1. Climate of Assam

Overview:

Assam has a **tropical monsoon climate** characterized by high humidity, significant rainfall, and moderate temperatures. Its location in the northeastern Himalayan foothills and proximity to the Bay of Bengal makes it prone to both heavy precipitation and frequent floods.

a. Temperature Pattern:

- Summers are warm and humid.
- The average summer temperature ranges from 25°C to 35°C.
- Winters are mild and dry, with temperatures ranging from 8°C to 20°C.
- The state does not experience severe extremes of temperature due to its proximity to the tropics and abundant vegetation cover.

b. Rainfall:

- Assam receives **heavy rainfall** under the influence of the **Southwest Monsoon**, with an annual average between 1,500 mm to over 3,000 mm.
- The **Barak Valley and southern hills** receive more rainfall than the central and western Brahmaputra Valley.
- **May to September** is the peak monsoon season.
- Flash floods and riverine floods are common during this period due to poor drainage and siltation.

c. Humidity and Winds:

- Humidity remains high (above 80 percent) for most of the year.
- Local winds like “loo” are absent. Instead, the region experiences cool breezes due to high forest cover and river systems.

d. Natural Hazards:

- Floods and erosion are recurrent problems.
- Occasional droughts and hailstorms are reported but are less frequent.
- The region also lies in a high seismic zone, which can influence climate patterns post-earthquakes.

---

2. Soils of Assam

Overview:

The soils of Assam have evolved under conditions of heavy rainfall, high temperature, and dense vegetation. They are young, alluvial, and highly fertile but vulnerable to erosion and waterlogging.

a. Alluvial Soils:

- Dominant in the **Brahmaputra and Barak valleys**.
- Formed from silt, sand, and clay deposited by rivers.
- Rich in nitrogen and humus but often deficient in phosphorus and potash.
- Highly suitable for paddy, jute, sugarcane, and pulses.

b. Lateritic Soils:

- Found in **hill districts** like Karbi Anglong and Dima Hasao.
- Formed due to intense leaching under heavy rainfall.
- Rich in iron and aluminum but poor in fertility.
- Suitable for tea, coffee, and certain fruits when properly managed.

c. Sandy and Gravelly Soils:

- Found near riverbanks and foothill areas.
- Porous and less fertile but used for crops like potatoes and vegetables with proper irrigation.

d. Peaty and Marshy Soils:

- Present in low-lying wetlands and beels (oxbow lakes).
- High organic content but prone to waterlogging.
- Useful for aquatic crops like water chestnut and wet paddy.

---

3. Natural Vegetation of Assam

Overview:
Assam lies in the Indo-Burma biodiversity hotspot and has a rich and diverse vegetation cover influenced by its climate and topography.

a. Tropical Evergreen Forests:

- Found in areas with high rainfall like **Upper Assam and the southern hills**.

- Dense canopy, multi-layered vegetation.
- Includes species like Hollong, Nahor, Gomari, and bamboo.
- High biodiversity, home to endemic orchids and medicinal plants.

b. Tropical Semi-Evergreen Forests:

- Occur in transition zones between evergreen and deciduous forests.
- Found in Karbi Anglong, North Cachar Hills, and parts of Barak Valley.
- Teak, Simul, and Nahar are commonly found species.

c. Tropical Deciduous Forests:

- Found in drier areas like western Assam.
- Shed leaves during dry season.
- Include Sal, Sissoo, and Terminalia species.

d. Grasslands and Wetlands:

- Common in floodplains and riverine tracts.
- Kaziranga, Manas, and Pobitora are examples of protected grasslands.
- Home to elephants, rhinoceros, wild buffalo, and a variety of birds.

e. Plantation Vegetation:

- Assam is famous for its **tea plantations**, especially in the districts of Dibrugarh, Tinsukia, Jorhat, and Sonitpur.
- Other plantation crops include rubber and arecanut in the southern hills.

Conclusion:

The interrelation of Assam’s climate, soil, and vegetation shapes its rich biodiversity and agrarian economy. While the state is naturally endowed, sustainable management of these resources is essential to combat challenges such as floods, erosion, deforestation, and land degradation.