

Indigenous Traditional Ecological Knowledge for Himalayan Ecosystem Restoration in India

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Abstract

Himalayan ecosystem in India is highly vulnerable to climate change, face glacier retreat, biodiversity loss, habitat degradation, and livelihood challenges. Indigenous and local communities in these hilly regions possess rich Traditional Ecological Knowledge (TEK) systems developed over the years. These include sustainable forest management, rotational grazing, indigenous agroforestry, water conservation techniques, and seasonal climate forecast that support adaptation in fragile environments. The study explores the integration of Traditional Ecological Knowledge with modern scientific approaches for sustainable development. Through in-depth interview with Gujjar, Bakarwal, Pahari, Bhotiya, and local communities in hilly regions along with participatory field observations, the research proven that traditional practices improve biodiversity conservation, sustainable land management, and community resilience. The findings show that TEK strengthens environmental conservation efforts which include habitat restoration and environment management, through promotion of ecological equity by empowerment of historically marginalized groups that are often excluded from policy processes. The study proposes a co-management framework that bridges indigenous wisdom with contemporary adaptation strategies that offers scalable and culturally appropriate solutions for ecosystem restoration, sustainable tourism, and natural resource governance in vulnerable mountain landscapes. Through centred on indigenous voices and experiential community-based practices, this research provides valuable insights for equitable sustainable development and emphasizes the critical role of traditional ecological knowledge to build long-term resilience amid rapid environmental change.

Keywords: Community-based Conservation; Environment Adaptation; Mountain Biodiversity; Sustainability; Sustainable Land Management