1. Minerals of Assam

Assam is endowed with several important mineral resources, which contribute to its industrial base and economy. Most of these are sedimentary in origin and located in the Brahmaputra and Barak valleys.

Petroleum and Natural Gas:
Assam is one of the oldest oil-producing regions in Asia. Oil was first discovered at Digboi in 1889. Major oil fields are located in Digboi, Naharkatia, Duliajan, and Moran. Natural gas reserves are found in upper Assam and are used for power generation and fertilizer production.

Coal:
Coal in Assam is mainly of tertiary origin and is found in the Makum, Dilli-Jaipur, and Ledo areas. Coal is used for local industries and thermal power generation, although its high sulfur content limits wider usage.

Limestone:
Assam has significant limestone deposits, especially in the North Cachar Hills and Karbi Anglong districts. Limestone is used in cement and lime industries.

Other Minerals:
Assam also has small deposits of clay, quartz, feldspar, and iron ore, but these are not exploited on a large scale. Granite and sand are locally important for construction.

Challenges:
Despite resource availability, mineral exploitation is limited by environmental concerns, poor

infrastructure, and resistance from local communities.

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2. Natural Hazards in Assam

Assam is prone to multiple natural hazards due to its geophysical setting, monsoonal climate, and river-dominated landscape.

Floods:
Annual floods caused by the Brahmaputra and Barak rivers are the most frequent disaster. Flash floods from hill tributaries and heavy rainfall aggravate the situation. Floods lead to displacement, loss of crops, erosion, and infrastructure damage.

Riverbank Erosion:
Large-scale erosion affects both people and agricultural land, especially in districts like Dhemaji, Dibrugarh, and Morigaon. It contributes to loss of livelihoods and internal migration.

Earthquakes:
Assam lies in Seismic Zone V, the highest risk category in India. The state has experienced major earthquakes, such as in 1897 and 1950, causing heavy damage and loss of life. Seismic vulnerability is high due to unplanned construction and population density.

Landslides:
Hilly districts such as Dima Hasao, Karbi Anglong, and parts of Barak Valley face landslides during the monsoon season. Deforestation and slope instability increase risk.

Droughts and Hailstorms:

Although rare, parts of western Assam sometimes experience temporary droughts or rainfall deficits. Hailstorms in early summer damage crops like boro rice and vegetables.

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3. Rivers and Drainage System of Assam

Assam has a well-developed and dynamic drainage system shaped by the Brahmaputra and Barak river basins. These rivers play a crucial role in agriculture, transportation, ecology, and hydropower.

Brahmaputra River System:
The Brahmaputra is the principal river of Assam, flowing westward across the state. It enters Assam at Sadiya and flows through several districts before exiting to Bangladesh. The river has a braided channel with several islands, including Majuli. It has numerous tributaries from both the north (e.g., Subansiri, Jia-Bharali, Manas) and south (e.g., Burhidihing, Dhansiri, Kopili). These rivers cause extensive flooding during monsoons but also support irrigation and wetlands.

Barak River System:
The Barak River drains the southern part of Assam (Barak Valley) and flows into Bangladesh to join the Meghna. Its major tributaries include Jiri, Dhaleswari, and Sonai. The Barak Valley has narrower floodplains compared to the Brahmaputra basin but still suffers from flood hazards.

Other Rivers:
Assam has many seasonal and perennial rivers originating from surrounding hills, contributing to the state’s dense hydrography. Rivers like the Puthimari, Pagladiya, and

Kolong often change courses, causing local flooding and sedimentation.

Features of Assam's Drainage:

The drainage pattern is mainly dendritic with features of an antecedent river system. High rainfall and steep gradients in upper catchments lead to fast-flowing rivers and high sediment load. The rivers support rich biodiversity, extensive wetlands, and alluvial agriculture.

Conclusion

Assam's geography is shaped by its mineral wealth, complex river systems, and vulnerability to natural hazards. Harnessing its resources sustainably while mitigating disaster risks is vital for the state's development. Integrated water management, disaster preparedness, and environmentally sensitive mining policies are crucial for balancing development with ecological stability.