

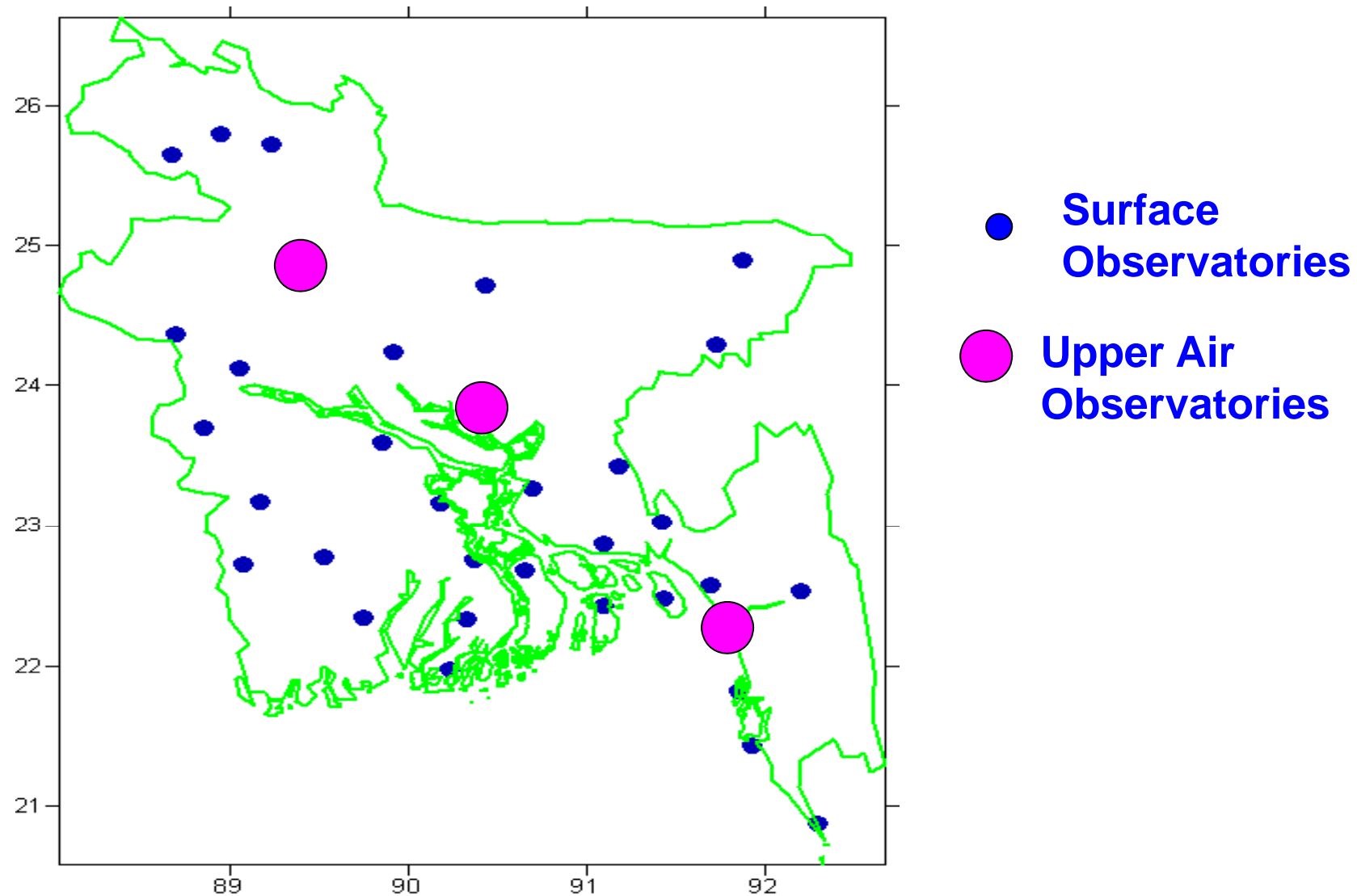
JMA / WMO Workshop on Quality  
Management in Surface, Climate and  
Upper-air Observations in RAI, Tokyo,  
27-30 July 2010

Shamsuddin Ahmed  
Assistant Director  
Bangladesh Meteorological Department



Bangladesh is surrounded by India on the west, the North and the northeast and Myanmar on the Southeast and the Bay of Bengal in the South.

# Location of weather observatories in Bangladesh

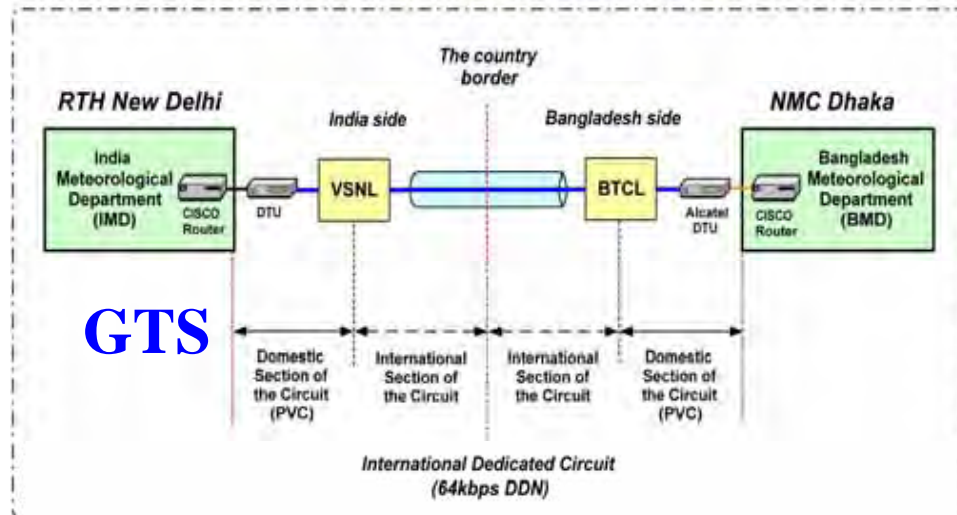


# Observatories of Bangladesh Meteorological Department

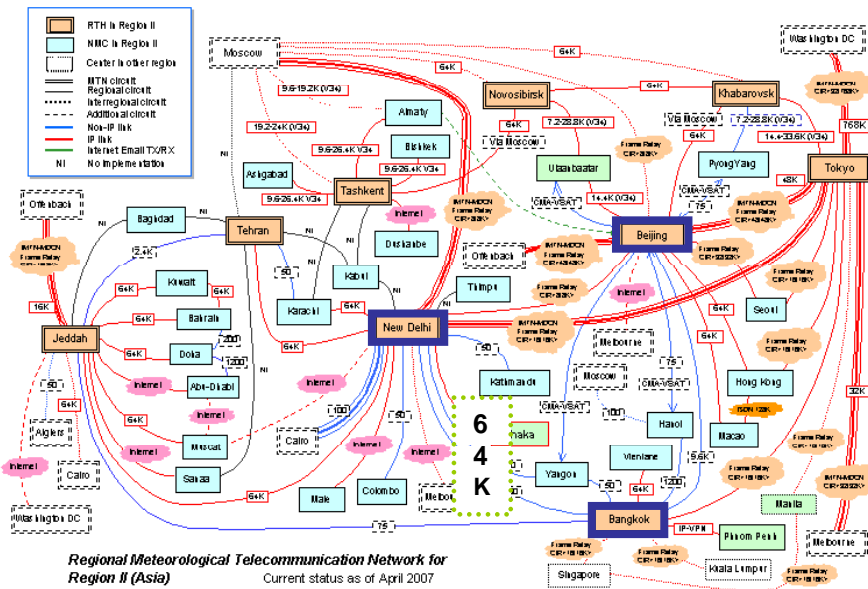
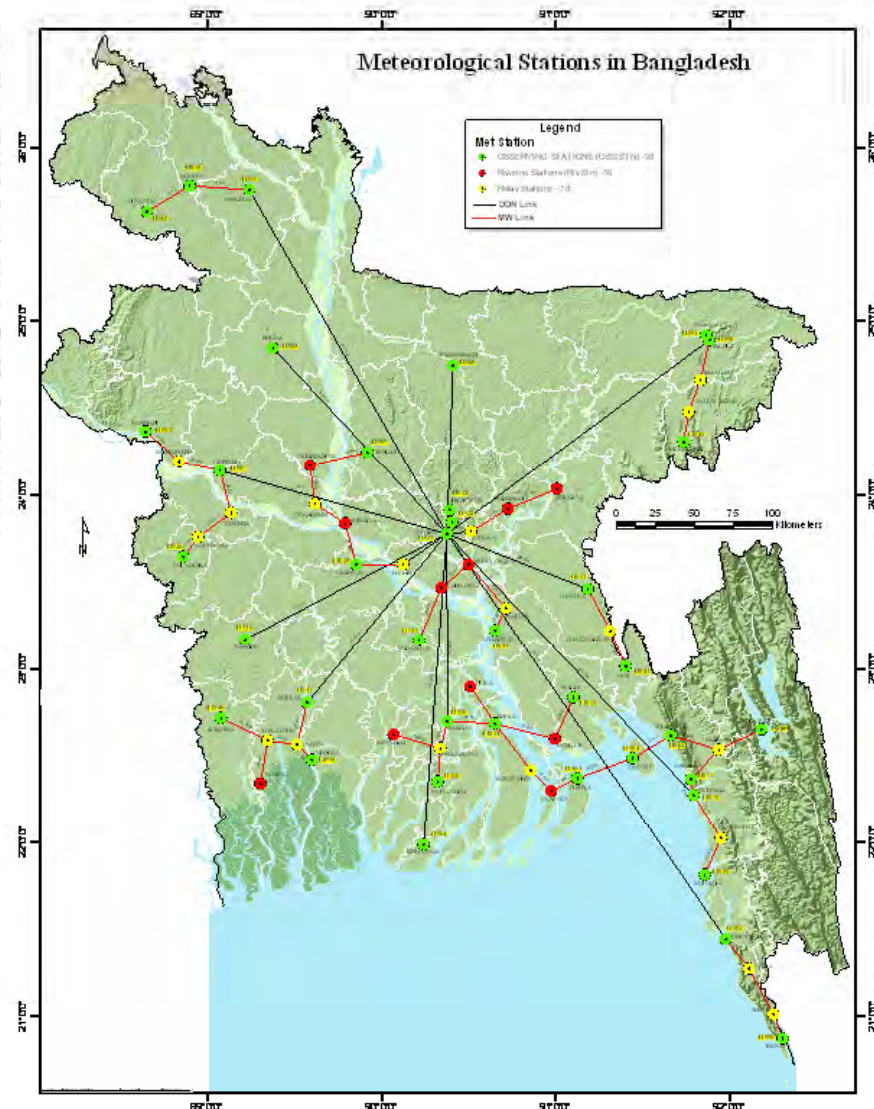
- Synoptic observatories :35
- Pilot Balloon Observatories :10
- Radiosonde observatories :03
- Agro Met Observatories :12
- Radar station :05
- Satellite receiving ground station : NOAA,  
MTSAT, INSAT
- GTS Observatories :10

# Data communication Centre

Connection Form of GTS Telecommunication Link  
between RTH New Delhi and NMC Dhaka  
over the Digital Dedicated Line



## Local data communication link



Regional Meteorological Telecommunication Network for Region II (Asia)  
Current status as of April 2007

### **3. Satellite/Radar products and images**

- a. MTSAT images (IR, VIS & WV) from BMD's MTSAT receiving system**
- b. NOAA images from BMD's NOAA receiving system**
- c. METEOSAT images (IR & VIS) from Dundee METEOSAT receiving system**
- d. INSAT images through MDUS**
- e. BMD's RADAR Systems (both Doppler and Conventional)**

# Surface Observation Time

- 24 hours per day i.e. 00, 01, 02, 03, 04 ---- UTC.
- Surface observation are reported 08 times per day to GTS i.e. 00, 03, 06, 09, 12, 15, 18 -- -- --- UTC.



# Data and Warning Message Dissemination System of BMD

WORLD WEATHER WATCH (WWW)

U.N ENVIRONMENT PROGRAMME (UNEP)

CLIMATE CHANGE MONITORING SYSTEM

GLOBAL TELECOMMUNICATION SYSTEM (GTS)

NATIONAL METEOROLOGICAL COMMUNICATION CENTRE (NMCC)





# Upper-Air observation

- GPS Radiosonde observation taken one time per day, conducted time is 00UTC.
- Pilot balloon observation taken 04 times per day.

# Instruments

<u>No.</u>	<u>Name</u>	<u>Company</u>	<u>Country</u>
1.	Barometer	F.Dartson & Co.	England
2.	Barograph	Casella	Eng.
3.	Thermometer	Zeal	Eng.
4.	Thermometer(Max.)	Venus	India
5.	Thermograph	Casella(London)	England
6.	Hygrograph		England
7.	Automatic Rain gauge	Casella	England
8.	General Rain gauge	BMD	Bangladesh
9.	Cup Anemometer(2&10 m)	Casella	England
10.	Wind Vain		

# Instruments

<u>No.</u>	<u>Name</u>	<u>Company</u>	<u>Country</u>
11.	E. Anemograph		
12.	Sun Shine Recorder	Casella	Eng.
13.	Grass Minimum	Venus	India
14.	P.T. Anemograph		
15.	Pyrometer	Casella	England
16.	Stevenson (Thermometer) BMD		Bangladesh
17.	Theodolite	Hall & Watts	England
18.	Pyrnograph	Weaher Tronics	
19.	Soil Thermometer	Casella	England

# Instruments

<u>No.</u>	<u>Name</u>	<u>Company</u>	<u>Country</u>
21.	Dew Balance	Wilh Lambrach.	Golfengen
22.	Floating Thermometer	Far Mount	UK
23.	Mechanical Wind Recorder	Thies Clima	Geramany
24.	Evaporograph	Hisamatsu	Japan

# Instruments Of Agro-Meteorology

<u>No.</u>	<u>Name</u>	<u>Company</u>	<u>Country</u>
1.	Data Logger		
2.	Sun Shine Recoder	Casella	Eng..
3.	Soil Thermometer(5,10,20,30&50 Cm)	Casella	England
4.	Grass Minimum	Venus	India
5.	Evaporation Pan	BMD	
6.	Submersible Thermometer Fair Mount		UK
7.	Cup Anemometer(2m)	Casella	England
8.	Oven (Electric)	Blue-M	USA

# Instruments Of Agro-Meteorology

<u>No.</u>	<u>Name</u>	<u>Company</u>	<u>Country</u>
11.	Dew Balance	Wilh Lambrach.Golfengen	
12.	Pyronograph	Weather Tronics	
13.	Evaporograph	Hisamatsu	Japan
14	Electric Balance	Adam equipment Co.	UK

# Quality control process of Upper-Air data

- At the observing station, the officer in charge checks all the observations and rectifies the mistakes.
- At the data processing center, the concerned personnel checks all the data sheets and the corrected data are entered in the computer system by using computer keyboards. The computerized data are rechecked again and final corrections are done.
- At the communication center the corrected data are disseminated to all the concerned users.



# Current Issues and Future Plan

## To improve capability of the Existing Observatories located in the targeted areas

### ➤ Site Survey at the Existing Observatories

- The following items will be surveyed at the 6 existing observatories of BMD located in the district capitals of Dhaka, Rajshahi, Sylhet, Barisal, Khulna and Chittagong.

1. Measurement of each existing observatory location (latitude, longitude, altitude) by GPS.

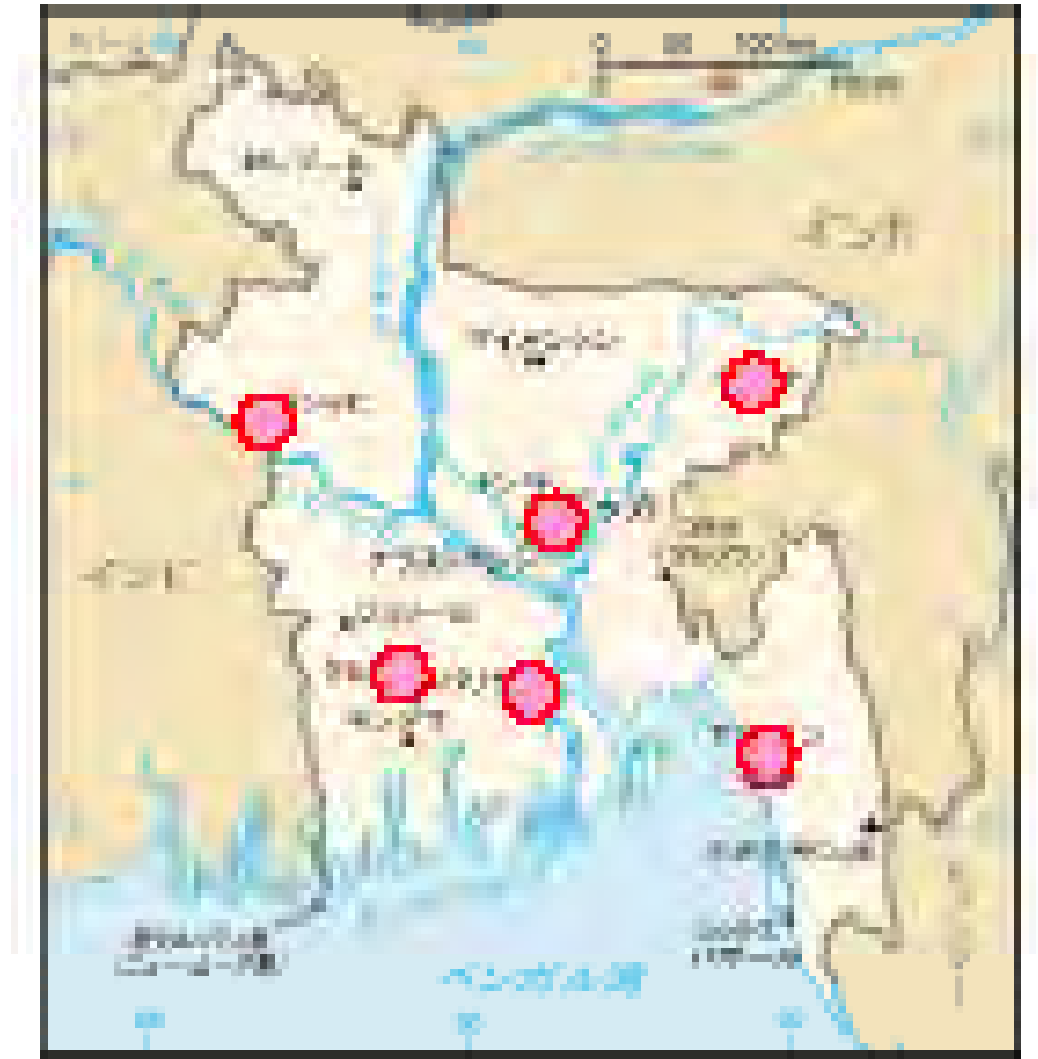
2. Confirmation of the existing instruments, name of the manufacture(s), model number, procurement year, calibration frequency, observation accuracy, operation condition, etc.

3. Survey of the existing observation field and instrument layout

4. Availability of the observed data and data base

5. Stability of the commercial power supply, frequency of grass cutting at the existing observation field, etc.

# Current Issues and Future Plan



# Current Issues and Future Plan

**BMD has taken initiative for preparation of technical specifications of the required Observation Instruments for the 6 existing observatories located in the district capitals**

**In accordance with the result of the site survey, preparation of technical specifications of the required Observation Instruments for the 6 existing observatories of BMD located in the district capitals will be conducted by the experts. For improvement of the 6 existing observatories, introduction of Automatic Weather Observation System (AWS) will be considered. Technical considerations for easy procurement of consumables and spare parts for AWS by BMD will be given in the above preparatory work.**

- **Confirmation of the existing instruments to be replaced**
- **Finalization of the technical specifications**
- **Preparation of a list of the required consumables and spare parts for AWS**
- **Obtaining cost estimates, study of each instrument price, confirmation of delivery time**
- **Preparation of instrument procurement and installation schedule**

# Current Issues and Future Plan

For installation of the observation equipment at the 6 existing observatories

Under supervision of the experts, BMD will conduct the following works.

- Equipment delivery to the 6 existing observatories
  - Installation of the equipment
  - Confirmation of the equipment operation capabilities
  - Implementation of the completion inspection
- 
- Evaluation of the observed data quality and the existing instrument accuracy
  - Through comparison between the observed data of AWS and the existing instruments, evaluation of the
  - observed data quality and the existing instrument accuracy will be made.

## Current Issues and Future Plan

- Preparation of the observation rule
- The required rules on the following items of observation, observed data recording and reporting works will be fixed-
  - Observation time
  - Observation order
  - Procedures of observation, recording and reporting

# Current Issues and Future Plan

- Preparation of the observation manual
- The manual required for appropriate observation will be prepared. Tables, figures and drawings will be utilized as much as possible in the manual instead of plain write-ups for easier understanding by BMD engineers.
- The manual will be delivered to the 35 existing observatories of BMD.
  - i. Required observation rules (observation order, time and duration, reporting time, etc.), Beaufort and cloud level.
  - li. Daily observation data input sheet (Excel file)
  - lii. Technical specifications of the observation instruments including spare parts and consumables to be supplied under the Project.
- Formula for calculating station pressure, sea level pressure, relative humidity, vapor pressure and dew-point temperature
- Standardized drawings of the observatory
- Contact details of the instrument manufacturer and the civil work company.

## Current Issues and Future Plan

### ➤ Inspection of field observation manual utilization

- One (1) year after completion of the instrument installation, the inspection of field observation manual utilization at the 6 existing observatories will be conducted, and confirm improvement level of each existing observatory.
- Revision of the manual will be implemented, if necessary.



# Current Issues and Future Plan

## ➤ Trainings on data acquisition and quality control

- At the 6 existing observatories, the following trainings with the inspection for completion of instrument installation will be conducted.

- ✓ Maintenance, adjustment and correction of the instrument to be supplied under the Project
- ✓ Explanation of the field observation manual
- ✓ Observed data recording in the daily observation data input sheet
- ✓ Handling of the observed data which deviates from normal level
- ✓ Method of the observed data transmission to BMD Head Office and allowable time duration

## Current Issues and Future Plan

### **Preparation of observatory maintenance and management record book**

- In order to know the existing maintenance and management situation, observatory maintenance and management record books (in Excel format) will be prepared.
- Proper and complete recording to the record books will be implemented at each existing observatory and all the books will be collected monthly at BMD Head Office for inspection of utilization of the record book.

## Current Issues and Future Plan

Preparation of observatory maintenance and management rules

Observatory maintenance and management rules regarding the following items will be prepared with C/P.

1) Frequency, item and method of the regular observatory maintenance

2) Adjustment and correction of the instruments and frequency of consumable replacement.

## Current Issues and Future Plan

Preparation of observation field & instrument maintenance and management manual

Preparation of observation field & instrument maintenance and management manual (in Excel format) will be made. Tables, figures and drawings will be utilized as much as possible in the manual instead of plain write-ups for easier understanding by BMD observers and inspectors.

The manual will be delivered to the 35 existing observatories.

## Current Issues and Future Plan

Implementation of trainings for observation field & instrument maintenance and management

According to the observation field & instrument maintenance and management manual prepared in the Project, the following trainings will be held at BMD Head Office and the 6 existing observatories.

- Practical training for observation field maintenance and management by the experts and C/P together.
- Training on observation instrument maintenance and management.
- Practical recording of the work progress done in (1) and (2) trainings indicated above to the manual.

# Utilization of the Existing Climate Data for Climate Change Analysis

## Implementation of statistical processing

In accordance with the following, statistical processing of the climate data will be implemented.

- ❑ Data: 1980-2009 for 30 years
- ❑ Target Observatory: 6 existing observatories of BMD located in the district capitals of Dhaka, Rajshahi, Sylhet, Barisal, Khulna and Chittagong.
- ❑ Target observation element: temperature, precipitation, etc. (showing notable trend of climate change)
- ❑ Statistical processing item: average, maximum, minimum, moving average
- ❑ Software: Excel 2007

 Statistical processing of the climate data of the other observatories will be implemented by BMD using data statistical processing sheet to be prepared in the Project.

**THANK YOU**