A Presentation on

Drought Vulnerability in Barind Area of Bangladesh

And

Adaptation Measures

by

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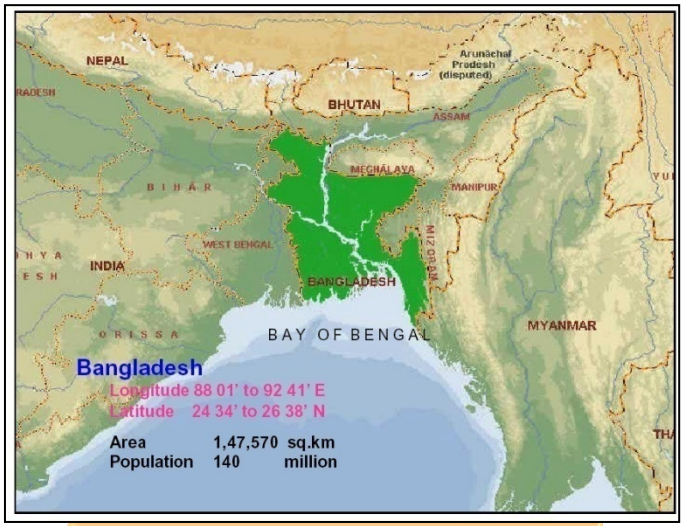
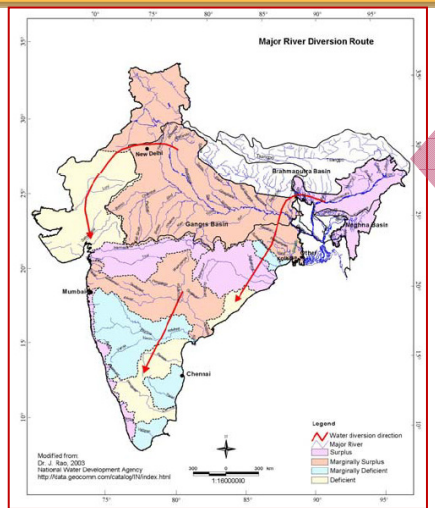
BANGLADESH AT A GLANCE



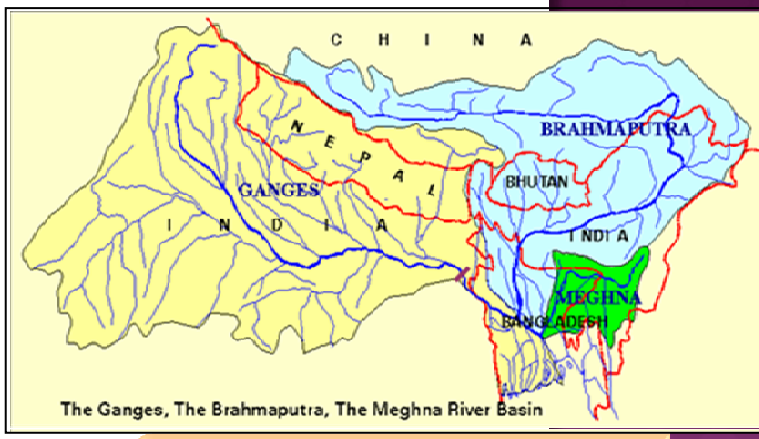
Geo-physical setting

Indian River Linking



Key Points:

- 160 million population
- 1,47,570 km^2 area of flat topography
- 57 rivers enter Bangladesh either from India or Myanmar
- 92% of the catchment areas are outside Bangladesh
- Bangladesh drains water from an area 12 times larger than its own size

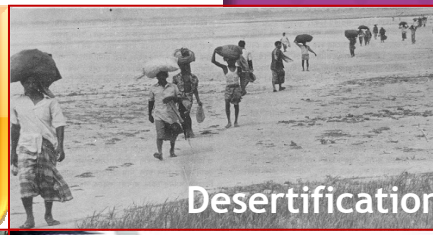


Brahmaputra, Ganges and Meghna Basin: Constitutes 80% of the floodplain

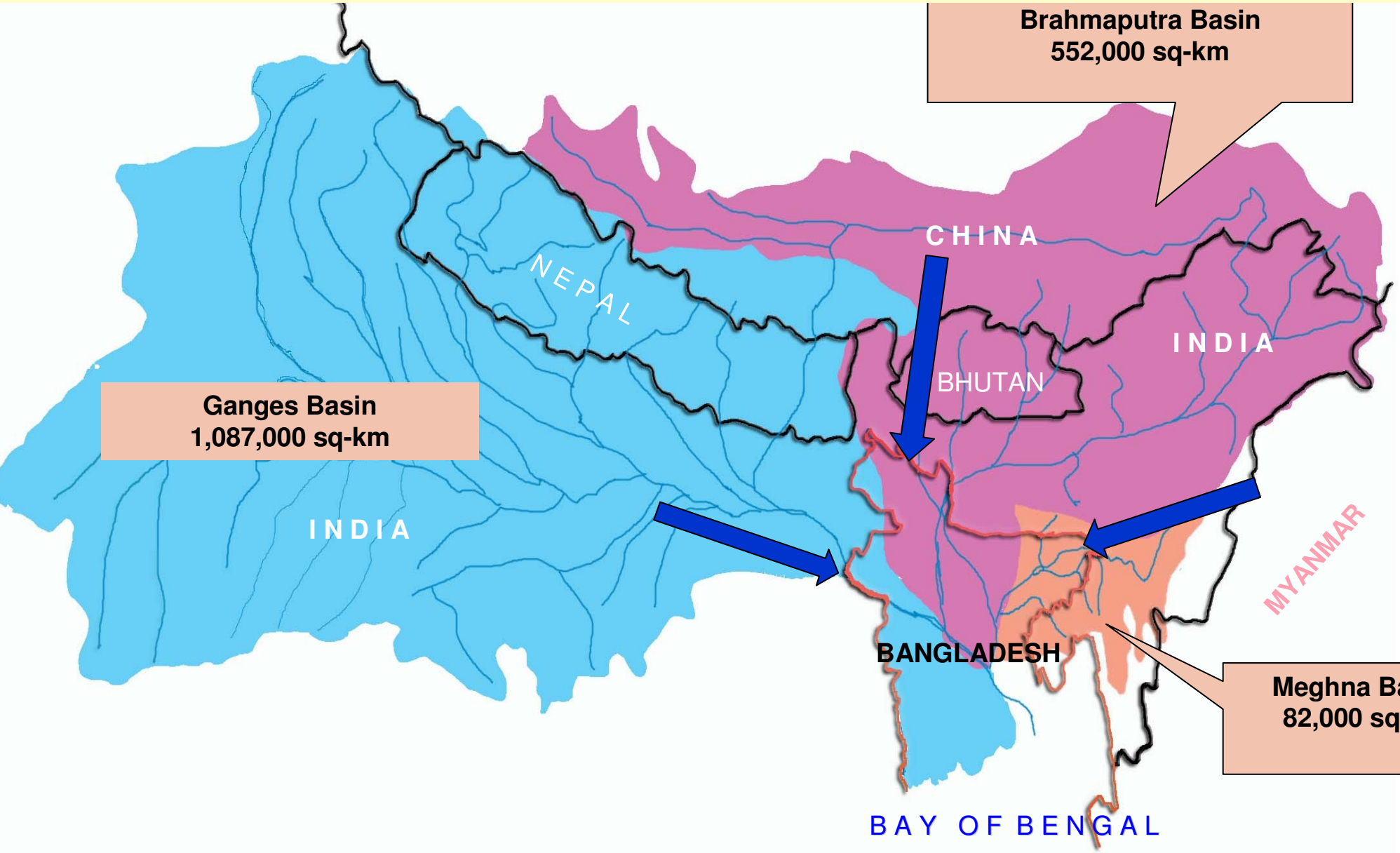
New threats to country's WR:

- River linking project by India together with the impact of climate change
- Desertification
- Frequent natural calamities
- Salinity intrusion
- Sea-level rise

Impacts of Climate Change

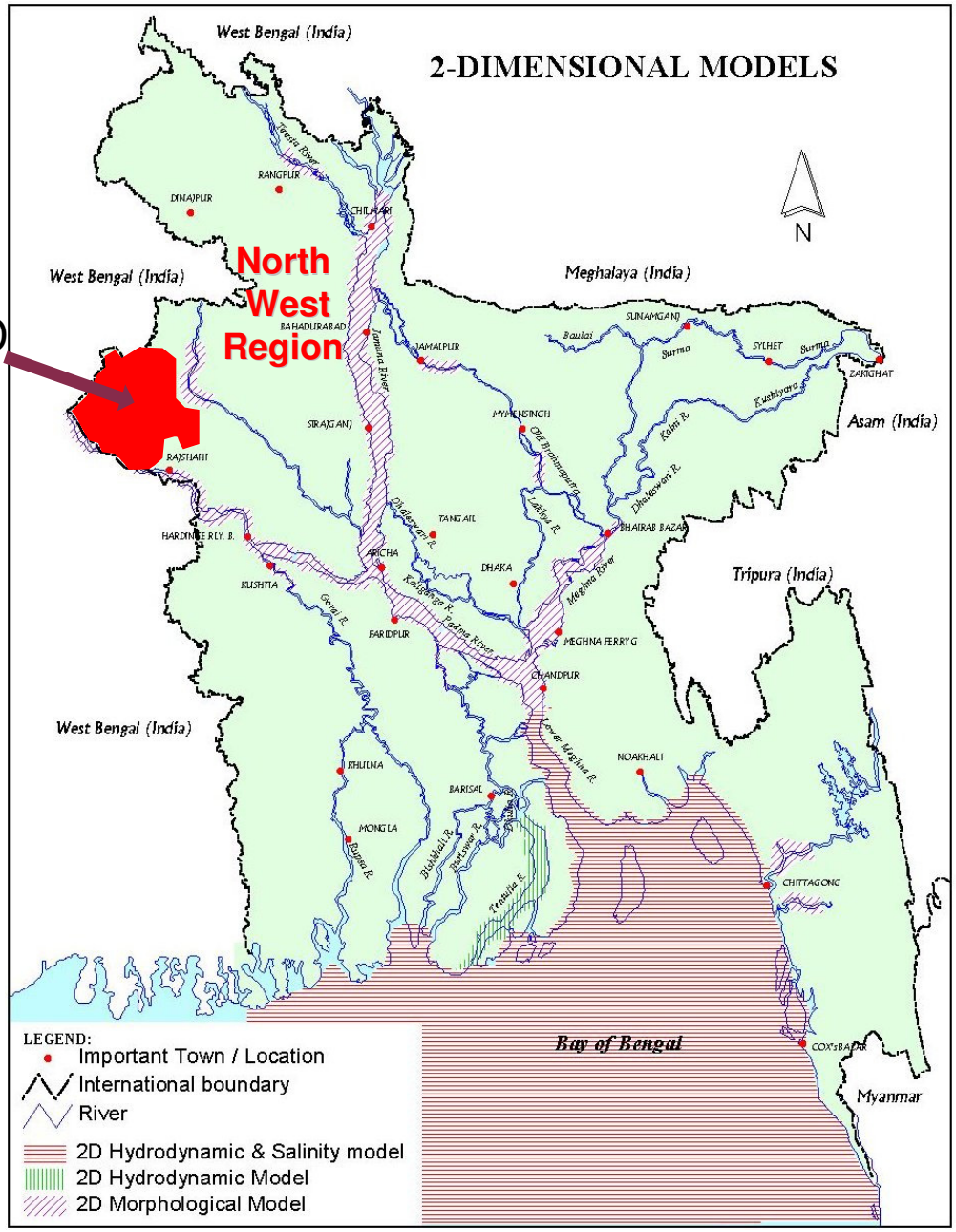


Bangladesh rivers receive runoff from a catchment of 1.72 million sq-km, around 12 times its land area



Proposed Project Area

BARIND AREA



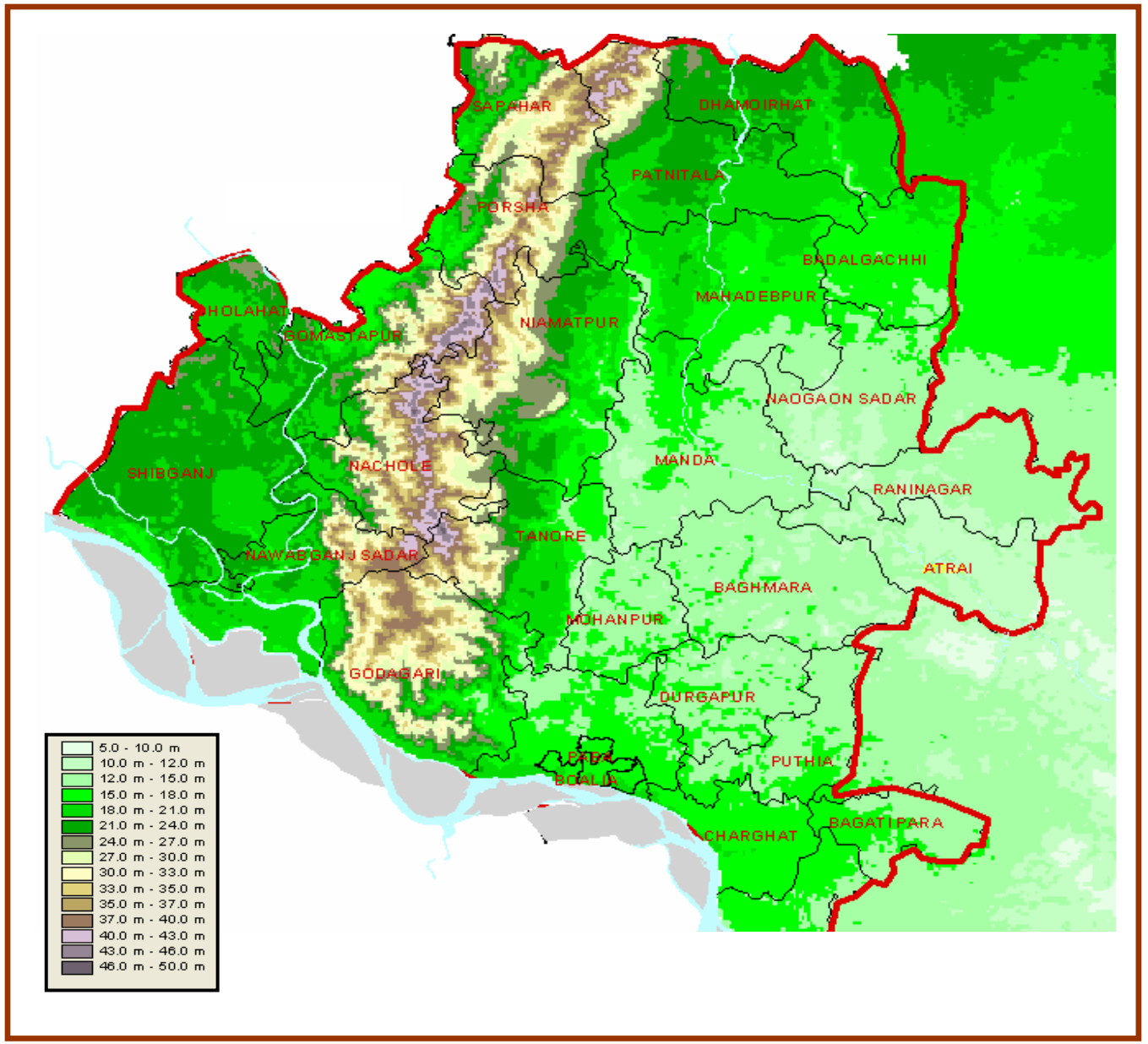
Project Covers 25 thana of Rajshahi, Nawabganj & Naogaon Districts

Total Area = 750000 ha
Cultivable Area = 595760 ha
Population = About 2 million
Rainfall ~ 1250 to 1600 mm/Yr
Nos of DTW = 6047
Nos of STW ~ 70,000

Topography

Elevation

9.00 mPWD 47.00 mPWD



OVER ALL GOAL

Assessment of Climate Change Impacts on water resources and adaptation measures for sustainable water resources management in Barind Area of Bangladesh

BACKGROUND OF THE PROJECT

- Low rainfall
- Limited availability of surface water
- Un-utilized surface water
- Unfavourable geological formation and topography
- Over utilization of groundwater

MAJOR ISSUES

- GWL goes bellow suction limit of STW & HTW and becomes inoperable, thereby suffers for domestic as well as irrigation water in most of the area during dry season
- Project area suffers frequent agricultural losses due to drought not only in dry season, but also sometimes in monsoon
- Present irrigation is mostly GW based; proper assessment of annual recharge to examine the expansion of safe yield, drinking water supply and environmental issues
- Scope of SW development is limited; almost no opportunity for dry season irrigation. However significant potentials exist for supplementary irrigation
- In some areas the GWL is in lowering trend due to higher abstraction than recharge
- Ganges water remains un-utilized; the proposed area suffers scarcity of water.

All these issues should be adequately addressed in an integrated manner considering both SW and GW including impacts of climate change for sustainable water resources management.

OBJECTIVES OF THE PROJECT

Specific Objectives are:

- Assessment of the present state of water resources.
- Assessment of SW and GW availability under present and future climate change condition.
- Assessment of water demand for different sectors.
- Formulation of suitable options for sustainable water resources management.
- Capacity building of related organization.

OUTPUT OF THE PROJECT

The probable outputs of the project are:

- Trend of groundwater level variation.
- Trend of river flow and water level variation.
- Assessment of water quality.
- Assessment of flooding characteristics e.g. flood duration, flood depth, areal extent etc.
- Assessment of SW availability at key location of the perennial rivers.
- Upazila-wise groundwater resources for the project area.

Contd..

OUTPUT OF THE PROJECT (Contd..)

- Present and future water demand assessment for different sectors e.g. agriculture, domestic and industrial, forestry, fisheries and in-stream needs.
- Impact assessment of different SW development options on GW resources.
- Socio-economic and environmental impact assessment of different options.
- Automatic monitoring network of GW level in a pilot area.
- An Interactive Information System (IIS) to facilitate better resource management.
- Performance evaluation of artificial GW recharge in a pilot area.
- Trained professionals on mathematical modeling, use of IIS, water demand assessment, water quality modeling, climate change assessment etc.

ACTIVITIES/SCOPE OF WORKS

- Collection of different hydrological and hydro-meteorological data from different organizations e.g. BWDB, WARPO, BADC, BMDA, BMD, DPHE, IWM etc.
- Quality checking of the collected data.
- Trend analysis of GW level, surface generation for pre and post monsoon season.
- Statistical analysis of river Water Level and flow.
- Collection and analysis of water quality data to assess seasonal and yearly variation.
- Development and application of flood model to determine extent and duration of flooding.
- Development and application of SW model using MIKE-11.
- Statistical analysis of river flow data for different dependability.
- Development and application of GW model using MIKE-SHE/MODFLOW.
- Analysis of GW model data for GW resource assessment.
- Select GCMs which can express the regional climatic property.
- Implement bias correction and down-scaling of the selected GCMs.

Contd..

ACTIVITIES/SCOPE OF WORKS (Contd..)

- Collection and analysis of cropped, forest and fishery areas, soil properties, population etc. from BWDB, DAE, SRDI, BBS etc.
- Identification of options in consultation with local people, professional communities and review of existing reports
- Technical evaluation of different options using mathematical model.
- Collection and analysis of socio-economic and environmental data
- Need assessment and installation of automatic GW level monitoring stations
- Institutionalization of the automatic network.
- Need assessment and development of the IIS
- Installation of artificial recharge well.
- Performance evaluation of the recharge wells using mathematical model.
- Assess training needs.
- Develop training modules
- Design and implement training courses in collaboration with national and international institutions and organizations.

KEY LEADERS, CONTRIBUTORS & COLLABORATORS

- Lead organization: Ministry of Defence, Government of Bangladesh
- Contributors: Likely funding agencies are ADB, JICA, WB etc.
- Collaborators:
- Ministry of Water Resources
- Ministry of Agriculture
- Ministry of Environment and Forest
- Bangladesh Water Development Board
- Barind Multipurpose Development Authority
- Bangladesh Agricultural Development Corporation
- Bangladesh University of Engineering and Technology
- Institute of Water Modeling (IWM) etc.

KILLER FACTORS AND MITIGATION MEASURES

Killer Factors	Mitigation Measures
Timely availability of sufficient fund.	Several donors may be explored
Coordination and cooperation amongst different agencies.	A steering committee comprising representatives from concerned agencies may be formed.
Knowledge gap	There are certain areas e.g. climate change, environmental flow requirement etc. in which case the physical processes are not yet fully clear. In such cases expert's support may be sought.
Discontinuity of related activities.	Suitable organization may be employed to continue it.

THANKS FOR YOUR PATIENT HEARING