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Environmental Education and Climate Awareness: Teachers' Perspectives in Schools of Sunwal Municipality

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Abstract

Environmental education has become increasingly significant in a world where climate change is reshaping natural systems and threatening human well-being. Recognizing teachers as central actors in shaping students' environmental awareness, this qualitative study examines how school teachers perceive, interpret, and implement environmental education and climate-related content in their classrooms in Sunwal Municipality. Drawing on semi-structured interviews with tenteachers from public and private schools in Sunwal Municipality, the study explores their understanding of environmental issues, their day-to-day teaching practices, and the realities they confront in attempting to integrate meaningful climate education. The findings reveal that although teachers acknowledge the growing urgency of global warming and view environmental education as a fundamental part of students' learning, they often feel constrained by limited resources, insufficient professional training, and rigid curriculum structures. These constraints leave many teachers feeling underprepared and unsupported despite their personal commitment to environmental awareness. The study underscores the need for sustained teacher capacity-building, greater access to experiential learning tools, and stronger institutional and policy-level support to ensure that climate education becomes an integral and effective component of the school experience.

***Keywords*:** *Awareness, Climate, curriculum, Environment, Teaching*

Introduction

Background

Climate change stands as one of the most pressing global challenges of the twenty-first century, with far-reaching consequences for ecosystems, public health, socio-economic stability, and patterns of human life. As communities around the world experience more frequent natural disasters, rising temperatures, shifting weather patterns, and resource scarcity, the need to foster climate literacy and environmental responsibility has become more urgent than ever (Yadav, 2025). Within this broader context, schools play a pivotal role in shaping students' values, attitudes, and behaviors toward the environment. Environmental education (Allert and Chatterjee) not only provides students with knowledge about ecological systems and human-environment interactions but also encourages critical thinking, problem-solving, and responsible citizenship aimed at long-term sustainability (Chavula, 2024).

Teachers occupy a central position in this educational process. Their understanding of environmental issues and their personal beliefs about climate change significantly influence how environmental themes are

presented and how deeply students engage with them. Teachers are not merely conveyors of information; they are facilitators who help students make sense of complex and often abstract climate-related concepts (Asimakopoulou et al., 2021). Their classroom choices, teaching strategies, and levels of confidence in addressing environmental topics shape how students perceive and respond to global environmental challenges. However, teachers' ability to fulfill this role is shaped by their experiences, institutional conditions, and the level of support they receive(Welch and Ockelford, 2016). This study, therefore, seeks to understand teachers' perspectives on environmental education and climate awareness, giving voice to their lived realities, concerns, and aspirations for more effective climate-focused teaching.

Statement of the Problem

Despite international and national efforts advocating for stronger climate education, many schools-particularly in developing and resource-constrained contexts-continue to face difficulties in incorporating environmental themes into regular teaching. Teachers often express a desire to teach environmental content more meaningfully but are hindered by limited instructional resources, inadequate teacher training, rigid curriculum demands, and insufficient administrative support. As a result, environmental education is frequently delivered superficially, with few opportunities for hands-on learning or critical reflection. Understanding the perspectives of teachers, who are at the frontline of implementing climate education, is essential for identifying practical barriers and envisioning strategies that can strengthen environmental learning in schools. Without insight into teachers' experiences, efforts to improve climate education risk failing to address the actual needs of classrooms and educators.

Research Objectives

This study is guided by four major objectives:

- To explore teachers' understanding of environmental education and climate awareness.
- To examine how teachers integrate environmental issues into their classroom practices.
- To identify challenges faced by teachers in teaching climate change and environmental topics.
- To explore teachers' suggestions for improving environmental education in schools.

Research Questions

Based on these objectives, the study seeks to answer the following research questions:

- How do teachers perceive the importance of environmental education and climate awareness ?
- What strategies and methods do teachers use to teach environmental topics ?
- What barriers do teachers face in implementing environmental education ?
- How can schools better support teachers in promoting climate awareness ?

Literature Review

Environmental Education in Schools

Environmental education (EE) has evolved over the past decades as educators recognize the need to prepare young people for the ecological challenges ahead. At its core, EE seeks to develop students' knowledge of environmental processes, their ability to think critically about human–environment interactions, and their capacity to act responsibly toward the natural world (Dillon and Herman, 2023).

Brahma (2025)argue that effective environmental education must extend beyond textbook knowledge and should actively engage students through real-world experiences. Approaches such as outdoor learning, project-based activities, nature observation, and community-based environmental projects are considered essential because they allow students to connect theoretical concepts with their immediate surroundings (Skalet, 2019).

Furthermore, environmental education is inherently interdisciplinary, drawing from science, geography, social studies, health, and civic education (Ahmad, 2024). Littledyke (2008) suggests that integrating these subjects helps students understand environmental issues as complex and interconnected rather than isolated scientific facts. As climate change becomes increasingly visible through rising temperatures, changing rainfall patterns, and frequent natural disasters, schools are encouraged to adopt holistic strategies that prepare students to understand and respond to these realities (Anderson, 2012). However, while these ideas are widely supported in theory, their practical application varies across educational settings.

Teachers' Role in Climate Awareness

Teachers are central to any discussion of climate education because they are the ones who translate environmental concepts into meaningful classroom learning (Shepardson et al., 2012). They serve not only as transmitters of knowledge but also as role models who can inspire students to adopt environmentally responsible behaviors. Nation and Feldman (2021)indicates that when teachers demonstrate enthusiasm and confidence in teaching environmental topics, students are more likely to engage deeply with issues such as conservation, climate change, and sustainability.

Teachers' perceptions of environmental issues significantly shape how they teach. Those who view environmental problems as urgent tend to integrate them more consistently into lessons, even when curriculum guidelines are limited (Stevenson, 2007). Teachers also personalize climate issues by relating them to local experiences-such as floods, droughts, pollution, or deforestation-helping students see the relevance of global phenomena in their daily lives. However, Lambert et al. (2012) shows that teachers' effectiveness depends heavily on their own subject knowledge. Climate science can be complex, involving concepts such as carbon cycles, greenhouse gases, and global atmospheric patterns. When teachers lack confidence or adequate training in these areas, they may avoid the topics entirely or teach them superficially(Cohen, 2011). Consequently, the role of teachers in climate awareness is both powerful and constrained, shaped by their beliefs, capacities, and the contexts in which they work.

Challenges in Teaching Climate Education

Despite the growing recognition of environmental education, teachers face numerous challenges that limit their ability to deliver comprehensive and engaging lessons. One of the most frequently cited barriers is the lack of teaching materials and practical resources (Bingimlas, 2009). Many schools lack environmental charts, models, or multimedia tools that can make climate concepts more accessible. Outdoor learning spaces, such as gardens or green schoolyards, may also be limited or poorly maintained.

Curriculum overload is another significant challenge. Teachers often work within rigid structures that prioritize exam-oriented subjects, leaving little time for hands-on activities or interdisciplinary projects

(Sun and Gu, 2025). As a result, environmental education is sometimes reduced to brief textbook chapters rather than meaningful experiential learning.

Insufficient teacher training further complicates matters. Climate science evolves rapidly, and many teachers report that they have not received professional development opportunities related to environmental issues in years (Drewes et al., 2018). Without updated knowledge, they may feel ill-equipped to address students' questions or to connect climate science with local realities.

Institutional support plays a critical role as well. Schools that lack environmental policies, eco-clubs, or administrative encouragement often struggle to maintain student interest in environmental topics(Huoponen, 2024). Some teachers also note that climate change can be perceived as controversial or politically sensitive, which can discourage open discussion in classrooms (Nation and Feldman, 2022). Collectively, these barriers limit the transformative potential of climate education.

Conceptual Framework: Teacher Agency Perspective

This study is guided by the Teacher Agency Perspective (Pantić, 2015), which views teachers not merely as executors of curriculum but as active decision-makers who shape educational experiences through their professional judgment. Teacher agency emphasizes that teachers' actions are influenced by their beliefs, experiences, motivations, and the structural conditions of their schools (Biesta et al., 2015). In the context of environmental education, teacher agency helps explain why some teachers successfully integrate climate topics despite challenges, while others struggle.

The framework recognizes that teachers operate within complex environments where personal commitment must be balanced with institutional constraints (Day et al., 2005). It also highlights the importance of giving teachers autonomy, resources, and support to enact meaningful environmental learning (Reddy, 2021). By applying this perspective, the study aims to capture the nuanced ways teachers navigate both opportunities and limitations as they work to promote climate awareness among students.

Methodology

Research Design

This study employed a qualitative research design, chosen for its capacity to capture the nuanced perspectives and lived experiences of teachers in their natural school settings (Du Plessis et al., 2015). Rather than attempting to test predetermined hypotheses, the study sought to listen closely to teachers' voices, explore the meaning they attach to environmental education, and understand the social and institutional contexts that shape their instructional choices. Qualitative description allowed for a flexible yet systematic approach that remained grounded in participants' narratives while generating rich, contextually embedded insights (Lim, 2025).

Study Site and Participants

The research was conducted across ten purposively selected (Public and Private) secondary schools, representing a diverse mix of educational environments. A total of ten teachers participated in the study. They taught subjects such as Science, Social Studies, and Health Education-areas where environmental and climate-related topics are commonly addressed. The participants varied in terms of institutional background and teaching experience, yet each contributed perspectives shaped by personal encounters with environmental issues, interactions with students, and the everyday realities of working

within the school system. These varying contexts enriched the dataset and allowed for a more holistic understanding of how environmental education is interpreted and practiced at the classroom level.

Sampling Technique

Purposive sampling was adopted to select information-rich participants who could meaningfully contribute to the research objectives. Teachers were chosen based on two key criteria: a minimum of three years of teaching experience and some degree of engagement with environmental or climate-related topics in their professional practice. This approach ensured that participants were not only knowledgeable but also reflective enough to articulate their experiences, providing depth and authenticity to the data.

Data Collection Methods

Data were collected using multiple qualitative methods to ensure a comprehensive understanding of the research questions.

- **Semi-structured interviews** served as the primary method, allowing teachers to share their experiences in their own words while providing the flexibility to probe deeper into emerging issues.
- **Document review** of school curriculum materials helped contextualize the instructional expectations placed on teachers and identify how environmental topics were officially framed.
- **Informal observations** of classrooms and school environments offered additional insights into how schools physically and socially embodied environmental values-for example, through eco-clubs, waste management practices, or classroom displays.

The interview protocol explored teachers' conceptual understanding of environmental education, the strategies they employed in teaching, the obstacles they faced, and their recommendations for enhancing climate awareness among students.

Data Analysis

Thematic analysis (Ahmed et al., 2025) was used to interpret the data systematically. Interview transcripts were read multiple times to develop a deep familiarity with the content. Coding was performed to identify meaningful segments of data, which were then grouped into broader categories reflecting recurring ideas or patterns(Williams and Moser, 2019). Through iterative analysis, these categories evolved into major themes that revealed how teachers perceive environmental education, how they implement it, and what structural or contextual factors influence their efforts. This process allowed the findings to remain firmly rooted in the voices and experiences of the participants while generating analytical clarity.

Ethical Considerations

Ethical integrity was maintained throughout the research process. Participants were informed about the purpose of the study, the voluntary nature of their involvement, and their right to withdraw at any time. Informed consent was obtained before interviews were conducted. To protect confidentiality, pseudonyms were used and identifying information was removed from transcripts and reports. Care was taken to ensure that participants felt comfortable sharing their experiences openly and that their contributions were treated with respect and sensitivity.

Results and Discussion

Teachers Recognize Climate Change as an Urgent Issue

Across interviews, teachers consistently expressed a sense of urgency and concern about the accelerating impacts of climate change. Many reflected on the visible environmental changes occurring in their communities-such as unpredictable weather patterns, rising temperatures, pollution, and increased frequency of natural disasters-and emphasized that these issues are no longer distant or abstract but part of students' lived experiences. This personal awareness shaped their belief that environmental education must be treated as a core element of schooling rather than an optional or secondary topic (Rickinson, 2001).

Several teachers shared that they felt a moral responsibility to help students understand the seriousness of environmental issues. One science teacher remarked, "Students need to understand climate change because they will face its impacts more severely than we do." Such sentiments reveal teachers' perception that climate education is essential not only for academic purposes but also for building students' capacity to navigate and respond to environmental challenges in their everyday lives.

Despite this strong recognition, teachers' depth of scientific understanding varied considerably. While some demonstrated solid conceptual knowledge of climate systems, others acknowledged gaps that made it difficult for them to explain more complex climate processes. This uneven understanding points to the need for continuous training and support to strengthen teachers' confidence and scientific literacy in environmental topics.

Environmental Topics Are Taught, but Often Superficially

Although teachers reported integrating environmental themes into their lessons, this integration was often limited to familiar and easily manageable formats. Environmental content was commonly delivered through textbook explanations, brief classroom discussions, or routine school activities such as cleanliness programs, tree plantation events, and project work. These practices demonstrate teachers' willingness to engage with environmental topics, but they also reveal a tendency to rely on traditional or symbolic activities rather than deeper, inquiry-based learning (Song and Looi, 2012).

Many teachers expressed frustration that meaningful environmental teaching was constrained by time pressures, overloaded syllabi, and the demands of exam preparation. A Social Studies teacher explained, "We teach environmental content, but it is rarely practical. There is not enough time to take students outdoors." This comment illustrates a broader challenge faced by teachers: while they recognize the value of experiential learning, the school environment often does not allow the flexibility needed to conduct field visits, experiments, or hands-on activities that could help students better understand the complexities of climate change.

As a result, environmental topics are often addressed in fragmented or superficial ways, limiting students' ability to develop holistic and critical perspectives on environmental issues.

Barriers to Effective Environmental Education

Lack of Resources

Teachers frequently highlighted the absence of teaching materials as a major barrier. Many reported having limited access to visual aids, updated data on environmental issues, models, charts, or digital tools that could make learning more interactive and engaging. Without such resources, teachers often resorted to

verbal explanations, which they felt were less effective for topics requiring demonstration or visualization (Eilam and Gilbert, 2014).

Limited Training

A significant number of teachers admitted that they had never received formal training on climate education. This lack of professional development left many feeling unprepared to teach complex scientific concepts such as greenhouse gas emissions, carbon cycles, or global warming mechanisms. Teachers indicated that they often relied on their own understanding-acquired from the internet, textbooks, or personal reading-rather than structured training or institutional guidance.

Curriculum Constraints

Teachers emphasized that the national curriculum remains heavily exam-oriented, leaving limited space for creative or participatory approaches to environmental learning. The pressure to complete the prescribed content within short timeframes discourages teachers from adopting exploratory or activity-based teaching methods. As a result, environmental education often becomes confined to specific units within textbooks rather than integrated into broader interdisciplinary learning (Vincent and Focht, 2011).

Institutional Limitations

Some teachers noted that their schools lacked basic infrastructure to support environmental education. For instance, schools without adequate green space found it difficult to conduct outdoor learning activities. Others mentioned the absence of functional waste management systems or school-wide environmental policies, which made it difficult to model sustainable practices for students. The lack of active eco-clubs-often due to insufficient funding or administrative support-further limited opportunities for student engagement beyond the classroom.

Teachers' Recommendations for Improving Climate Education

Teachers offered several meaningful recommendations aimed at strengthening the quality and effectiveness of environmental education in schools. A recurring suggestion was the need for regular training and workshops that would equip teachers with updated knowledge, new teaching strategies, and confidence to handle complex environmental topics. Teachers stressed that such capacity-building efforts should be continuous rather than one-off events.

Another key recommendation was the incorporation of more practical and experiential learning activities, including field trips, nature walks, school gardening programs, and community-based environmental projects. Teachers believed that hands-on experiences could deepen students' understanding and help them relate theoretical knowledge to real-world contexts.

Additionally, teachers called for revitalizing environmental clubs, which they saw as platforms for student leadership and peer learning. Strengthening these clubs will provide opportunities for awareness campaigns, competitions, and collaborative environmental initiatives within the school (Potoski and Prakash, 2013).

Teachers also emphasized the importance of curriculum reform to increase the visibility and depth of climate-related content. They recommended integrating local examples, culturally relevant case studies, and multimedia resources to make lessons more relatable for students.

As one English teacher observed, "If we want students to be environmentally aware, schools must model eco-friendly practices." This comment highlights an important insight: effective climate education requires not only changes in classroom pedagogy but also broader institutional commitments to sustainability.

Overall, the recommendations offered by teachers resonate strongly with global research that advocates for experiential, interdisciplinary, and context-driven approaches to environmental education.

Conclusion

This study concludes that teachers hold a deep awareness of the seriousness of climate change and view environmental education as an indispensable component of contemporary schooling. Their narratives reflect a strong moral and professional commitment to cultivating environmentally conscious students who can navigate a world increasingly shaped by ecological uncertainty. However, this commitment often exists in tension with the practical realities of school life. Teachers consistently reported feeling underprepared to teach complex climate concepts due to insufficient training opportunities and a scarcity of teaching materials that translate scientific ideas into accessible classroom content.

Moreover, structural constraints-such as rigid curricula, achievement-oriented assessment systems, and limited institutional support-restrict teachers' ability to engage students in meaningful, hands-on learning experiences. Many teachers described wanting to take students outdoors, initiate recycling programmes, or conduct project-based environmental activities, but such aspirations remained difficult to realize within existing school frameworks. Nevertheless, the presence of strong teacher motivation offers a promising foundation on which improved environmental and climate education can be built. For meaningful change to occur, it is crucial that educational policies, school cultures, and curriculum designs align with teachers' efforts by providing them with the time, resources, and professional recognition necessary to enact effective climate pedagogy. Strengthening institutional support, revising curricular content to prioritize environmental issues, and expanding teacher professional development are essential steps toward empowering teachers and fostering environmentally literate future generations.

Implications and Recommendations

Implications for Schools

Schools serve as vital spaces where environmental values and practices can be modelled, experienced, and internalized by students. To strengthen environmental education, schools should consider establishing well-functioning eco-clubs that actively involve students in awareness campaigns, recycling initiatives, biodiversity projects, and local environmental actions. These clubs can serve as platforms for experiential learning and leadership development. Additionally, schools should introduce and enforce institutional environmental policies-such as waste segregation systems, paper reduction practices, and water conservation measures-that align the school environment with the values taught in the classroom. Encouraging project-based learning, field visits, and other forms of outdoor education can further help students connect theoretical knowledge with real-world environmental concerns.

Implications for Policy-makers

Policymakers play a decisive role in ensuring that environmental education receives adequate attention at the systemic level. Developing comprehensive teacher training modules on climate change and environmental literacy would equip educators with the conceptual knowledge and pedagogical skills necessary to

teach these topics confidently. Furthermore, providing grants or financial incentives for school-based environmental projects can help create the infrastructure needed to support hands-on learning. Integrating climate education more prominently into the national curriculum would not only validate its importance but also ensure that environmental learning is systematically and uniformly implemented across schools.

Implications for Future Research

Future research can build on the present study by conducting comparative inquiries across rural and urban school settings to examine how geographical contexts shape teaching practices and environmental awareness. Longitudinal studies that track changes in students' environmental literacy over time would be valuable in assessing the long-term impact of school-based climate education initiatives. Additionally, quantitative studies could complement qualitative findings by measuring the relationship between teacher preparedness, institutional support, and learning outcomes. Together, such research efforts can contribute to the development of more comprehensive and contextually grounded climate education strategies.

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