

Module VII and VIII

Disasters in Bangladesh

Environmental Pollution



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Natural Hazards in Bangladesh

Storm

Cyclone

Tornado

Nor'wester (Kal-Baishakhi)

Flood

Storm surge

Riverbank erosion

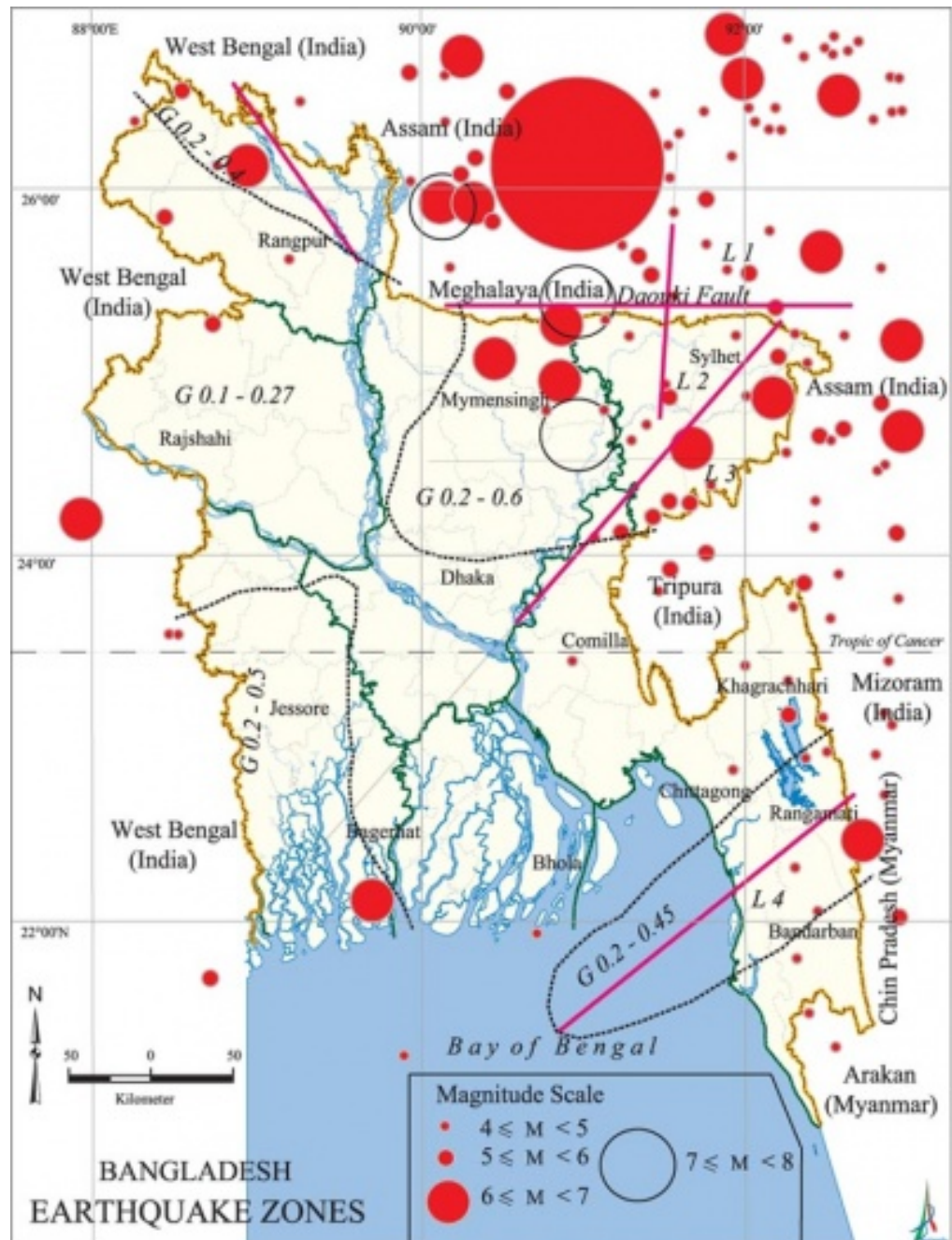
Landslide

Earthquake

Drought

<https://reliefweb.int/country/bgd>

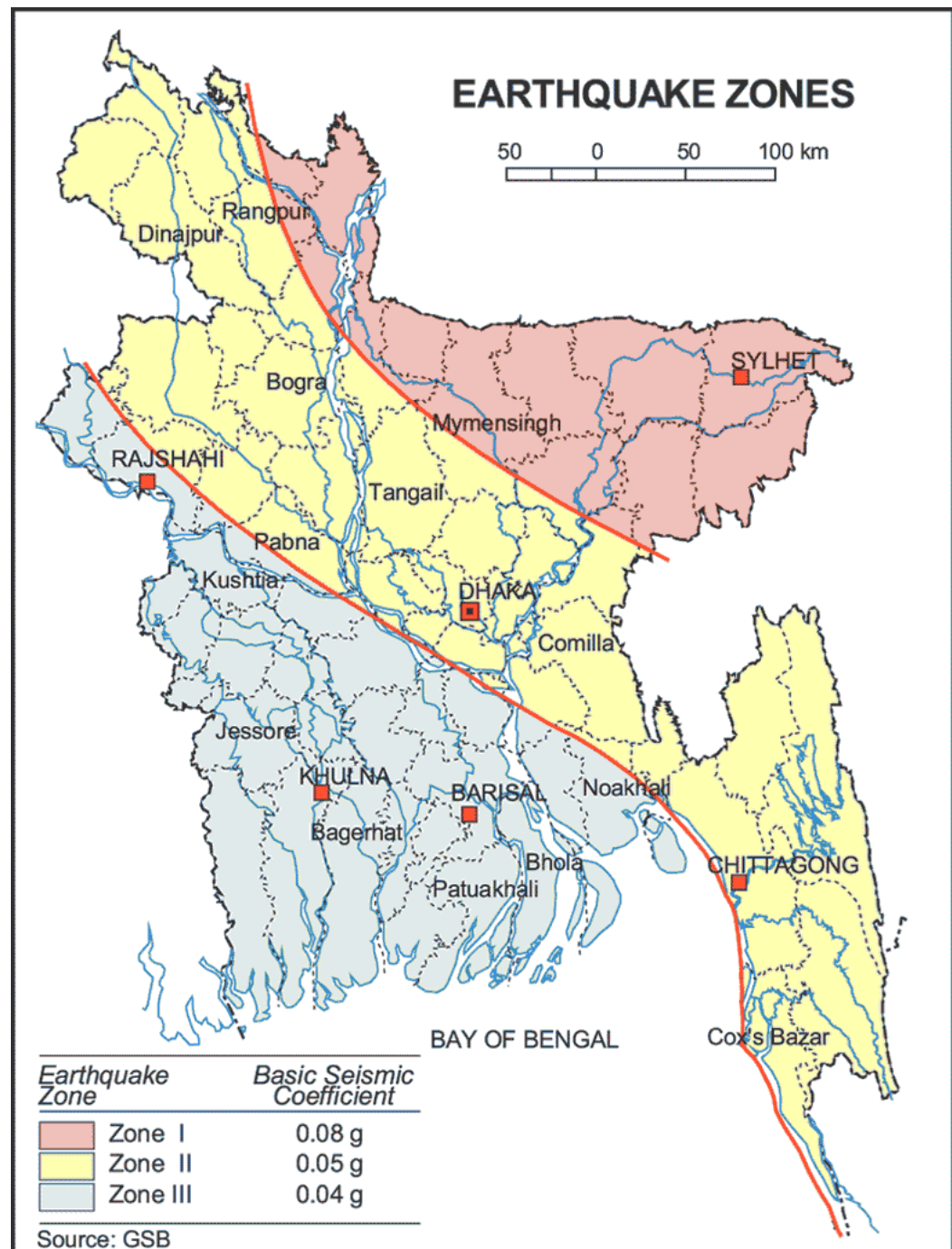
Earthquake



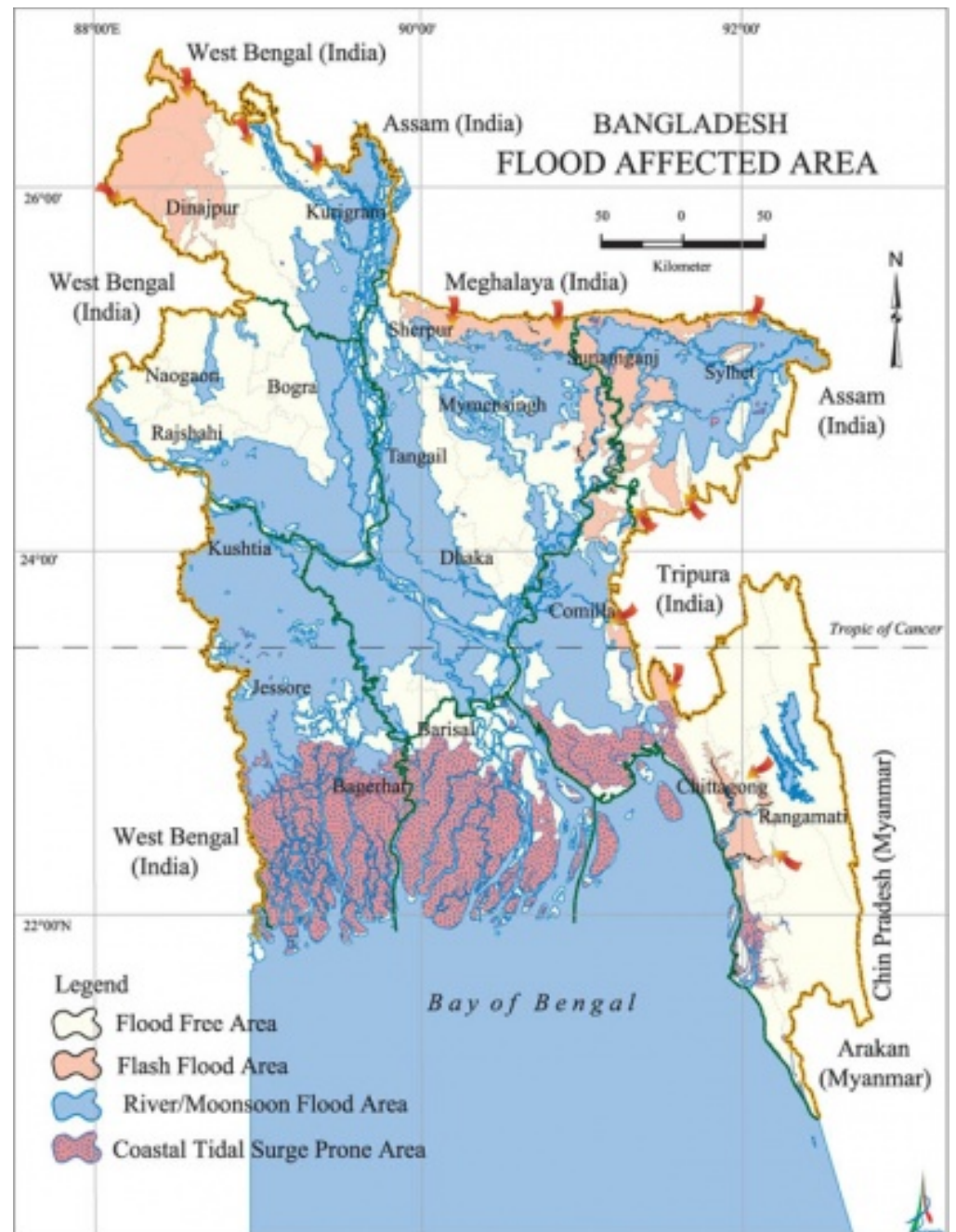
[https://
earthquake.usgs.gov/
earthquakes/map/](https://earthquake.usgs.gov/earthquakes/map/)

<https://www.tsunami.gov/>

Earthquake



Flood



<http://www.ffwc.gov.bd/>

Types of Flood in Bangladesh

Types of Flood	Causes of occurrence	Time/duration	Tentative affected area
Flash Flood	Run-off during exceptionally heavy rainfall occurring in neighboring upland areas	Pre monsoon months of April and May	The foot of the Northern and eastern hills of Bangladesh
Rainwater / Monsoon Flood	Heavy rainfall occurring over food plane and terrace areas within Bangladesh.	April-May June-August	In the south- western part of the country
River Flood	Snow melt in high Himalayans, heavy monsoon rainfalls over the Himalayans, the Asam Hills, the Tripura Hills and the Uppar Brahmaputra and Ganges food plains	April-May and June-September	Catchment areas of three major rivers.
Coastal Flood	In case of important cyclones the entire coastal belt is flooded. Coastal areas are also subjected to tidal flooding	Tidal food occurs from June to September	South western coastal areas.

Causes of Flood in Bangladesh

The causes of flood are many and they vary in different country. In Bangladesh, the most affective reasons behind the floods are:

1. An increased amount of precipitation during the monsoon period can cause enormous flow of water through rivers of Bangladesh, resultant flooding.
2. Due to relatively higher settling velocity, the large-grained sediments are deposited near the source area on the riverbeds, forming sand bars and aggradations of river channel.
3. Deforestation in the upstream region due to increase of population cause the melting of snow of that area resultant flooding in the downstream.
4. Construction of Embankment in a river reduces the velocity of water flow, causing sedimentation and riverbed aggradations and in turn reducing the water carrying capacity of the river.
5. High Subsidence rate and low Compaction rate of soil make the mainland lower than the riverbed caused overflow of water.



Causes of Flood in Bangladesh

6. Rapid population growth creates extra pressure on the land and encroachment of the flood plain and natural reservoirs. Unplanned infrastructure like road and embankments.

7. Rising of sea level due to global warming is evident cause for recent flooding in Bangladesh. The world is about to enter a period of rapid warming.

8. Unplanned infrastructure like road and embankments.

9. Huge volume of water from the upstream area. Increase in water level in all three major rivers of the country and simultaneous excessive rainfall.

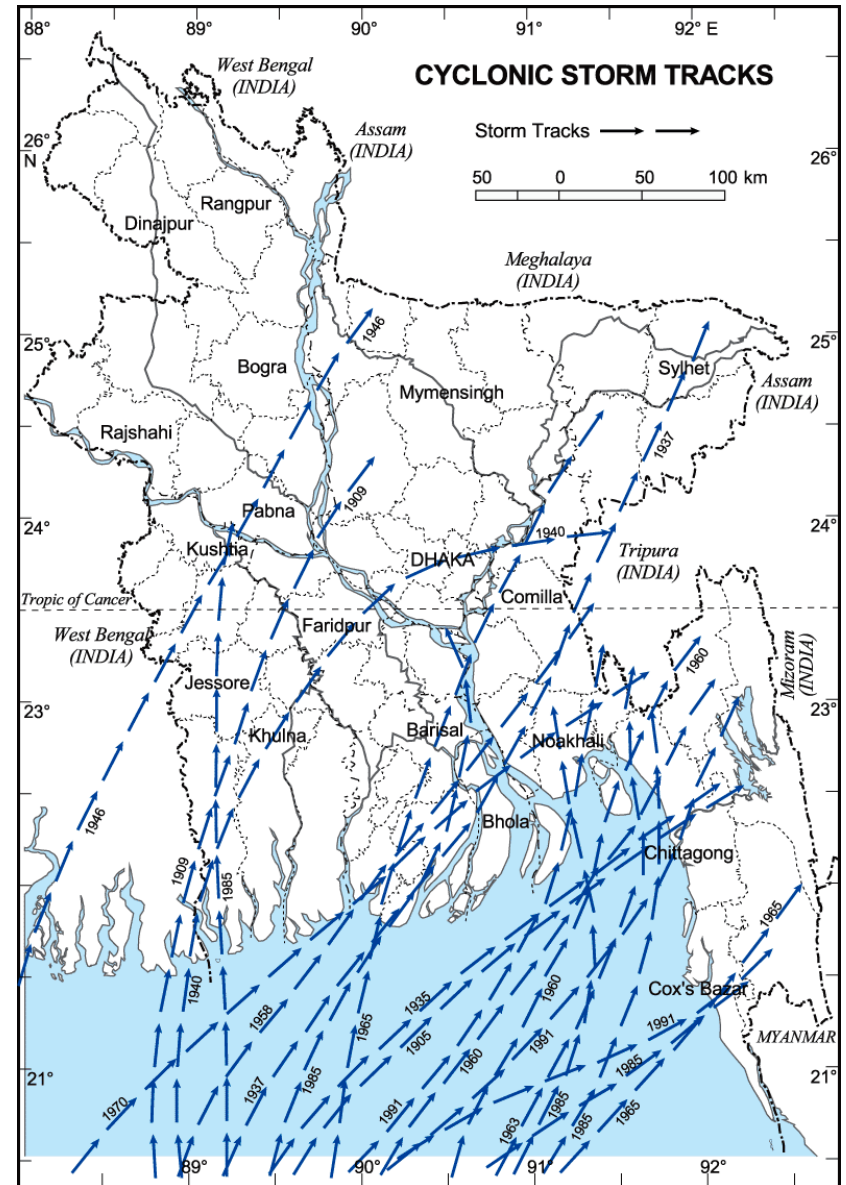
10. General low topography of the country.

11. Blockage in the natural way of movement of water.

12. Storm surge in ocean.



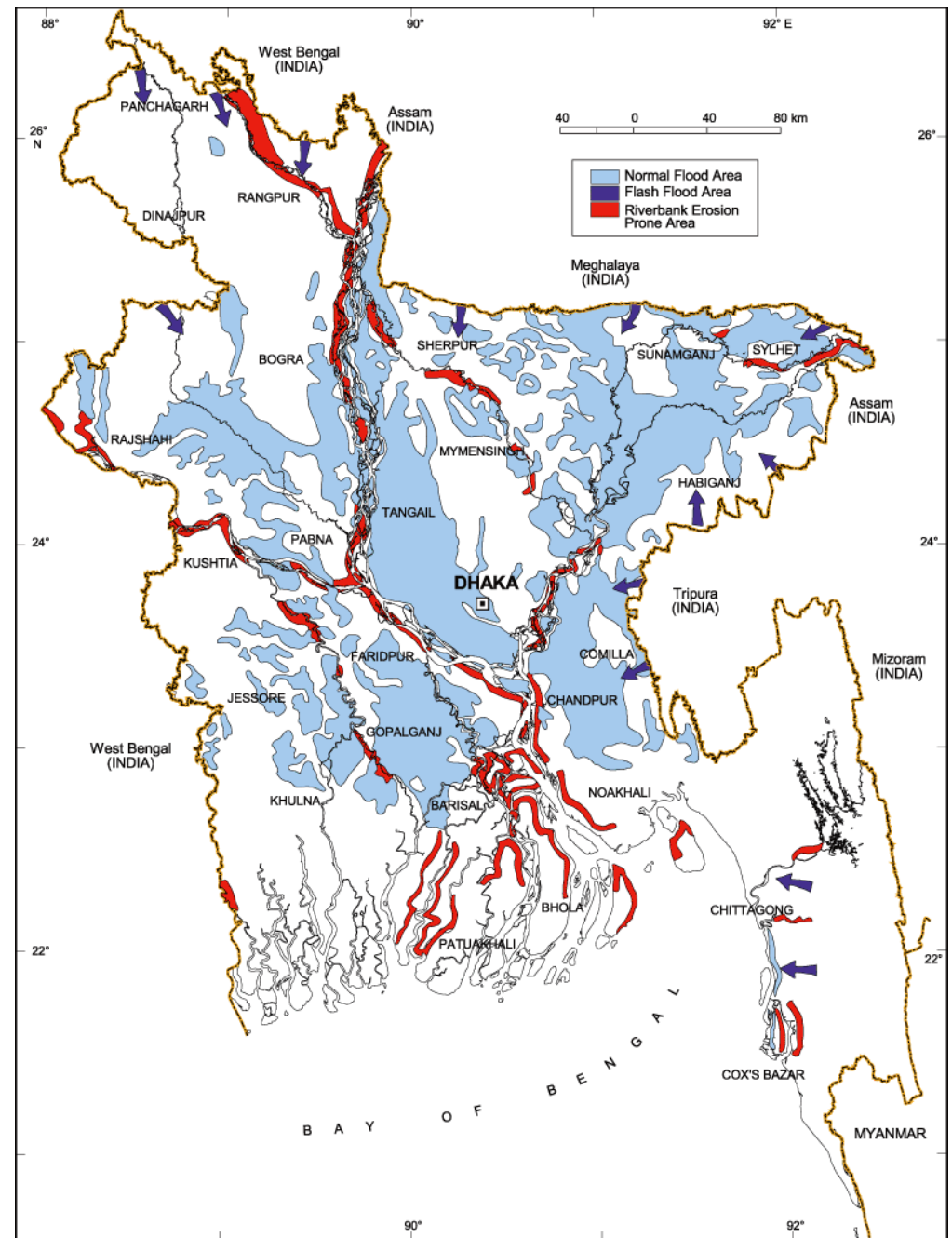
Cyclone



Riverbank erosion

[https://earthobservatory.nasa.gov/
WorldOfChange/PadmaRiver](https://earthobservatory.nasa.gov/WorldOfChange/PadmaRiver)

[https://www.maproomblog.com/2018/08/
the-changing-padma-river/](https://www.maproomblog.com/2018/08/the-changing-padma-river/)



Consequences of Riverbank Erosion in Bangladesh

Major cause of national poverty - A poor man is more insecure than a rich man as he is more vulnerable to different crises. He has less economic strength and lower social status, as such he has less capacity of coping with any crisis. So, we can say that river erosion is creating long-term poverty and it is also a key reason of poverty in Bangladesh.

Major cause of rural-urban migration - Thousands of people migrate to the urban areas mainly to Dhaka city every year after losing their homes and crop land to the endless river erosion

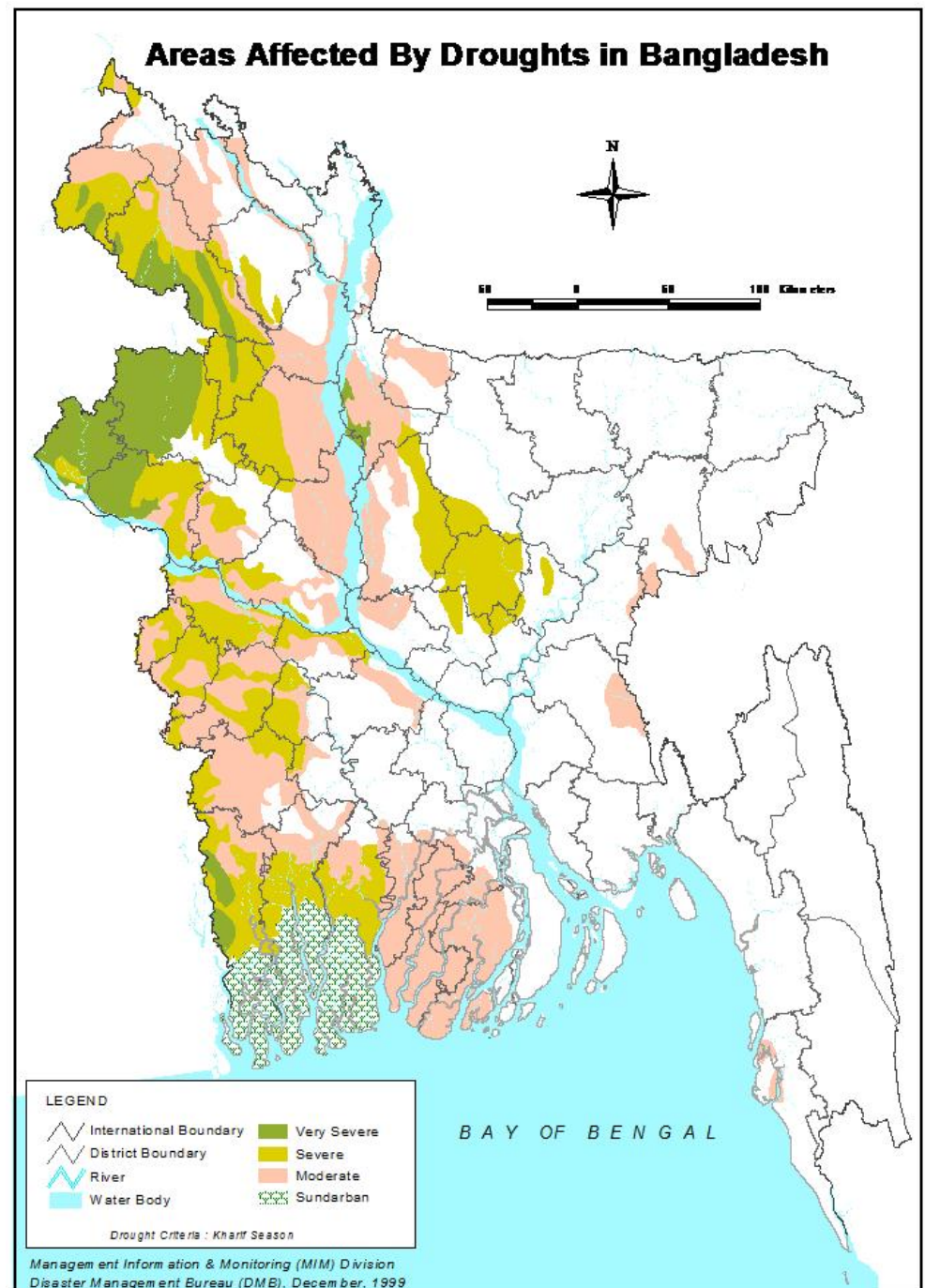
Loss of agricultural land - Four million people has so far been affected by river bank erosion when more than 2,000 square kilometers of land have vanished into rivers.

Loss of homestead - 530 hectors of homesteads in 2007, 1,00,000 people become homeless due to erosion each year

Loss of national property - 5% national territory affected by erosion annually
Financial loss of \$500 mill per year - dams, roads and infrastructures destroyed by the three major rivers— Padma, Jamuna and Megna in 2007.



Drought





Module VIII

Environmental Pollution



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Environmental pollutions

Any alteration to air, water, soil or food that threatens the health, survival capability of humans or other living organisms, is called pollution.

A pollutant is any biological , physical or chemical substance that in identifiable excess is known to be harmful to the desirable living organisms.

Causes of pollution

–Natural

- Volcanic eruptions
- Soil erosion/ sediment transport
- Dust storms
- Tsunami

–Human-induced

- Domestic
- Industrial
- Agricultural
- Mining

Types of pollution

- Water pollution
 - Surface water
 - Ground water
 - Marine water
- Soil or land pollution
- Air pollution
- Noise pollution
- Light Pollution
- Visibility pollution

Water pollution

- Water pollution refers to degradation of water quality.
- Water in domestic uses must be free from constituents harmful to health. It should taste and smell good. It should not damage household appliances.
- Water quality for industrial processes varies widely depending on the process. Some requires distilled water also. Water pollution can occur as-
 - Surface water pollution
 - Ground water pollution
 - Marine pollution

Some sources of water pollution

- Surface water

- Industrial effluent
- Urban runoff
- Agricultural runoff
- Accidental spills of chemicals
- Sediments
- Air fallouts
- Sanitary intrusion

- Groundwater

- Leaks from waste disposal site
- Saltwater intrusion into coastal aquifers
- Seepage from mines and septic systems
- Seepage from pesticides
- Seepage from accidental spills
- Seepage from polluted stream

Major categories of water pollution

- **Infectious agents:** disease causing agents or pathogens, including bacteria, viruses, protozoa, parasites. These come from raw sewage and animal waste and they may be responsible for 80% of the disease in the developing countries.
- **Water soluble inorganic chemicals:** acid, salts and metals. Make water unfit to consume and use for irrigation. Also can harm organism and metal corrosion.

- **Organic chemicals:** including oil, gasoline, plastics, pesticides and detergents. Present health risk to human and other organisms.
- **Plant nutrients:** nitrates, phosphates, ammonium... from fertilizer mostly.
- **Sediments:** mud, silt , sand. disrupt photosynthesis and bad for aquatic animals.
- **Radioactive materials:** radon, uranium.... May come either from natural anthropogenic sources.
- **Heat:** from cooling water for power plants and other industrial plants. Lower solubility of oxygen in water. Also affect aquatic lives directly.

Causes of surface water pollution

- Uncontrolled discharge of waste water from agricultural land
- Discharge of domestic waste water
- Industrial waste
- Acid rain through air pollution is also one of the causes of surface water pollution.
- Decaying of organic matters into water bodies
- Salt water intrusion in ground water
- Leaching of chemicals
- Wash down of components of volcanic eruptions

Ground water pollution

- Domestic and industrial waste water pollutes the ground water.
- Pesticides used in agricultural activities enter the ground water through irrigation water.
- Special problems related to ground water pollution
 - Decomposing bacteria may not be present in sufficient numbers
 - Cooler temperatures, lack of sunlight slow chemical reactions that decomposes wastes
 - Aquifer characteristics may be poorly known.

Marine pollution

Pollutants	Sources	Impacts
sediments	Deforestation, soil erosion, mining and farming	Blocks water flows and coastal ecosystems, clogs gills of fish
Pathogenic organisms	Sewage and livestock wastes	Contaminates coastal swimming places and seafood, spreading diseases
Litter, specially plastics	Disposed by people and plastic industry, thrown overboard from ships	Pollutes the water and beach areas
Oil	industries, ships and oil tankers	Kill sea fish and causes diseases in marine life
Radioactive waste	Discharge from nuclear power stations, reprocessing plants etc.	Causes diseases in marine life
Toxic waste (heavy metal and chemicals)	Metals from mining and industries, pesticides from farms, discharge water from cities	Poisons marine life and contaminates sea food

Coastal/marine pollution: why should we care?

- About half of our population lives within 200 km of the coast
- We eat at least 15 lbs. of seafood per person each year
- Just about everything bought & sold goes through ports in cargo ships
- 90% of ocean species live in continental shelf close to land. Each one play vital role for balance of the nature.
- 17% of our oil and 25% natural gas come from offshore

Effects of Water Pollution

- ❑ Kills life that inhabits water-based ecosystems. Dead fish, birds, dolphins, and many other animals often wind up on beaches, killed by pollutants in their habitat.
- ❑ Pollution disrupts the natural food chain as well. Pollutants such as lead and cadmium are eaten by tiny animals. Later, these animals are consumed by fish and shellfish, and the food chain continues to be disrupted at all higher levels.
- ❑- Eventually, humans are affected by this process as well. People can get diseases such as hepatitis by eating seafood that has been poisoned.
- ❑- Polluted drinking water can cause cholera or typhoid infections, along with diarrhea.

Measures to control water pollution

- Pollution can be reduced by providing suitable facilities for collection, treatment and disposal of domestic waste.
- Adopting modern technologies in industries that use less water.
- Reusing and recycling industrial waste water.
- Preventing wild dumping of solid and liquid waste on land.
- Providing proper sanitation facilities at urban and rural areas.

