Recent Floods in Eastern Bangladesh: Causes and Countermeasures

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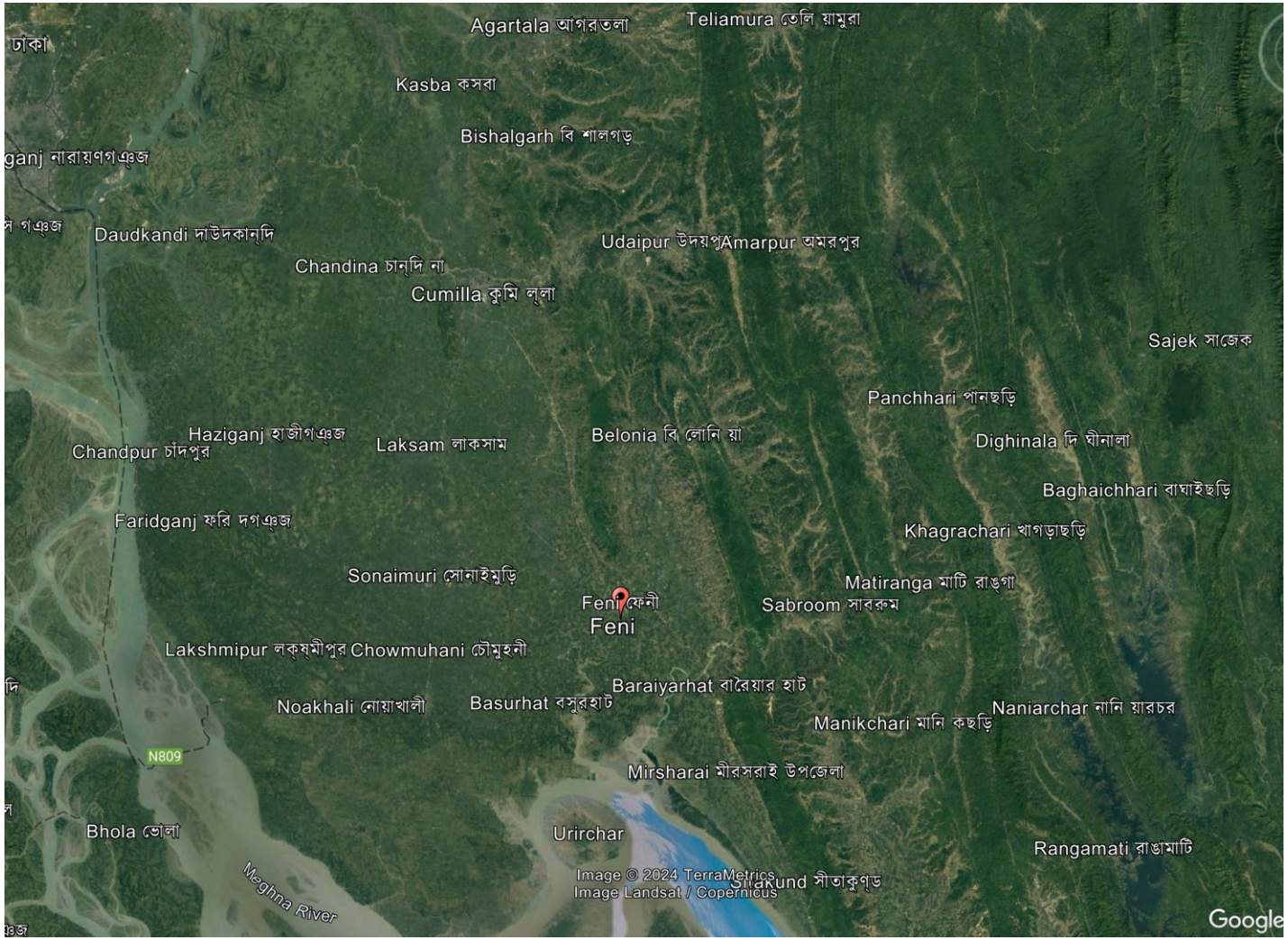
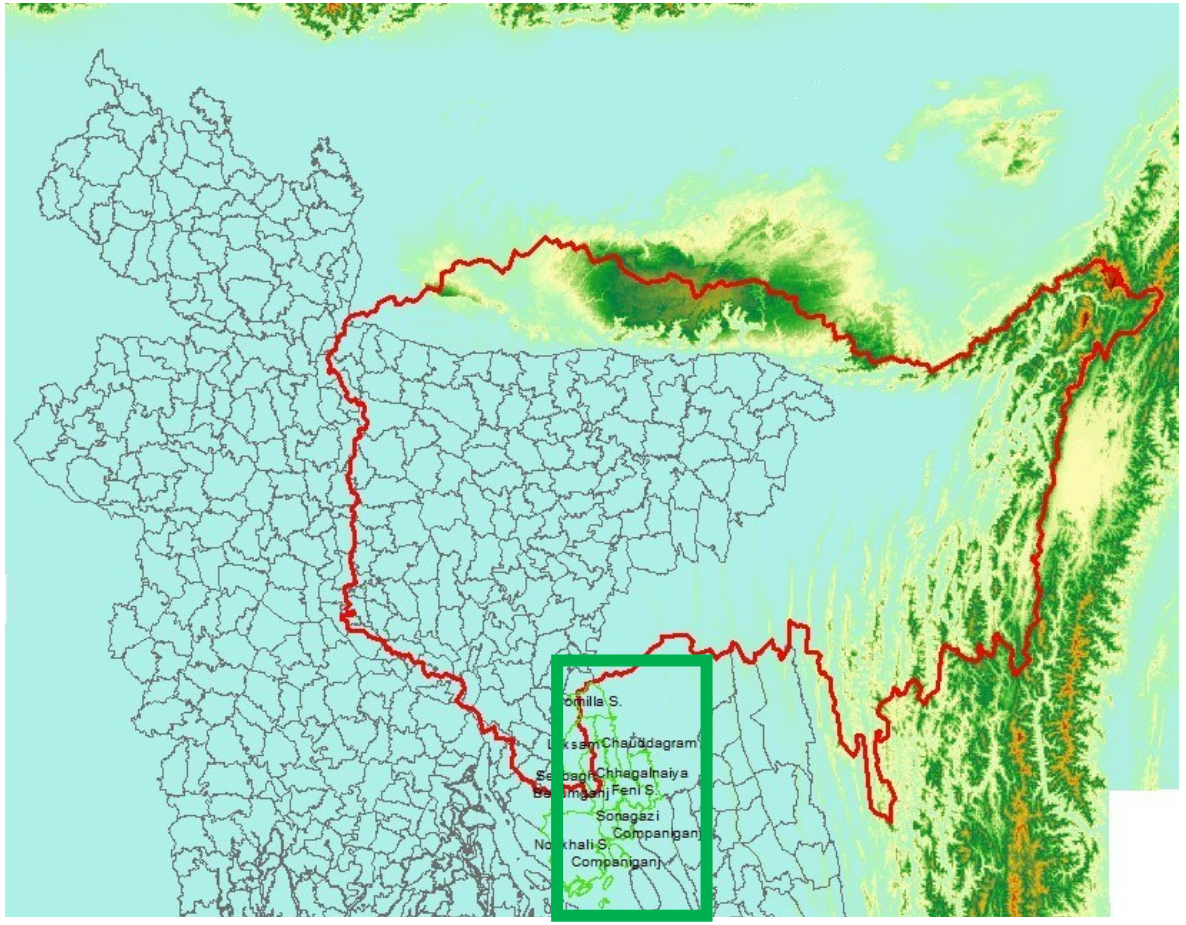
Orientation and Perspective

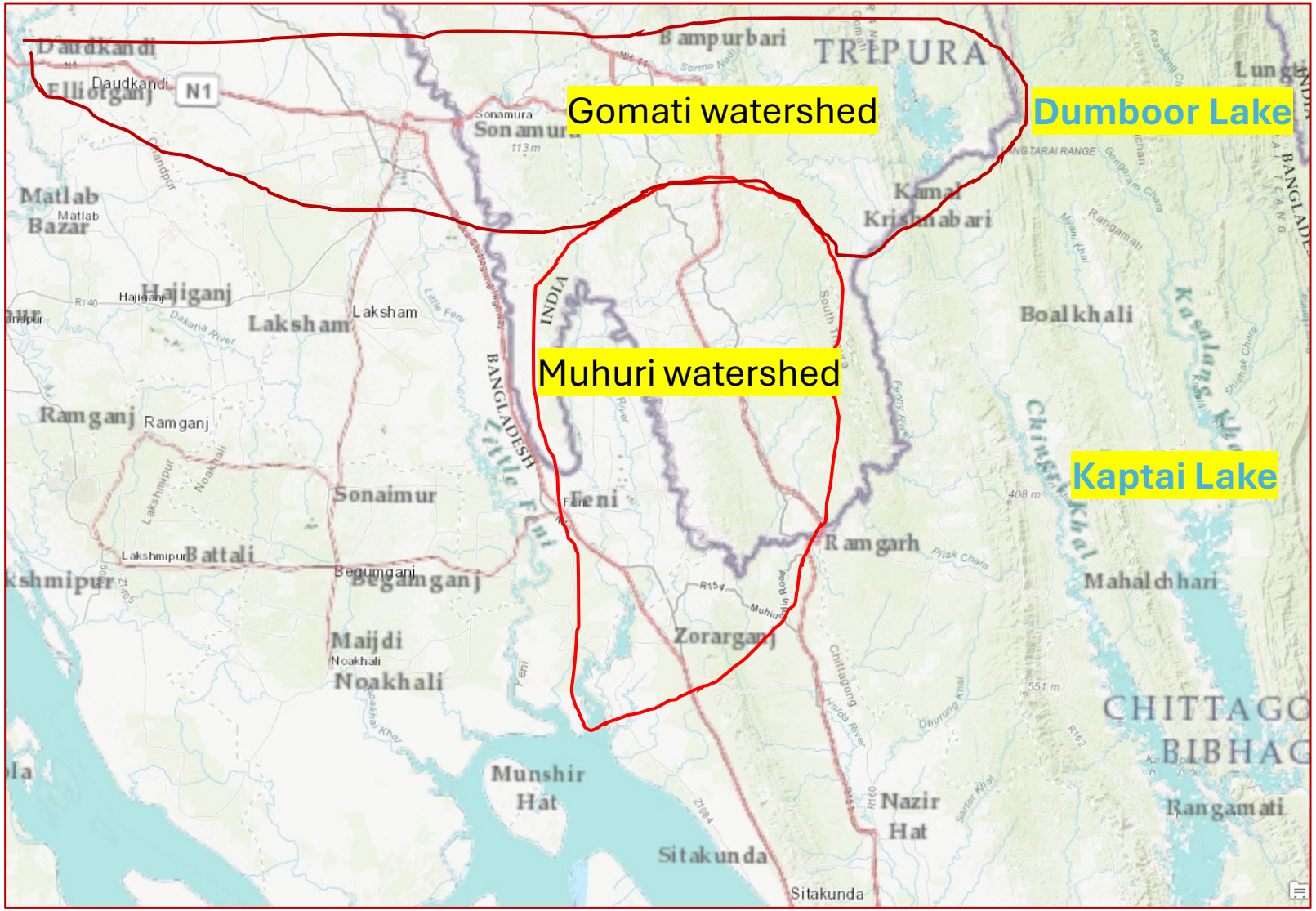


NE Watersheds: Meghna and Gomati-Muhuri

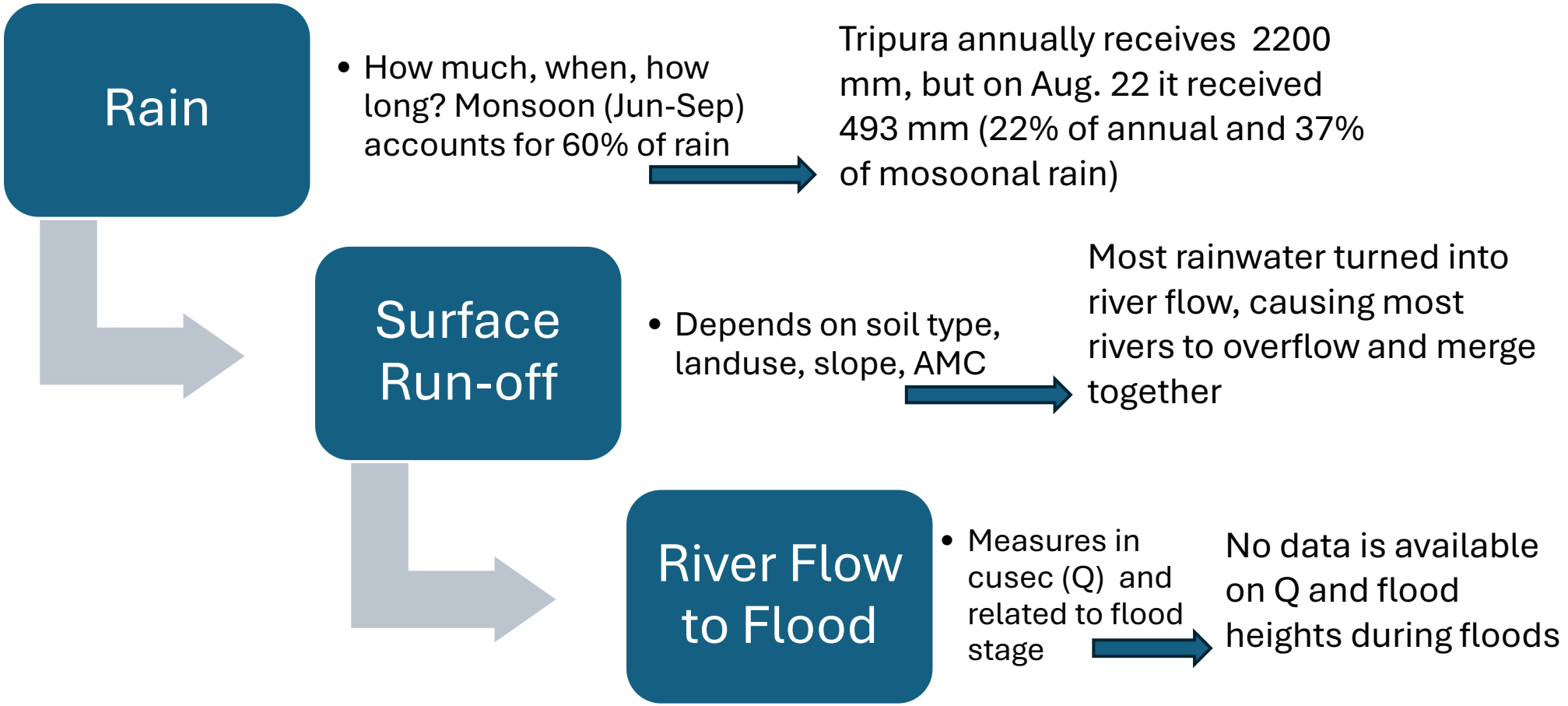


Area of Interest

Gomati and Muhuri Watershed Areas



Basics of Flooding



Watershed or Catchment of a River

- Natural building block and is the basis for water resources management planning
- Transboundary watersheds require involvement by all stakeholders
- Without collaborations among stakeholders, it will be impossible to manage flooding, drought, and sediment
- Flood-affected areas belong to several transboundary watersheds, such as the Gumati and Muhuri, both of which have unilateral control by upstream India
- Normal flood inundations are confined within each watershed, but the waters from major floods can cross over to other watershed areas, such as in haor region

Potential for Flooding due to Rain in August

Location	Daily rain in mm	Rainfall in 4 days in mm	Affected watershed	Affected Locations in Bangladesh
Cumilla	139*	557	Gomati (2800 km^2)	Cumilla
Sonamura	293		Gomati	Cumulla
Gomoti District	155		Gomati	Cumilla
West Tripura	233		Haora	Akhaura
Average	**205**			
Feni	108*	435	Muhuri (2000 km^2)	Parshuram, Sonagazi, Feni
South Tripura	493		Muhuri	Parshuram, Sonagazi, Feni
Average	**300**			
Noakhali	151*	605		Noakhali

139* = inferred from 4-day data

Amount of rainfall over watershed in a day

- **Gomati Watershed:**
- Q = Quantity = Area X rain depth = 2,800,000,000 m^2 X 0.205 m = 820 MCM
- =335,173 cusec (~Rainy season's Brahmaputra!)
- Can inundate 20% low-lying areas in watershed with a depth of 1.0 m = 3.28 feet!

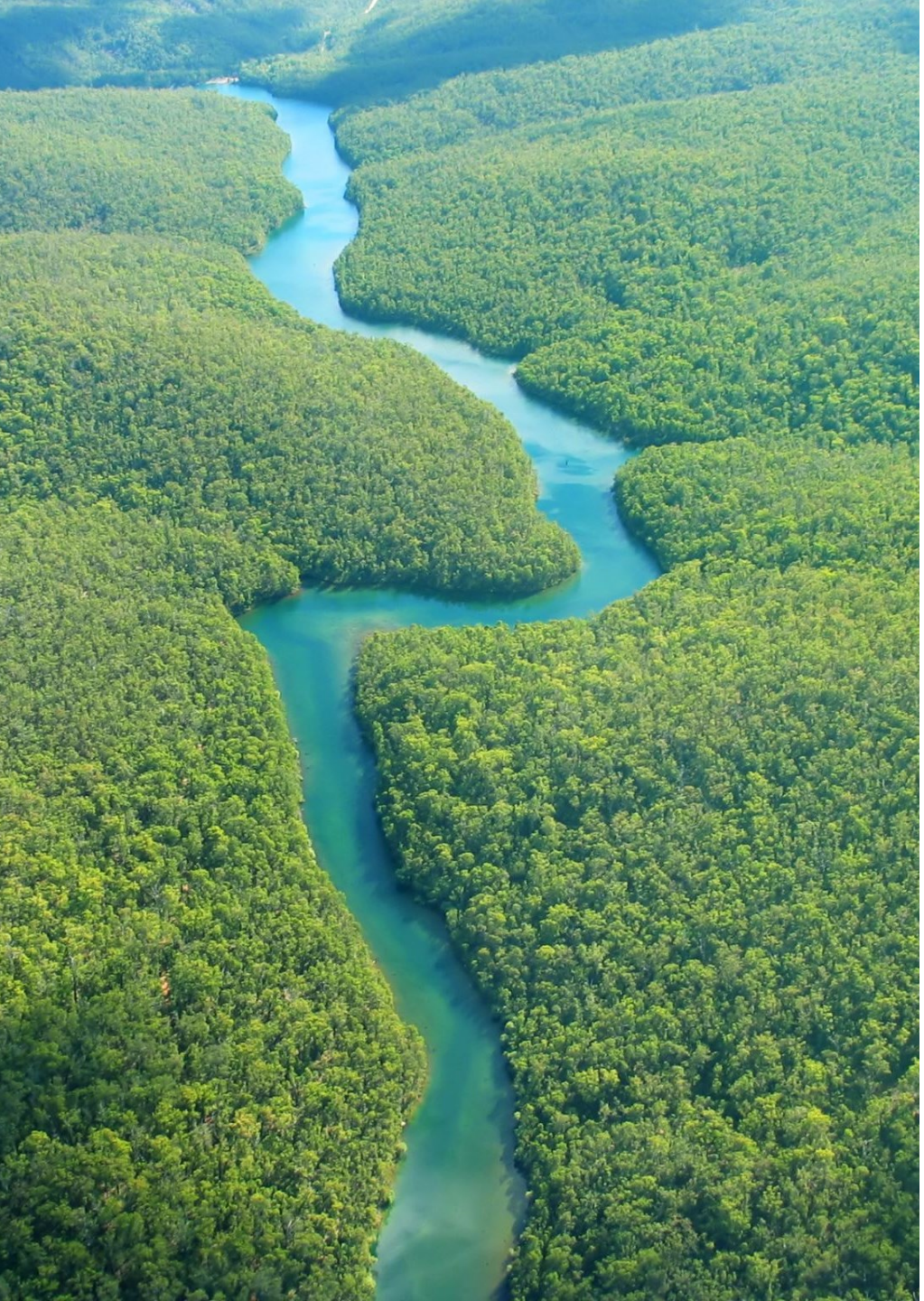
- **Muhuri Watershed:**
- Q = 2,000,000,000 m^2 X 0.3 = 600 MCM
- = 245,138 cusec! (Rainy season's Padma!)
- Could inundate 20% low-lying areas in the watershed with a depth of 1.5 m or about 5 feet!

Contribution by the Dumboor Dam?

- Details are unknown as to when did they open the gate, for how long, at what flow rate.
- What was the flood condition in the Gumati River when they opened the gates?
- The Dumboor (41 km^2) can hold up to 200 MCM of water and rain added additional 0.205 m of water = 8.4 MCM of water
- If they released the additional water over night for 12 hours, then it would have added 1400 cusec (which is about dry season Teesta flow!)
- Definitely did have the potential to make a bad situation worse in the Gomati River watershed!

What Other Factors Contributed to the Flood?

- Lack of natural drainage due to encroachment by land grabbers
  - Apparently, there are more than 11,000 of them in Feni District alone!
- Unplanned urbanization created impediments to flow
- Dams and embankments both in India and Bangladesh creaded a false sense of security and intensified floods at locations of breech
- Deforestation, construction, agriculture contributed to siltation of riverbeds
- Drainage congestion due to plastic and garbage in urban areas reduced flow velocity
- Tidal cycle and sea level rise slowed down river discharge efficiency



Where to from here?

- Integrated watershed-based planning and management of water and sediments needed in light of the UN Convention (1997)
- Recover natural drainage from land grabber and dredge them in light of basin development factor, i.e. widen and deepen them compared to their natural state to accommodate more water
- Adopt Ecological Approach to rivers and watershed management
- Adjust building and house design to account for additional flood risks due to climate change
- Better flood waning system and flood shelters.

Thank You!!!