

Environmental Education towards Developing Conservation Ethics: Evidence from College Students in Berhampore, Murshidabad

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Abstract

Environmental degradation is both a scientific and ethical issue, highlighting human responsibility towards nature and future generations. This study explores how environmental education promotes conservation ethics among college students in Berhampore Block, Murshidabad, West Bengal. Using a mixed-method design, quantitative data were collected from 52 undergraduates level students, using a structured questionnaire, incorporating adapted measures of environmental beliefs, attitudes and conservation behaviour, supplemented by a semi-structured interview guide with 12 selected students of the same academic standard. The findings indicate that while students hold favourable environmental beliefs and attitudes, their conservation behaviours are moderate. Specifically, the mean I-NEP score was 33.86/45 (75.2%), the Environmental Attitude Inventory score was 29.17/35 (83.3%), and the conservation behaviour score stood at 23.48/35 (67.1%). Though all respondents completed mandatory environmental studies, participation in non-formal activities was lower. Four themes emerged from the qualitative data: a limited link between the curriculum and local environmental issues, the value but limited impact of experiential learning, barriers to environmental action, and a preference for practical, place-based learning. The study suggests that while environmental education establishes a foundation for conservation ethics, enhancing experiential and local learning opportunities could improve practical application.

Keywords: Environmental Education; Conservation Ethics; Environmental Attitudes and Behaviour; Berhampore Block.

Introduction

Environmental degradation is one of the most pressing challenges of our time, with issues like pollution, biodiversity loss, climate change, and ecosystem deterioration, significantly impacting human health and social well-being (IQAir, 2023). These challenges reflect our collective understanding of nature and our responsibilities towards current and future generations. Thus, effective environmental conservation depends not only on scientific knowledge but also on fostering appropriate beliefs, attitudes, values, and behaviours.

Environmental education is crucial in this effort. It goes beyond merely conveying information about ecosystems to developing awareness, ecological understanding, values, skills, and active participation (Rieckmann, 2017; UNESCO, 1978). By promoting conservation ethics, such education encourages individuals to recognize the value of nature and accept responsibility for environmental impacts.

Higher education serves as a vital platform for cultivating these principles. College students are future

professionals and leaders (Irfana et al., 2026), making environmental education essential for fostering responsible citizenship and encouraging involvement in sustainability initiatives.

In India, environmental responsibility is embedded in our constitutional framework. Article 48A directs the state to protect the environment, while Article 51A(g) establishes the protection of nature as a fundamental duty of every citizen (The Constitution of India, 1950). Environmental education has been integrated into higher education through various initiatives (UGC, 2024). This study aims to explore the relationship between environmental education and students' sense of environmental responsibility.

Berhampore Block in Murshidabad offers a significant context for this investigation due to its urban-rural mix and various environmental challenges (Directorate of Census Operations, West Bengal, 2011). The Bhagirathi River is a key geographic and socio-economic feature, supporting agriculture in rural areas of this Block. However, the region contends with pressing issues like waste accumulation, traffic congestion, air and noise pollution, and gradually declining drinking water quality.

Mukherjee (2022) emphasizes the importance of the Bhagirathi River, framing the environmental challenge as a shift from reverence to responsibility. This aligns with the ethical foundation of this study and highlights the need to connect environmental education with students' ecological surroundings.

The study identifies three related dimensions: environmental beliefs, attitudes, and conservation behaviour of UG level students. Environmental beliefs reflect students' understanding of the human-nature relationship, attitudes capture their emotional responses to environmental issues, and behaviour refers to reported responsible actions (Zelezny et al., 2000). Acknowledging this distinction is vital, as positive beliefs do not always lead to action.

Guided by the Value-Belief-Norm (VBN) theory (Stern et al., 1999), this study connects values and responsibilities to pro-environmental behaviour. It also addresses the value-action gap identified by Kollmuss and Agyeman (2002) and incorporates insights from Steg and Nordlund (2018) on the factors affecting environmental behaviour.

Overall, this study examines environmental education and conservation ethics among college students in Berhampore Block, focusing on both formal and informal education while exploring their beliefs, attitudes, behaviours, and the barriers to environmental action they face.

Research Objectives

The following objectives guided the study:

1. To assess the environmental awareness and conservation ethics of college students in Berhampore Block, Murshidabad.
2. To examine the role of formal and non-formal environmental education in relation to students' conservation-oriented beliefs, attitudes and behaviour.
3. To identify challenges and barriers that impede the translation of environmental education into conservation-oriented action and to explore students' suggestions for strengthening environmental education programmes.

Research Questions

The study seeks to address the following research questions:

1. What are the patterns of environmental beliefs, environmental attitudes and conservation behaviour among college students in Berhampore Block?
2. How do students experience formal environmental education in their undergraduate studies?

3. What is the extent of students' participation in non-formal environmental education?
4. What barriers do students perceive in translating environmental learning into conservation-oriented action?
5. What forms of environmental education do students consider most relevant to their local context?

The overarching research question is:

What role does environmental education play in promoting conservation ethics among college students in Berhampore Block, Murshidabad?

Review of Literature

Environmental education has increasingly developed from a knowledge-centred approach towards a broader model involving values, competencies, participation and sustainable action. Rieckmann (2017), for example, emphasises competencies required for sustainable development, including systems thinking, critical thinking and responsibility. Such approaches are particularly relevant to conservation ethics because environmental responsibility cannot be reduced to factual knowledge. Albertz and Pilz (2025) further highlight the importance of green skills development in educational contexts, particularly in vocational training settings in India.

The VBN framework of Stern et al. (1999) provides an important theoretical basis for understanding environmental responsibility. It proposes that values and ecological worldviews can influence awareness of consequences and responsibility, which may activate personal norms and contribute to environmentally responsible behaviour. Schwartz's (1977) earlier work on normative influences on altruism provides an important foundation for understanding the role of personal norms within such processes.

Environmental attitudes have also been examined through established psychometric instruments. Milfont and Duckitt's (2010) Environmental Attitudes Inventory provides a multidimensional measure of environmental attitudes. In the present study, selected dimensions were adapted for undergraduate respondents and locally contextualised. Nunnally and Bernstein (1994) provide foundational guidance on psychometric properties that informed the instrument adaptation process.

Varkey, Augustine and Tom (2022) developed and used the Indian New Environmental Paradigm (I-NEP) Scale in research involving architecture students in Kerala. The instrument provides a specifically Indian context for assessing ecological worldviews and was used in the present study as the basis for measuring students' environmental beliefs. The relevance of an Indian environmental paradigm is particularly useful when studying students whose environmental experiences are shaped by local social, cultural and ecological contexts.

Research among Indian higher-education students has also demonstrated the complexity of environmental attitudes and behaviour. Varah et al. (2020), studying undergraduate students in Delhi, examined environmental attitudes and behaviours and highlighted the need to distinguish favourable attitudes from actual behaviour. Bhattacharyya and Chatterjee (2024) investigated environmental attitude and conservation behaviour among higher-education students in West Bengal and examined demographic differences. Sen et al. (2025) similarly investigated environmental attitudes among undergraduate students in Purulia district, West Bengal. Biswas and Sen (2025) examined climate change challenges through student surveys, contributing to the growing body of evidence on environmental perceptions among Indian students.

The distinction between environmental attitude and behaviour is important because positive attitudes may coexist with comparatively weaker behavioural engagement. Kollmuss and Agyeman (2002) explain this

through the environmental value–action gap, in which individual, social and structural factors may intervene between environmental concern and actual behaviour. Steg and Nordlund (2018) similarly emphasise the importance of contextual and psychological factors in explaining environmental behaviour. International research has consistently demonstrated similar patterns across diverse cultural contexts, suggesting that the attitude-behaviour gap is a universal challenge in environmental education rather than being unique to the Indian context.

The local environmental context is also important. Mukherjee (2022) examines human impact on the Bhagirathi River in Murshidabad District and conceptualises the environmental challenge in terms of movement from reverence to responsibility. This local perspective is highly relevant to the present study because students' environmental beliefs and attitudes cannot be separated from the ecological systems in which they live.

Experiential and non-formal environmental education can potentially address the gap between knowledge and action. NSS activities, eco-clubs, field visits, environmental campaigns and community projects can provide opportunities for students to encounter environmental problems directly and to experience collective responsibility. Morris et al. (2024) demonstrate how climate change beliefs differ by education levels in India, underscoring the importance of educational interventions. The present study's qualitative findings indicate that students regarded such activities as particularly meaningful.

Despite the growing literature as stated above, relatively little mixed-method research has focused specifically on environmental education and conservation ethics among college students in Berhampore Block. The present study seeks to address this geographical gap while also responding to the methodological need to combine quantitative measurement with qualitative accounts of students' experiences.

Methodology

Research Design

The study employed a mixed-method explanatory-sequential design (Creswell & Clark, 2007). Quantitative data were collected first to establish patterns of environmental beliefs, attitudes, behaviour and environmental-education exposure. Qualitative interviews were subsequently used to deepen and contextualise these findings.

The mixed-method approach was selected because quantitative scores alone could not adequately explain why favourable environmental beliefs and attitudes might coexist with more moderate behavioural engagement. The qualitative component therefore sought to explain, elaborate and contextualise the quantitative patterns.

Study Area

Berhampore Block is characterised by a mixed urban-rural setting (Directorate of Census Operations, West Bengal, 2011). The Bhagirathi River runs along the eastern side of the block and is significant for irrigation, water resources and local livelihoods. The area also contains urban environmental problems associated with waste, traffic, air pollution and noise. Rural agricultural practices, including dependence on chemical fertilisers, constitute another important environmental dimension.

This combination of urban and rural environmental experiences makes Berhampore a useful setting for examining how environmental education relates to conservation ethics.

Sample and Data Collection Procedure

The quantitative sample consisted of 52 undergraduate students drawn from Murshidabad Maharaja Kris-

hnath University and Berhampore College. The sample comprised 30 female students (57.7%) and 22 male students (42.3%). Twenty-seven students (51.9%) were in the first year and 25 (48.1%) in the second year. All respondents were from the Arts stream and government institutions. Thirty-five students (67.3%) had rural backgrounds and 17 (32.7%) urban backgrounds.

Convenience sampling was used for the quantitative phase (Etikan et al., 2016). The qualitative phase employed purposive sampling from among survey respondents (Patton, 2015). A total of 10–12 undergraduate students were selected to provide variation in demographic characteristics and conservation-related responses. Interviews continued until recurring themes were identified. Participation was voluntary, and confidentiality of data was maintained.

Tools

This study utilized a quantitative instrument consisting of a 30-item composite questionnaire organized into five sections: demographic background, environmental education experience, perspectives on nature and the environment, feelings and attitudes, and self-reported pro-environmental behaviour.

The questionnaire was adapted from the following trusted sources:

1. The Indian New Environmental Paradigm (I-NEP) Scale by Varkey et al. (2022) for assessing environmental beliefs.
2. Key components of the Environmental Attitude Inventory by Milfont and Duckitt (2010), as applied in West Bengal by Bhattacharyya and Chatterjee (2024) for environmental attitudes.
3. The Pro-nature Conservation Behaviour Scale by Barbett et al. (2020) for measuring conservation behaviours.

Local context was emphasized by referencing the Bhagirathi River, regional ponds, waste management, air pollution, and chemical fertilizers. The language was simplified for undergraduate students and translated into Bengali. Psychometric rigor followed the guidelines of Nunnally and Bernstein (1994).

The qualitative component included a semi-structured interview guide that explored environmental education experiences, influences on nature perceptions, personal responsibility, obstacles to action, and suggestions to enhance environmental education initiatives. This comprehensive approach promotes a deeper understanding and effective action towards environmental stewardship.

Data Analysis

Quantitative data were analysed through frequencies, percentages, means and standard deviations. Qualitative data were analysed thematically following Braun and Clarke (2006). The analysis identified four major themes, and the qualitative findings were subsequently integrated with the quantitative results. As the adapted instrument combines different constructs, the present article does not construct or report a single composite conservation-ethics score. Environmental beliefs, attitudes and behaviour are analysed separately.

Data Analysis

Demographic Profile

Table 1. Demographic profile of respondents (N = 52)

Variable	Category	n	%
Gender	Female	30	57.7
	Male	22	42.3
Year	First Year	27	51.9

	Second Year	25	48.1
Stream	Arts	52	100.0
College type	Government	52	100.0
Residence	Rural	35	67.3
	Urban	17	32.7

The sample, therefore, reflects a predominantly rural and Arts-stream student group. The mixed rural-urban composition is relevant because students encounter different environmental problems in their everyday lives.

Exposure to Environmental Education

Table 2. Students' exposure to environmental education (N = 52)

Environmental-education experience	n	%
Compulsory environmental studies course	52	100.0
NSS/NCC environmental activity	28	53.8
Eco-/nature-club membership	14	26.9
Environmental seminar/workshop	22	42.3
Field trip to natural/polluted site	16	30.8
Quality of formal instruction	M = 3.21	SD = 1.04

The compulsory environmental studies course reached all respondents, whereas participation in non-formal activities was substantially lower. Only 26.9% belonged to an eco- or nature club and 30.8% had participated in a field trip.

Summary of the Three Principal Quantitative Dimensions

Table 3. Summary of environmental beliefs, attitudes and behaviour

Dimension	Items	Mean	Maximum	% of maximum	SD
Environmental beliefs (I-NEP)	9	33.86	45	75.2	6.35
Environmental attitudes	7	29.17	35	83.3	5.70
Conservation behaviour	7	23.48	35	67.1	6.30

The three dimensions display a clear descriptive pattern: environmental attitudes were most favourable relative to their maximum possible score, followed by environmental beliefs, while self-reported conservation behaviour was comparatively lower. The figures should not be combined into a single composite index because the source instrument consisted of adapted components measuring conceptually distinct domains.

Environmental Beliefs

Table 4. Selected I-NEP item means

Item	Environmental belief	M	SD
C1	Humans are seriously harming the environment	4.15	0.88
C2	Balance of nature is delicate	4.08	0.91
C3	Plants and animals have equal right to exist	4.23	0.83
C4	Humans remain subject to nature's laws	4.00	0.95
C5	Humans must live in harmony with nature	4.35	0.77

C6	Continued environmental degradation may lead to disaster	3.92	1.00
C7	Nature can cope with modern industry*	3.19	1.13
C8	Ecological crisis has been exaggerated*	3.00	1.19
C9	People worry too much about the environment*	2.94	1.21

*Reverse-coded items.

The total I-NEP score after reverse coding was 33.86/45. The strongest endorsement concerned living in harmony with nature (M = 4.35), followed by recognition of the rights of non-human species (M = 4.23).

Environmental Attitudes

The Environmental Attitude Inventory produced a mean of 29.17/35.

Table 5. Environmental attitude item means

Item	Environmental attitude	M	SD
D1	Enjoyment of natural places	4.23	0.86
D2	Sadness about pollution in Bhagirathi River/local ponds	4.08	0.93
D3	Anger at dumping garbage into the river	3.96	0.99
D4	Human right to use nature even when harmful*	2.81	1.16
D5	Protecting nature for future generations	4.48	0.75
D6	Saving water/electricity for environmental reasons	3.73	1.07
D7	Reducing chemical fertilisers to protect soil and water	3.88	1.01

*Reverse-coded item.

The highest response concerned protecting nature for future generations (M = 4.48), followed by enjoyment of natural places (M = 4.23). Concern about pollution of the Bhagirathi River was also relatively high (M = 4.08), demonstrating the relevance of local environmental conditions to students' attitudes.

Conservation Behaviour

Table 6. Conservation-behaviour item means

Item	Behaviour	M	SD
E1	Avoiding plastic waste in open places/river	3.77	1.04
E2	Saving water at home	3.60	1.10
E3	Saving electricity	3.52	1.13
E4	Planting trees	3.02	1.19
E5	Participating in cleaning drives/campaigns	2.77	1.16
E6	Advising family/friends not to pollute	3.38	1.11
E7	Reducing plastic-bag use	3.42	1.09
Total	Conservation behaviour	23.48	6.30

The strongest behavioural trend in the study was the commitment to avoiding plastic waste (M = 3.77), followed closely by efforts to save water (M = 3.60). In contrast, participation in cleaning drives and environmental campaigns received the lowest ratings (M = 2.77), with tree planting (M = 3.02) also lacking engagement. This indicates that while individuals are more likely to adopt personal, routine

behaviours, organized collective action is less common. It is important to note that these findings are based on self-reported data and should not be seen as direct observations.

Qualitative Findings

The semi-structured interviews revealed four key themes:

Theme 1: Curriculum Lacks Local Relevance.

Students felt the mandatory environmental studies course provided foundational knowledge but failed to connect with local issues like Bhagirathi River pollution and waste management. The focus on lectures over field experiences reduced engagement.

Theme 2: NSS and Eco-Clubs are Valuable but Limited.

Participants in NSS or eco-clubs found activities like riverbank cleaning meaningful, yet access to these opportunities was often restricted due to institutional capacity.

Theme 3: Barriers from Economic and Social Factors.

Rural students cited reliance on chemical fertilizers and economic pressures as challenges. They also noted inadequate waste infrastructure and urban issues like traffic noise and air pollution.

Theme 4: Demand for Place-Based Learning.

Students showed awareness of their environment and expressed a desire for practical experiences, such as field visits and lessons on waste segregation and composting, calling for more involvement from local experts and community members.

Discussion

The study provides valuable insights into environmental learning among college students in Berhampore, revealing a significant disparity between their beliefs and behaviours. While students hold positive environmental beliefs and strong conservation attitudes, their self-reported conservation behaviours are only moderate. This aligns with the environmental value-action gap identified by Kollmuss and Agyeman (2002), which suggests that strong attitudes do not always translate into action due to psychological, social, and structural barriers. Students pointed to inadequate infrastructure, economic pressures, family practices, and limited opportunities for practical engagement as key obstacles.

The I-NEP findings highlight a strong ecological orientation, with students emphasizing the importance of living in harmony with nature and recognizing the rights of all living beings. This suggests an understanding of humanity as part of ecological systems. The I-NEP framework by Varkey et al. (2022) effectively supports a deeper exploration of these beliefs. Similarly, findings from the Environmental Attitude Inventory emphasize the ethical aspect of students' views, particularly their commitment to protecting nature for future generations. Concerns about pollution in the Bhagirathi River further underscore the influence of local experiences. Mukherjee's (2022) analysis illustrates a transition from reverence to responsibility. In summary, while students express significant environmental concern, bridging the gap between awareness and sustained conservation behaviour remains a pressing challenge. The distinction between formal and non-formal environmental education is significant. All respondents completed the mandatory environmental studies course, indicating its universal reach. However, participation in NSS/NCC environmental activities was only 53.8%, eco-club membership was 26.9%, and field-trip participation was 30.8%. This suggests that while formal education is widespread, hands-on experiences are limited. Students expressed that practical engagement is particularly meaningful. However, these findings do not imply that non-formal education directly leads to stronger conservation

ethics. The study's design and sampling methods make causal conclusions difficult. It's likely that students engaged in such activities already have a strong interest in environmental issues. Thus, the observed correlation between participation and positive conservation responses reflects shared values, with students recognizing the value of practical engagement in their learning.

The findings underscore the critical importance of place-based environmental education. Local factors such as the Bhagirathi River, ponds, agricultural practices, waste management, and urban air pollution are immediate concerns for students. Their preference for field trips and hands-on activities suggests that these local realities can serve as powerful educational resources, making environmental concepts more relatable to their experiences.

In the rural-urban context, education must be locally relevant. Rural students face issues tied to agriculture and water management, while urban students are more affected by waste, traffic, and pollution. By incorporating these diverse experiences, environmental education can inspire students to understand and act on environmental responsibility in their communities.

Behavioural insights reveal that simple actions like reducing plastic waste and conserving water are more commonly adopted than participation in organized activities like cleanup drives. This indicates that individual actions may be easier to undertake, highlighting the role of social and institutional support in fostering environmental behaviour (Steg & Nordlund, 2018).

Colleges should treat environmental education as more than just a subject. Implementing practices such as waste segregation, water conservation, and biodiversity initiatives on campus can provide students with essential opportunities to engage with and practice environmental stewardship. Irfana et al. (2026) also stress the importance of educational institutions in cultivating environmentally responsible behaviour, ultimately fostering a sustainable future.

The findings of this study align with some previous researches. Varah et al. (2020) distinguish between environmental attitudes and behaviours among undergraduates, while Bhattacharyya and Chatterjee (2024) highlight the importance of demographic and educational factors. Furthermore, Sen et al. (2025) provide evidence from West Bengal, and Biswas and Sen (2025) enhance understanding of students' environmental perceptions. The present findings add to this by focusing on Berhampore and combining quantitative data with student narratives about local challenges and educational experiences.

Summary

This study highlights the essential role of environmental education in shaping conservation ethics among 52 undergraduate students in Berhampore Block.

First, while formal environmental education is universally available and all students completed the compulsory course, the perceived quality of instruction is moderate, scoring 3.21 out of 5 (SD = 1.04). This presents an opportunity for improvement.

Second, participation in non-formal environmental education is limited: 53.8% are involved in NSS or NCC, eco-club membership is at 26.9%, workshops at 42.3%, and field trips at 30.8%. Access to these experiences must be expanded.

Third, students demonstrate favourable environmental beliefs, with an I-NEP score of 33.86 out of 45, strongly supporting harmony with nature and non-human rights.

Fourth, strong environmental attitudes are evident, with a mean score of 29.17 out of 35, particularly regarding nature protection for future generations.

Fifth, conservation behaviour is moderate, averaging 23.48 out of 35; students excel in avoiding plastic and conserving water but show weaker participation in campaigns and tree planting.

Finally, qualitative feedback reveals a disconnect between formal education and real-world issues. Although students value NSS and eco-clubs, they face economic and infrastructural barriers. They advocate for practical, place-based learning to enhance their engagement with local ecosystems. Immediate action is needed to address these gaps and strengthen environmental action.

Conclusion

This study highlights the essential role of environmental education in fostering conservation ethics among college students in the Berhampore Block. The students displayed positive attitudes toward the environment, particularly regarding harmony with nature, future protection, and local degradation concerns.

However, their moderate conservation behaviour scores indicate that a positive mindset does not always lead to action. Factors such as infrastructure, economic challenges, family practices, and institutional support significantly influence this gap.

While mandatory environmental studies provide valuable learning opportunities, the study suggests that education is most effective when students can relate it to their surroundings. Local contexts, like the Bhagirathi River and urban pollution, enhance this learning experience.

Ultimately, environmental education should be viewed as a foundational element for developing conservation ethics. Its impact can be strengthened through place-based, experiential, and participatory learning, supported by institutions that empower students to act on their values.

Recommendations

Environmental education should be localized and experiential, incorporating the Bhagirathi River, local ponds, waste management, pollution, and agricultural practices into teaching. This includes classroom instruction, field visits, environmental audits, and community activities. Strengthening the National Service Scheme (NSS) and eco-clubs can enhance practical engagement with environmental issues.

Colleges must promote green campus initiatives such as waste segregation, plastic reduction, and water conservation. Students should document and address local environmental challenges, supported by partnerships with local authorities and organizations. Teacher preparation should emphasize sustainability-focused pedagogies (Albertz & Pilz, 2025).

Institutional barriers like inadequate resources and limited access to practical activities must be removed. Besides, adopting activity-based assessments—incorporating projects and fieldwork—will ensure conservation responsibility is not only taught but practiced on campus.

Future Research

Future research should focus on larger, diverse samples across various disciplines, institutions, and socio-economic backgrounds to effectively investigate environmental beliefs, attitudes, and behaviours. Comparative and longitudinal studies in Murshidabad and nearby districts of West Bengal can help track changes over time. Additionally, intervention studies should evaluate place-based initiatives like Bhagirathi River studies, waste management projects, campus biodiversity efforts, and sustainable agriculture programs. It is essential to examine how institutional environmental culture influences student

learning. For impactful quantitative research, sufficiently large samples should be used for solid inferential analysis, with validated instruments or locally adapted measures.

Limitations

This study's findings are limited due to a small sample of 52 arts students from government institutions, affecting generalizability. Its cross-sectional design allows for descriptive insights but does not establish causality in environmental education effects. Self-reported conservation behaviour may be influenced by social desirability bias. The questionnaire, combining established instruments, lacks a validated single conservation ethics scale. The qualitative analysis involved only 10 to 12 students, requiring verification with original interview records. Consequently, the primarily descriptive dataset does not justify treating subgroup differences as statistically significant or causal, highlighting the need for further research.

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