Bridging Tradition and Policy: Integrating Traditional Ecological Knowledge with NEP 2020 for Sustainable Development in Uttarakhand

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Abstract:

Traditional Ecological Knowledge (TEK) refers to the cumulative body of knowledge, practices, and beliefs that have evolved through adaptive processes and been handed down through generations by cultural transmission. In Himalayan societies, particularly in Uttarakhand, TEK has been the foundation of human-nature relationships for centuries. This review paper examines the role of TEK in achieving Sustainable Development Goals with special reference to Uttarakhand. Drawing from sociological perspectives, the paper argues that TEK is not merely ecological information but also social capital embedded in community institutions, rituals, and gendered labour. However, rapid migration, formal education, and market integration have led to knowledge erosion in the region. The National Education Policy (NEP) 2020 provides a timely framework to revitalise TEK through curriculum reform, community engagement, and experiential learning. By analysing existing literature and policy documents, this paper suggests that integrating TEK into formal education and development planning can contribute to climate resilience, biodiversity conservation, and cultural identity in Uttarakhand. The paper concludes with policy recommendations for institutionalising community-university partnerships as envisioned in NEP 2020.

Keywords: Traditional Ecological Knowledge, Sustainable Development, NEP 2020, Himalaya, Indian Knowledge Systems

1. Introduction:

Uttarakhand, a Himalayan state of India, has long been known for its unique socio-ecological systems. The communities here have developed intricate knowledge systems to manage forests, water, agriculture, and biodiversity under fragile ecological conditions. This knowledge, termed Traditional Ecological Knowledge (TEK), represents a dynamic interaction between people and their environment over generations.

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From a sociological lens, TEK is more than data about plants or weather. It is socially constructed, transmitted through oral traditions, rituals, and everyday practices. It is tied to caste, gender, and community institutions like Van Panchayats. As Berkes (2012) notes, TEK is a "knowledge-practice-belief complex" that shapes both livelihoods and worldviews.

However, Uttarakhand is facing a dual crisis. On one hand, climate change is making traditional agriculture and water systems vulnerable (Negi et al., 2018). On the other hand, out-migration and modern education are causing rapid erosion of TEK. The youth are increasingly disconnected from traditional practices (Rawat & Chand, 2021).

In this context, the National Education Policy 2020 emerges as a critical policy intervention. NEP 2020 emphasises Indian Knowledge Systems, experiential learning, and community participation (Ministry of Education, 2020). It provides an opportunity to document, validate, and integrate TEK into formal education and development planning.

This review paper therefore asks: How can TEK contribute to sustainable development in Uttarakhand? And how can NEP 2020 act as a bridge between traditional knowledge and modern policy?

2. Methodology:

This paper adopts a qualitative review and policy analysis approach to examine the role of Traditional Ecological Knowledge in sustainable development in Uttarakhand, with specific reference to NEP 2020.

2.1 Data Sources:

The review is based on three types of sources. First, peer-reviewed journal articles and books on TEK, sociology, and Himalayan studies published between 1993 and 2026 were consulted. Databases such as JSTOR, Scopus, and the UGC-CARE list were used. Second, policy documents, including the National Education Policy 2020, SDG reports, and the Uttarakhand State Action Plan on Climate Change, were analysed. Third, case studies and ethnographic reports from Uttarakhand focusing on Van Panchayats, traditional agriculture, and water systems were reviewed.

2.2 Analytical Framework:

A sociological lens was applied to interpret TEK not just as ecological data, but as social capital embedded in institutions, gender roles, and community practices.

Concepts from Bourdieu on cultural capital and Berkes on the knowledge-practice-belief complex guided the analysis. The paper specifically examined how the NEP 2020 provisions on Indian Knowledge Systems and community engagement can be operationalised to revitalise TEK.

2.3 Scope and Limitations:

The study focuses on Uttarakhand due to its ecological fragility and rich TEK base. While the review draws on secondary literature, it identifies gaps in empirical documentation of TEK under NEP 2020 and suggests pathways for future field-based research. The analysis does not claim to cover all communities of Uttarakhand but highlights representative cases from Garhwal and Kumaon regions.

3. Conceptualising TEK: A Sociological Understanding:

TEK cannot be understood in isolation from the social structure. In Uttarakhand, knowledge about medicinal plants is often held by women and traditional healers (Kala, 2005). Knowledge about forest management is embedded in Van Panchayat institutions (Rawat & Chand, 2021). Agricultural calendars are linked to festivals and religious beliefs. Thus, traditional ecological knowledge is deeply embedded in society and social structure. Within the fabric of Indian social structure, traditional ecological knowledge has been nurtured through diverse classical traditions, ancient mythological texts, and the tales and stories of everyday life. There is a profound relationship between traditional ecological knowledge and sociology.

3.1 TEK as Social Capital:

Bourdieu's concept of cultural capital helps us understand TEK. For rural communities, TEK is a resource that provides food security, health, and resilience. The exchange of seeds, sharing of labour during transplanting, and community forest rules are all examples of TEK embedded in social networks (Gadgil et al., 1993).

3.2 Gender and TEK:

Women in Uttarakhand are primary custodians of TEK related to seeds, food processing, and ethnomedicine (Negi et al., 2018). Yet this knowledge is often invisible in policy. A feminist sociological perspective argues that recognising women’s TEK is essential for both gender equity and sustainability.

3.3 Knowledge Erosion:

Sociologists argue that knowledge loss occurs not just due to forgetting, but due to structural changes. Migration of youth, a shift to cash crops, and the dominance

of textbook knowledge have weakened the intergenerational transmission of TEK in Uttarakhand (Gupta, 2006).

4. TEK and Sustainable Development in Uttarakhand:

Uttarakhand's sustainable development challenges are directly linked to ecology. TEK offers solutions in 3 areas:

4.1 Water Conservation:

Traditional systems like naula, dhara, and chaal-khal were designed for rainwater harvesting in hills (Maikhuri et al., 1998). Community rules managed these systems. With piped water schemes, this knowledge is declining but remains relevant for water security.

4.2 Agriculture and Food Security:

TEK includes knowledge of 200+ local crop varieties, organic pest control, and climate indicators (Singh & Kumar, 2000). Mixed cropping and barter systems reduced risk. This aligns with SDG 2: Zero Hunger and SDG 13: Climate Action (Sharma & Singh, 2019).

4.3 Biodiversity and Forest Management:

Van Panchayats, sacred groves, and taboos on cutting certain trees reflect TEK-based conservation (Negi, 2010). This supports SDG 15: Life on Land. Recent studies show that villages with strong TEK have better forest cover.

5. NEP 2020 and the Revitalisation of TEK:

The National Education Policy 2020 has 3 direct linkages with TEK:

5.1 Indian Knowledge Systems:

NEP 2020 proposes to include IKS in the curriculum from school to higher education (Ministry of Education, 2020). For Uttarakhand, this means courses on Himalayan ecology, traditional medicine, and local history can be developed.

5.2 Experiential Learning and Community Engagement:

NEP promotes internships, field projects, and collaboration with local communities. Universities in Uttarakhand can start "TEK documentation projects" where students work with elders to record knowledge.

5.3 Multidisciplinary Approach:

NEP breaks silos between science and humanities. TEK can be taught in Sociology, Environmental Science, and Education departments together. Tamta et al. (2026) argue that NEP 2020 can prevent TEK erosion by institutionalising documentation and creating livelihood opportunities linked to traditional knowledge.

6. Challenges and Policy Recommendations:

Challenges:

- Validation: How to make TEK "scientific" enough for policy
- Intellectual Property: Risk of biopiracy
- Implementation gap in NEP 2020

Recommendations:

- Establish TEK Cells in universities under NEP 2020 to document local knowledge
- Curriculum Reform: Add "Himalayan TEK" as a value-added course in schools and colleges
- Community-University Partnership: Students should do fieldwork with Van Panchayats
- Recognition: Give certificates to traditional knowledge holders as "Guru" under NEP

7. Conclusion:

TEK in Uttarakhand is not a relic of the past but a living resource for the future. From a sociological perspective, it is deeply embedded in community life and social relations. Sustainable development in the Himalaya cannot be achieved by ignoring this knowledge base.

NEP 2020 provides a historic opportunity to bridge the gap between traditional and formal knowledge systems. By integrating TEK into education and development policy, Uttarakhand can move towards a model of development that is both ecologically sustainable and culturally rooted.

The task ahead is to move from policy to practice. This requires political will, academic collaboration, and most importantly, respect for the knowledge holders in our villages.

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