changes

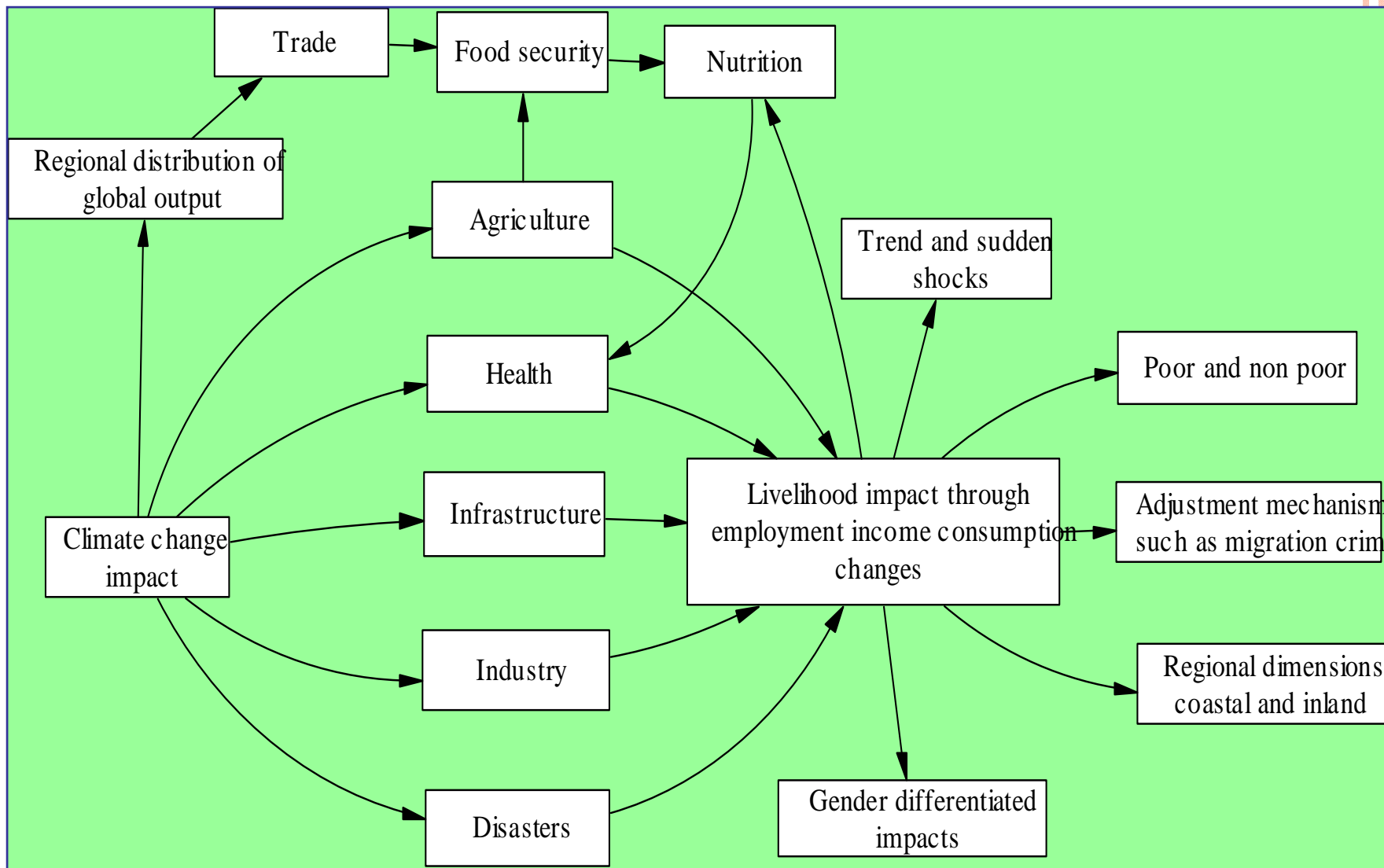


IMPACT ON INFRASTRUCTURES: NEEDS NEW DESIGN TO ADAPT TO CC

- River/canal/wetland de-silting
- Embankments/polders/submersible dykes/FCD/FCDI
- Urban drainage/storm sewerage
- Energy/power plants
- Ports/airports/EPZ/EZ
- Roads & Highways, Bridge/culverts
- Housing/cluster village/growth centers
- Cyclone shelter/flood shelter/killia



Intensity of Impacts on different sectors due to Climate change (ref: NAPA, 2009)



Economic and Social Impacts for Major Climatic Events



TROPICAL CYCLONES AND STORM SURGES

Impacts

- Most of 123 polders constructed since the 1960s.
- Analyses of all 19 severe cyclones during the past 50 years indicate that they would overtop 43 of the existing polders.
- Super-cyclonic storms (with winds greater than 220 km/hr) have a return period of around 10 years; currently, a single such storm would result in damages and losses averaging 2.4 percent of GDP.
- Climate change is expected to increase the severity of cyclones and the surges by 2050. When combined with an expected rise in sea level, cyclone-induced storm surges are projected to inundate an additional 15 percent of the coastal area.
- The depth of inundation is also expected to increase.



ADAPTATION OPTIONS AND COST

- Existing investments, which have reduced the impacts of cyclone-induced storm surges
- However, these investments are not sufficient to address the existing risks, much less the future risk from climate change.
- By 2050, total investments of \$5,516 million and \$112 million in annual recurrent costs will be needed to protect against storm surge risk, including that from climate change
- Of this, strengthening 43 polders against existing risks requires investments of \$2,462 million and annual recurrent costs of \$49 million.
- an additional 2,930 shelters will need to be constructed by 2050 at an estimated cost of \$628 million to accommodate the expected population growth in coastal areas even under existing risk.



FLOODING

Impacts

- Bangladesh has been incurring significant damages in terms of crop losses, destruction of roads and other infrastructure, disruption to industry and commerce, and injuries and losses in human lives from severe inland monsoon floods once every three to five years.
- The 1998 flood inundated over two-thirds of Bangladesh and resulted in damages and losses of over \$2 billion, or 4.8 percent of GDP.
- Increased monsoon precipitation, higher trans boundary water flows, and rising sea levels resulting from climate change are expected to increase the depth and extent of inundation.



ADAPTATION OPTIONS AND COST

- The cost of protecting against the existing risks of severe monsoon flooding was not estimated largely because of data limitations.
- The additional cost to protect
 - (a) road networks and railways,
 - (b) river embankments to protect highly productive agricultural lands,
 - (c) drainage systems, and
 - (d) erosion control measures for high-value assets such as towns against the higher inundation depths due to climate change are estimated at \$2,671 million in investment costs and \$54 million in annual recurrent costs



AGRICULTURE AND FOOD SECURITY

Impacts

- The combined effects of rising temperatures, higher precipitation, severe flooding, occasional seasonal droughts, and loss of arable land in coastal areas resulting from climate change are expected to result in declines in rice production of 3.9 percent each year, or a cumulative total of 80 million tons over 2005–50.
- Overall, climate change is expected to decrease agricultural GDP by 3.1 percent each year—a cumulative \$36 billion in lost value-added—during 2005–50.
- The economic losses increase by threefold—to a cumulative \$129 billion
- And as high as \$5.1 billion per year under more pessimistic climate scenarios—with economic losses rising in later years.
- The southern coastal regions and the northwestern regions are expected to experience the largest income declines.



ADAPTATION PRACTICES

Rice Variety

Salinity tolerant Aman variety:

- BRRI dhan40
- BRRI dhan41

Salinity tolerant Boro variety:

BRRI dhan47

Early Aman Variety for Cyclone affected areas

- BINAdhan-7 :

Other varieties

BINA variety for saline areas

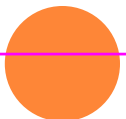
- BINA China badam-1
- BINA China badam-2

Salinity Resistant Jute variety by BJRI

- HC-2, HC 95, CVL 1

Saline tolerant sugarcane variety

- ISWARDI-40 BY BSRI



ADAPTIVE CROPPING PATTERN IN COASTAL SALINE AREA

- BRRI dhan47-BRR dhan40/BRRI dhan41/BRRI dhan46/BR23
- BRRI dhan40/BRRI dhan41/BR23-BRRI dhan47
- BRRI dhan27-BRRIdhan41-Tomato

- BRRI dhan41-Cowpea (Felon)/Watermelon


- Bhatisk found more tolerant (8-12 ds/m) in saline condition compared to Radish, red amaranth which resulted higher yield and income.

- Bottle gourd, bean and sweet gourd are more remunerative than other root (radish, carrot) and fruit type vegetables (Lady's finger, bitter gourd)

- Other salt tolerant non rice-e.g. Chili, Carrot, Sugar beet, Barley

ADAPTATION TO LOCAL-LEVEL PERSPECTIVES

Impacts

- The risks from tropical cyclones, storm surges, floods, and other climatic hazards are geographically concentrated in specific regions of the country, which also have higher concentrations of the poor.
 - The poor and the socially most vulnerable are disproportionately affected, as they have the lowest capacity to cope with these losses.
 - The most vulnerable population includes those with few assets, subsistence farmers, the rural landless, the urban poor, fishing communities, women, children, and the elderly.
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ADAPTATION TO LOCAL-LEVEL PERSPECTIVES

- The most common forms of private adaptation activities among surveyed households are temporary migration of adult men for day labor, construction of platforms to protect livestock, and storage of food and drinking water prior to extreme events.
- The preferred public adaptation activities from a local perspective—include
 - (a) environmental management (mangrove preservation, afforestation, coastal greenbelts);
 - (b) water resource management (drainage, rainwater harvesting, drinking water provision, and flood control);
 - (c) Infrastructure (roads, cyclone shelters);



ADAPTATION TO LOCAL-LEVEL PERSPECTIVES

- (d) livelihood diversification and social protection for fishers during the cyclone season;
- (e) education;
- (e) agriculture, including development of salt-tolerant and high-yield varieties and crop insurance;
- (f) fisheries, including storm-resistant boats and conflict resolution between shrimp and rice farmers;
- (g) governance, especially access to social services for urban poor;
- (h) gender-responsive disaster management, including separate rooms for women in cyclone shelters, mini-shelters closer to villages and
- (i) mobile medical teams in Char areas.



NATIONAL AND INTERNATIONAL
INITIATIVES FOR CLIMATE CHANGE



POLICY DOCUMENTS WHICH ADDRESSES THE ISSUES OF CLIMATE CHANGE

The following national policy documents developed by the Government of Bangladesh (GoB) have addressed the issues of climate change including adaptation:

- The Constitution: through its 15th amendment, considered the issue of climate change, albeit implicitly. Constitutional Amendment included the following article in 'Part II: Fundamental Principles of State Policy' and was passed accordingly: “18A. Protection and improvement of environment and biodiversity: The State shall endeavour to protect and improve the environment and to safeguard the natural resources, biodiversity, wetlands, forests and wild life for the present and future citizens.”
- Vision 2021: Vision 2021 that provides political directions to all national policy documents states, “All measures will be taken to protect Bangladesh, including planned migration abroad, from the adverse effects of climate change and global warming.”



POLICY DOCUMENTS WHICH ADDRESSES THE ISSUES OF CLIMATE CHANGE

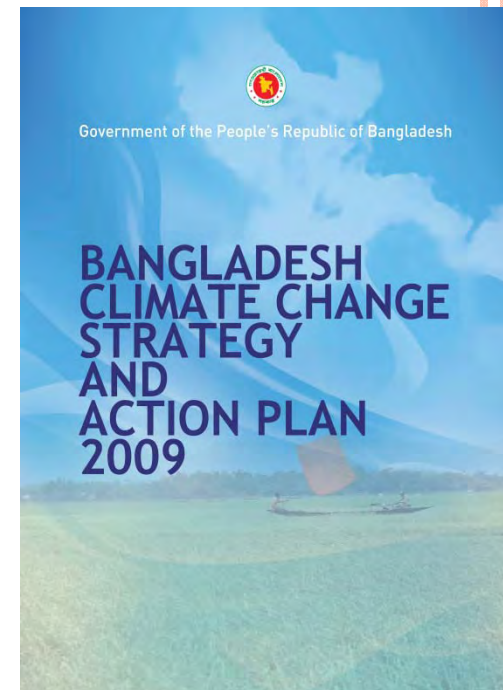
- Sixth Five Year Plan (SFYP): ‘Bangladesh Sixth Five Year Plan FY2011-FY2015’ provides strategic directions and policy framework as well as sectoral strategies, programmes and policies taking consideration of CC adaptation for accelerating growth and reducing poverty of the country.
- Other Policy Documents: It has been observed that other national sectoral policy documents that are being reviewed currently also considering the effects of climate change and directing policy propositions to combat those.
- Bangladesh Climate Change Strategy and Action Plan first prepared in 2008, modified and approved by the Government in 2009 with wide consultation with Government and non government sector, community based organization, development partners, experts, academia etc.
- BCCSAP – 2009 is a one of the first landmark document among the developing countries.



BCCSAP 2009

SIX THEMATIC AREAS

- Food security, social protection and health
- Comprehensive disaster management
- Infrastructure
- Research & knowledge management
- Mitigation & low carbon development
- Capacity building & institutional strengthening
 - 44 thematic programmes developed
 - Implementation of several projects initiated



NATIONAL CLIMATE CHANGE INITIATIVES

- Bangladesh is active to address climate change issues
- Climate change cell (CCC) was established in the year 2004 under the Department of Environment
- CCC has been working for climate change mainstreaming, capacity building, knowledge management, modeling, awareness building and adaptation research. So far cell published 40 publications.
- Bangladesh already submitted initial national communication to the UNFCCC in the year 2002 and expected to submit its second national communication in June, 2012.
- NAPA prepared in 2005 and updated in 2009



NATIONAL EFFORTS- CLIMATE CHANGE TRUST FUND

- Enactment of Climate Change Trust Fund Act, 2010.
- Establishment of Climate Change Trust Fund (CCTF) and Climate Change Trust Fund Board.
 - Establishment of climate change unit under the ministry of environment and forest and climate change focal point in different ministries
- Budget allocation for CCTF: US\$ 100 million for 2009-2010 and US\$ 100 million for 2010-2011 from Government's own resources. Government also allocated same amount of money for the current financial year



BANGLADESH CLIMATE CHANGE TRUST FUND

- CCTF has approved 82 government projects for implementation. An amount of Tk. around 150 million USD has been allocated for these projects.
- CCTF has also approved on principle around 55 projects of NGOs (around 35 crore taka)
- Several projects of Government and NGOs are in the process of consideration



Bangladesh Climate Change Resilience Fund (BCCRF)

- ❑ BCCRF , signed May 2010, Managed by GoB, Trustee WB
- ❑ **Objective; Implementation of BCCSAP**
- ❑ **Implementation by GO line agencies, 15-25 M USD, 3 years**
- ❑ **Governing council: Advise, oversee, approve, advocate, 17 member**
- ❑ **Minister MoEF is chair person and secretary MoEF is the member secretary, 2 donor member, 2 civil society, one WB**
- ❑ **Management committee: Budget of BCCRF, review, endorse grant proposals, day to day management**
- ❑ **Secretary of MoEF is the chair for management committee and joint secretary (development) is the member secretary**



Bangladesh Climate Change Resilience Fund (BCCRF)

- PKSF is the lead implementation agency and to produce separate operating procedure for grants for the NGOs
- Support the development of grassroots communities to increase their resilience
- A total of 10% of the BCCRF will be channeled for CSO/NGO
- WB will ensure the fiduciary responsibility
- Board of governors of PKSF will approve the projects
- Under go same review process as for government projects



Available Fund and Allocation

- ***A total 125 million USD is available currently***
- 3 ministry proposals have already been selected:
 - o LGED – cyclone shelters – USD 25m
 - o DAE – resilient crops – USD 25m
 - o MoEF – coastal and hilly afforestation – USD 25m




FUTURE PROBABLE ADAPTATION STRATEGY

Near term

- **Addressing current climate-related risks**
- **Research and Knowledge Building**

Medium to Long Term

- **Sound development policies**
 - **Adjustment of design standards for infrastructure**
 - **Development of climate-resilient cultivars and cropping**
 - **Improved governance and stakeholder participation**
 - **Strengthened regional cooperation**
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CONCLUSION

- Bangladesh is one of the most vulnerable country to Climate change and CC impacts will be enormous in the coming near future
- Livelihood support and employment opportunity for the poor and ultra poor will be drastically reduced particularly for the vulnerable areas
- For making country climate resilient up to 2050 Bangladesh needs huge investment
- In BCCSAP -2009 44 programs and in NAPA 45 adaptation options is identified. For implementation of adaptation options the country will need to invest a lot of money.



CONCLUSION

- As Bangladesh invested over 10 billion USD for the last three decades to make the country more climate resilient. For implementation of BCCSAP Bangladesh will need 5 billion USD for the first five years. So adaptation activities will create some employment opportunities.
- Bangladesh should prepare itself for the proper implementation of BCCSAP and NAPA
- Policy and planning support needed to generate sector specific and need based human resources.
- Capacity building
- Institutional mechanism
- Diplomatic and negotiation skill should be enhanced to get the financial and technical support to meet the adaptation needs





THANKS

