

A Study on the Awareness and Perception of Community-Based Climate Resilience Education among University Students at Banaras Hindu University, Varanasi

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Abstract

This research investigates the awareness, perceptions, and participation of higher education students at Banaras Hindu University, Varanasi, in the domain of community-based climate resilience education (CB-CRE). Employing a mixed-method approach, it analyses structured responses from 212 students across varied disciplines, revealing moderate awareness but strong conceptual clarity once exposed, significant experiential learning gaps, and a robust preference for hands-on and interdisciplinary engagement.

The study synthesizes Indian and global literature on CB-CRE, contextualizes findings with primary data, and proposes actionable recommendations for academic and community integration. These results provide a roadmap for strengthening climate resilience education in Indian universities and underscore the importance of institutional support and curricular innovation for sustainable adaptation.

Introduction

Climate change is acknowledged as one of the gravest threats facing humankind, disrupting natural systems, endangering livelihoods, and imposing disproportionate burdens upon vulnerable populations. As the frequency of extreme weather events increases and environmental degradation accelerates, the need for community-level resilience becomes urgent. Higher education institutions such as Banaras Hindu University (BHU) play a pivotal role in shaping youth perspectives, mobilizing knowledge resources, and catalysing sustainable behavioural change within and beyond campus boundaries.

Community-based climate resilience education (CB-CRE) has emerged as a transformative approach, combining academic inquiry with participatory action. Its goal is to equip students not only with theoretical understanding but also with practical skills and a sense of responsibility towards local adaptation efforts. However, despite policy advocacy and the emergence of pilot programs, the extent of

integration, effectiveness, and student experiences with CB-CRE within Indian universities remains uneven and understudied. This research thus addresses a critical knowledge gap by systematically investigating students' awareness, perceptions, and engagement in CB-CRE at BHU, drawing implications for curriculum development and institutional practice.

Literature Review

Global Context

Internationally, community engagement and practical learning are increasingly considered core to advancing climate resilience. UNESCO's initiatives for Education for Sustainable Development (ESD) emphasize the cross-cutting inclusion of climate change education, stressing hands-on projects and partnership with local communities for holistic adaptation. Ruiz-Malln et al. (2022) recognize CB-CRE as central to participatory knowledge production, while comparative studies across Europe, North America, and Australia confirm that experiential integration enhances both student agency and societal outcomes. These frameworks underscore the dual imperatives of knowledge transfer and civic empowerment but highlight the persistent challenge of systematizing grassroots engagement within formal curricula.

National Context: India

The integration of climate change content into the undergraduate curriculum is policy-mandated in India, yet studies by Gupta & Singh (2023) and others reveal a largely theoretical focus, with classroom lectures taking precedence over community-linked adaptation practices. Ministry of Environment, Forest and Climate Change (2017) calls attention to inconsistent uptake and weak institutionalization. Case reports describe credit-based internships and project-based learning as promising, but their reach remains fragmented, often restricted by resource constraints, lack of interdisciplinary vision, and insufficient faculty training. The push for reform is echoed by Singh & Yadav (2024), who advocate for broadening institutional structures to mainstream climate resilience, and by Sharma & Singh (2023), who urge more rigorous monitoring and evaluation systems for such initiatives.

State and Local Context: Uttar Pradesh and BHU

Uttar Pradesh is especially vulnerable to climate-induced hazards, from erratic rainfall and heatwaves to water scarcity and ecological degradation. At the state level, research (Mishra & Das, 2022) identifies moderate student awareness but sparse and fragmented participation in community-based climate resilience activities. BHU, a prominent institution in the region, has piloted workshops, National Service Scheme (NSS) camps, and collaborations through its Climate Change Centre, but structural obstacles remain: limited academic recognition of extra-curricular work, lack of formal interdisciplinary mandates, and limited institutional resources impede widespread adoption. Yet, emergent initiatives demonstrate the potential for universities to act as bridges between scientific expertise and community needs.

Statement of Problem and Research Gap

Despite rising policy attention and sporadic programmatic success, the substantive integration of community-based climate resilience education into the higher education ecosystem remains nascent in India. Existing research centres largely on awareness levels and attitudinal surveys but rarely dissects the nuances of experiential engagement, institutional constraints, or the motivations and barriers faced by students in the practical context. There is a need for empirically grounded, context-sensitive investigations that can chart pathways for mainstreaming CB-CRE within the academic and operational structures of major Indian universities. This research directly addresses that gap by coupling a robust literature review with systematic primary data analysis at BHU.

Objectives

1. To evaluate the current level of awareness and understanding of climate resilience concepts among students at BHU.
2. To analyze student perceptions regarding the integration and importance of community-based approaches in higher education curricula.
3. To assess participation rates, patterns, and barriers for students in climate-related community actions.
4. To propose recommendations tailored for institutional, curricular, and community engagement in the context of climate resilience.

Methodology

Research Design

A mixed-method framework, anchored in both quantitative and qualitative traditions, underpins this study. The research blends secondary data (from journals, policy reports, and institutional documentation) with systematic primary data garnered through a structured survey instrument designed to elicit comprehensive responses on demographics, awareness, attitudes, experiences, and suggestions related to CB-CRE.

Sample and Data Collection

An adaptive, stratified sampling approach was employed in recognition of the academic diversity at BHU while accommodating practical limitations in proportional access across all faculties. Voluntary participation yielded a final sample of 212 respondents, covering a broad disciplinary spectrum, including sciences, arts, social sciences, law, education, commerce, agriculture, management, and performing arts. The questionnaire comprised 25 questions divided into five sections: demographic profile, awareness, perception, participation, and suggestions. Both closed (Likert and multiple-choice) and open-ended items were used to provide depth and breadth in the data.

Data Analysis Techniques

Descriptive statistics (frequency, percentage distributions) were used to identify key trends and patterns. Thematic coding and direct content analysis were applied to open responses, allowing nuanced interpretations and cross-sectional synthesis with quantitative findings. Inferential analysis was limited to subgroup breakdowns given the sample size and research objectives.

FINDINGS

DEMOGRAPHIC PROFILE

- **Gender Distribution:** The sample is predominantly female (74.1%), with males comprising only 25.9%. This composition aligns with studies highlighting higher environmental concerns and participatory tendencies among young women.
- **Academic Level:** 67% of respondents are postgraduates, 21.7% undergraduates, and 11.3% research scholars, attesting to an academically mature student base likely to inform nuanced perspectives on climate issues.
- **Exposure to Environmental Programs:** Only 38.7% of students had attended climate or environmental programs; most (61.3%) had not, indicating a gap between curricular presence and practical or structured learning opportunities.

AWARENESS AND KNOWLEDGE OF CB-CRE

- **Perceived Impact of Climate Change:** 94.8% of students believe climate change affects their lives. Commonly reported symptoms include rising temperatures, shortened winters, unpredictable rainfall, health and productivity disruptions, and mental or psychosocial stresses.
- **Climate-Nutrition Linkages:** 92% think climate change is affecting food and nutrition—students cite disruptions in crop yields, nutritional quality, seasonal patterns, prices, and increases in pests, pollution, and chemical reliance.
- **Familiarity with Concepts:** Only 23.6% felt very familiar with the concept of “climate resilience,” though 83% could define it correctly once explained, showing moderate awareness versus high scientific clarity post-exposure.
- **Recognition of Practices:** Students overwhelmingly linked climate resilience to education (71%), water conservation (68%), sustainable farming (58%), and waste management (58%). Knowledge of technical and institutional aspects, such as energy efficiency or climate finance, was low (<1%).
- **Awareness of Local Initiatives:** Only 18.9% were aware of ongoing community-based climate initiatives in Varanasi, signifying poor connect between student populations and real-world adaptation efforts despite high levels of personal concern.

PERCEPTIONS AND ATTITUDES TOWARDS CB-CRE

- **Value of Community-Based Education:** 67.5% deem it very important, 28.8% important, and none unimportant. This consensus positions CB-CRE as a high priority in student worldviews.
- **Student Roles:** 97.6% agree or strongly agree that students play a key role in climate resilience—demonstrating a robust sense of ownership and responsibility.
- **Multidisciplinary Demand:** 74.5% advocate for the inclusion of climate resilience themes in all academic disciplines, transcending the boundaries of environmental studies.
- **Preferred Learning Modes:** Experiential methods such as field visits (30.7%), community projects (27.8%), and awareness campaigns (23.6%) were strongly preferred over conventional lectures (5.7%) or social media initiatives (12.3%).

PARTICIPATION AND BARRIERS

- **Engagement Rates:** 66.5% have participated in climate-related activities at least once; only 10.8% reported regular involvement, and almost 40% “rarely” engaged, indicating sporadic but not sustained participation.
- **Willingness to Volunteer:** 85.8% are open to or eager for volunteering in climate actions, revealing untapped potential where appropriate structures are in place.
- **Perceived Opportunities:** Just 34% felt the university provided sufficient opportunities, while half found provision partial, absent, or unknown—pointing to communication and outreach gaps.
- **Key Barriers:** Absence of time (28.3%), lack of interest (17.9%), insufficient institutional support (13.7%), and some level of perceived unawareness (10.8%) dominate as reasons for non-participation.
- **Preferred Motivators:** Field training (28.3%), credit-based projects (24.5%), and NGO internships (23.6%) are viewed as most effective for fostering higher and sustained participation than traditional clubs or workshops.

Discussion

Synthesis with Literature and Data

Findings from BHU mirror international evidence suggesting that student awareness is high when personally affected, yet experiential engagement, conceptual grasp of technical and systemic solutions, and actual community involvement lag behind policy aspirations. The literature review underscores that the most successful CB-CRE implementations, globally and nationally, are those rooted in interdisciplinary structures, hands-on projects, and institutional partnerships—strategies corroborated by student preferences here.

Yet, the persistence of programmatic silos, limited credit recognition, resource gaps, and lack of faculty development continue to stifle scalable impact. The data also suggest that most students underestimate or overlook institutional barriers initially but articulate them clearly when reflecting on their real experiences. A marked gap is apparent between high attitudinal willingness and actual participation—this is consistent with the “knowledge-action” gap highlighted in the literature.

Major Patterns and Gaps

Several interconnected patterns emerge:

- **Strong concern and conceptual clarity** coexist with **low technical/systemic knowledge** and **weak continuity of engagement**.
- **Women** in the sample are overrepresented and show higher ecological sensitivity, consistent with gendered participation patterns seen globally.
- **Institutional support and communication gaps** limit the realization of student enthusiasm and volunteerism.
- **Multi-disciplinarity and practical exposure** are critical levers for future program success, with students expressing strong demand for these reforms.

Recommendations

Drawing directly from the syntheses above and international best practice, the following multi-level recommendations are advanced:

For Curriculum and Institutional Practice

- **Integrate climate resilience modules across all disciplines**, ensuring every faculty includes credit-based projects, practical assignments, and case studies linked to local adaptation issues.
- **Prioritize experiential, project-based learning**: Organize field visits to climate-affected areas, sustained community internships, and real-world problem-solving competitions focused on resilience.
- **Establish a BHU Climate Resilience Cell** to anchor awareness, research, and outreach—bringing together students, faculty, NGOs, and external experts on a single institutional platform.
- **Develop and publicize regular volunteering, internship, and research opportunities**, leveraging digital and physical campus communication campaigns for maximum reach.
- **Recognize and reward student participation**: Certificates, transcripts, awards, and formal recognition foster greater and sustained involvement.

For Community Partnerships and Outreach

- **Expand collaborations with NGOs, local government, and traditional knowledge holders** to root campus learning in community realities, mobilize practical resources, and ensure locally appropriate solutions.
- **Promote campaigns that make visible active climate initiatives in Varanasi and similar contexts**, allowing students to link theory to visible successes and localized interventions.

For Policy Makers and External Stakeholders

- **Allocate dedicated funding for interdisciplinary and community-linked teaching innovations**, enabling faculty and department heads to experiment and scale effective practices.
- **Mainstream CB-CRE as a core priority in national university evaluation frameworks**, ensuring not just curricular compliance but practical demonstration of impact through annual reporting and benchmarking.

Limitations

- **Sample Size:** The number of respondents is modest relative to BHU's total population, though stratified representation lends diversity.
- **Reliance on self-reporting** means social desirability and recall bias may influence the data, especially around participation and awareness levels.
- **Single Institutional Focus:** Results may not generalize in detail to other universities without accounting for contextual variation, though major patterns likely hold across similar Indian institutions.
- **Lack of Longitudinal Data:** The snapshot nature of this study precludes inferences on long-term behavioural or attitudinal change; follow-up research should address this gap.

Conclusion

Students at Banaras Hindu University demonstrate both awareness and readiness to tackle climate change; they view community-based climate resilience education as essential to shaping their capacity for action, yet confront structural and institutional constraints in translating motivation into sustained practice. Bridging the knowledge-action gap requires not only curriculum reform and expanded opportunities but also a reimagining of the university's institutional mission—from classroom learning to community empowerment and leadership in local adaptation schemes.

BHU, with its diverse, motivated student body and existing foundation of pilot programs and partnerships, is well positioned to become a regional leader in CB-CRE. The recommendations outlined herein—co-curricular integration, experiential exposure, and stronger external partnerships—offer a roadmap for reform, while providing a generalizable model for other higher education institutions in India and beyond.

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