Regenerative Capacity of Tropical Forest

Prelims: *Current events of National and International importance| Environment*

Why in News?

A study by researchers from the Birbal Sahni Institute of Palaeosciences analyzed fossil pollen from the Chakradhara Wetland in Bandhavgarh Tiger Reserve, showing that tropical moist deciduous forests in central India can regenerate and expand when the Indian Summer Monsoon (ISM) strengthens and climate conditions turn favorable.

- **Location–** Chakradhara Wetland, Bandhavgarh Tiger Reserve (Umaria district, northeastern Madhya Pradesh).
- **Methods–** Radiocarbon dating and pollen analysis of a wetland sediment core, paired with Earth System Palaeoclimate Simulation (ESPS) models.
- **Publication–** *Quaternary Research*.

Observations on Monsoon, Vegetation, and Forest Recovery

- **~2,700–2,300 years BP–** Strong ISM conditions supported dense tropical moist deciduous forests dominated by sal (*Shorea robusta*).
- **~2,300–1,600 years BP–** Fluctuating climate phases—including humid periods, prolonged drought, and gradual recovery—shifted forest composition and structure.
- **1,600–820 years BP–** Relatively stable monsoons maintained dense tropical forest cover.
- **820–400 years BP–** A weakened ISM reduced moist deciduous forests and expanded dry deciduous vegetation. Rising *Cerealia* and other cultivated pollen pointed to increased agriculture, land-use change, and human activity.
- **Past ~400 years–** Strengthening monsoon conditions drove the recovery and expansion of moist deciduous forests, highlighting the resilience and regenerative capacity of tropical forest ecosystems under favorable climate conditions.

Reference

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