Himalayas and Kashmir’s Climate Shift

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A recent **palaeobotanical study** conducted by **scientists from the Birbal Sahni Institute of Palaeosciences (BSIP),** Lucknow, has revealed that the **Kashmir Valley**, currently known for its **cool Mediterranean-type climate**, was **once a warm and humid subtropical region** approximately 4 million years ago.

- **BSIP was founded in 1946** to promote research in palaeobotany, and **its foundation stone was laid by Prime Minister Jawaharlal Nehru** in 1949. It received **UNESCO** support (1951–53) and became an autonomous body in **1969**, funded by the **Department of Science and Technology (DST).**

Study on Kashmir’s Climate Shift

- **About the Study:** The study, based on a **historic fossil leaf** collection at BSIP, was prompted by a **climatic mismatch** between s**ubtropical fossil specimen**s and **Kashmir’s present-day temperate flora,** leading to a **fresh investigatio**n into the valley’s ancient climate.
- **Scientific Techniques Used:** To reconstruct Kashmir’s palaeoclimate, the study used two key methods- **CLAMP (Climate Leaf Analysis Multivariate Program)**, which analyzed **leaf morphology** (shape, size, margins) to estimate past **temperature and rainfall**, and the **Coexistence Approach**, which compared **fossil taxa** with their **modern relatives** to infer ancient **climate ranges**.
- **Key Findings: Fossilized leaves** from the **Karewa sediments from Kashmir** indicate that the valley once supported a **lush subtropical forest**.
    - Many fossils resemble modern species from **warm and humid climates**, contrasting sharply with today's **alpine and coniferous vegetation**.
    - The study attributes this climatic shift to the **tectonic uplift of the Pir Panjal Range**, part of the **sub-Himalayan system**.
        - This uplift acted as a **geological barrier**, blocking the **Indian summer monsoon**, thereby reducing rainfall and transforming the region’s climate over geological timescales.
- **Significance of the Study:** The study enhances **climate modelling** by linking **tectonic activity with ecosystem change**, highlights the **sensitivity of Himalayan ecosystems**, and offers analogues for understanding **monsoon dynamics**, **glacial melt**, and **topography interactions**.
    - It underscores the **policy relevance of palaeoclimate research** for **biodiversity conservation**, **disaster preparedness**, and **sustainable development** in fragile mountain regions.

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