An overview of Disasters & Disaster Communications in Bangladesh

Presented by

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ITU/ESCAP Disaster Communications Workshop, 12- 15 December 2006
Bangkok, Thailand

Position of Bangladesh in the Asia Map

GEOGRAPHY OF BANGLADESH

Bangladesh is a Southeast Asian country extends from 20^0 30’ to 26^0 40’N and from 88^0 03’ to 92^0 40’E.

Most part of this country is a plain low land, with the hills in the south-eastern, eastern and north-eastern parts.

It is surrounded by the Assam Hills to the east, by the Himalayan to the north.

The Bay of Bengal lies to the south of the country;

West are the contiguous plain of west of West Bengal and the Gangetic plain of India.

Climate of Bangladesh

Four seasons:

- **Winter or North - East Monsoon: December, January and February**
- **Summer or Pre - Monsoon: March, April and May**
- **South - west Monsoon or Monsoon: June, July, August and September**
- **Autumn of Post - monsoon: October and November**

Climatic parameter

Winter or North - east Monsoon:

- **Temperature: 10-17° C with lowest minimum 8 - 10° C**

- **Rainfall: In the winter season normal rainfall is about 1.8% of the total annual rainfall of the country.**

Summer or Pre - Monsoon:

- **Temperature: April and May are the hottest months. 34 - 40° C occasionally up to 42 °C .**
- **Rainfall: In the Summer or Pre - Monsoon normal rainfall is about 19% of the total annual rainfall of the country.**

Natural Disasters of Bangladesh

■Bangladesh is the most disaster prone area in the world.

■ Most of these disasters are meteorological and hydrological in nature. Such as-

- Floods
- Cyclone & associated Storm Surge
- Nor'westers/Tornadoes
- Drought
- River Erosion
- Heat Waves and Cold Waves
- Earthquakes and Tsunami
- Land slide

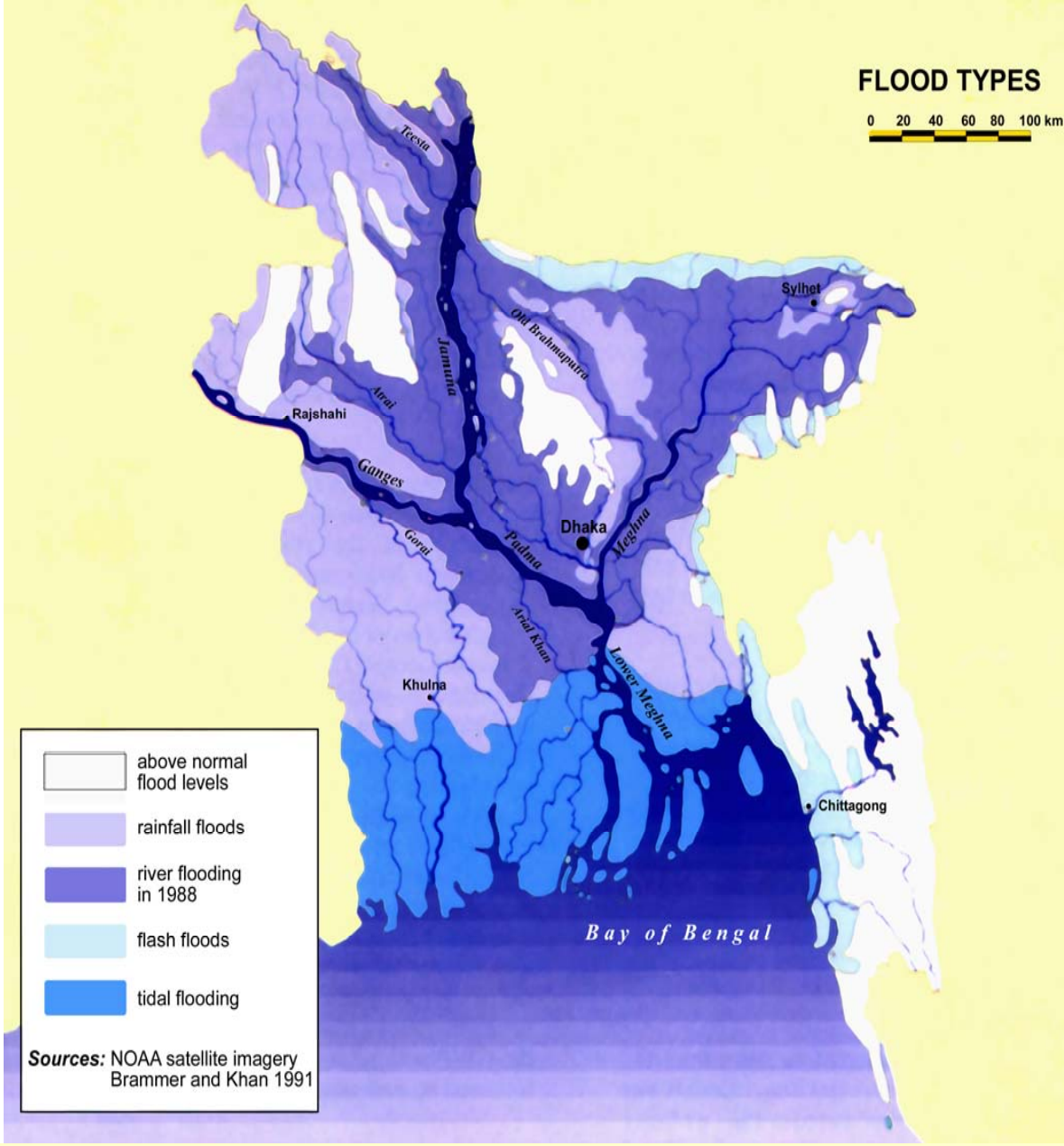
Types of flood

1 River Flood

2 Flash Flood

3 Rain-fed Flood

4 Tidal Flood due to Storm Surges



Flood types in Bangladesh

Notable Flood Disasters in Bangladesh

1974 flood	Moderately severe, over 2,000 deaths, affected 58% of country, followed by famine with over 30,000 deaths
1984 flood	Inundated 52,520 sq km, damage estimated at US$378 million
1987 floods	Inundated over 50,000 sq-km, estimated damage US$ 1.0 billion, 2055 deaths
1988 floods	Inundated 61% of country, estimated damage US$ 1.2 billion, more than 45 million homeless, between 2,000-6,500 deaths
1998 floods	1,100 deaths, inundated nearly 100,000 sq-km, rendered 30 million people homeless, damaged 500,000 homes, heavy loss to infrastructure, estimated damage US$ 2.8 billion
2004 floods	Inundation 38%, damage US$ 6.6 billion, deaths 700, affected people nearly 3.8 million

Flood Scenery

- Flood occurs in Bangladesh regularly
- Being low-lying country,at least 22% is flooded every year
- In case of severe flood, 66% area inundated
- 1954,'55,'74,'87, '88 & '98 and 2004 floods were catastrophic.

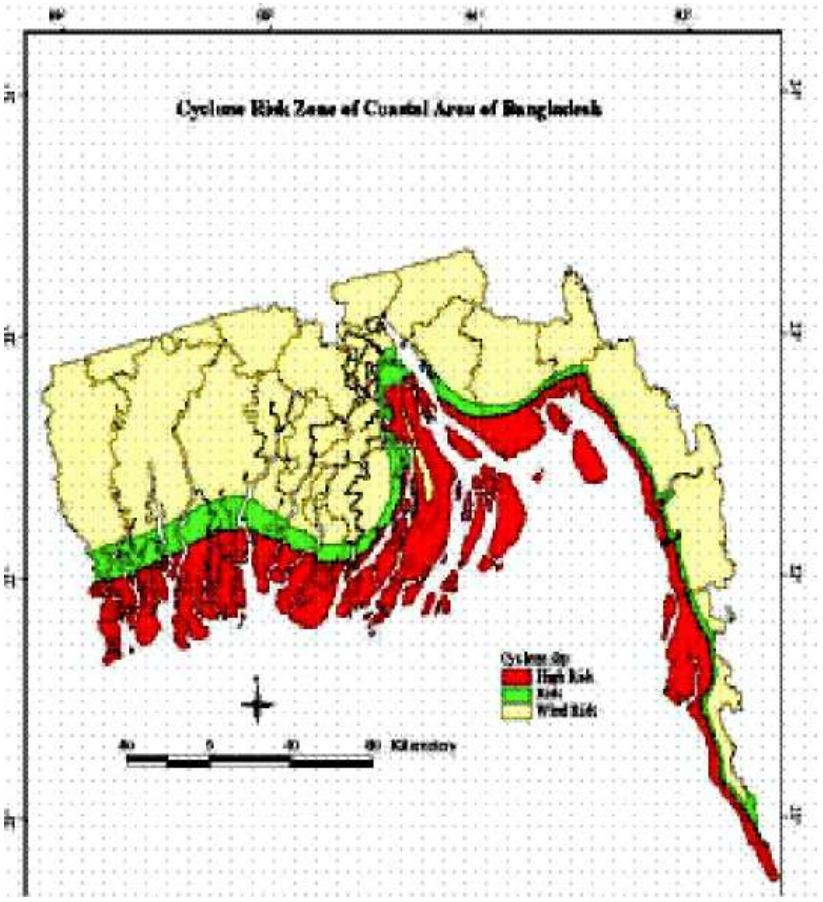
Two Pictures on Flood Devastation

Flood damage to telephone exchange

Flood damage to fiber optic link

Cyclones

- Tropical cyclones originate in the Bay of Bengal, and affect the southern part of Bangladesh. The cyclones and the attendant storm surges often result in high number of casualties in Bangladesh. Storm surge heights in excess of 10m are common. For example, in 1876, the greatest Bakerganj cyclone had a surge height of 13.6 m and in 1970 the height was 10 m.



Cyclone prone area of Bangladesh

List of the Most Destructive Cyclones in Bangladesh

Name of Cyclone	Date of Occurrence
The Great Backerganj	1876
Worst Killer Cyclone	November 1970
Urichar Cyclone	May 1985
Severe Cyclone	November 1988
Killer Cyclone	April 1991
Severe Cyclones	May and September 1997

Most Destructive Tornados

Tornados:

Demra Tornado of 1969
Manikganj Tornado of 1974
Madaripur Tornado of 1977
Saturia Tornado of 1989
Louhajong Tornado of 1995
Tangail Tornado 1996

State agencies involved in disaster emergencies

Concern Ministry:

Ministry of Disaster Management and Relief (MDMR)

Agencies:

- Disaster Management Bureau (DMB)
- Bangladesh Metrological Department (BMD)
- Flood Forecast and Warning Center (FFWC)
- Cyclone Preparedness Program (CPP)
- Bangladesh Police Force
- Bangladesh Defense Forces
- Bangladesh Telegraph and Telephone Board (BTTB)

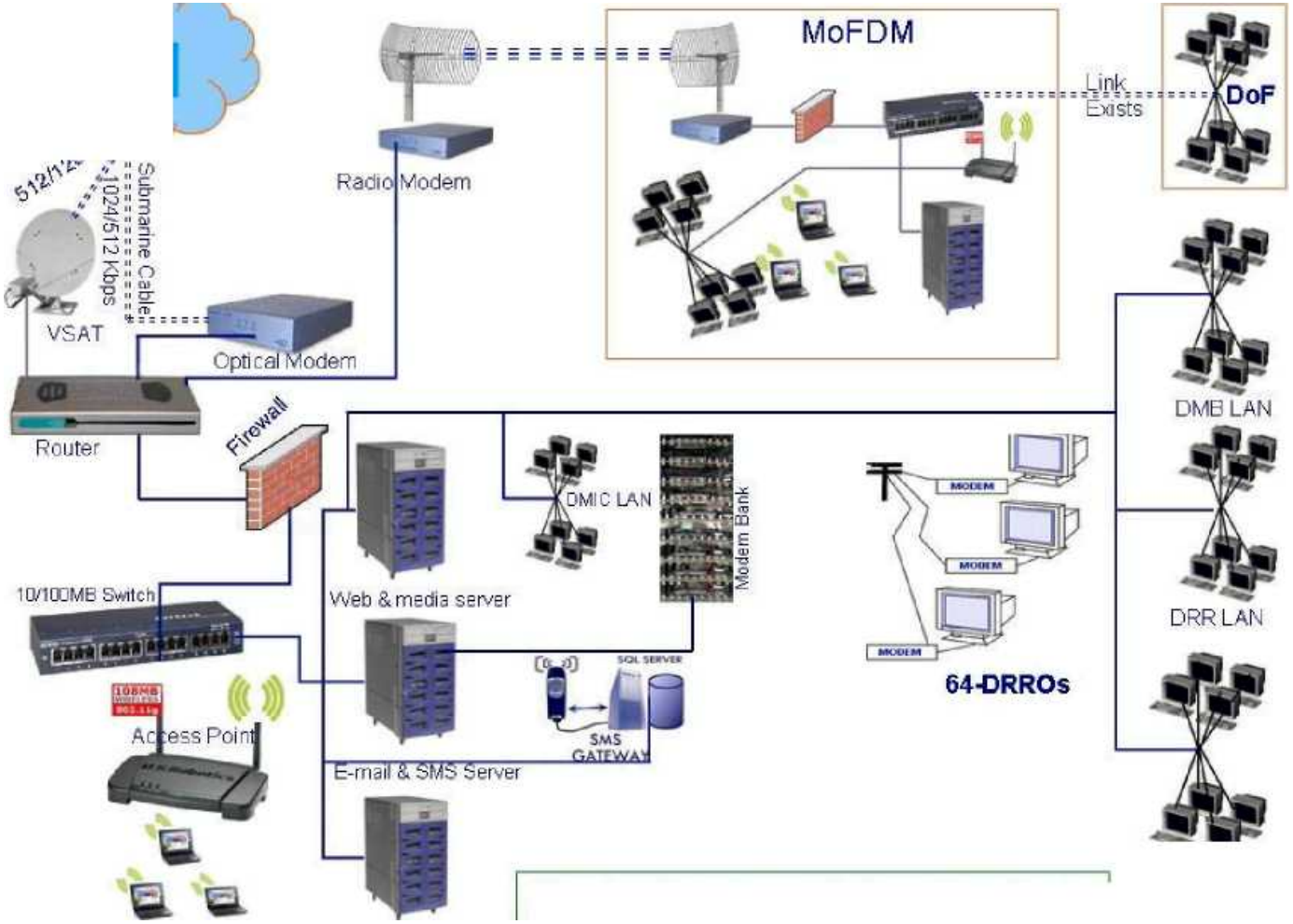
Other Non State agencies involved in disaster emergencies

- NGOs
- Telecommunications Operators
- International Organizations :UNDP, CARE Bangladesh, Comprehensive Disaster Management Programme (CDMP)

Disaster Management Bureau (DMB)

- The DMB's main role is to provide support to disaster management decision makers, planners and practitioners at all levels in Bangladesh to perform specialist functions in the field of disaster preparedness, local level disaster action and contingency planning, awareness training, facilitating improved information collection and warning dissemination.
- The DMB carries out its activities based on the Standing Order on Disasters (SOD) published in 1999 by Ministry of Disaster Management and Relief (MDMR). The SOD defines the specific emergency responsibilities of all concerned agencies including the telecommunications component which is the responsibility of the Ministry of Posts and Telecommunications (MOPT) and the BTTB.
- At present, the DMB operates the HF/SSP network for communication.

Communication Network of DMB



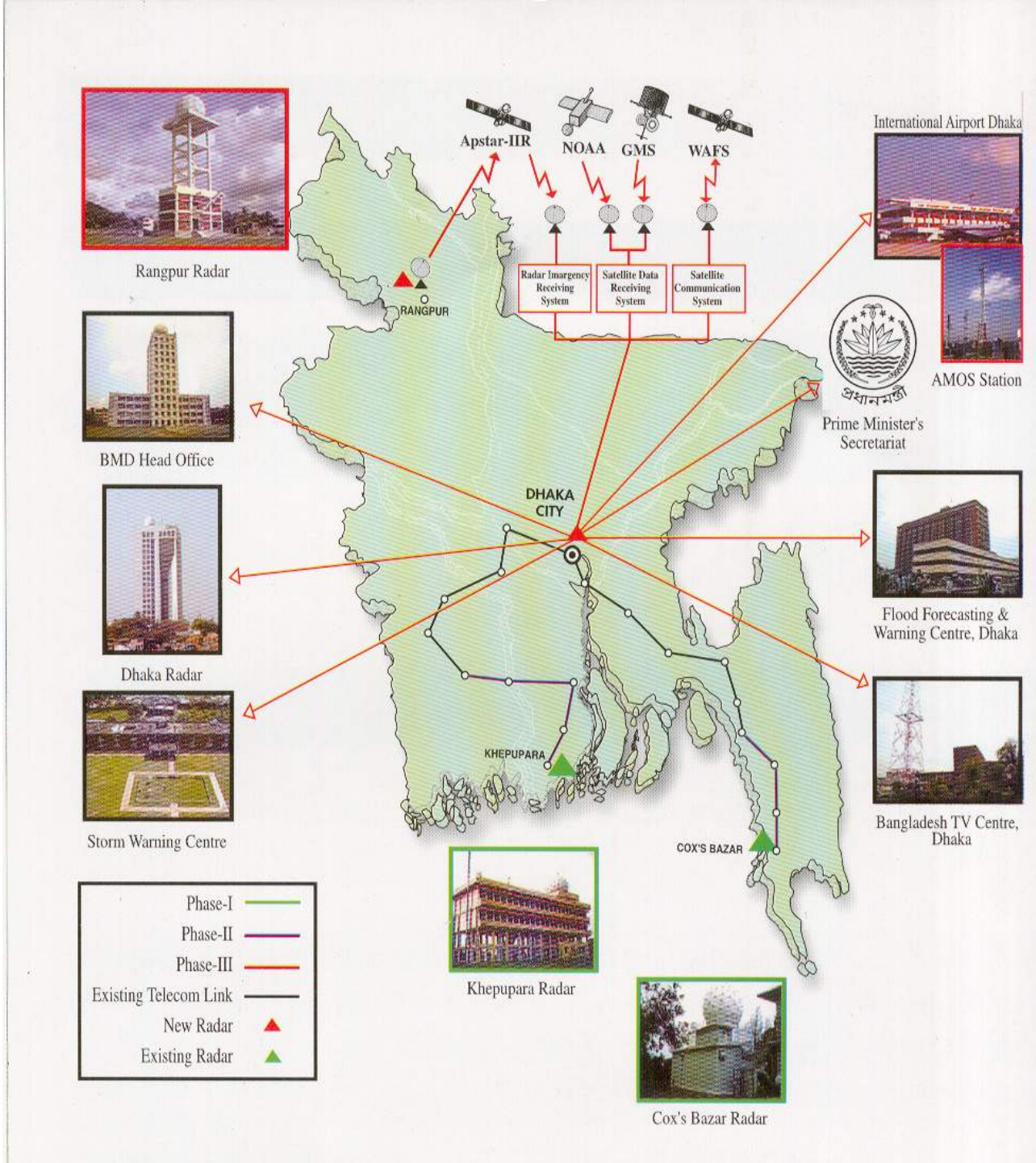
Bangladesh Metrological Department (BMD)

- The Bangladesh Meteorological Department is the government agency that is responsible of providing weather forecasts for public, farmers, mariners and aviators on routine basis and issue warnings for severe weather phenomena such as tropical cyclones, tornadoes, heavy rainfall, etc.
- BMD maintains a network of surface and upper air observatories, radar and satellite stations, agro-meteorological observatories, geomagnetic and seismological observatories and meteorological telecommunication system.
- BMD provides meteorological information to the region and at the same time access regional data to and from India through the Global Telecommunication System (GTS).

BMD's Contribution in Flood forecasting

- **BMD is issuing short, medium and long range rainfall forecast regularly and passes these forecast to Flood Forecasting and Warning Centre of Bangladesh through microwave link.**
- **BMD is receiving Radar Image in a routine basis from different Radar Stations and passes these data immediately through dedicated channel to Flood Forecasting and Warning Centre of Bangladesh.**
- **BMD received Satellite Images from NOAA, INSAT, GMS (is going to replaced by MTSET) satellites and passed these images to Flood Forecasting and Warning Centre of Bangladesh. But due to communication problem the system is not functioning now.**
- **BMD is going to established a PC VSAT as an aid from China and in near future image from FY series satellite will be received regularly.**
- **BMD is collecting real time rainfall data from 35 observatories of its own and upper catchment area of Bangladesh and through these data to Flood Forecasting and Warning Centre of Bangladesh through microwave link.**

A BMD Network for Signal dissemination



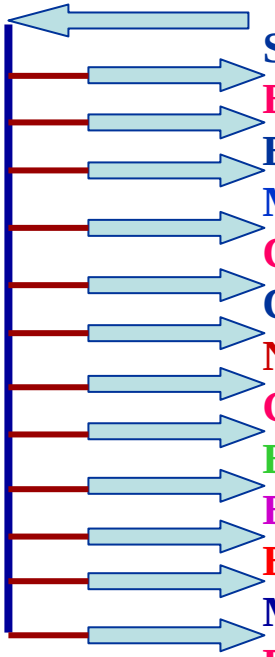
WARNING MESSAGE DISSEMINATION PLAN/ BMD

WORLD WEATHER WATCH (WWW)

U.N ENVIRONMENT PROGRAMME (UNEP) **CLIMATE CHANGE MONITORINGSYSTEM**

GLOBAL TELECOMMUNICATION SYSTEM (GTS)

NATIONAL METEOROLOGICAL COMMONICATION CENTRE (NMCC)



STORM WARNING CENTRE (SWC)
BANGLADESH BETAR (RADIO)
BANGLADESH TELEVISION (BTV)
MINISTRY OF DISASTER MANAGEMENT & RELIEF
CYCLONE PREPAREDNESS PROGRAMME (CPP)
COASTAL VOLUNTEERS
NEWS PAPERS
GENERAL MASS
BANGLADESH ARMY
BANGLADESH NAVY
BANGLADESH AIR FORCE
MARITIME AND RIVERINE PORTS
FLOOD CONTROL AND FORECASTING CENTRE

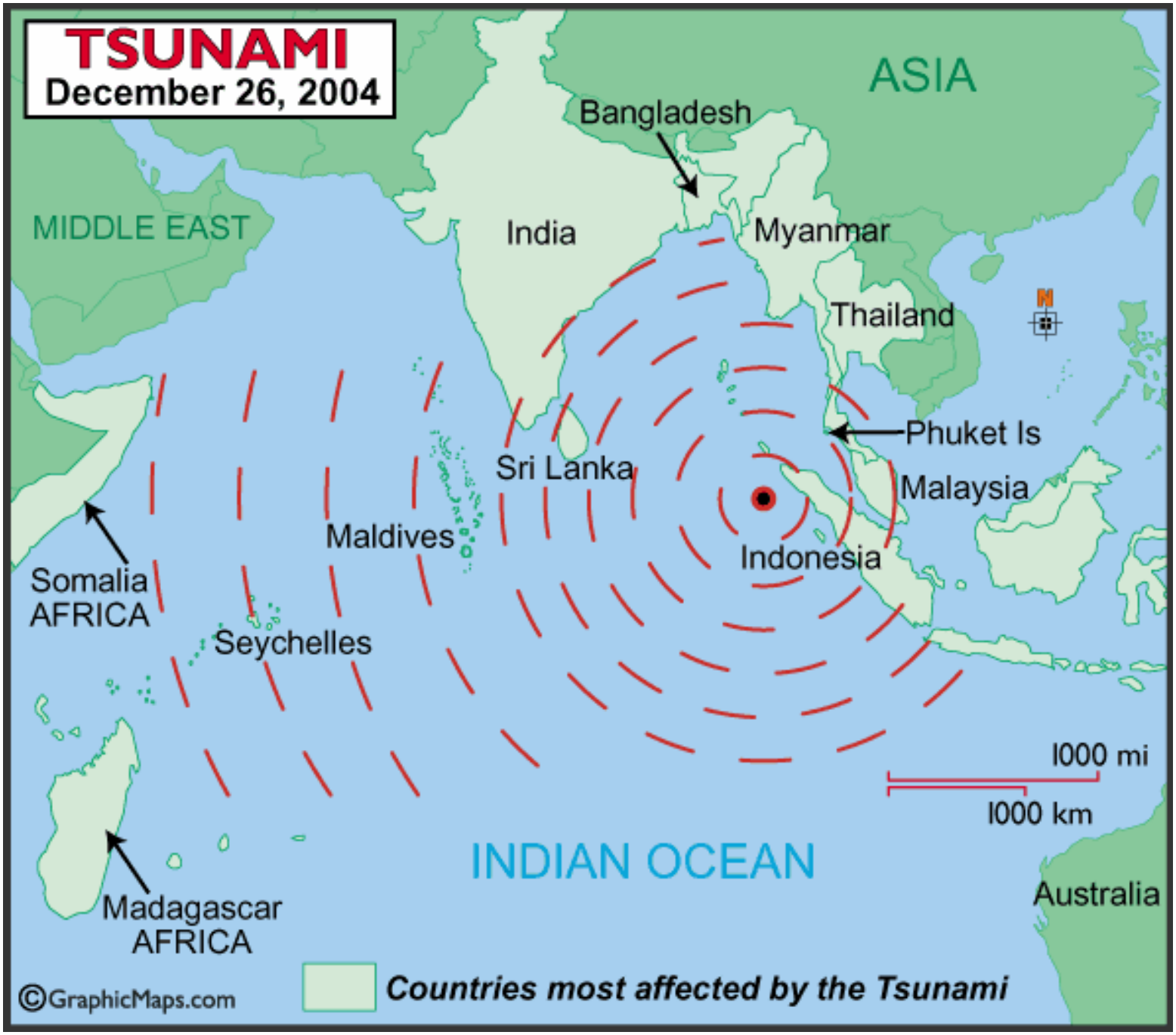
SEISMIC ZONING OF BANGLADESH

- In 1979 compiled a seismic zoning map of Bangladesh which has divided this country into three seismic zones.
- The north-eastern part including Sylhet , Mymensingh and Rangpur regions are in Zone-I, which is the most active seismic zone of the country. Here earthquake shocks with maximum intensity of 9.0 in Reichter's Scale is possible.
- Dinajpur, Bogra, Tangail, Dhaka, Comilla and Chittagong regions fall in Zone-II , where shocks with maximum intensity of 8.0 in Reichter's Scale is possible.
- Zone -III covers the regions of Rajshahi, Pabna, Kushtia, Jessore, Faridpur, Khulna, Barisal, Patuakhali and Noakhali, where the maximum possible earthquake intensity is 7.0 in Reichter's Scale.

Zone No.	Regions Included	Highest Possible Earthquake Magnitude in Reichter's Scale	Seismic Co-efficient
I	Sylhet , Mymensingh , Rangpur	9.0	0.08
II	Dinajpur, Bogra, Tangail, Dhaka, Comilla, Chittagong	8.0	0.05
III	Rajshahi, Pabna ,Kushtia, Jessore, Faridpur, Khulna, Barisal, Patuakhali, Noakhali	7.0	0.04

Some Significant Earthquake that affected Bangladesh

- Cachar Earthquake of 10th January, 1869
- Bengal Earthquake of July, 1885
- Assam Earthquake of 12th July, 1897
- Srimangal Earthquake of 8th July, 1918
- Dhubri Earthquake of 3rd July, 1930
- Assam earthquake of 15th August, 1950
- Bangladesh Burma Earthquake of 14th December, 1955

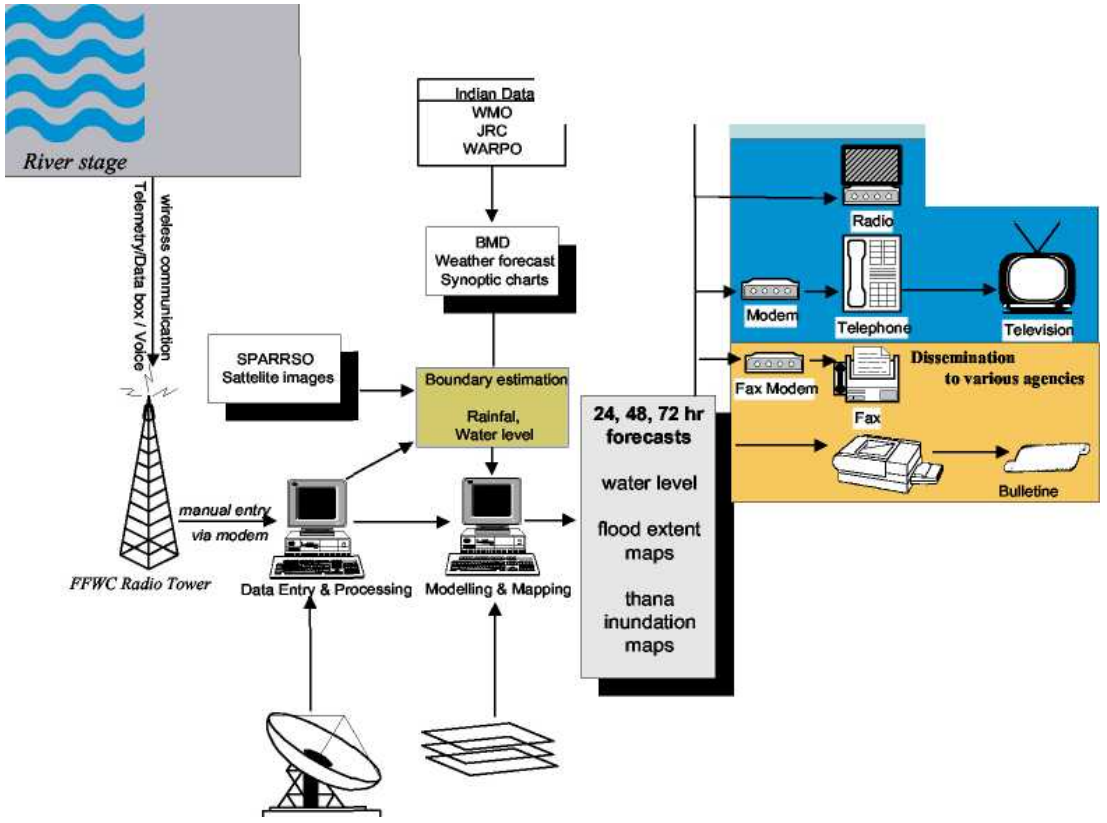

TSUNAMI
December 26, 2004
ASIA
Bangladesh
MIDDLE EAST
India
Myanmar
Thailand
N
Phuket Is
Sri Lanka
Malaysia
Maldives
Indonesia
Somalia
AFRICA
Seychelles
1000 mi
1000 km
INDIAN OCEAN
Australia
Madagascar
AFRICA
©GraphicMaps.com
Countries most affected by the Tsunami

Seismic Network proposed now

FFWC

- The Flood Forecasting and Warning Center (FFWC) is an operational component of the BWDB which is established in 1972. The principal functions of the FFWC are:
- Data collection,
- Flood forecast model operation,
- Flood warning issue and
- Operating 'Flood Information Center' during flood period.
- The BWDB is under the Ministry of Water Resources.

Warning message dissemination network of FFWC



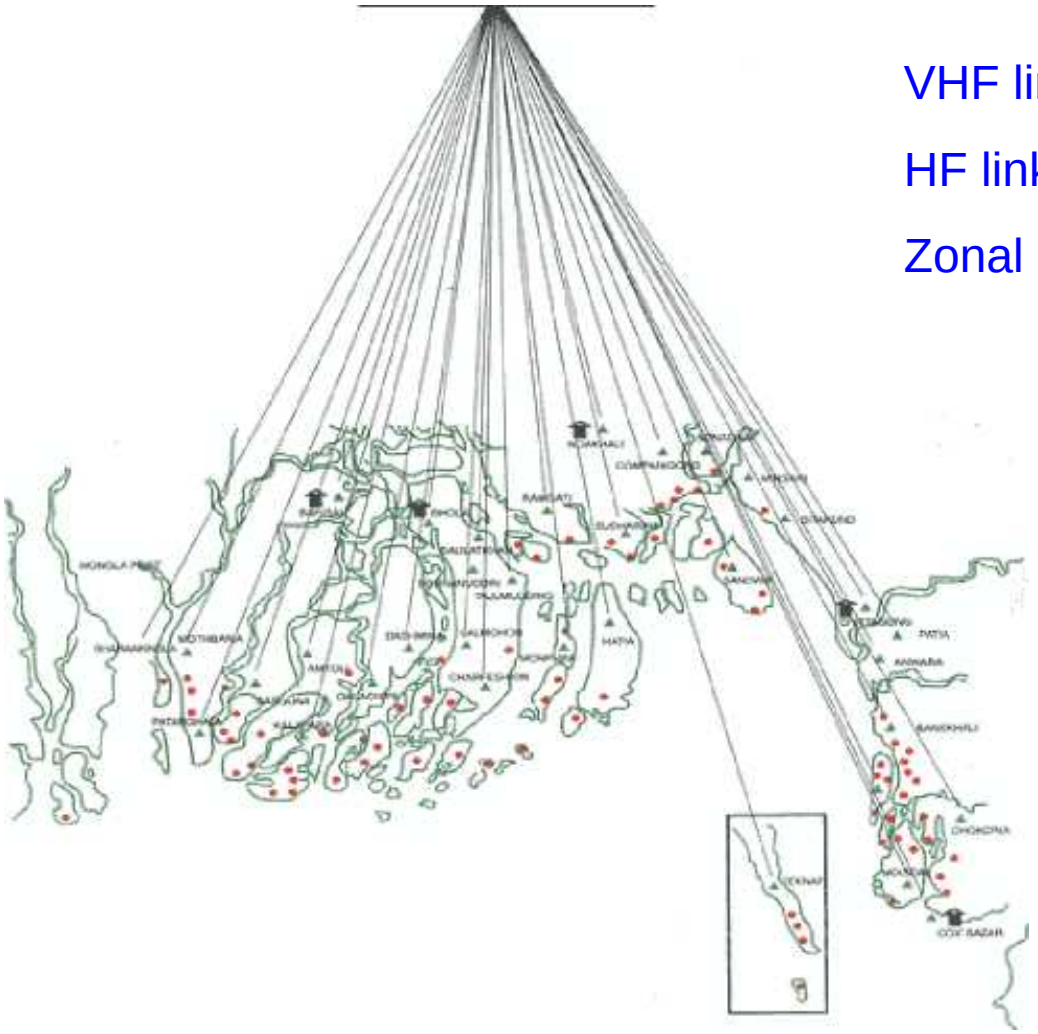
Cyclone Preparedness Program (CPP)

- The Cyclone Preparedness Program is managed jointly by the Government of Bangladesh and Bangladesh Red Crescent Society and is one of the most successful cyclone preparedness program. The CPP operates an extensive network of radio communications facilities in the coastal area, linked to its communication center at its headquarters in Dhaka. The network consists of a combination of HF and VHF radios which covers the high-risk cyclone zone areas.
- The telecommunication network of the CPP is composed of the following three elements:
- High Frequency (HF) transceiver radios with a main base station located at the Dhaka headquarter to transmit information related to the cyclone. From the field station local information related to the progress and effects of the cyclone is sent to Dhaka head quarters.

CPP / cont..

- A field station system of Very High Frequency (VHF) transceivers to receive and transmit messages from HF Field Station to Sub-Stations located at Union (group of villages) level.
- Transistor radios used at village level to receive meteorological information and cyclone warning signal bulletins transmitted by Radio Bangladesh special weather bulletin on regular basis during the time of cyclones or depressions.
- It has well-trained, large volunteer base at different levels. These volunteers are equipped with appropriate warning equipment such as megaphones, sirens, public address equipment, signal lights and signal flags. The volunteers are also provided with appropriate gear such as rain coat, gum boots, hard hats, life jackets and torch lights. The entire program has a significant training and public awareness component. Volunteers are given basic training on different aspects such as dissemination, evacuation, sheltering, rescue, first aid and relief operation. The training of volunteers is complemented by an extensive public awareness program that includes cyclone drills and demonstration, staging of dramas/ folk songs, distribution of posters, leaflets and booklets, film/ video shows and radio and TV programs. The CPP is an excellent example of how the use of communication technology in disasters can be made effective by preparing an appropriate social and cultural context in which these technologies are applied.

Telecommunication Network of CPP, Red Crescent Society



VHF links

HF links

Zonal Offices

Bangladesh Armed Forces

- Bangladesh armed Forces are deployed during the emergency period on disasters for :
- Rescue operations
- Quick restore of the communications
- Rehabilitation purpose.

- **One Earthquake observatory was established** under BMD b**ut one observatory is not adequate for providing all the information related to a earthquake occurrence.**
- **At the moment, this observatory is in partial operation.**
- **Recognizing the importance of getting all the information the Government of Bangladesh tried several times to establish a network of observatories for the collection of earthquake's magnitude, epicenter, intensity and ground movement etc. with donor assistance. But the efforts were failed.**

Initiatives taken towards disaster management

- In 2004 the Government of Bangladesh finalized the plan to establish 3 (three) new earthquake observatories along with up-gradation of the existing one in Chittagong by its own fund and accordingly a project is now being in the process of implementation.
- The building construction part of the Project has been completed, the procurement of the instrument is also in final stage, in next June 2006, it will be operational with a networking among the stations with a dedicated digital telecommunication and Radio link for data transmission and dissemination.
- A Central Data Processing unit is also included in the Project.

Extract from a Study Report

From the recent studies by the Geology Dept. of Dhaka University and Colombia University, New York, USA, it is suggested that the accumulation of stress in Bengal Basin is increasing due to the converging plate movement of Indian plate and Burmese plate.

This situation will lead to an accumulation of strain energy along the pre-existing faults in the country, eventually it is creating seismically Bangladesh more vulnerable (Tectonic Plate movement).

- **Both raising public awareness and popularization of knowledge on disaster risk management are the major key elements for the success of early warning or early information dissemination and overall disaster management system.**

- **Regarding earthquake awareness raising, along with other societal conditions, they have to have basic idea about earthquake, what implies its magnitude, epicenter, intensity and what will be the impacts.**
- **Quick warning or information dissemination up to local communities or individuals.**
- **Awareness raising is the cost-effective way of disaster management.**

Vulnerability of Bangladesh

- Because of high density of population in the world, vulnerability in terms of earthquake disaster would be much higher than other country, particularly in the cities. People's low capacity to withstand the disaster, unplanned and fragile infrastructure are the main causes.

- If the present trend of population growth continues, vulnerability, even in case of a moderate earthquake will create a catastrophe for human deaths and rescue operation will be a mess.

Evolution of Telecommunication Services in Bangladesh

The Government of the People's Republic of Bangladesh by declaring National Telecommunication Policy in 1998 liberalized the telecom sector for private investor's participation with a view to raising tele-density in Bangladesh currently having 150 million population with huge potential market. Historically Bangladesh Telephone and Telegraph Board (BTTB) is the only state owned operator enjoying monopoly in providing the fixed line telephone services in the country here to before as the main player in the telecom field. To strengthen policy and facilitate the provision of affordable telecommunication services throughout the country without compromising performance, to provide legal backing and establish regulatory regime for sound and orderly growth of the sector the government enacted the Bangladesh Telecommunications Act, 2001 pursuant to which the Bangladesh Telecommunication Regulatory Commission (BTRC) has been established in 31st January, 2002 with the exclusive power and functions to grant license and do all that are necessary for the over all development of the telecom sector.

Telecom Regulatory Responsibility

upto 1995

Ministry of Post and Telecommunication

and

Bangladesh Telegraph and Telephone Board

from 1995-2001

Ministry of Post and Telecommunication

From 2002

Bangladesh Telecommunication Regulatory Commission

Present telecom scenario

- The current telecommunication network infrastructure in Bangladesh is composed of Fixed Phones (Wire and WLL), Cellular Phones, satellite/microwave transmission, optical fiber, very small aperture transmission (VSAT) and Data communications (ISP, VSAT, DDCSP). These networks are operated by both government and private telecommunication operators .

- Most of the concerned government agencies rely on Bangladesh Telegraph and Telephone Board (BTTB) transmission networks. From the Dhaka City to the District offices, the backbone telecommunication is the microwave links (Figure 1). Consequently, the district offices are connected with respective Upazilas /Thanas by UHF radio links while many of the Thanas are linked with villages / bazaars with base / PCO radios and other terrestrial means. The same radio link (HF/VHF) is also used by non-government institutions whose volunteers in the villages are provided with radios which connect them to the headquarters in Dhaka.

Satellite/Microwave Network

- Bangladesh relies primarily upon the IO-Inmarsat synchronous orbit satellites which is located above the Indian Ocean. This geo-stationary satellite/terrestrial microwave link network is solely used for international telecommunication and consists of four earth stations: two standard "A" stations located in Betbunia, and in Mohakhali, in Dhaka City; the standard "B" station at Talibabad, and the standard "F" station in Sylhet.
- The microwave links carry the intra-country portion of the traffic. For instance, the Betbunia station is connected to Chittagong by a 2 GHz 140 Mb/s PDH Microwave; the international channels are then transmitted through a STM-16 Optical Fiber transmission system to Dhaka, where the three international gateway switches (two at Moghbazar and one at Mahakhali adjacent to the satellite Earth Station) are installed. The Talibabad station is connected to the international switch at Moghbazar through a single hop 6 GHz microwave link.
- Sylhet and adjoining areas. This satellite station is directly connected to the international gateway switch of British Telecom in UK.
- Two more international terrestrial links include the microwave link from Chuadanga near Kushtia to Krishnanagar in India and the UHF link from Attari near Dinajpur to Bhadrapur in Nepal.

Optical Fiber Network

- BTTB has optical fiber backbone network almost country wide
- The Mobile operators have optical fiber network
- PGCB has Optical fiber network along with their HV transmission line and at present they are allowed to lease out it to the service providers.

- Bangladesh has joined the SEA-ME-WE-4 submarine cable network consortium which has 10Gbs Bandwidth

Cellular Phone Networks

- There are 6 licensed private cellular-phone network operators in Bangladesh. The evolution of cellular phones in Bangladesh is most significant. At present mobile teledensity is about 12 per 100 inhabitants, the coverage is almost 90% of the geographical area of the country. 90% of the population has the tele access.

Present Telecommunication Status in Bangladesh

Fixed Telephone Line	1.133 million
Cellular Mobile lines	17.65 million
Tele Access	more than 90%
Telephone Density (Overall)	12.52%
Telephone Density (fixed)	0.76%
Telephone Density (mobile)	11.77%
Fixed Phone Operator	20
Cellular Mobile Operator	6
Data Communication Service Provider	434

Available Telecommunication Services

- Public Switched telephone Service (PSTN)
- Cellular Mobile Phone Services
- Satellite Mobile Phone Services (GMPCS)
- National Long Distance Service
- Overseas Telecommunication Service
- Internet Data Communication Service (ISP)
- Data Communication Service
- VSAT services
- Paging Services
- Radio Trunking services
- VoIP Service
- Network Service

Cellular Mobile Phone Status

Name of Operator	Technology Used	Services Provided
Grameen Phone(GP)	GSM 900 & 1800	Voice, Data (GPRS, EDGE)
Telecom Malaysia BD. Ltd. (TMIB) - AKTEL	GSM 900 & 1800	Voice, Data (GPRS)
Sheba Telecom Ltd. (Banglalink)	GSM 900 & 1800	Voice, Data (GPRS)
Pacific Bangladesh Telecom Ltd. (PBTL) - CityCell	CDMA 800	Voice, Data
TeleTalk Bangladesh Ltd.	GSM 900 & 1800 Gov. owned	Voice, Data (GPRS)
Warid Telecom International L.L.C.	GSM 1800	Not in service as yet

Thank you for listening

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