



WATER RELATED ISSUES IN BANGLADESH

Shah Md. Sultan Uddin Iqbal

Joint Secretary, Ministry of Defence

Government of the People's Republic of Bangladesh,

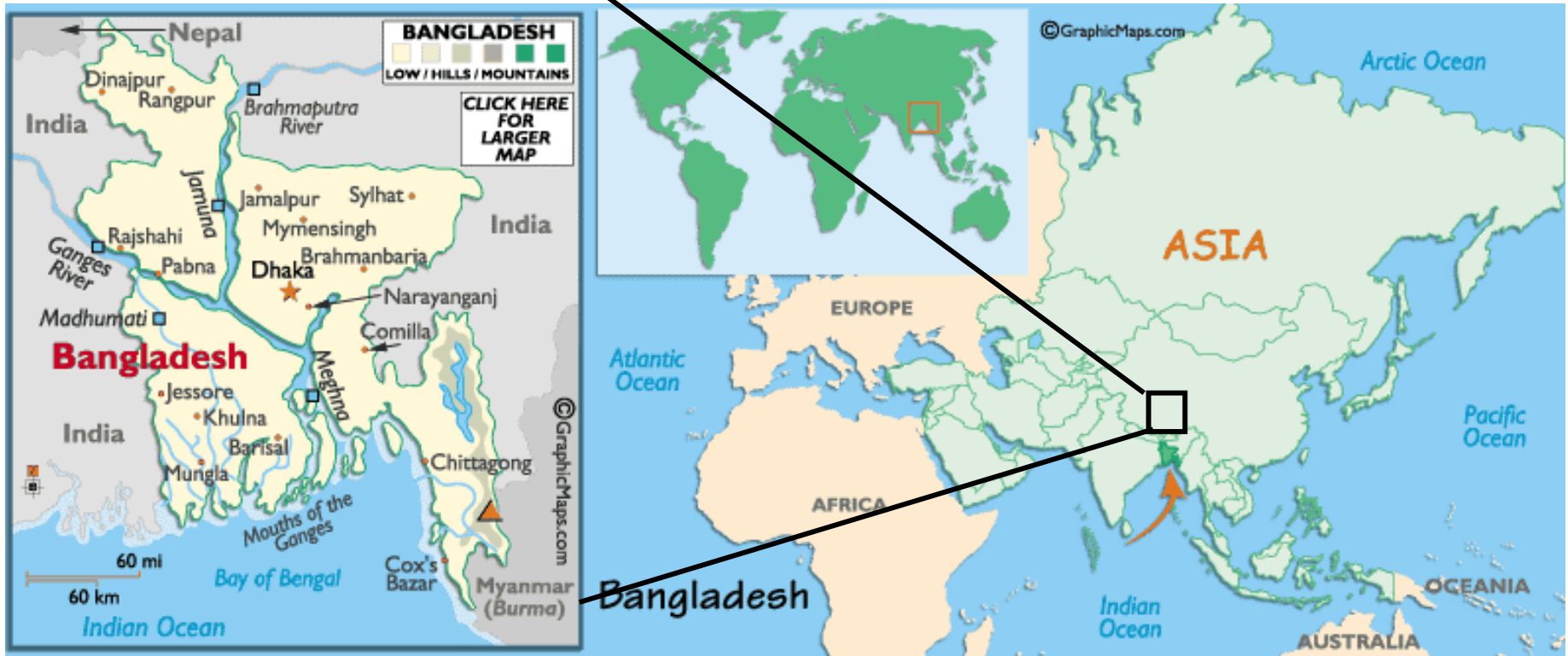


Introduction

- **Water is fundamental to human welfare, to all socio-economic development and for maintaining healthy ecosystems.**
- **There is clear and convincing evidence, however, that the status of its availability and the current patterns of water use and demand are not evaluated and cannot be sustained in the Asian region.**
- **One of the key scientific and social issues of this century is water and its related events.**
- **Because of growing population and human activities on nature, there is scarcity of water and water is being contaminated. The non-uniform distribution of rainfall and its intensity cause either floods or drought in some regions of Asia almost every year.**

- **Climate change issues may also have impact on intensifying the water scarcity and threat to freshwater ecosystems, increase water-related diseases and associated impacts on society.**
- **It is not possible to control floods and drought completely and they are leading to large human and socio-economic losses but it is possible to mitigate and reduce the losses by taking proper measure in due time through water resources managements in the regions.**
- **About 60% of the world population lives in Asia, and their various social activities including agriculture depend on the beneficial monsoon rainfall, which contributes about 70-75% of the total annual rainfall.**
- **At the same, it can be the cause of floods and droughts, and consequently, may be responsible for an enormous amount of human and economic damage.**

Maps of Bangladesh, world and Asia



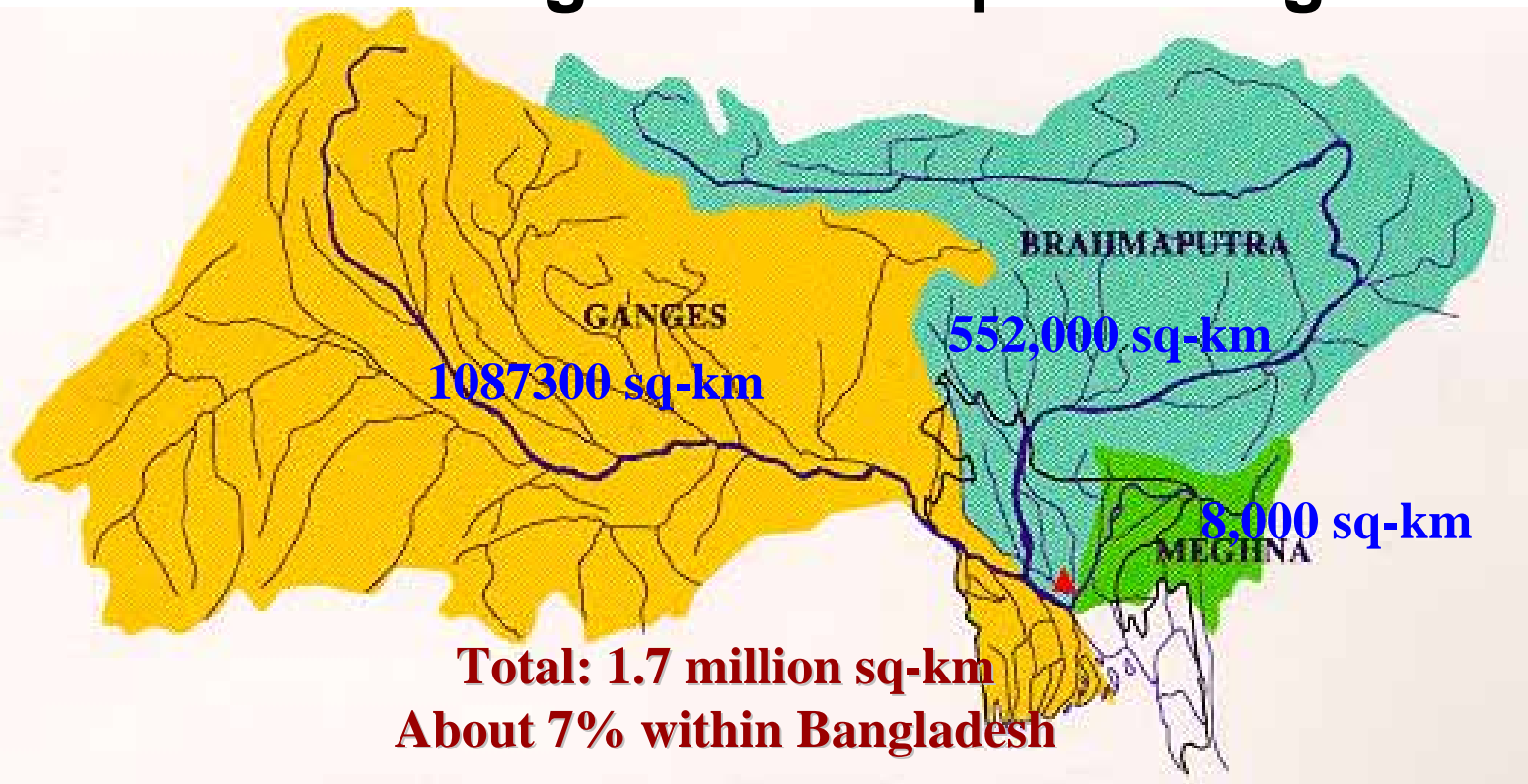
Bangladesh and Major rivers:Ganges, Brahmaputra and Meghna.

Water Related Problems

- **Water Sharing**
- **Excess Water/Floods**
- **Scarcity Water**
- **Arsenic Contamination and its Impact**
- **Climate Change (Global, regional, atmospheric pollution, greenhouse gases)**
- **Drought (Global, regional)**
- **River Erosion/River bed uplift**
- **Water Level data of the Upper Catchments**
- **River Navigation Problem**
- **Salinity of Water**

As a mitigation, water sharing is of paramount importance (Approach should be multidirectional/multilateral).

The Ganges-Brahmaputra-Meghna Basins



About 93% of flood water comes from outside the country

Total: 1.7 million sq-km
About 7% within Bangladesh

➤ Flow

- ❑ The Ganges-Padma: 1,000 ~ 120,000 cumec
- ❑ The Brahmaputra: 2,400 ~ 102,000 cumec
- ❑ The Meghna: 500 ~ 30,000 cumec

If stored over Bangladesh Plain would have about 9.0 m of standing water depth

➤ Annual Sediment Transport

- ❑ The Ganges-Padma: 886 Mtons
- ❑ The Brahmaputra: 600 Mtons
- ❑ The Meghna: 1 Mtons

If stored over Bangladesh flood plain would have about 1.6 cm thick sedimentation

Examples of the problems for/ or by water



Bamboo protection wall to protect the from the movements of engine boats. *Photo collected by Zonal manager, Faridpur*



Women and children from Sultansadi village are bringing safe water from far places. *Photo - Salahuddin Azizee*



AFP

Examples of the problems for/or by water



Drought



Flood

Arsenic



Flood



River Erosion

Why all the water related problems have happened ?

surplus/deficit of Water !

Major Source of Water ?

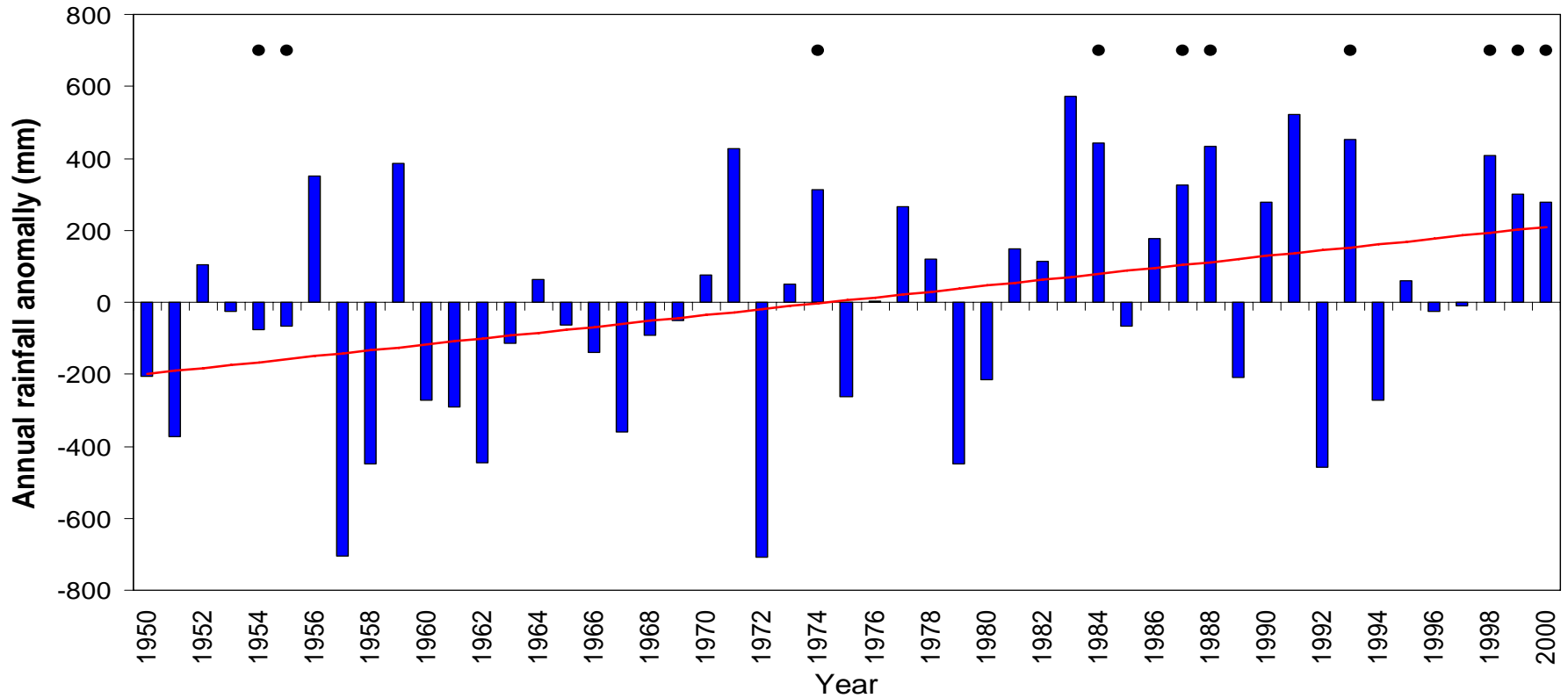
The RAIN !

Therefore, we have to measure the **RAINFALL** as **accurate** as possible and for an **area as large** as possible

How is it possible to measure RAINFALL for a **large area** ?

**Use of Remote Sensing and Simulation
DATA**

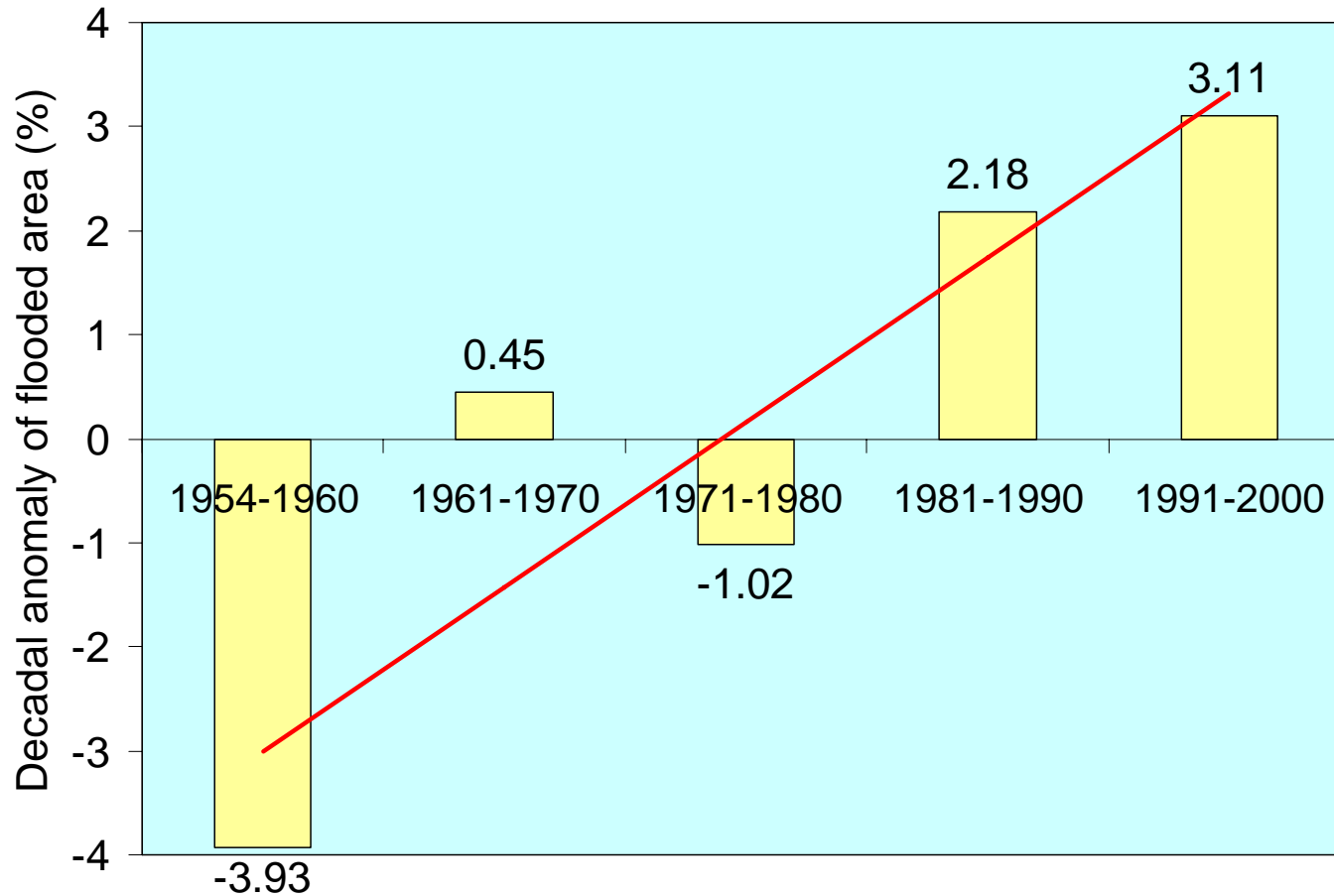
Trend of Rainfall in Bangladesh (1950-2000)



Closed circle represents severe flood years in Bangladesh

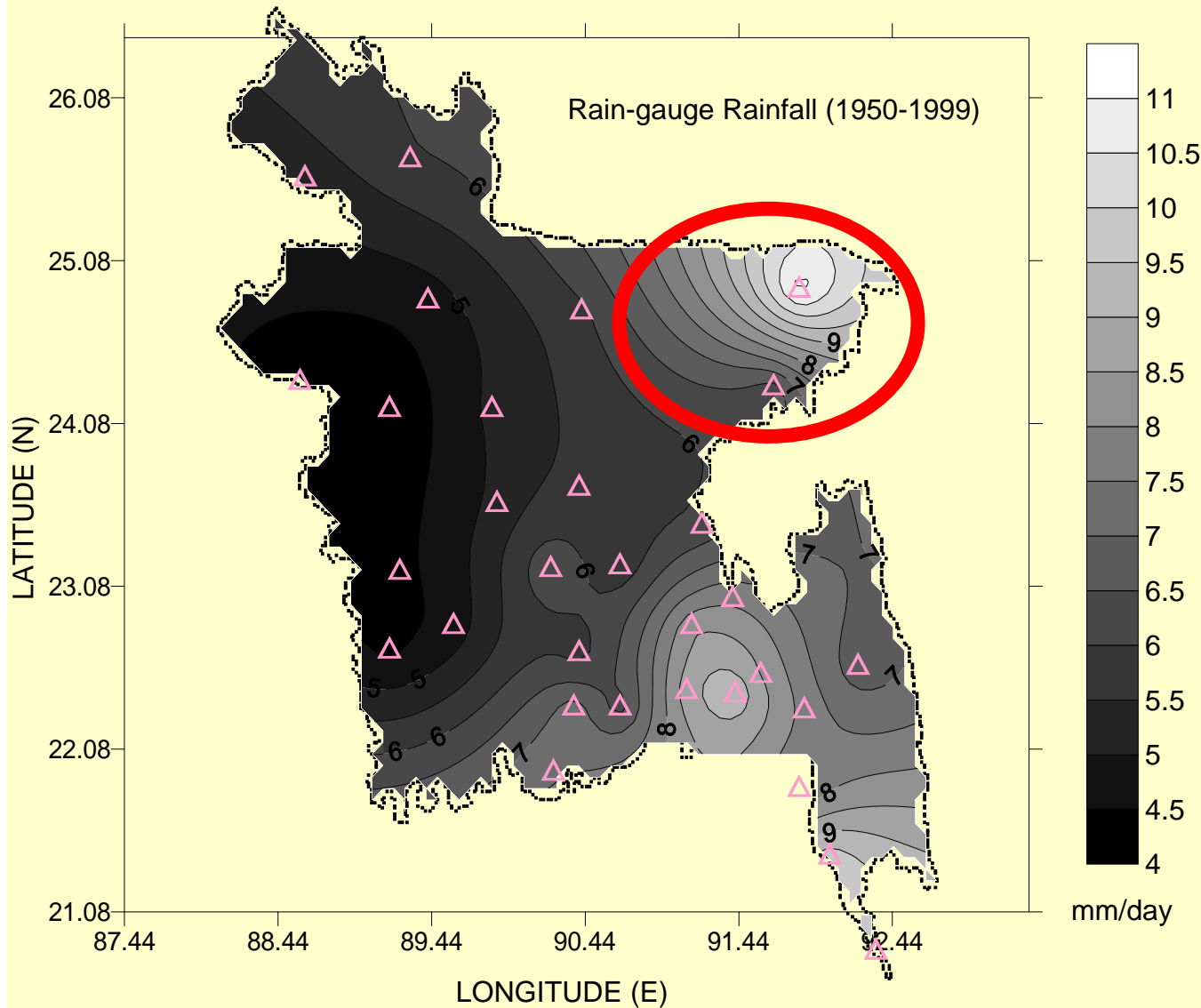
Sometimes severe floods occur in Bangladesh even there is deficit of Rainfall in the Country e. g., in 1954 & 1955. It means that Floods may occur due to onrush of water from outside of Bangladesh. Therefore, international (regional) cooperation is very much important.

Decadal Anomaly of Flood Areas in Bangladesh



It seems that Flood affected area is increasing in the present days. This is very alarming.

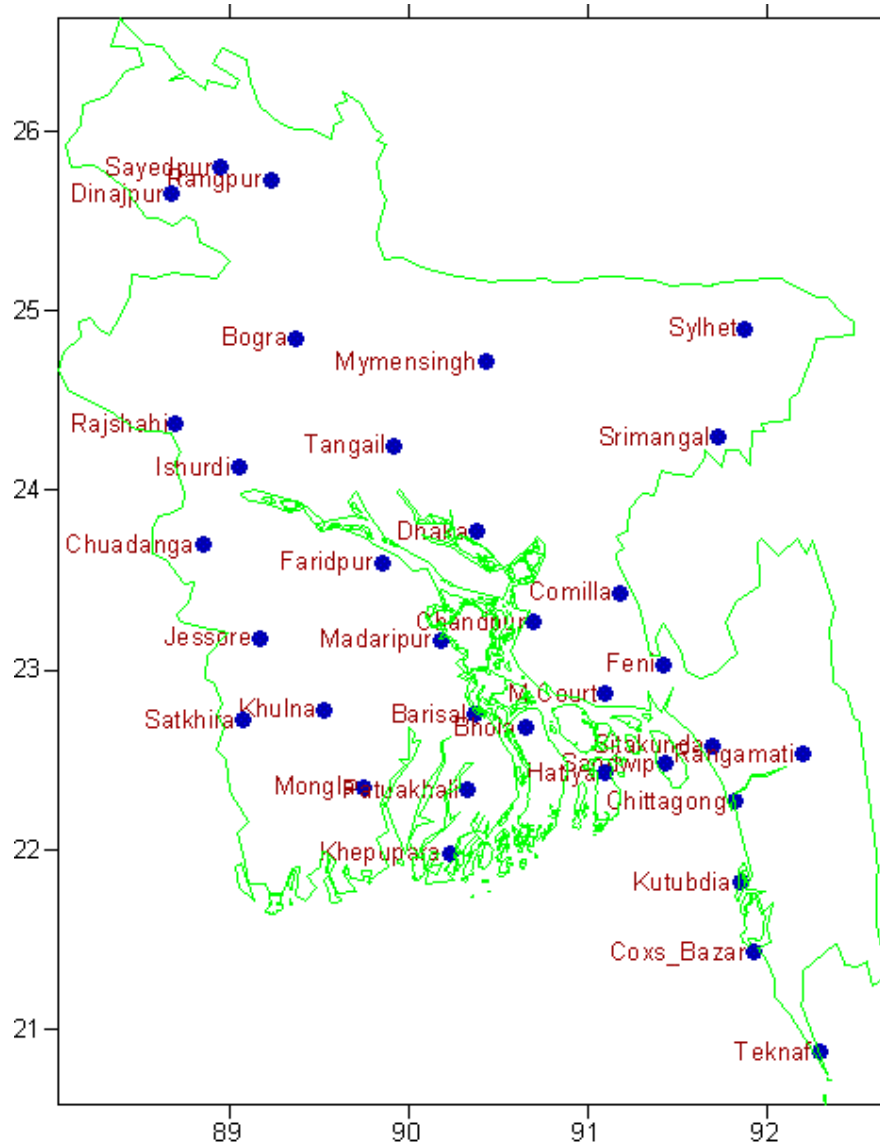
Rainfall over Bangladesh (1950-1999)



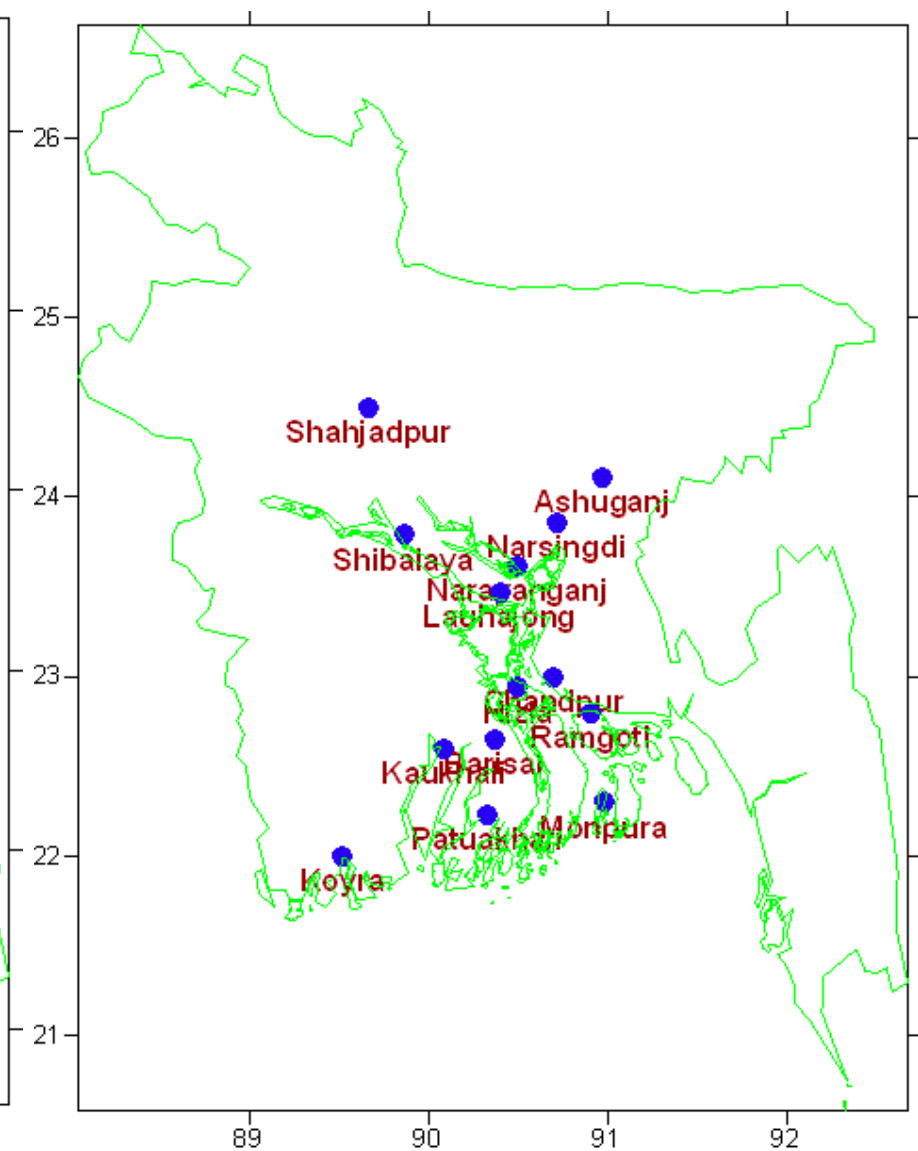
Historical (1950-1999) rainfall over the country. The triangles represent the rain-gauge locations in Bangladesh.

The maximum rainfall is over NE and SE parts of the country.

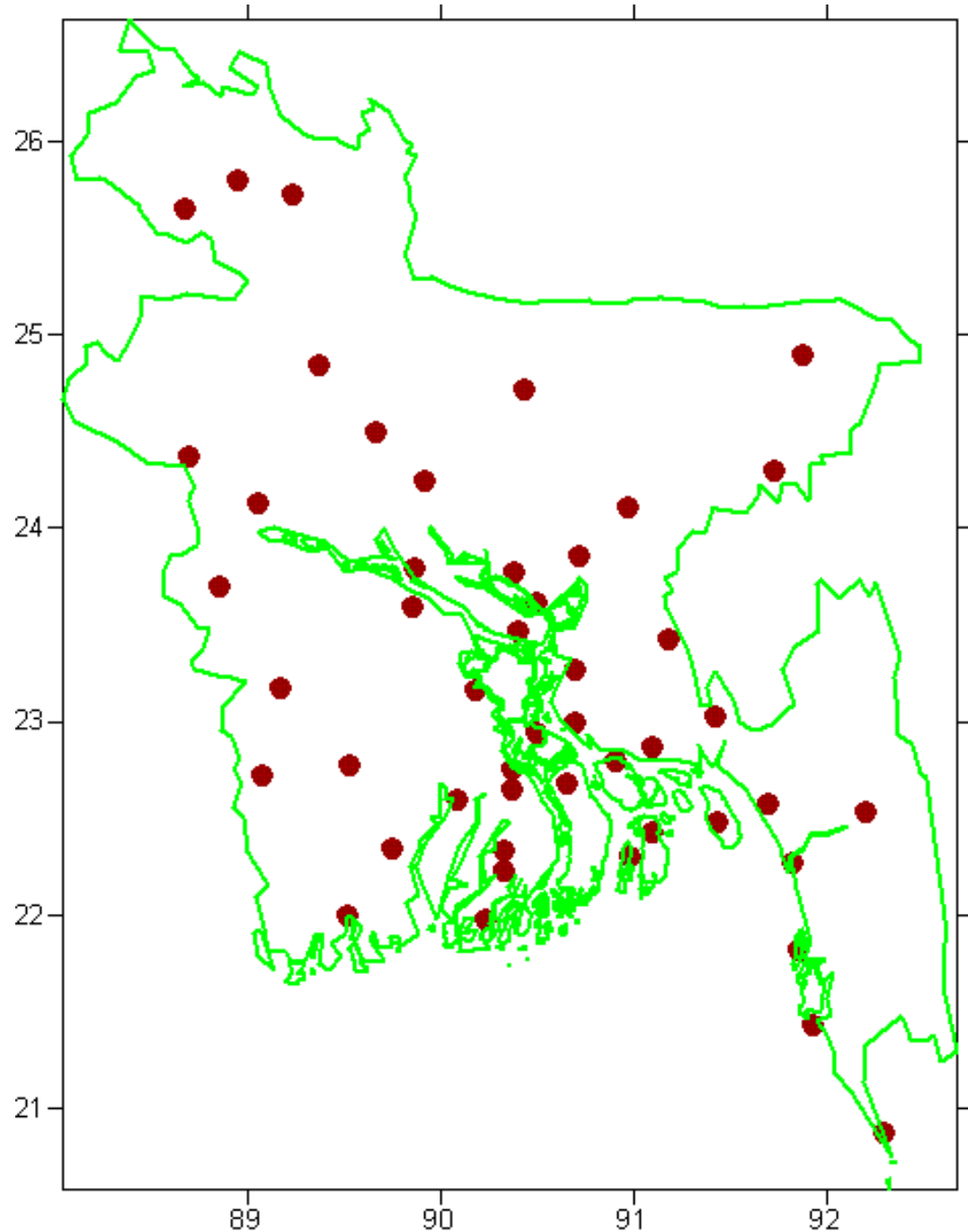
34 Existing rainfall measuring stations of BMD



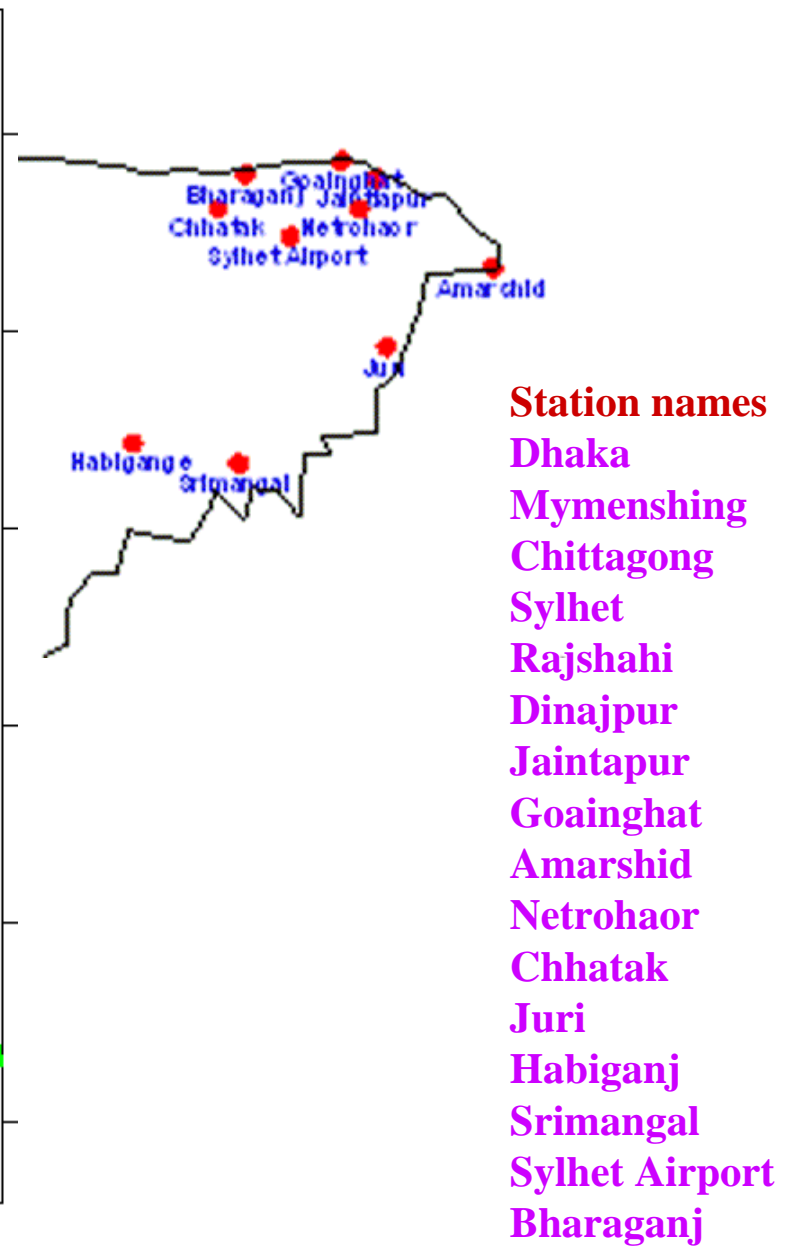
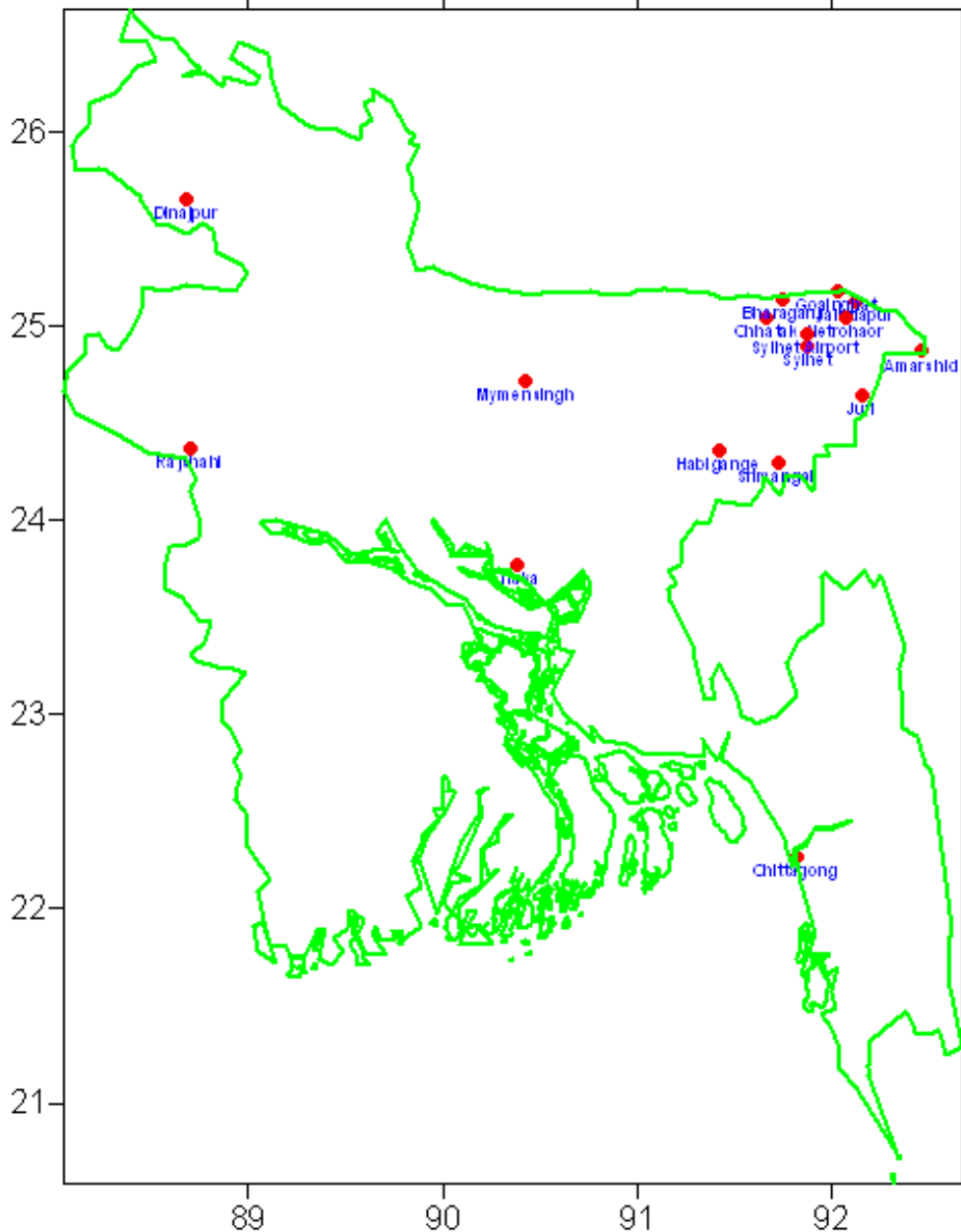
14 Proposed New Weather Forecasting Centres of BMD



**Position total
number of rainfall
measuring stations
(Existing 34 + 14
Proposed Weather
Forecasting
Centres) of BMD**



Automatic rain-gauge Stations over Northeastern Bangladesh under MAHASRI project



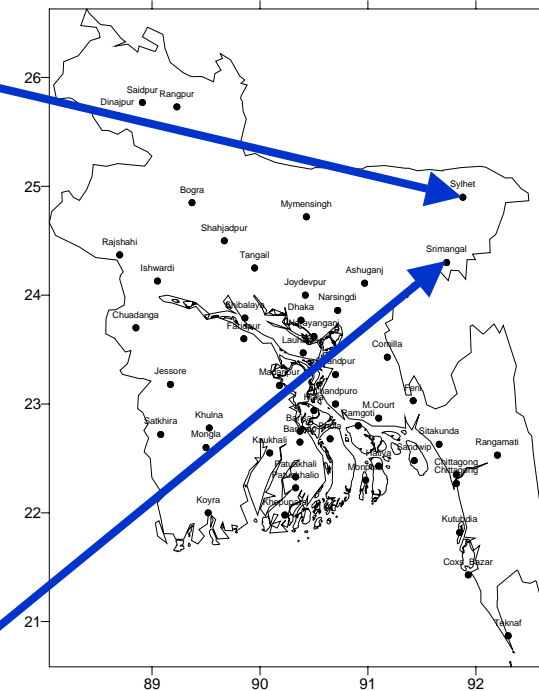
- Station names**
- Dhaka
 - Mymensingh
 - Chittagong
 - Sylhet
 - Rajshahi
 - Dinajpur
 - Jaintapur
 - Goainghat
 - Amarshid
 - Netrohaor
 - Chhatak
 - Juri
 - Habiganj
 - Srimangal
 - Sylhet Airport
 - Bharaganj

Existing Observatories of BMD in NE-Bangladesh

Sylhet(24.9N, 91.88E):

Established 1952; Elevation 34 m

Climate Data Available: From 1952



□ Srimangal (24.3N, 91.73E):

Established 1905; Elevation-22 m

Climate Data Available: From 1948 A.D.

Existing Observatories of BMD in N & NW-Bangladesh

Syedpur (25.65N, 88.68E):
Established-1976; Elevation 37.6 m
Climate Data Available: From 1976

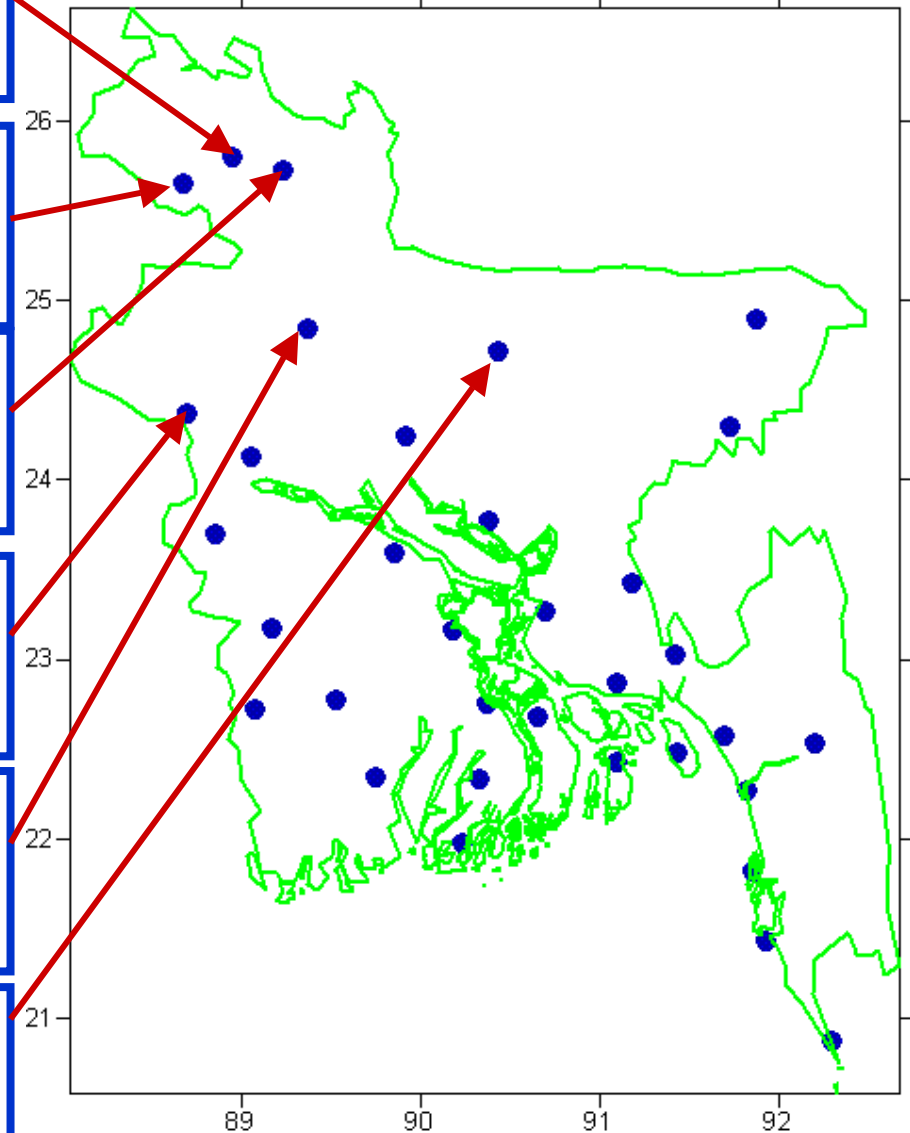
Dinajpur (25.65N, 88.68E):
Established-1883; Elevation 36.0 m
Climate Data Available: From 1948

Rangpur (25.65N, 88.68E):
Established-1883; Elevation 33.0 m
Climate Data Available: From 1954

Rajshahi (24.37N, 88.70E):
Established-1883; Elevation 17.0 m
Climate Data Available: From 1964

Bogra (25.65N, 88.68E): Established-1984; Elevation 20.0 m
Climate Data Available: From 1948

Mymensingh (24.72N, 90.43E):
Established-1883; Elevation 19.0 m
Climate Data Available: From 1948

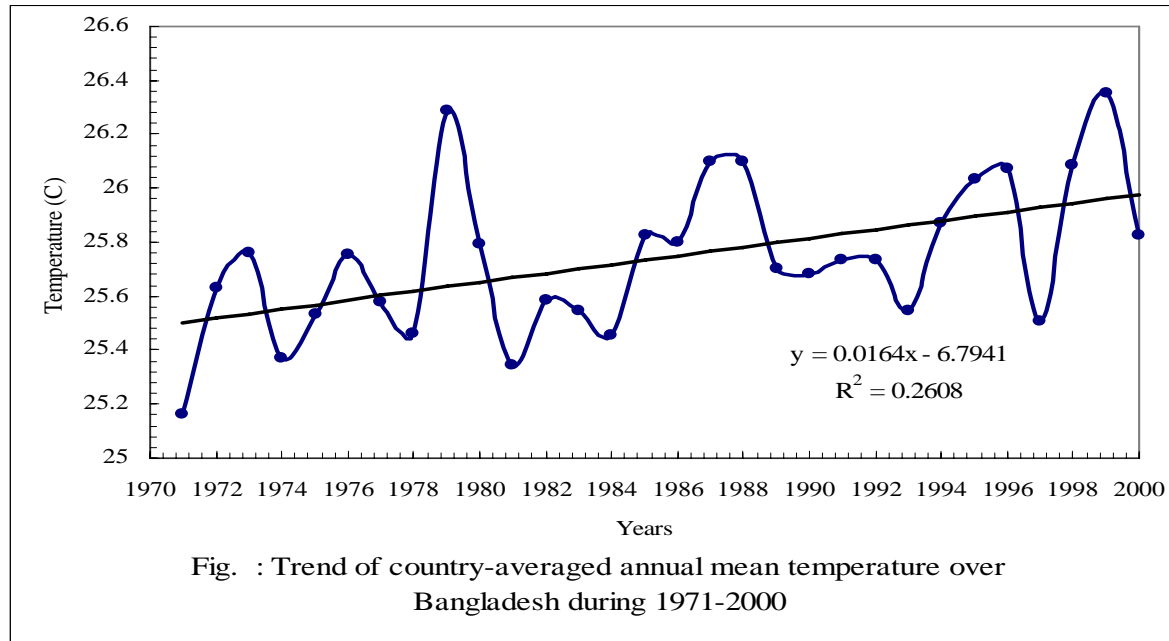


Types of Available Climate Data

- 1. Air temperature (including maximum and minimum):
Continuous observation (Graphically)**
- 2. Air temperature (including maximum and minimum):
3hourly and 6 hourly**
- 3. Relative humidity: 3hourly, 6 hourly and continuous
observation (graphically)**
- 4. Mean Sea Level Pressure: 3 hourly,6 hourly and
continuous graphically**
- 5. Rainfall: 3 hourly, 6 hourly and continuous graphically**
- 6. Cloudiness: Eye estimation**
- 7. Surface wind: 3 hourly and six hourly**
- 8. Bright sunshine hours: continuous (graphically)**

Climate Change

Trend in Annual Mean Temperature



- The country-averaged annual mean temperature over Bangladesh has **increasing trend at the rate of 0.0164 °C per year**, which is statistically significant at **95% level**.

Trend of Annual Rainfall

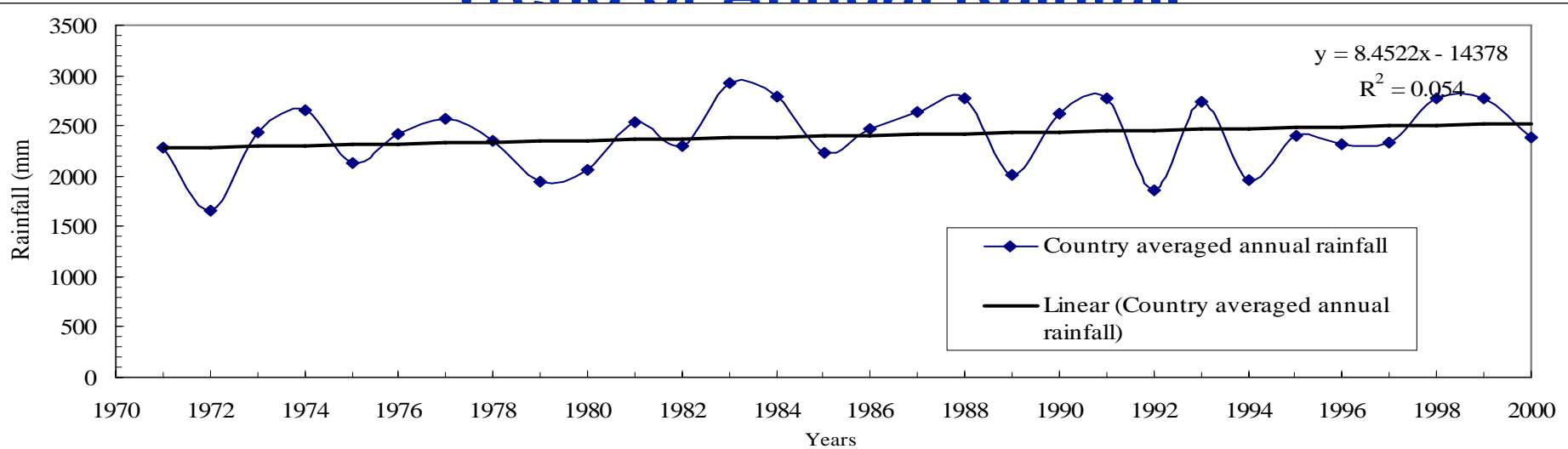


Fig. : Trend of the country-averaged annual rainfall over Bangladesh during 1971-2000

• The country-averaged annual rainfall over Bangladesh has increasing trend at the rate of 8.4522 mm per year. The trend is not statistically significant.

Trends of temperature and rainfall in Bangladesh may have adverse effects on natural disasters.

Needs for water related issues

- **Facilitating communication and cooperation among the Meteorological and Hydrological Services of the regional countries.**
- **Collecting, analyzing and disseminating information on the past and current Meteorological, Hydrological and other water related data.**
- **Promoting the availability of information on the socio-economic aspects of water relates issues.**
- **To promote the development of data assimilation methods for application to numerical weather and climate predictions and for the estimation of derived climatological quantities.**
- **To use the data (both real and derived) in models for flood forecasting.**

- To promote the timely exchange of information, data and new knowledge on atmospheric and water modeling through publications, workshops and meetings.
- Improving collection, management, exchange, access to and use of observational data and other relevant information on current and historical Meteorological and water related events, and their impacts and promoting improvement of observations including the monitoring of Meteorological and Hydrological variability.
- To build up awareness.

MAY BE GEOSS WILL TAKE UP THE ABOVE MENTIONED ISSUES

What Bangladesh looks for?

- **Bangladesh needs rainfall and water level data in the upper catchments of the major rivers e. g. Meghna-Brahmaputra-Ganges to give efficient and timely forecasts of flood.**
- **To keep reasonable flow of the rivers.**
- **Capacity building of relevant personnel.**
- **Free access to rainfall and water related data of upper catchment areas.**
- **Management of Water Resources.**
- **To promote activities related to Meteorology and water management for monsoon studies regionally**

- **Quantitative real time precipitation for the input of Hydrological Models**
- **Coupling of Meteorological and Hydrological modeling will be beneficial (in space and time)for flood forecasting.**

THANK YOU