Food Security and Climate Change: Building Adaptation Strategies for Bangladesh

by
Mozaharul Alam and Atiq Rahman
Bangladesh Centre for Advanced Studies (BCAS)

The Role of Food, Water and Biomass in Rural Development: Opportunities and Challenges

Environmental Development Action in the Third World (ENDA)
Dakar, Senegal

About Presentation

- Study Team
- Objectives
- Study Methodology
- Result – Land use changes and biomass production
- Next Steps
- Concluding remarks

Team

- Dr. Atiq Rahman – overall guidance
- Mr. Mozaharul Alam – principal investigator and coordinator
- Mr. Dwijen Mallick – analysis of social aspects
- Mr. Abdul Alim – GIS and database analysis
- Mrs. Arifah Ahmed – GIS analysis
- Mr. Shohel Parvez – field investigation
- Mr. Rabi Uzzaman – field investigation

Objectives

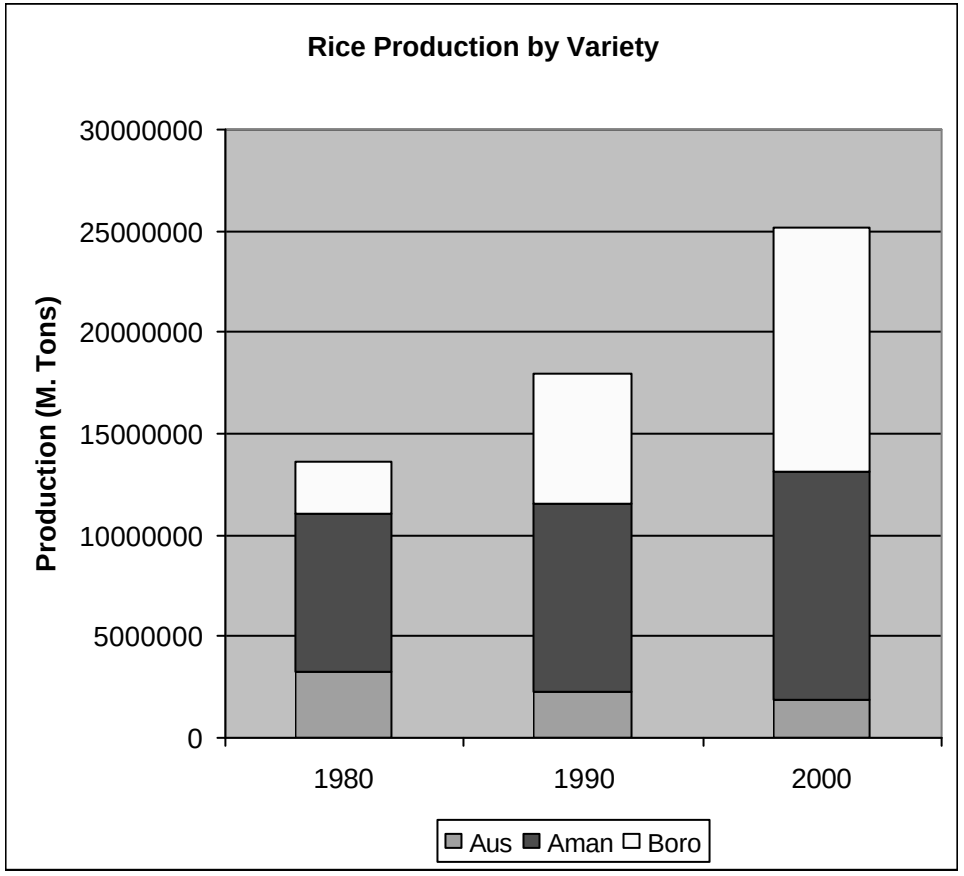
- Enhance understanding of implications for national and international policy making on land use change and food security in Bangladesh;
- Enhance understanding on implication on water use and biomass production due to land use changes;
- Contribute to a synthesis paper on rural development land use change for food security, water and biomass, and (inter) national policy making;
- Participate and contribute to two international workshops;
  - One on rural development and the role of biomass and
  - One on the implications of the “development first approach” for international climate policies
- Help to build Adaptation Strategies for Bangladesh in the context of Food Security and Climate Change
- Share with relevant stakeholders including policy makers

Methodology

- Top-down Approach
  - Collection of data (agriculture, forest etc) from National Sources (agricultural census and statistics, bureau of statistics, etc) by administrative district;
  - Analysis data to see land use changes over time and space;
  - Overlay with existing and future problems related to climate to find possible area for bottom up analysis;
- Bottom-up Approach
  - Understand location and context specific changes and coping mechanisms with implication (good, bad etc.)
  - Discussion with individuals and Focus Group Discussion (FGD)
  - Compile and synthesis of findings to build adaptation strategies

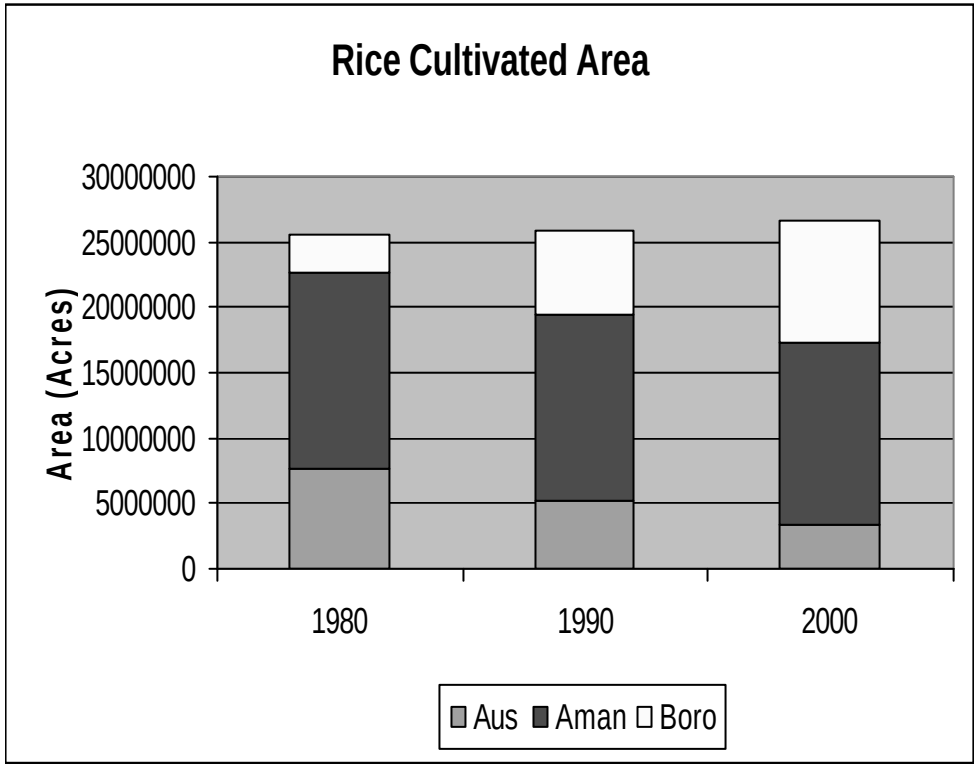
Study Results (Partial…): Changes in Production

- Overall production of rice has increased from 13.66 million to 25.10 from 1980 to 2000
- Population has increased from 90 to 129 million from 1980 to 2000
- Country became food-grain self sufficient due to increased production
- Contribution of High Yielding Variety (*Boro*) is significant



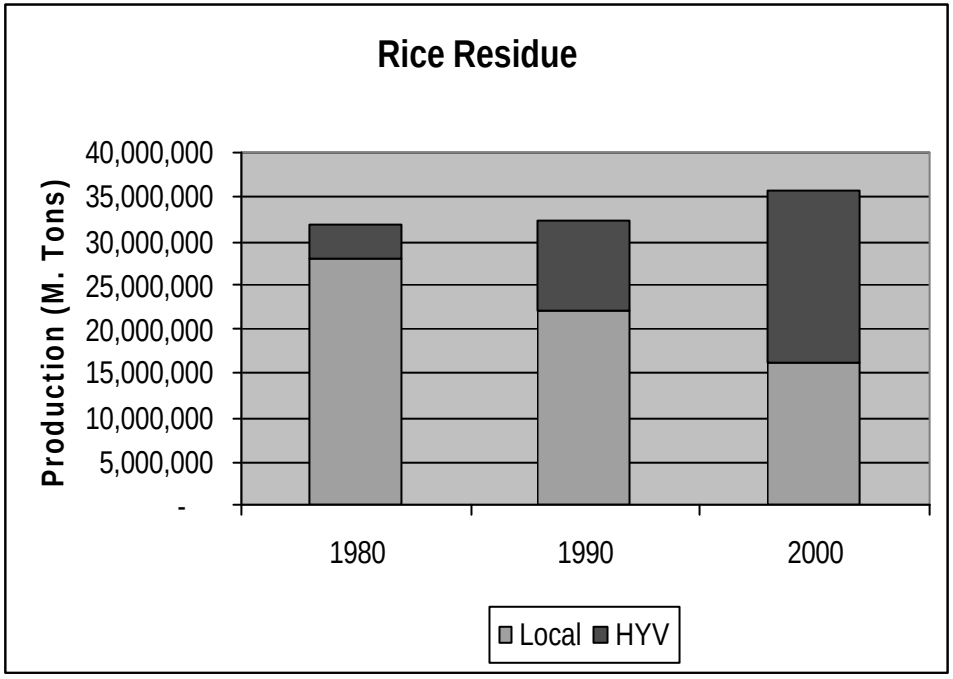
Study Results (Partial…): Changes in Area

- Agricultural land area of the country is declining at the rate of 200 ha/day
- Overall cultivated area has increased due to increased crop intensity (176 in 2001)
- Cultivated area under High Yielding Variety (boro) has increased significant
- Significant decrease is observed in Aus cultivation

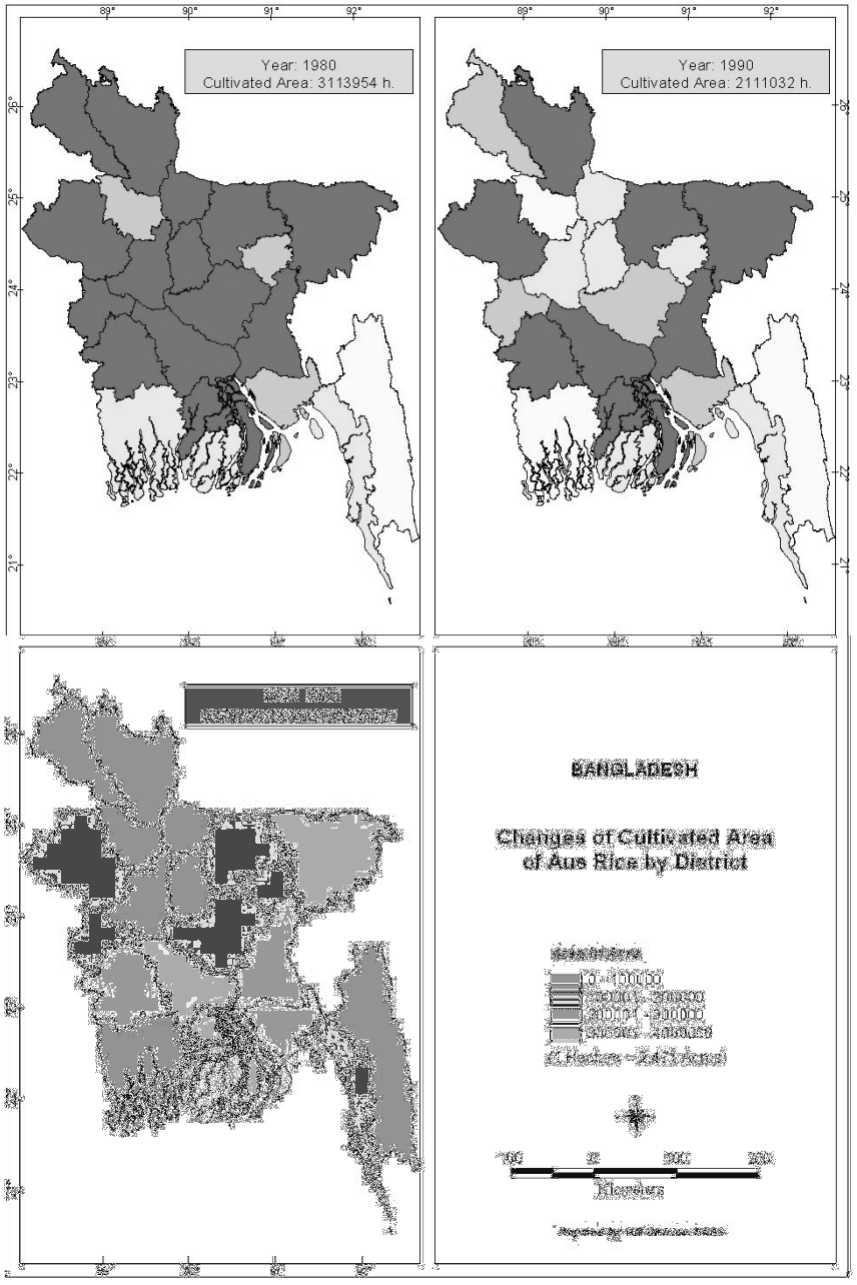


Study Results (Partial...): Changes in Biomass Production

- Production from local variety has declined
- Production from high yielding variety had increased
- Total residue from rice production has increased but is not doubled as production
- Less replenishment of soil micro nutrient from biomass
- Crop biomass is using as fodder and fuel in rural area



Study Results (Partial...): Changes in *Aus* Cropped Area



- Aus cropped area has declined over the years
- In 1980, it was 3.11 Mha and became 2.11 Mha in 1990.
- In 2000, it was only 1.33 Mha.
- Major changes noticed in northwest and central regions

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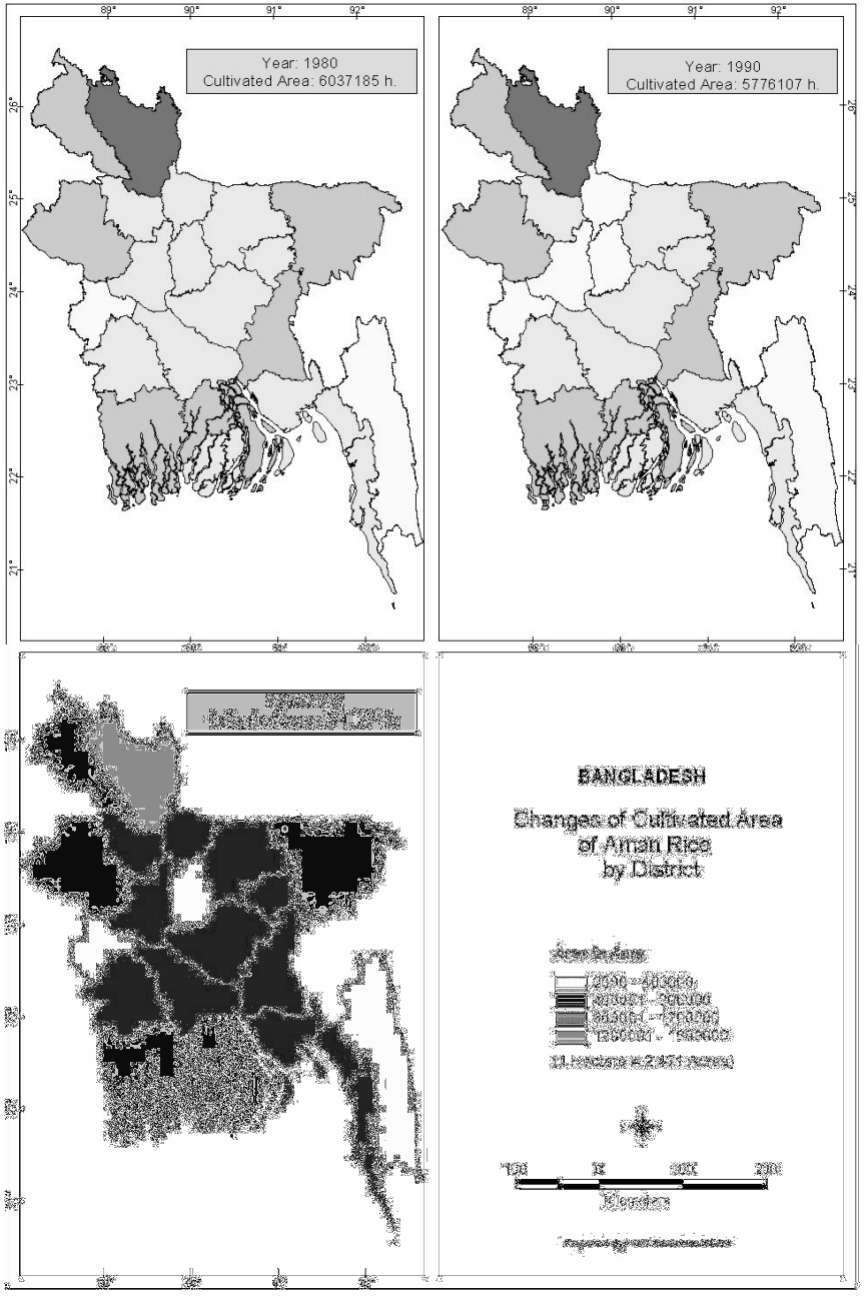
Study Results (Partial...): Changes in *Aman* Cropped Area



- *Aman* cropped area has not declined significantly over the years;
- In 1980, it was 6.03 Mha and became 5.77 Mha in 1990.
- In 2000, it was only 5.71 Mha.
- Changes noticed in northwest and north-central regions

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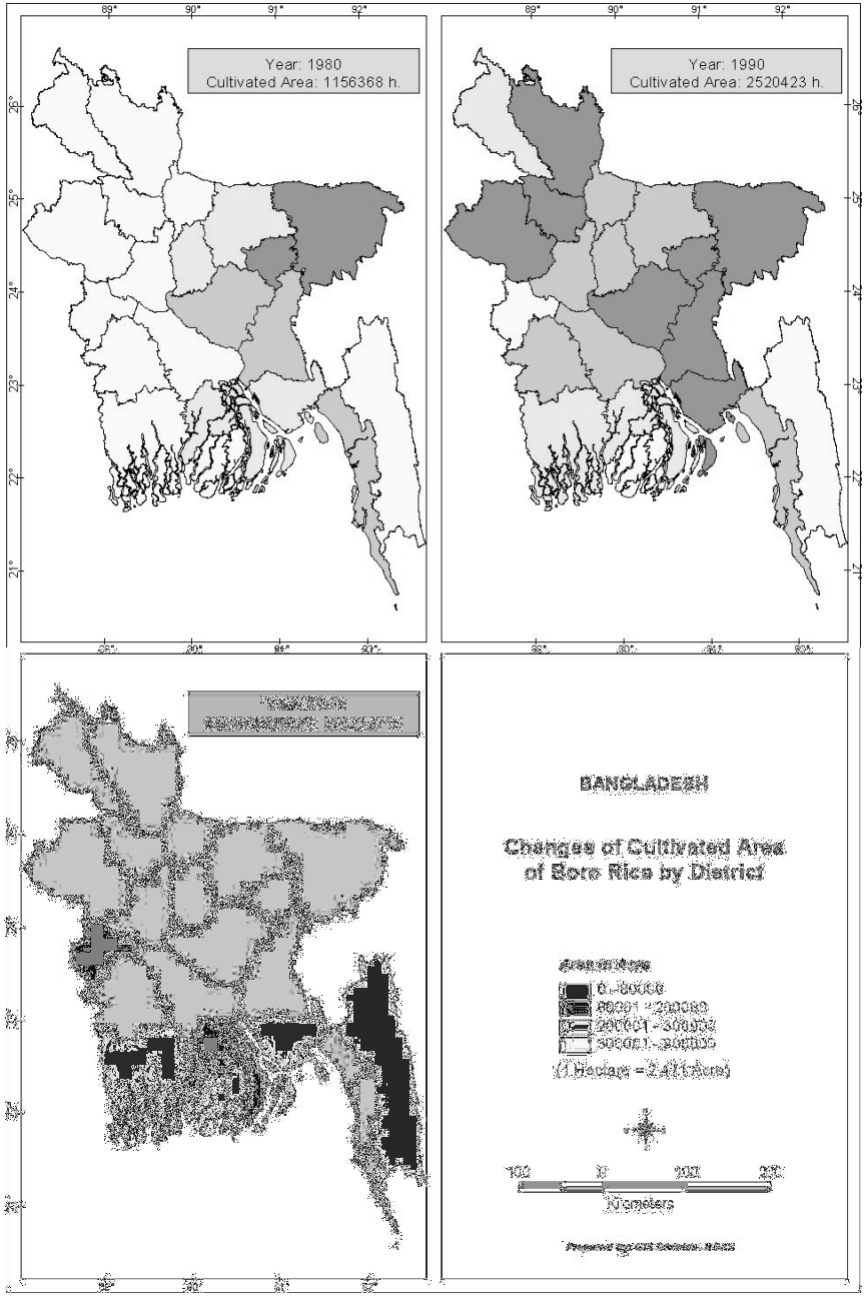
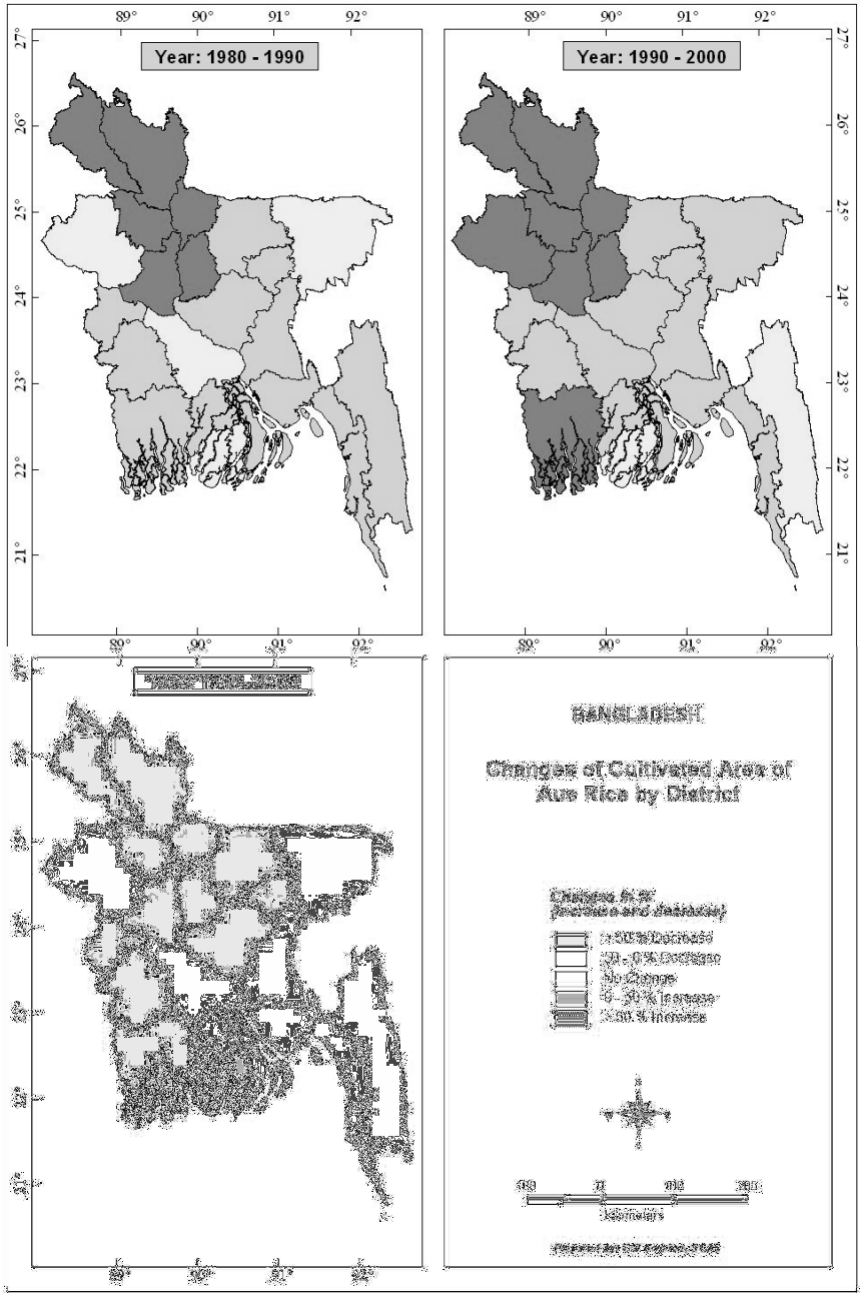
Study Results (Partial...): Changes in *Boro* Cropped Area

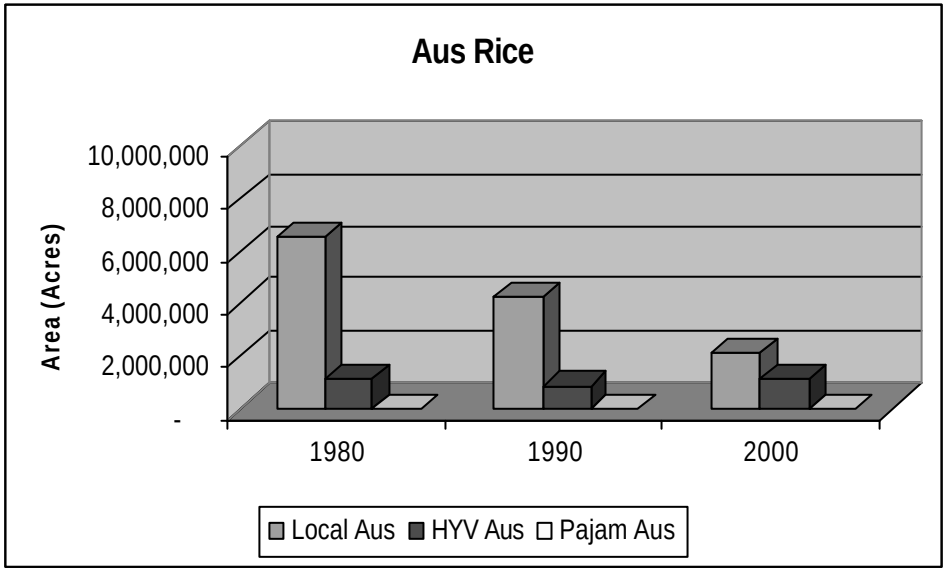


- *Boro* cropped area has increased significantly over the years;
- In 1980, it was 1.15 Mha and became 2.52 Mha in 1990.
- In 2000, it was only 3.76 Mha.
- Major expansion occurs in northwest and southwest regions

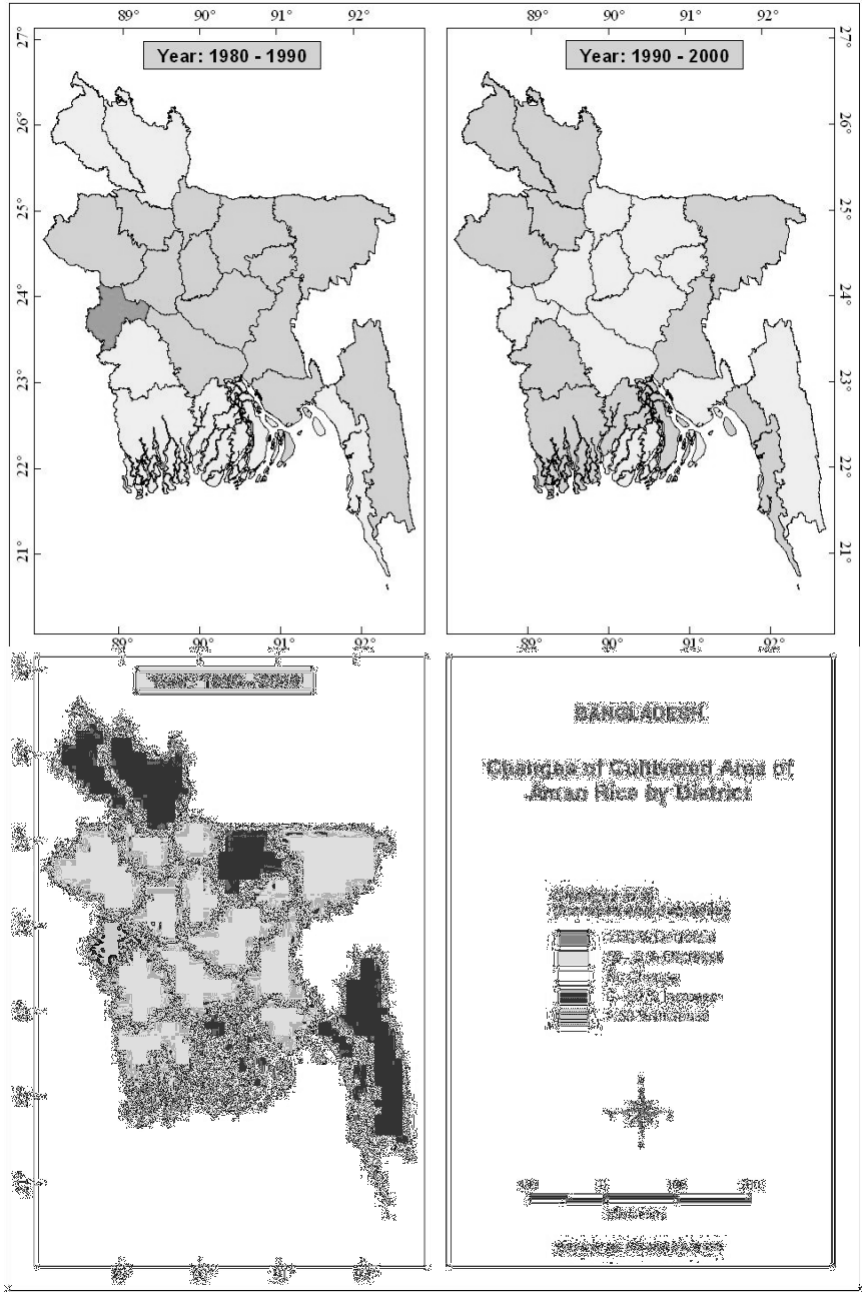
Study Results (Partial…): Changes in *Aus* Cropped Area



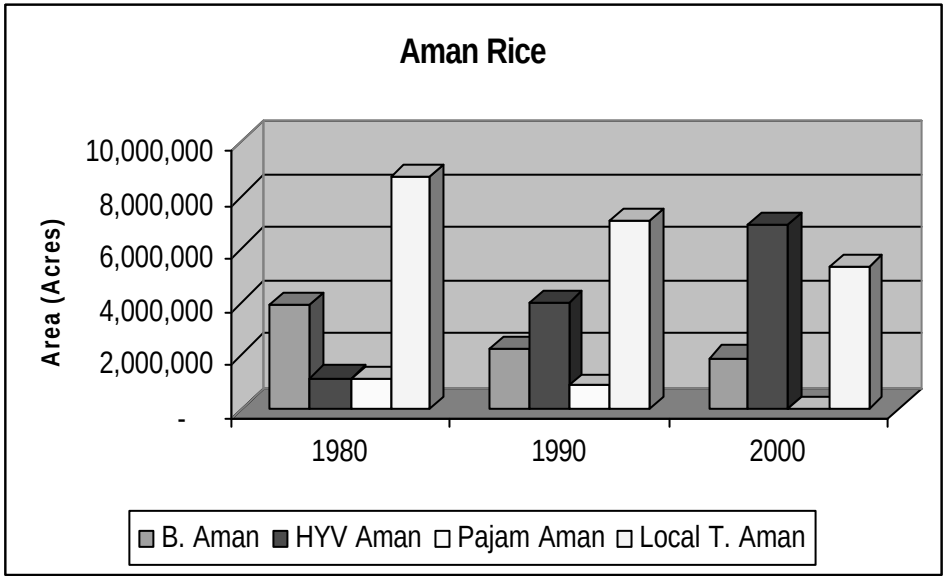
- *Aus* cropped area under local variety has decreased significantly over the years;
- But high yielding variety of *Aus* has increased



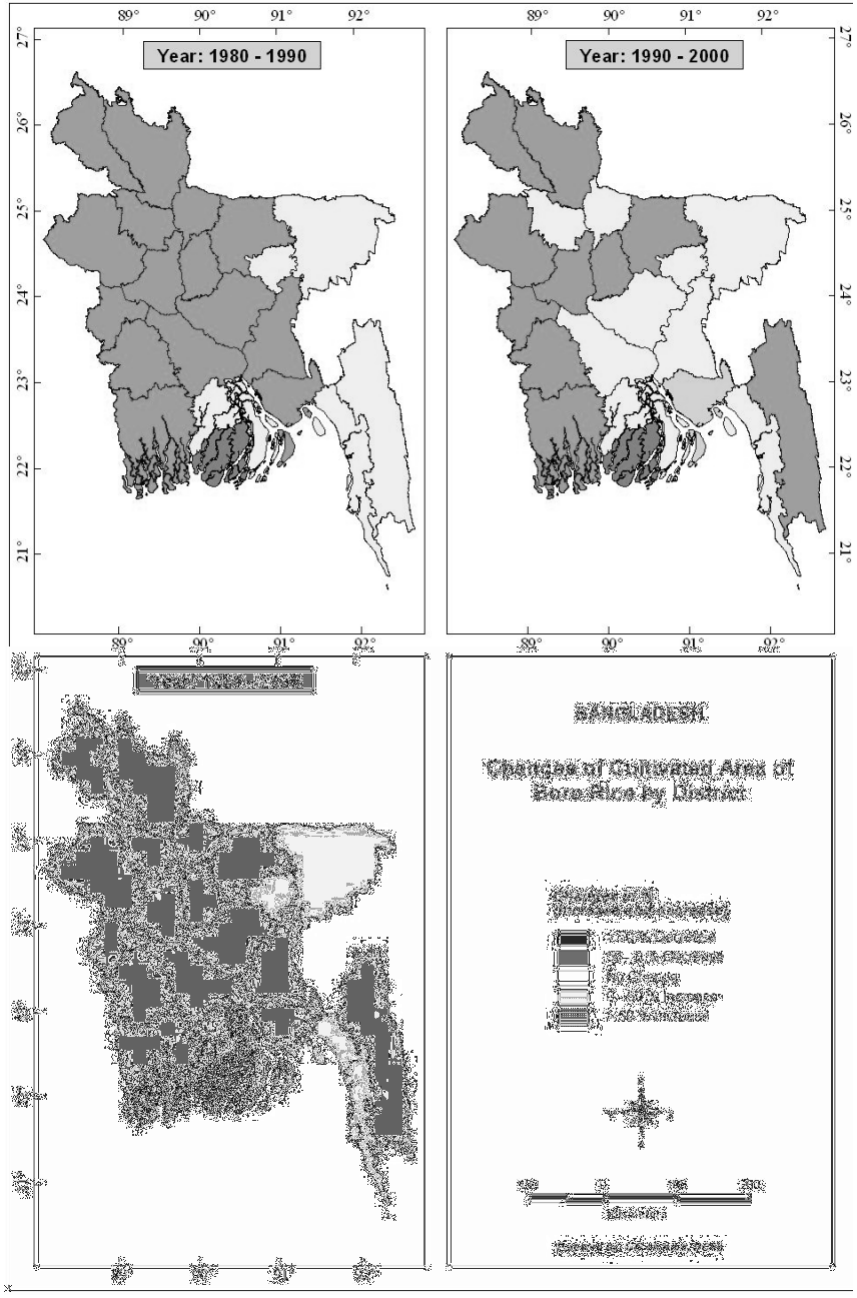
Study Results (Partial...): Changes in *Aman* Cropped Area



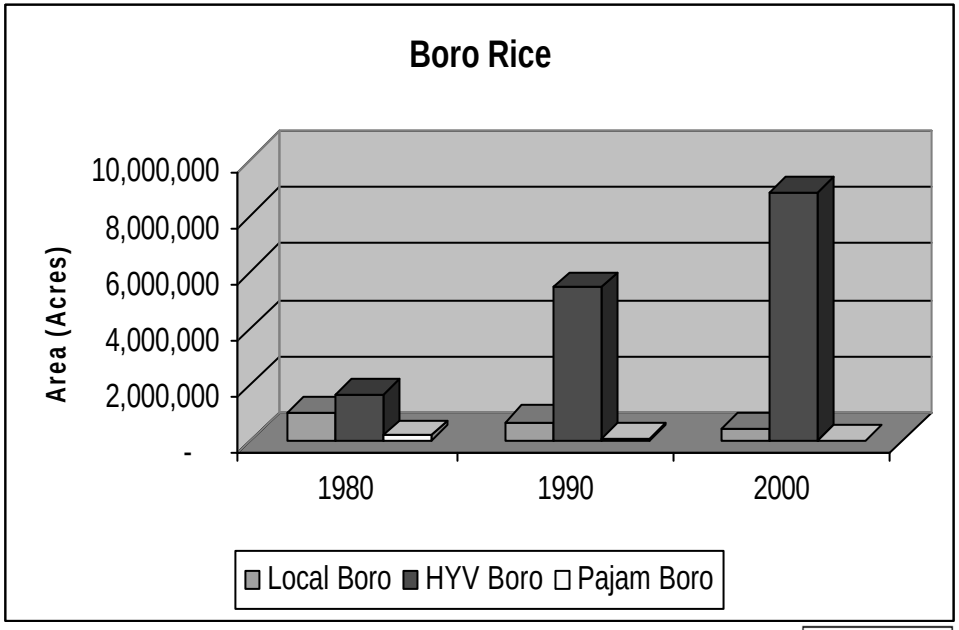
- *Aman* cropped area under broadcast, local transplanted pajam variety has decreased over the years;
- But high yielding variety of *Aman* has increased



Study Results (Partial...): Changes in *Boro* Cropped Area



- *Boro* cropped area under local and pajam variety has decreased over the years;
- But high yielding variety of *Boro* has increased



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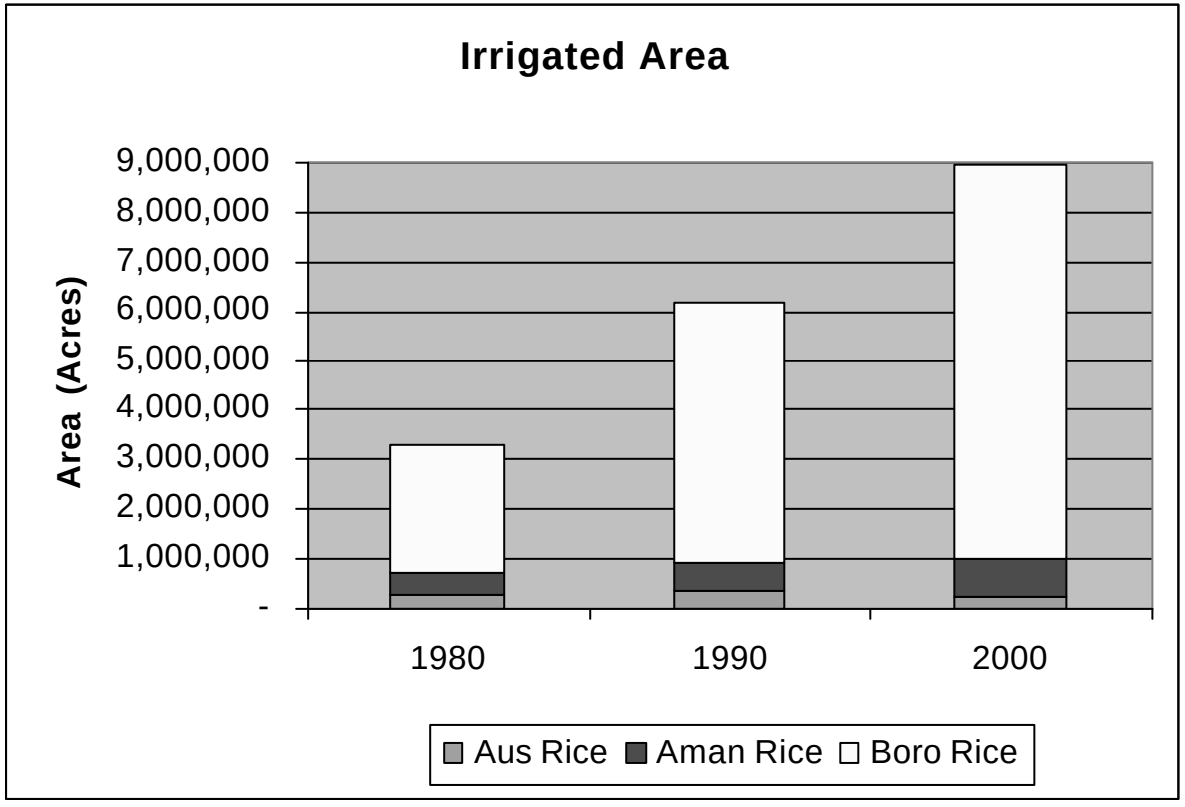
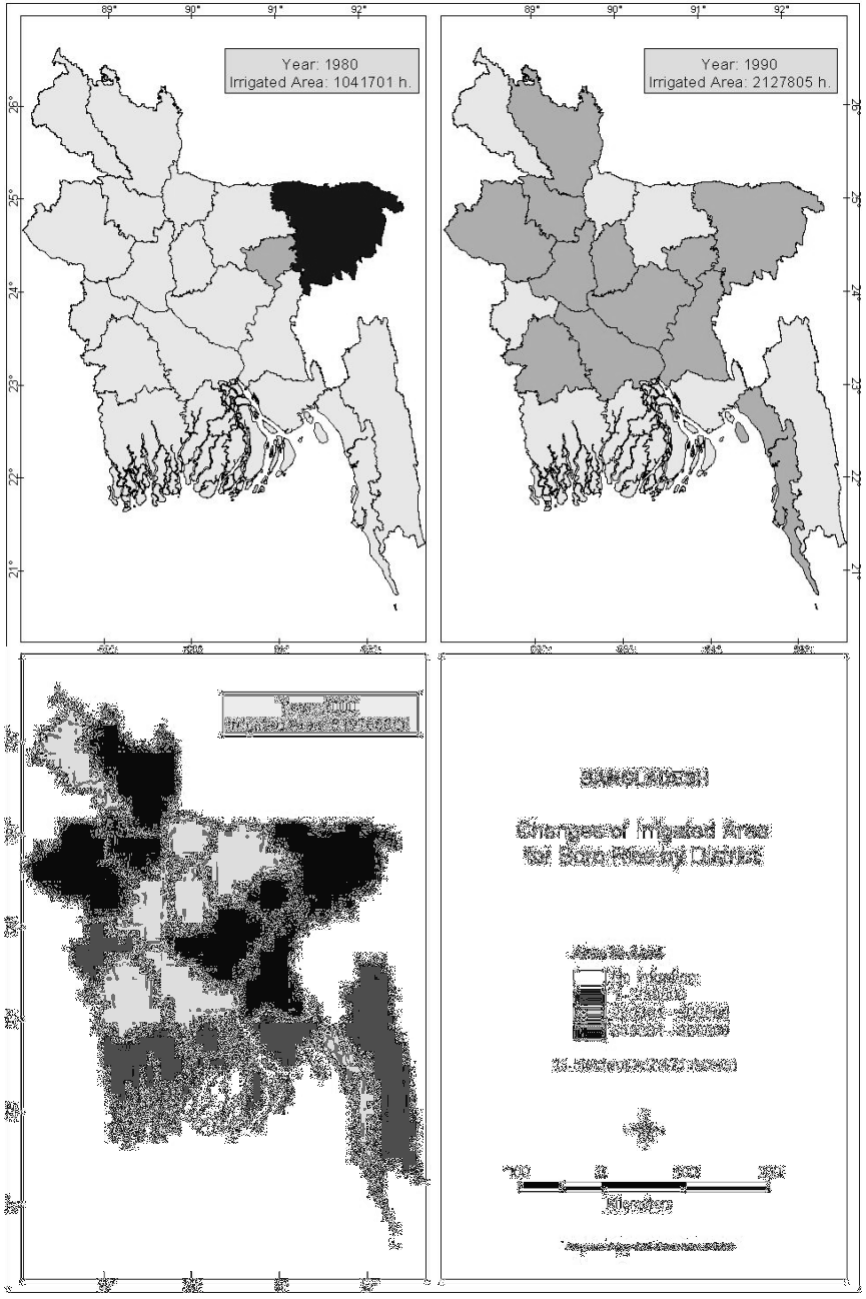
Study Results (Partial...): Changes in Irrigated Area

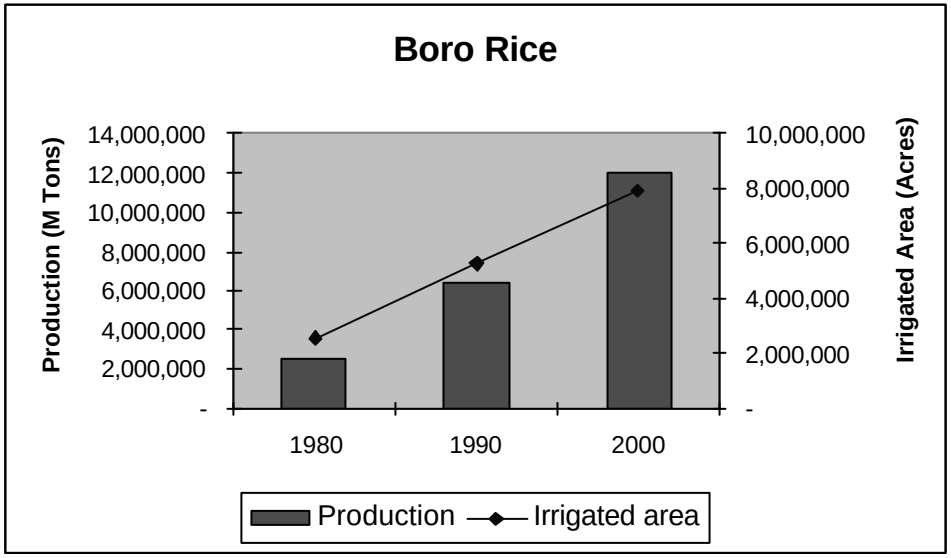
- Irrigated area has increased about 3 times over the last 20 years



Changes in Irrigated Area for *Boro*

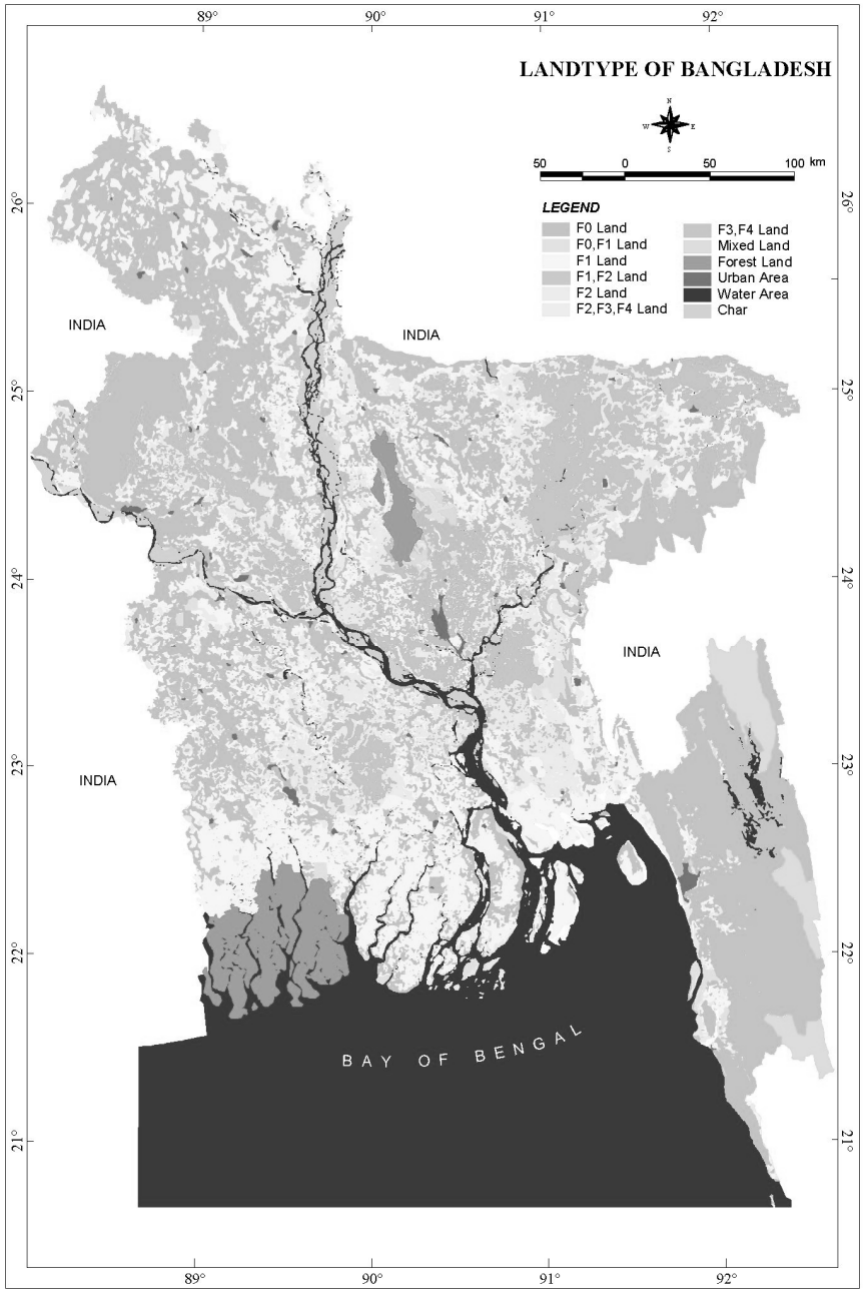


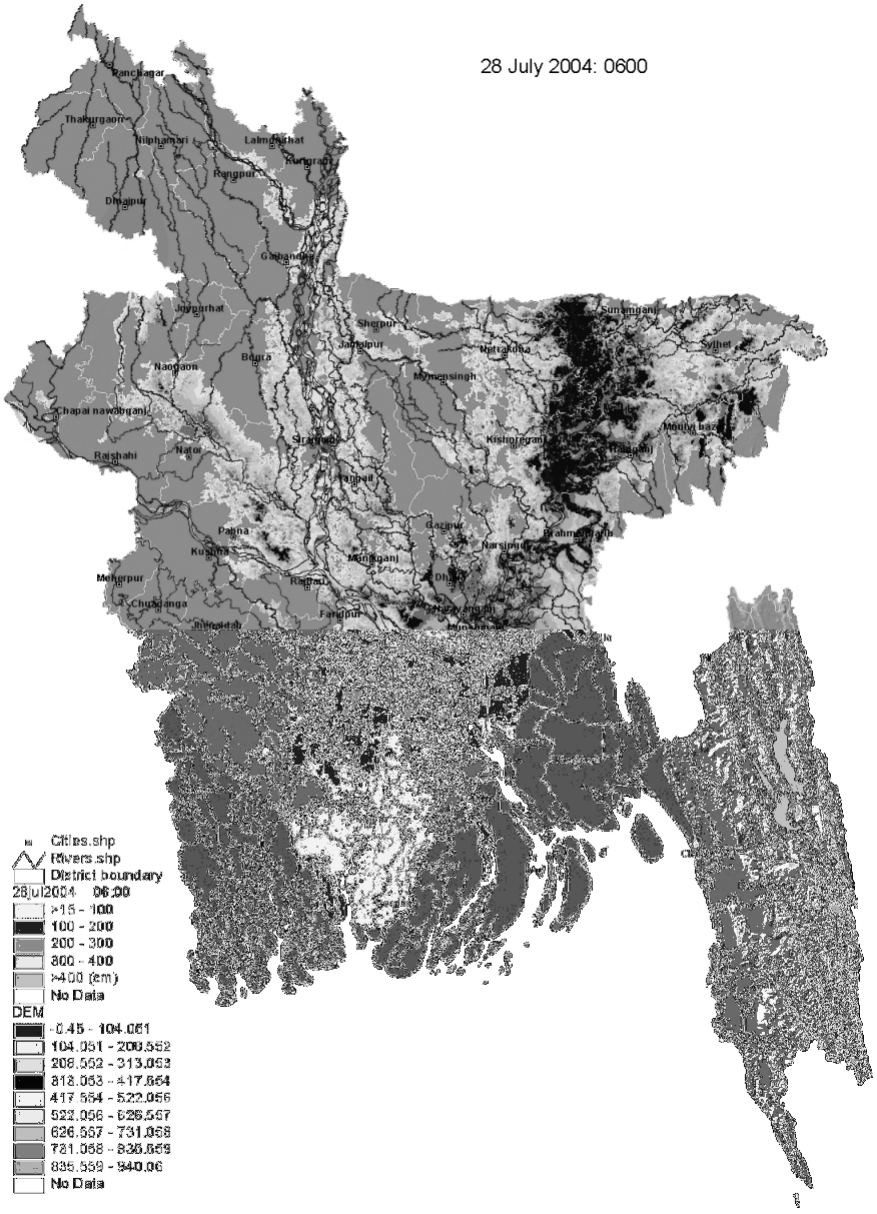
- Irrigated area under *Boro* Rice has increased significantly compared to other rice crops
- Major increased noticed in northwest, northeast and central region



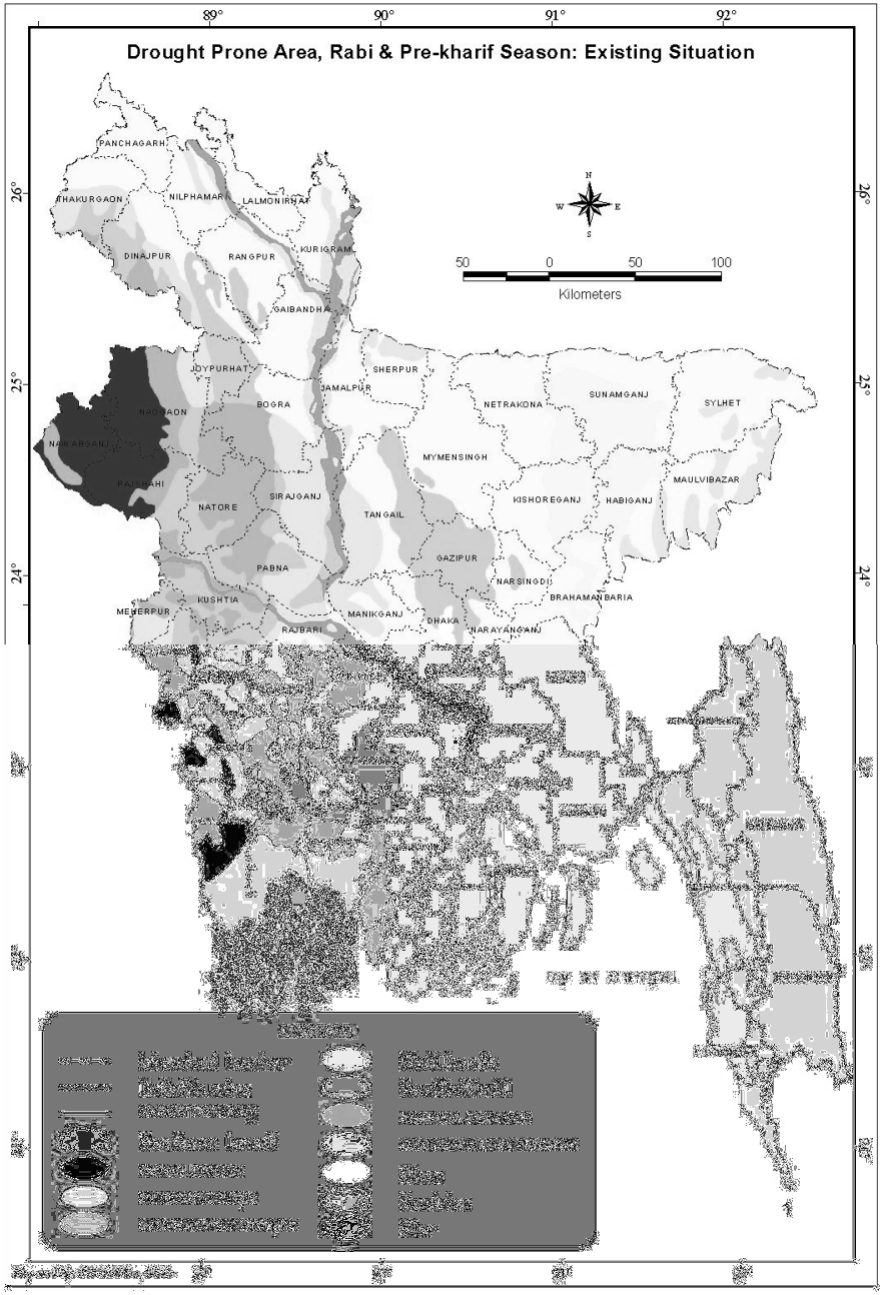
Changes in Natural Physical System due to Climate Changes

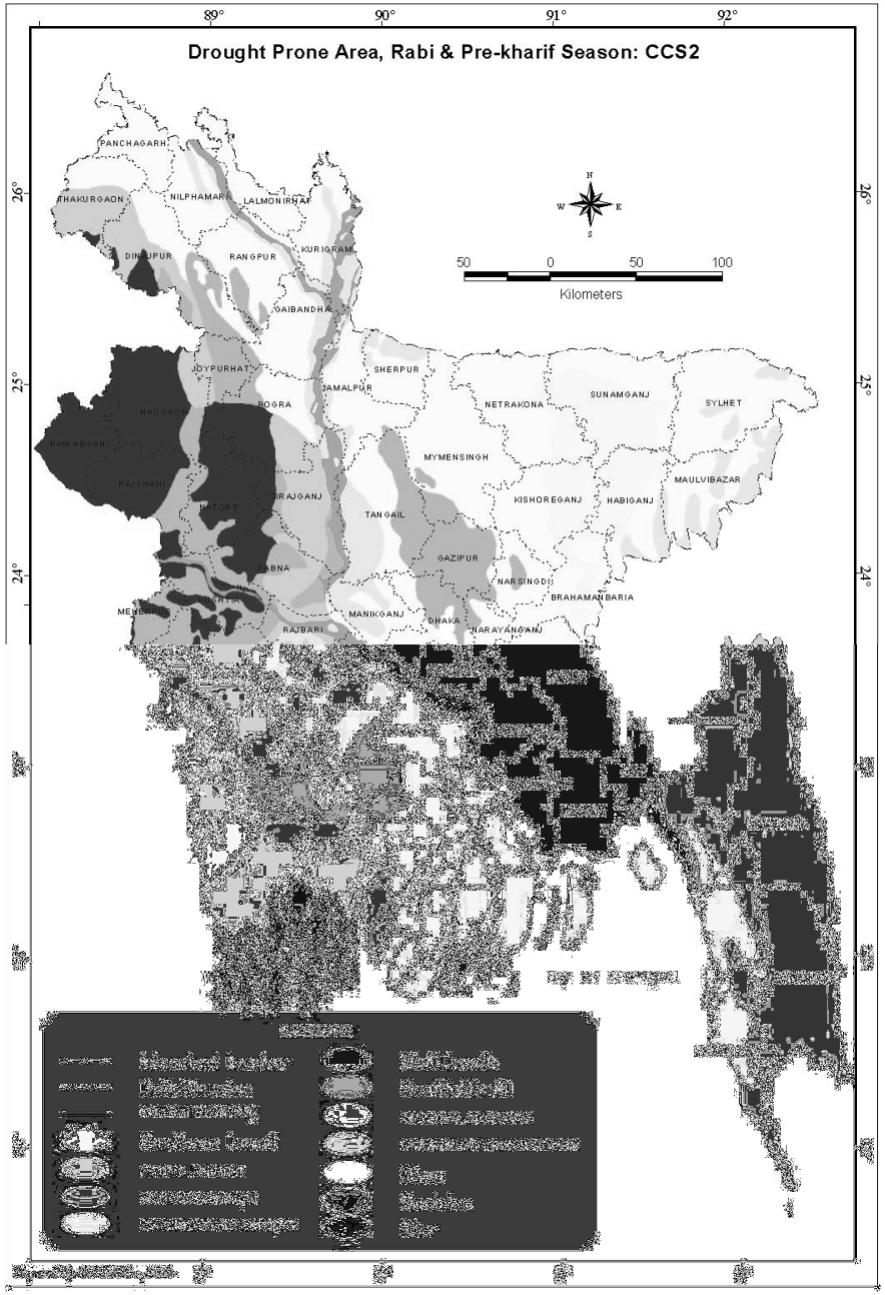
Changes in Flood Regime: spatial and temporal aspects



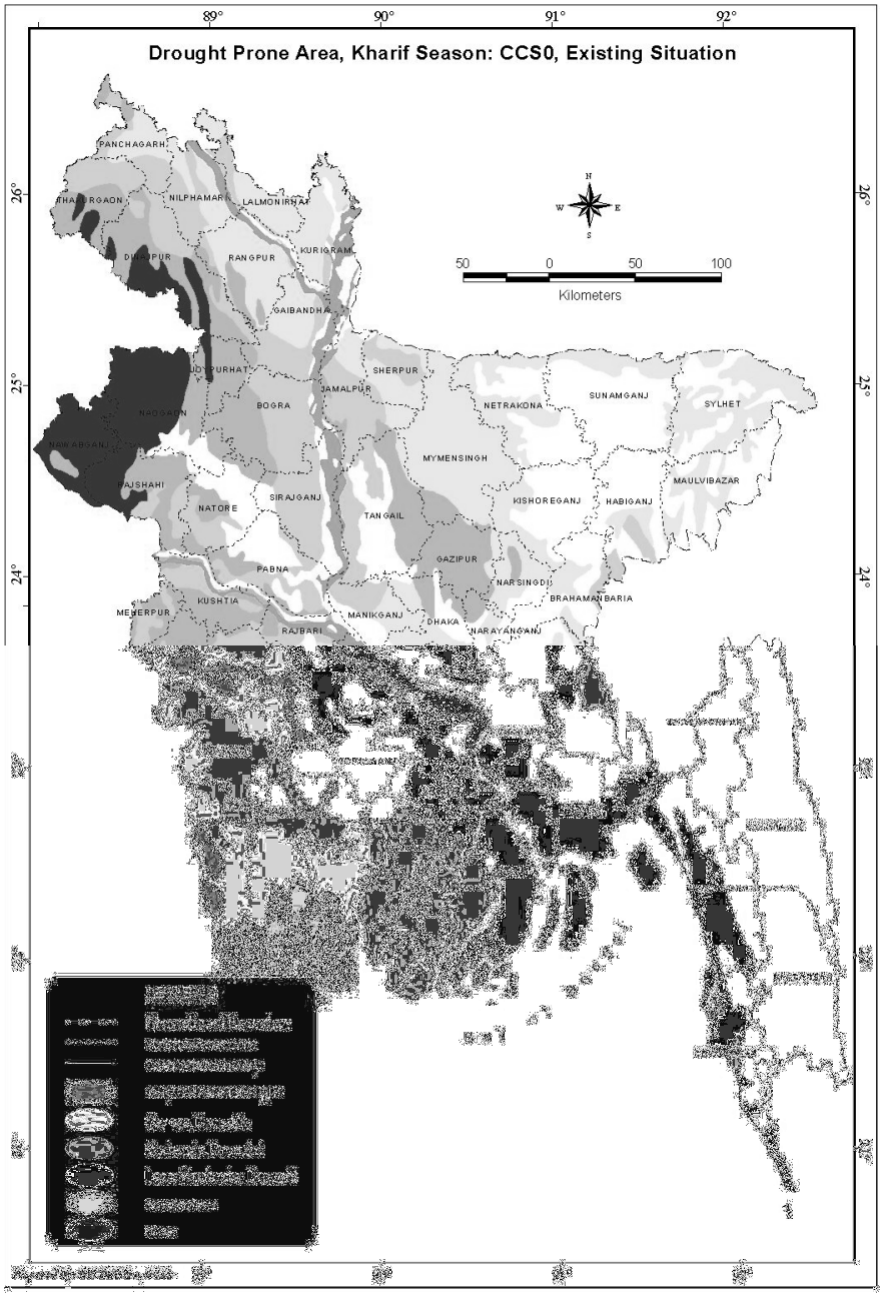


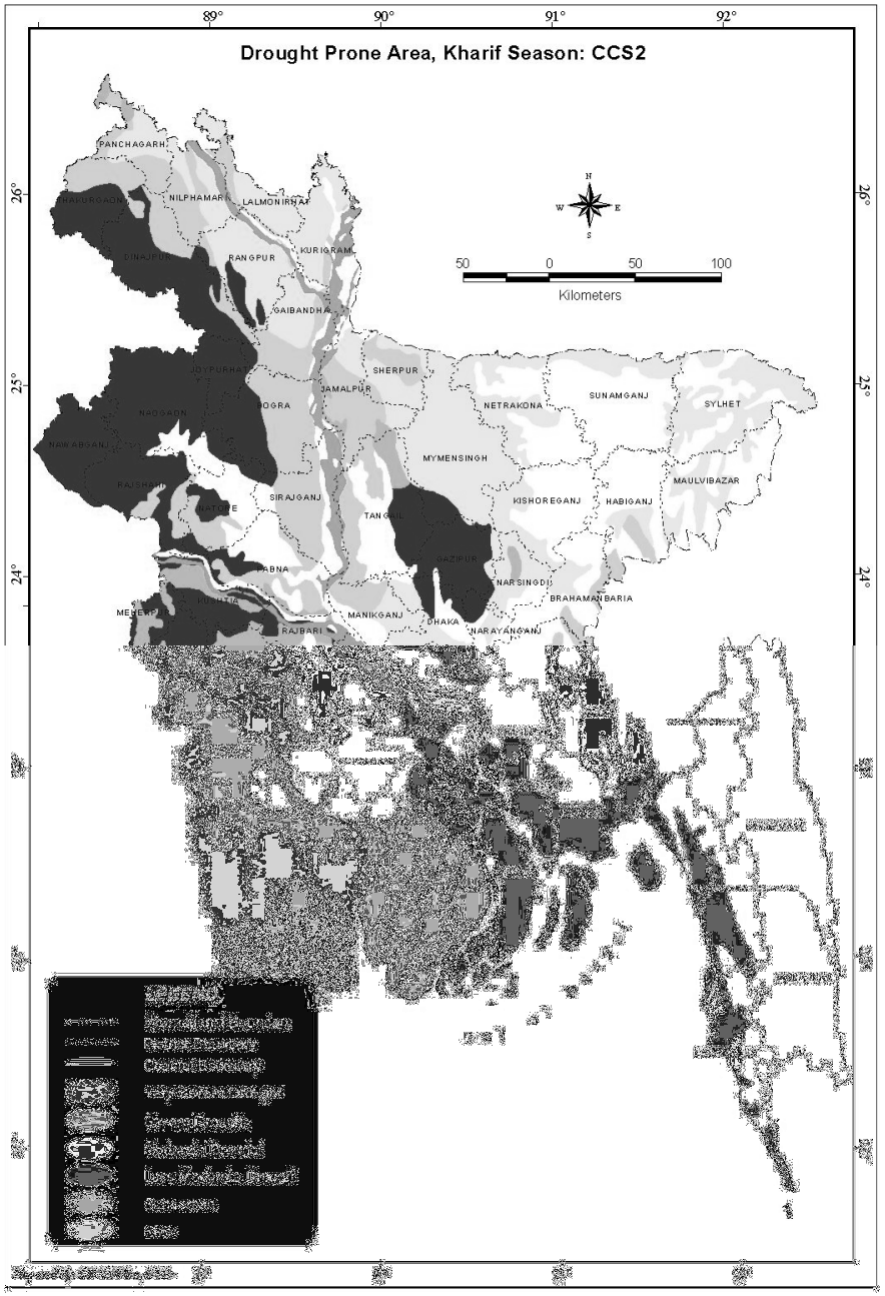
Changes in Drought: spatial and temporal aspects



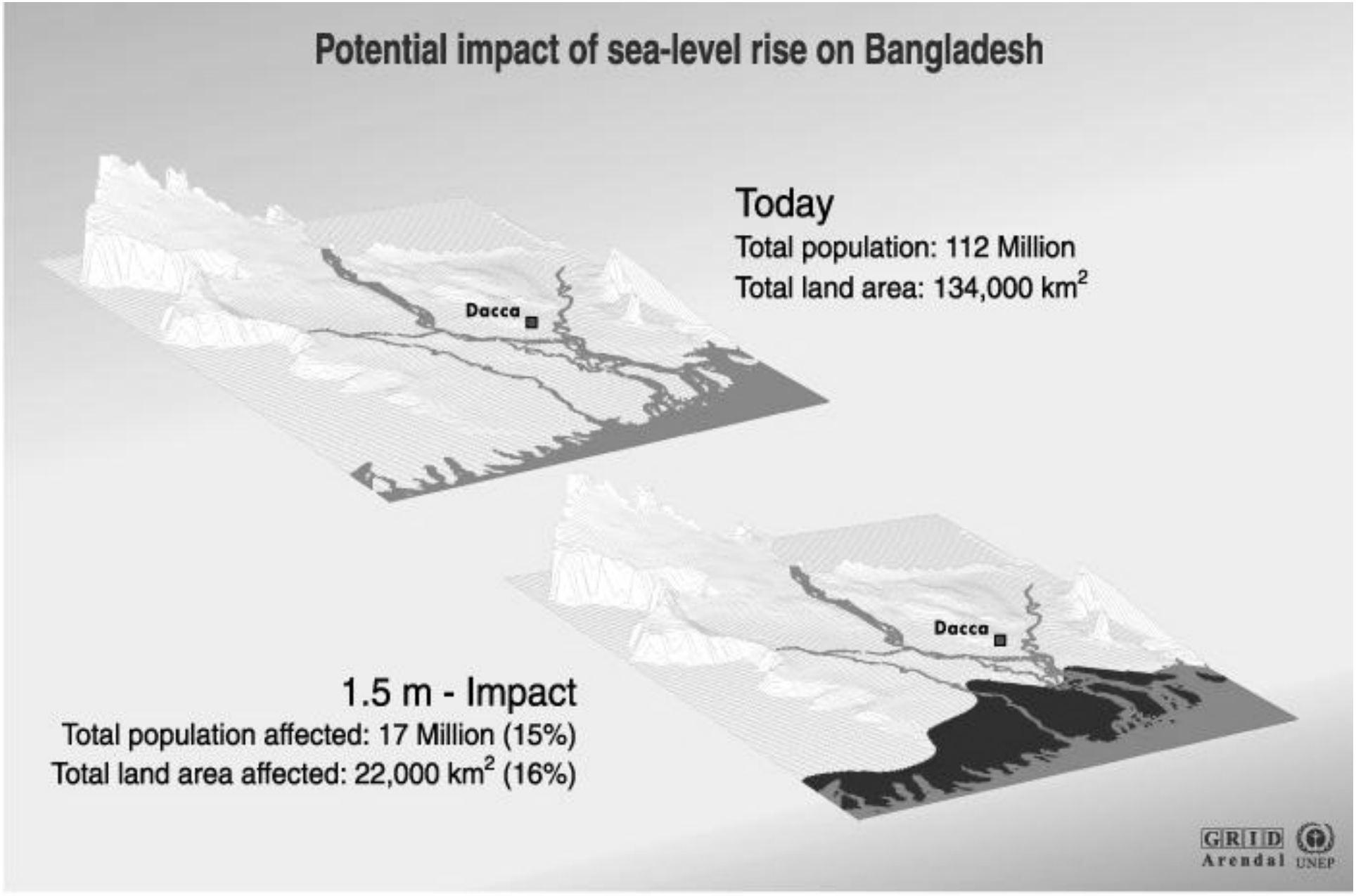


Changes in Drought: spatial and temporal aspects



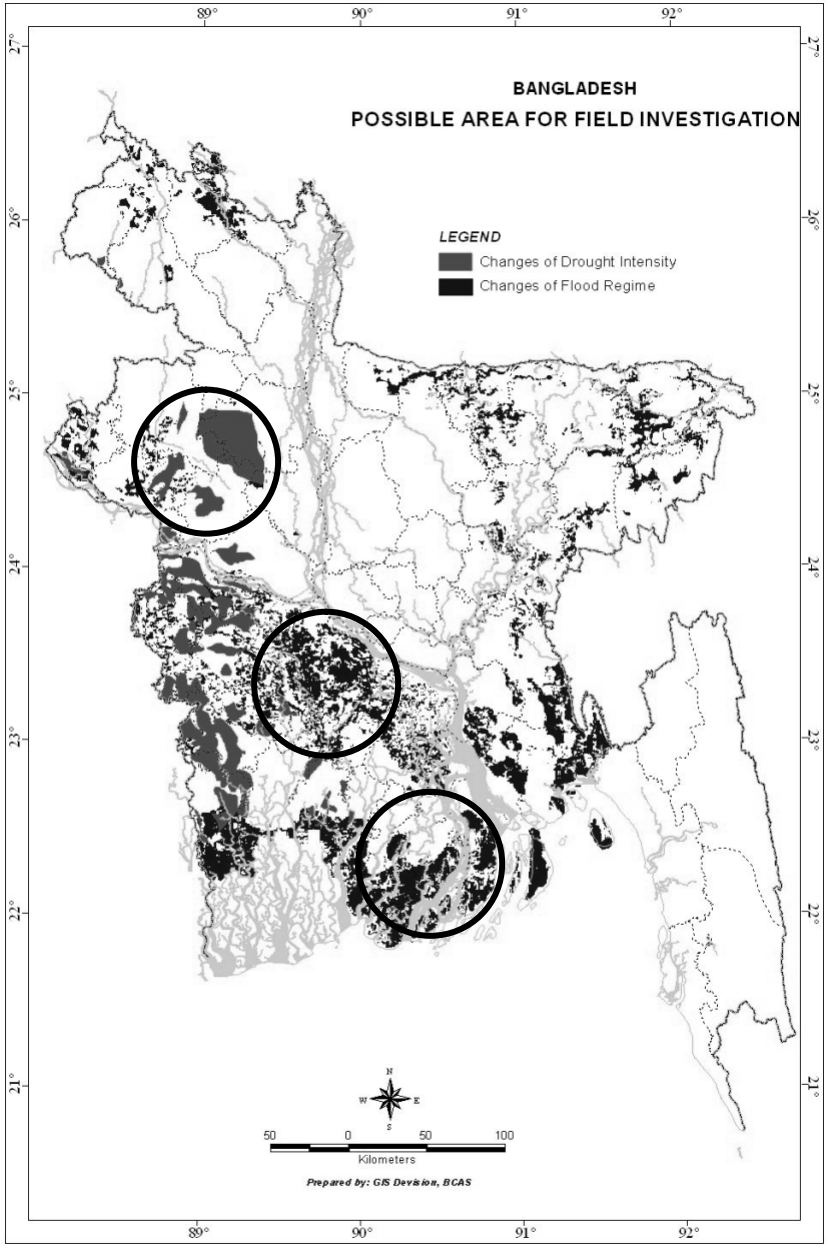


Changes in Drought: spatial and temporal aspects



Source : UNEP/GRID Geneva; University of Dacca; JRO Munich; The World Bank; World Resources Institute, Washington D.C.

Possible Area for Field Level Investigation



- Northwest region for drought
- Central region for flood
- Coastal region for salinity and coastal flood

Concluding Remarks

- Changes occurs in the agricultural system in Bangladesh to ensure food-grain self sufficiency;
- It has compromised with other sectors particularly dependent on water;
- Changes in thinking is emerging and number of pilot scale activities are going on;
- Our analysis and finding through bottom-up approach will able to contribute in the discussion and policy making in Bangladesh;
- Help to build agricultural sector adaptation in the context of climate change and food security is a target

Thank You