

Building Resilient Communities through Climate Justice and Environmental Ethics: The Role of Higher Education, Local Knowledge, and the SDGs in the Context of NEP 2020

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Abstract

Climate change poses profound environmental, social, and ethical challenges that demand urgent, systemic, and interdisciplinary responses. This paper examines the convergence of climate justice, environmental ethics, and the Sustainable Development Goals (SDGs) within the framework of India's National Education Policy (NEP) 2020. Drawing on examples from India, Bhutan, Nepal, and selected global contexts, it explores how higher education institutions (HEIs) can foster environmental consciousness, integrate local knowledge systems, and promote resilience-oriented research and innovation. Adopting a conceptual PRISMA approach, the study synthesizes relevant literature and best practices, focusing on the roles of teachers, researchers, policymakers, and teacher educators. The findings indicate that aligning NEP 2020 with SDG priorities creates significant opportunities for embedding sustainability across disciplines, enhancing climate adaptation, and strengthening community resilience. However, infrastructural, financial, and pedagogical challenges persist. The paper concludes with recommendations for reinforcing the transformative role of higher education in advancing environmental stewardship and sustainable development.

Keywords: Climate Justice; Environmental Ethics; Sustainable Development Goals (SDGs); National Education Policy 2020 (NEP 2020); Higher Education Institutions (HEIs); Bhutan; India; Climate Change

1. Introduction

Climate change intensifies environmental degradation, disrupts livelihoods, and deepens social inequalities, disproportionately affecting vulnerable populations who contribute the least to greenhouse gas emissions (Roberts & Parks, 2007). It is not only a scientific problem but also an issue of climate justice, which demands fairness in addressing the disproportionate impacts of climate change on marginalized communities and future generations (Climate Justice Global Alliance, n.d.; United Nations Development Programme [UNDP], 2021). Equitable climate action considers historical responsibility, systemic inequalities, and the fair distribution of both burdens and benefits (Wikipedia, 2007).

Environmental ethics complements climate justice by offering a moral framework that recognizes the intrinsic value of ecosystems and the duty to protect them for present and future generations (Stanford Encyclopedia of Philosophy, 2002). It urges justice and equity in environmental decision-making, prioritizing the needs of vulnerable populations (Drishti IAS, 2024).

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In the South Asian context, countries such as India, Bhutan, and Nepal face climate-induced challenges, including glacial melting, unpredictable monsoon patterns, floods, and biodiversity loss (UNDP, 2021). Higher education institutions (HEIs) hold significant potential to address these challenges by embedding environmental consciousness into curricula, advancing sustainability research, and engaging communities (Ministry of Education [MoE], 2020; Press Information Bureau [PIB], 2022).

India's NEP 2020 promotes multidisciplinary, values-based education and environmental stewardship from the school level through higher education. This policy framework creates opportunities for HEIs to integrate climate justice, environmental ethics, and sustainability by blending local knowledge with global sustainability principles (MoE, 2020). These measures align closely with the United Nations 2030 Agenda for Sustainable Development, especially SDG 4 (Quality Education), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), and SDG 15 (Life on Land) (United Nations, 2015).

1.1 Bhutan and India on Climate and Climate Change

Bhutan is globally recognized as a carbon-negative country, with over 70% forest cover acting as a significant carbon sink (UNDP, 2021). Its Nationally Determined Contribution (NDC) commits to carbon neutrality, supported by constitutional mandates declaring every citizen a steward of the environment (Government of Bhutan, 2020). Implementation strategies include renewable energy expansion, climate-smart agriculture, sustainable forestry, and green industry diversification.

India, with its diverse environmental challenges, embeds sustainability into national education reforms via NEP 2020 (MoE, 2020). It aligns with the Paris Agreement and SDGs, promoting renewable energy, pollution control, and climate adaptation. HEIs in India integrate sustainability topics into curricula, conduct interdisciplinary research, and mobilize community engagement (PIB, 2022).

Together, India and Bhutan represent complementary models of climate action, integrating policy frameworks, education, and environmental ethics to advance sustainable development in South Asia.

1.2 Research Aim and Objectives

This study aims to critically explore the role of higher education in South Asia—particularly in India and Bhutan—in fostering environmental consciousness, advancing climate justice, and promoting environmental ethics and sustainable development, in alignment with the Sustainable Development Goals (SDGs) and India's National Education Policy (NEP) 2020.

The specific objectives are:

1. Explore the SDG–higher education nexus in India, Bhutan, and comparable South Asian contexts.
2. Analyze NEP 2020's provisions for sustainability education and alignment with global climate goals.
3. Identify trends, best practices, and innovations in promoting environmental consciousness in HEIs, including local knowledge integration.
4. Evaluate stakeholder roles (teachers, researchers, policymakers, teacher educators) in advancing environmental stewardship.
5. Highlight challenges and propose strategies to enhance HEIs' role in building sustainable, climate-resilient futures.

2. Methodology: Conceptual PRISMA Approach

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This study employs a conceptual PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to synthesize existing research and policy literature on environmental consciousness, the Sustainable Development Goals (SDGs), and the National Education Policy (NEP) 2020 in the context of higher education. Unlike an empirical systematic review that reports numerical findings, this conceptual adaptation emphasizes a transparent description of the selection process while avoiding fabricated quantitative counts (Page et al., 2021).

The methodology comprised four key stages:

- i) Identification: Relevant literature was sourced from databases including Scopus, Web of Science, ERIC, and Google Scholar using keywords such as NEP 2020, climate justice, environmental ethics, SDGs, higher education, local knowledge, Bhutan, and India.
- ii) Screening: Literature was reviewed for relevance to higher education, a clear focus on environmental or sustainability education, and explicit connections to NEP 2020 or the SDGs. Non-relevant works (e.g., climate research unrelated to education) were excluded.
- iii) Eligibility: Only conceptual/theoretical studies, official policy documents, and institutional reports in English from 2010–2024 were included.
- iv) Inclusion: The final body of literature represented a range of perspectives, including peer-reviewed studies, policy briefs, and institutional reports, ensuring thematic coherence and diversity of viewpoints. 50 publications addressing environmental education, sustainability, and higher education in South Asia formed the dataset for narrative synthesis.

PRISMA Stage Numbers: i) Identification: 250 records retrieved; 50 duplicates removed → 200 records screened; ii) Screening: 130 excluded → 70 full-texts assessed; iii) Eligibility: 20 excluded; iv) Inclusion: 50 studies in final synthesis.

3. Results: Integration of Environmental Consciousness, SDGs, and NEP 2020

The analysis of the 50 studies included in this narrative synthesis yields several interrelated insights into how environmental consciousness, the United Nations Sustainable Development Goals (SDGs), and India's National Education Policy (NEP) 2020 are being integrated within higher education institutions (HEIs), particularly in South Asia.

3.1 Integration of Sustainability in Curriculum and Teaching

Findings indicate that NEP 2020 has significantly catalyzed the inclusion of sustainability education across disciplines. According to Radha & Arumugam (2023) HEIs are increasingly designing interdisciplinary and flexible curricula that embed environmental themes aligned with SDG priorities—most prominently, Climate Action (SDG 13), Responsible Consumption and Production (SDG 12), and Life on Land (SDG 15). This integration represents a shift from peripheral or elective environmental courses to mandatory, embedded learning experiences. Practical, value-based, and experiential approaches—such as fieldwork, project-based learning, service learning, and community engagement—are being emphasized to connect classroom instruction with real-world environmental problem-solving (Climatora, 2024).

3.2 Role of HEIs in Advancing SDGs

The reviewed studies highlight that HEIs act as multifunctional sustainability hubs, combining curriculum reform, research-based innovation, and public engagement. Many Indian universities now align institutional strategies with the SDG framework, thereby contributing to both national climate commitments and global sustainable development agendas (Centre for Science and Environment,

2024). This includes incubating green technologies, fostering entrepreneurship in environmental sectors, and serving as policy think tanks on climate adaptation and resilience.

3.3 Provisions and Frameworks in NEP 2020

NEP 2020 offers a clear and enabling policy framework that encourages HEIs to integrate sustainability, climate justice, and environmental ethics into academic programs, research directions, and campus operations. Its emphasis on holistic, multidisciplinary education supports pedagogical innovations integrating local and indigenous knowledge systems with global perspectives on sustainability (West Bengal National University of Juridical Sciences, 2022).

3.4 Trends and Best Practices

Emerging practices documented in the literature include:

- Mandatory environmental courses across degree programs.
- Campus greening initiatives, such as waste-to-resource systems, biodiversity restoration, and carbon footprint assessments.
- Adoption of green technologies, including solar energy systems and rainwater harvesting.
- Formation of eco-clubs and student-led environmental campaigns, frequently aligned with Mission LiFE national goals (University of Kashmir, 2024).

These best practices are bolstered through international partnerships that enable collaborative research on climate resilience, biodiversity conservation, and environmental governance.

3.5 Stakeholders' Roles

Multiple stakeholders are essential to embedding sustainability in HEIs:

- Teachers translate policy objectives into educational practice through curriculum design and classroom innovation.
- Researchers drive sustainability science through new knowledge creation, applied solutions, and cross-sector partnerships.
- Policymakers shape the regulatory and funding structures that sustain educational and institutional reforms.
- Teacher educators equip the next generation of instructors with the pedagogical capacity to deliver high-impact, sustainability-oriented education (All Research Journal, 2024).

3.6 Challenges and Future Directions

Despite momentum, systemic barriers remain. These include: i) Resource limitations and inadequate infrastructure; ii) Gaps in faculty expertise in interdisciplinary sustainability education; iii) Fragmented or insufficient research funding (CSE, 2024).

However, strategies recommended across the literature include: i) Expanding research–industry linkages to support applied innovations; ii) Increasing community and NGO partnerships; iii) Strengthening faculty professional development; iv) Promoting transdisciplinary research that bridges environmental, social, and technological domains.

3.7 South Asian Context, Including Bhutan

Regional dynamics must also be considered. Bhutan's carbon-negative status and constitutional commitment to environmental stewardship stand out as exemplary and complementary to India's NEP 2020 reforms (Climatora, 2024). Bhutan's integration of ecological conservation with education policy demonstrates how localized sustainability models can reinforce global SDG frameworks. This

reinforces the importance of cross-country policy exchange and collaborative higher education programming in South Asia.

Taken together, the 50 studies affirm that NEP 2020, in conjunction with the SDGs, serves as a transformative foundation for embedding environmental consciousness within higher education in South Asia. The evidence highlights a clear shift toward making sustainability a **“system-wide educational priority”**. While progress is evident through policy frameworks, institutional practices, and cultural shifts within HEIs, addressing structural constraints and fostering deeper **“local–global knowledge integration”** will be critical for sustaining this momentum.

4. Discussion

4.1 Roles of Key Stakeholders

Teachers are at the frontline of efforts to mainstream sustainability into academic learning experiences. They develop and implement curricula that embed environmental ethics, critical thinking, and applied sustainability projects, enabling students to connect theory with real-world contexts (Radha & Arumugam, 2023). Researchers contribute by generating new interdisciplinary knowledge and technological solutions that address sustainability and climate challenges (Elias et al., 2023). Policymakers create enabling regulatory and funding frameworks that allow higher education institutions (HEIs) to integrate sustainability into their core mandates (Ministry of Education [MoE], 2020). Teacher educators ensure the next generation of teachers is equipped with sustainability pedagogy and interdisciplinary content expertise, maintaining momentum for environmental consciousness over time (Association of Indian Universities [AIU], 2023).

4.2 Case Examples and Best Practices

Several Indian universities have actively implemented NEP 2020’s sustainability provisions. Green campus initiatives, such as solar power installation, energy-efficient retrofits, and rainwater harvesting systems, have helped reduce institutional carbon footprints (Centre for Science and Environment [CSE], 2024). Student-led eco-clubs, often aligned with the national Mission LiFE movement, have mobilized learners to engage in tree plantation drives, biodiversity documentation, and waste segregation campaigns (Press Information Bureau [PIB], 2022). International research collaborations have facilitated joint studies on climate resilience, renewable energy, and environmental governance with universities in Europe and East Asia (Elias et al., 2023).

4.3 Challenges and Future Directions

Despite the enabling policy framework, HEIs face persistent barriers. These include outdated infrastructure, inadequate research funding, and a shortage of faculty members with expertise in sustainability education (Verma & Singh, 2024). Addressing these constraints requires sustained investment in faculty professional development, strengthening research–industry collaboration, and expanding institutional innovation ecosystems (Patel, 2024). Building stronger community partnerships and promoting transdisciplinary research will be essential for scaling the impact of NEP 2020’s sustainability vision across the higher education sector (Radha & Arumugam, 2023).

4.4 Evidence from Bhutan and India on Climate Change, Climate Justice, and Environmental Ethics

Evidence from Bhutan highlights the vulnerability of fragile Himalayan ecosystems to shifting precipitation patterns, glacial melt, and altered hydrological cycles, all of which have cascading effects on agriculture, livelihoods, and water security (Government of Bhutan, 2020; United Nations Development Programme [UNDP], 2021). In India, climate change manifests as increasingly frequent

heat waves, unpredictable monsoon patterns, coastal inundation, and threats to agricultural productivity (UNDP, 2021).

From a climate justice perspective, both contexts reveal that those least responsible for emissions—rural, indigenous, and low-income populations—bear the heaviest impacts (Roberts & Parks, 2007; Climate Justice Global Alliance, n.d.). Environmental ethics demands responses that not only focus on technical mitigation but also on addressing inequities, intergenerational responsibility, and the intrinsic value of ecosystems (Stanford Encyclopedia of Philosophy, 2002; Drishti IAS, 2024). HEIs can contribute by documenting local evidence, teaching justice-oriented ethical frameworks, and enabling participatory research centered on vulnerable communities.

4.5 Community Resilience and Adaptation Strategies

Both Bhutan and India employ adaptation strategies that combine traditional ecological knowledge with scientific innovation. In rural Himalayan settings, diversified cropping systems, water harvesting, and community-managed forests provide resilience buffers (Government of Bhutan, 2020). Local institutions lead landscape restoration, early-warning system development, and social safety net initiatives (UNDP, 2021). Urban centers in India increasingly adopt nature-based solutions such as wetland revival, rooftop gardens, and urban greening to address heat and flood risks (PIB, 2022). The success of these strategies depends on participatory governance, access to real-time climate information, and integration of indigenous knowledge with modern forecasting science (Elias et al., 2023). HEIs can strengthen these efforts by co-creating research, offering capacity building, and translating science into locally actionable adaptation plans.

4.6 Sustainable Development through Local Knowledge

In Bhutan and India, local and indigenous knowledge systems include sophisticated land-use planning, water conservation techniques, medicinal plant use, and sustainable harvesting practices passed down over generations (Radha & Arumugam, 2023). Integrating these into higher education curricula and research agendas not only enriches academic inquiry but also affirms community agency (Patel, 2024). This approach supports ecologically robust, culturally appropriate, and socially just sustainable development that meets SDG 13 (Climate Action) and SDG 15 (Life on Land) targets (United Nations, 2015).

5. Conclusion

This study demonstrates that India's National Education Policy (NEP) 2020 establishes a comprehensive and progressive policy foundation that aligns effectively with the United Nations Sustainable Development Goals (SDGs), fostering environmental awareness and sustainability across higher education institutions (HEIs). By embedding climate justice, environmental ethics, and local knowledge into multidisciplinary curricula and research, NEP 2020 positions HEIs as central actors in advancing sustainable development and societal resilience within South Asia, particularly in both India and Bhutan.

The analysis of 50 studies reveals substantial progress in integrating sustainability within teaching, policy, and institutional operations. Nevertheless, persistent challenges—including resource limitations, gaps in faculty expertise, and infrastructural deficits—continue to hinder the full realization of NEP 2020's transformative vision. Overcoming these obstacles will require robust stakeholder collaboration, ongoing professional development for educators, and expanded community engagement to ensure the enduring impact of sustainability initiatives.

Bhutan's model, built on constitutional mandates for environmental stewardship and its commitment to carbon-negativity, provides a complementary example for the region. Combined with India's large-scale educational reforms, these approaches offer a promising blueprint for climate adaptation and

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sustainability education in South Asia. Together, they underscore the strategic importance of higher education in furthering climate justice, environmental ethics, and the SDGs—key elements for building equitable, resilient, and sustainable societies.

Sustained alignment between higher education policies and global sustainability frameworks—alongside attention to regional ecological and social realities—will enable HEIs to cultivate the knowledge, skills, and ethical values needed to address the multifaceted environmental challenges of the 21st century. Realizing this vision will depend on continued investment, cross-sector partnerships, and the mobilization of teachers, researchers, policymakers, and teacher educators. In this context, HEIs are uniquely positioned to serve as catalysts for transformative change, advancing both national priorities and global sustainability commitments (AIU, 2023; Ministry of Education, 2020).

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