

CE 2141 ENGINEERING GEOLOGY AND GEOMORPHOLOGY

Lecture 13~14 – Geomorphology of Bangladesh

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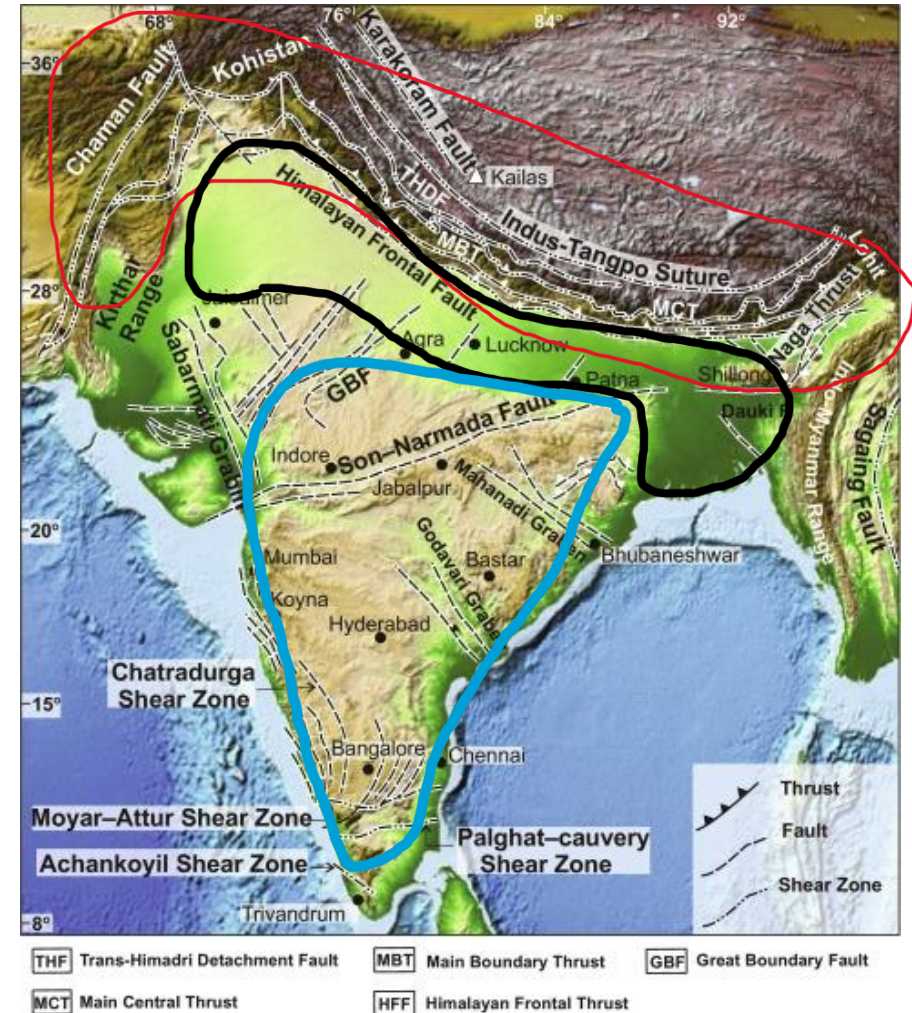
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Lecture 13~14: Topics

- Geologic Evolution of Bangladesh
- Hilly Area
- Rivers and Floodplain
- Coastal Region

Indian Plate

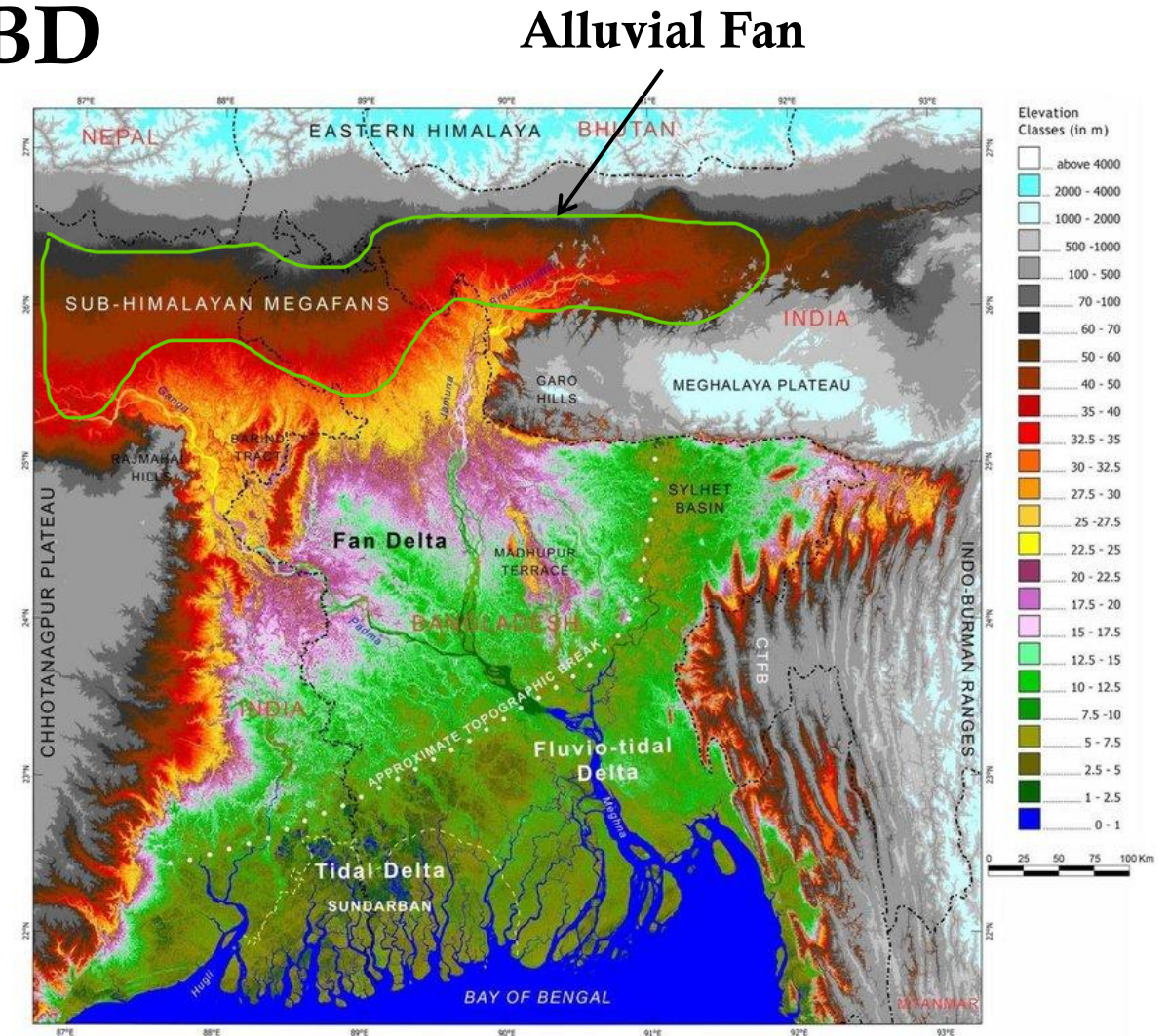
The geologic formations of the Indian subcontinent are broadly divided into three major units: the **Himalayan mountain belt in the north**, the Indo-Gangetic Plain to its south, and **the Indian Shield (or Deccan Plateau) in the south**.



Physiographic Settings of BD

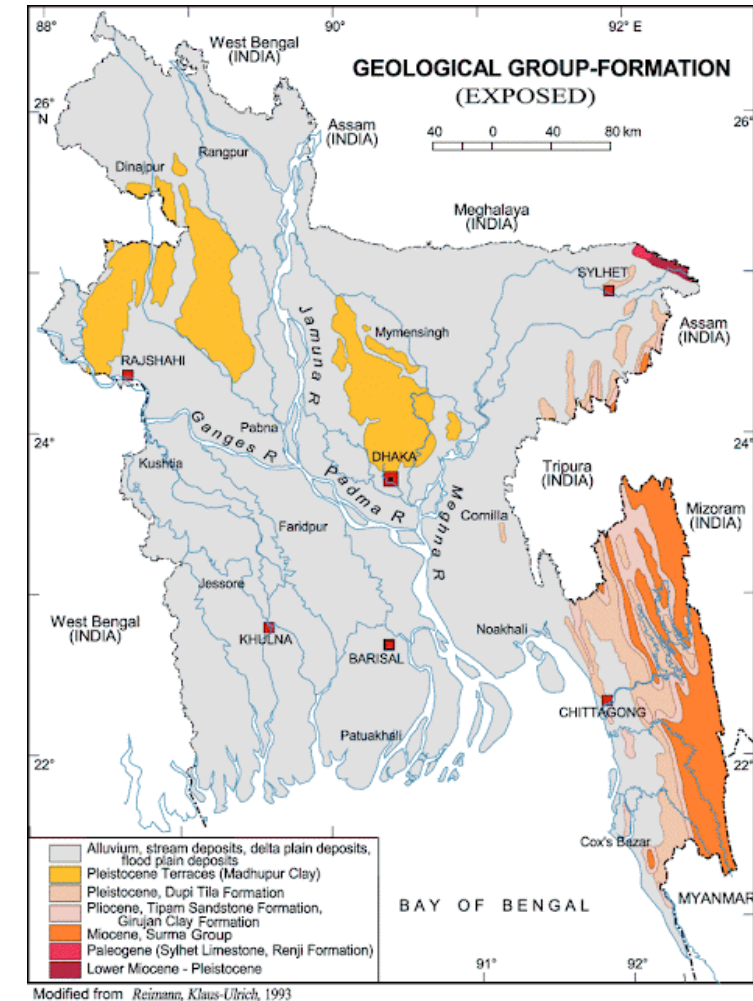
Physiographic divisions:

- Tertiary Hills (the oldest and highest, in the southeast and northeast),
- Pleistocene Terraces (older, elevated plains like the Barind and Madhupur tracts), and
- Recent Floodplains, which include the vast deltaic plain, tidal plains, and piedmont plains near the Himalayas.



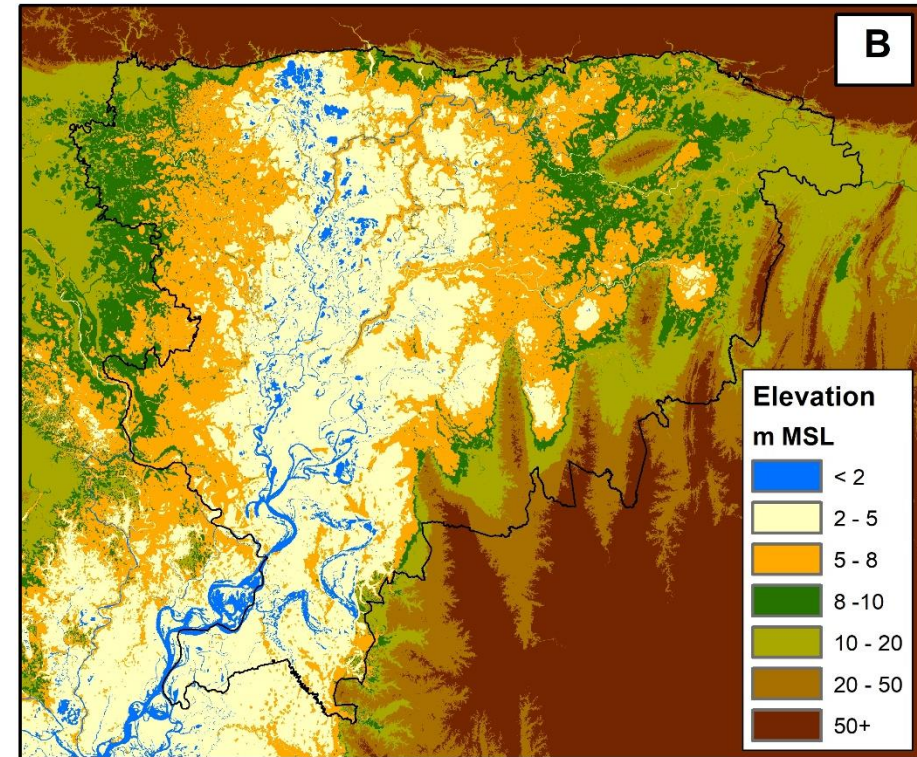
Geological Group

- The northwestern and northern regions, specifically the Barind Tract and Rajshahi area, contain old volcanic rocks (Rajmahal Trap) from the Cretaceous period.
- The northeastern region around Sylhet has exposed limestone formations (Sylhet Limestone) that are also from the Cretaceous period (120 million years old).
- Beneath the entire country, the deepest "basement" rock is ancient Pre-Cambrian igneous and metamorphic rock, which is over 550 million years old.



North-Eastern Hills & Haors

- **High Plateau Neighbor:** To the north, the land in India (Meghalaya) is very high and steep.
- **Rivers Carry Sediment:** Small rivers flow down from these high hills. As they move, they carry gravel sand and mud with them.
- **Shallow Wetlands Form:** Because the land is sinking and filling with sediment, it is very flat and low, known as Haor.
- **Flash Flooding:** Meghalaya mountain cause convectional rainfall, which flow very quickly from the mountain to flat Haor basin and flash flood occur.



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South-Eastern Hills

- **Topography:** The area is characterized by steep, rugged hills and narrow valleys, part of the young folded mountain ranges.
- **River System:** The rivers here are typically straight and fast-flowing.
- **Climatic Condition:** It experiences a tropical monsoon climate and receives the 2nd highest rainfall in Bangladesh.
- **Disasters:** This region is highly vulnerable to natural hazards, particularly landslides during the monsoon and sudden flash floods.



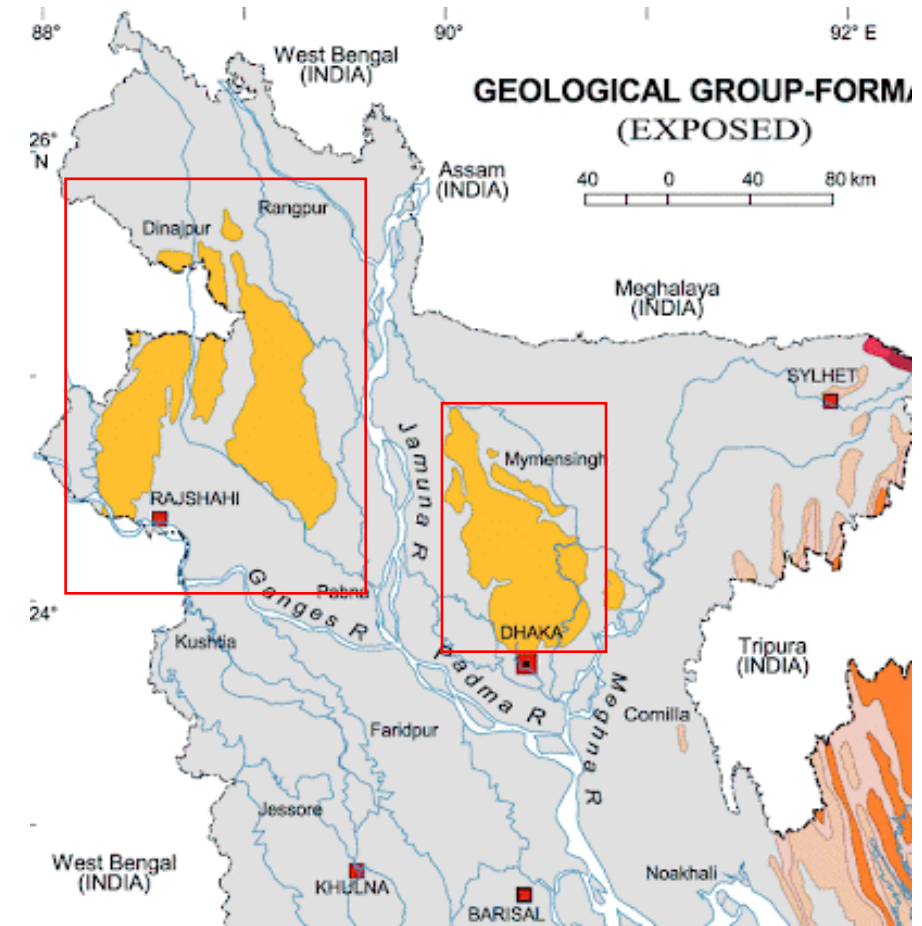
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Barind and Madhupur Tracts

- **Topography:** They are elevated, flat-topped plateau-like areas known as Pleistocene terraces (60 million years old), standing above the surrounding floodplains.
- **River System:** They are not formed by modern rivers but are older landforms dissected by small, seasonal streams.
- **Climatic Condition:** Experience a relatively drier climate compared to the rest of the country, with less annual rainfall.
- **Disasters:** Prone to seasonal drought and water scarcity, especially during the dry period.



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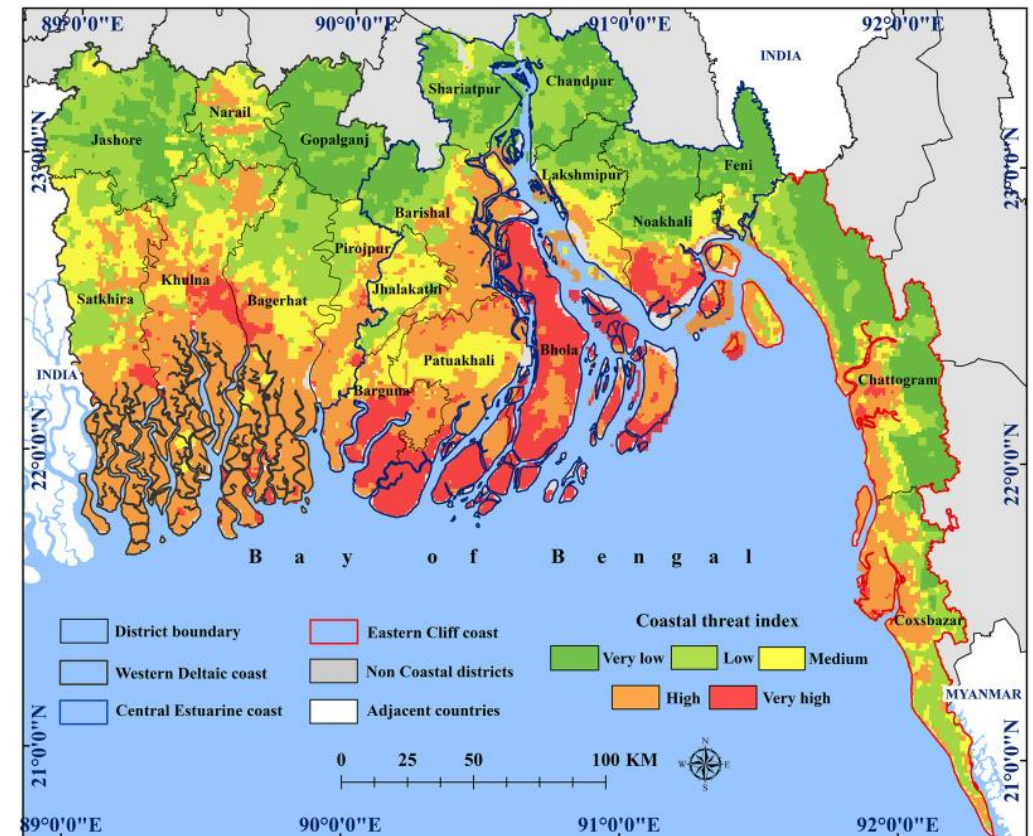
Alluvial Floodplain

- **Topography:** Flat, low-lying land formed by river-deposited silt and sand, making up most of Bangladesh's land area.
- **River System:** Dynamic, meandering rivers (like Padma, Jamuna) that often flood, shift course, and create chars (sandbars).
- **Climatic Condition:** Dominated by a tropical monsoon climate with heavy seasonal rains and high humidity.
- **Disasters:** Highly vulnerable to recurring river flooding, riverbank erosion, and waterlogging.



Coastal Zone

- **Topography:** Low-lying, flat plains with tidal rivers, marshes, and the Sundarbans mangrove forest.
- **River System:** A complex network of tidal rivers and estuaries influenced by daily tides and saline water.
- **Climatic Condition:** Tropical monsoon climate with high humidity and frequent cyclones.
- **Disasters:** Extreme vulnerability to cyclones, storm surges, coastal flooding, and salinity intrusion.



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