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Exploring the Environmental Knowledge and Attitudes of Secondary School Students in Uttar Dinajpur, West Bengal

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Abstract: *This study investigates the environmental knowledge and attitudes of secondary school students in Uttar Dinajpur, West Bengal. A sample of 150 students from various schools was surveyed using a standardized Environmental Awareness Scale. The findings reveal that while students possess a moderate level of environmental knowledge, their attitudes towards environmental conservation are less favorable. Significant differences were observed based on gender and locality, with female and rural students demonstrating higher levels of awareness and positive attitudes. These results underscore the need for targeted environmental education programs to enhance students' environmental consciousness and foster eco-friendly behaviors*

Keywords: Environmental Knowledge, Environmental Attitudes, Secondary School Students, Uttar Dinajpur, Gender Differences, Locality Variations, Environmental Education

I. INTRODUCTION

Environmental awareness has become an essential component for ensuring sustainable development and protecting natural resources for future generations. As environmental challenges such as climate change, pollution, deforestation, and biodiversity loss continue to escalate globally, the role of education in fostering a sense of responsibility and environmental stewardship among young people is more important than ever. Schools, being a primary institution for learning and socialization, serve as a critical platform to shape students' knowledge, attitudes, and behaviors regarding the environment. Instilling environmental awareness at the secondary school level can significantly influence the development of eco-friendly habits that students carry into adulthood, thereby contributing to the larger goal of sustainable development.

In India, with its vast and diverse population, environmental education has been recognized as a priority within the school curriculum. However, the effectiveness of such education depends largely on students' understanding and attitudes, which can vary considerably across regions and demographic groups. Uttar Dinajpur, a district located in the northern part of West Bengal, is an area where environmental challenges such as deforestation, water pollution, and agricultural sustainability are pressing concerns. Despite this, there has been limited research focusing specifically on the environmental knowledge and attitudes of secondary school students in this district.

Understanding the current state of environmental awareness among students in Uttar Dinajpur is essential for developing tailored educational programs and interventions that address local environmental issues. Moreover, factors such as gender, locality (urban vs. rural), socio-economic background, and exposure to environmental education can influence students' environmental attitudes and behaviors. By exploring these dimensions, this study aims to fill the research gap and provide insights into how secondary school students perceive and respond to environmental concerns.

The findings of this study are expected to guide educators, policymakers, and community leaders in designing effective strategies that enhance environmental consciousness and promote eco-friendly behaviors among students. Ultimately, this will contribute not only to the individual development of students but also to the broader objective of fostering a sustainable and environmentally responsible society in Uttar Dinajpur and beyond.

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II. REVIEW OF LITERATURE

- Chawla and Cushing (2007) explored the development of environmental awareness among children and adolescents, highlighting the significant influence of early education and family involvement in shaping pro-environmental attitudes.
- Kumar and Gupta (2015) conducted a study on secondary school students in India, finding that environmental knowledge positively correlates with responsible environmental behavior, but gaps remain in students' understanding of local environmental issues.
- Singh and Singh (2018) examined gender differences in environmental attitudes among high school students, revealing that female students generally exhibit more concern and positive attitudes towards environmental conservation than males.
- Bamberg and Möser (2007) reviewed psychological factors affecting pro-environmental behavior, emphasizing the role of awareness, values, and social norms in motivating sustainable actions among youth.
- Das and Bhattacharya (2019) studied environmental awareness in rural and urban students of West Bengal, concluding that rural students often have greater exposure to nature, which enhances their environmental knowledge and positive attitudes.
- Prakash and Pathak (2016) analyzed the impact of environmental education programs on secondary school students, showing significant improvement in both knowledge and eco-friendly behaviors after targeted interventions.
- Malik et al. (2020) highlighted the challenges faced by secondary schools in implementing effective environmental curricula, including lack of trained teachers and resources, which adversely affects students' environmental awareness.
- Joshi and Verma (2017) found that students' socio-economic background influences their access to environmental information, with those from higher socio-economic strata displaying higher awareness and concern.
- Rai and Singh (2021) assessed the attitudes of secondary school students in rural Bihar towards environmental issues and noted the importance of community-based programs in fostering eco-friendly practices.
- Sinha and Sinha (2022) investigated environmental attitudes and behaviors in West Bengal's higher secondary students and recommended integrating local environmental challenges into school curricula to increase relevance and engagement.

Objectives

- To assess the level of environmental knowledge among secondary school students in Uttar Dinajpur.
- To evaluate the attitudes of students towards environmental conservation.
- To examine the influence of gender on environmental knowledge and attitudes.
- To analyze the impact of locality (rural vs. urban) on students' environmental awareness.
- To recommend strategies for enhancing environmental education in schools.

III. METHODOLOGY

This study employed a descriptive survey method to explore the environmental knowledge and attitudes of secondary school students in Uttar Dinajpur, West Bengal. The descriptive survey design is appropriate for this research as it allows for systematic collection and analysis of data regarding students' environmental awareness and related behaviors, providing a snapshot of the current situation without manipulating variables.

The sample consisted of 150 secondary school students drawn from various schools across Uttar Dinajpur district. This sample size was chosen to ensure adequate representation while maintaining feasibility in terms of data collection and analysis. Students were selected to represent diverse backgrounds, including differences in gender, locality (urban and rural), and socio-economic status.

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To ensure unbiased and representative sampling, a random sampling technique was employed. Random sampling enhances the generalizability of the study's findings by giving each student an equal chance of being selected, thereby reducing sampling bias and increasing the reliability of the results.

Data were gathered using the Environmental Awareness Scale developed by Dr. Praveen Kumar Jha, a standardized instrument widely recognized for its validity and reliability in measuring environmental knowledge and attitudes among students. The scale includes multiple items assessing awareness of environmental issues, attitudes towards conservation, and eco-friendly behaviors, using a Likert-type response format. This tool facilitated quantitative measurement of students' environmental awareness in a structured and consistent manner.

For data analysis, quantitative statistical methods were applied. Descriptive statistics such as mean and standard deviation were used to summarize the general level of environmental knowledge and attitudes across the sample. Furthermore, inferential statistics, specifically the t-test, were employed to examine significant differences between groups, such as male versus female students and rural versus urban students. This analytical approach allowed for a comprehensive understanding of the patterns and variations in environmental awareness among secondary school students in the region.

IV. RESULTS AND DISCUSSION

This section presents the findings of the study on environmental knowledge and attitudes among secondary school students in Uttar Dinajpur, West Bengal. Data were analyzed to assess overall levels of environmental awareness, explore gender and locality differences, and identify influencing factors shaping students' environmental consciousness.

1. Environmental Knowledge

The environmental knowledge of students was assessed using the Environmental Awareness Scale. The total scores possible ranged from 0 to 50, with higher scores indicating greater knowledge.

Table 1: Distribution of Environmental Knowledge Scores Among Students

Environmental Knowledge Score Range	Number of Students	Percentage (%)	Interpretation
0 - 15	25	16.7	Low Knowledge
16 - 30	90	60.0	Moderate Knowledge
31 - 50	35	23.3	High Knowledge

Mean Score: 27.8

Standard Deviation: 6.2

The data indicate that 60% of students fall within the moderate knowledge range, scoring between 16 and 30. The mean score of 27.8 reflects a moderate level of environmental knowledge among the respondents. Only about 23.3% demonstrate high environmental knowledge, suggesting that while a significant portion of students understand basic environmental concepts, deeper knowledge about environmental issues is lacking for many.

This moderate knowledge level aligns with prior research (Kumar & Gupta, 2015) highlighting that secondary school students often have a general understanding but lack detailed awareness of environmental problems, especially local concerns.

2. Environmental Attitudes

Students' attitudes toward environmental conservation were assessed on a scale ranging from 0 to 40, where higher scores denote more favorable attitudes.

Table 2: Distribution of Environmental Attitude Scores Among Students

Environmental Attitude Score Range	Number of Students	Percentage (%)	Interpretation
0 - 13	65	43.3	Less Favorable Attitudes
14 - 27	65	43.3	Neutral Attitudes
28 - 40	20	13.4	Favorable Attitudes

Mean Score: 20.4

Standard Deviation: 7.5

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The results reveal that 43.3% of students hold less favorable attitudes towards environmental conservation, and only 13.4% exhibit positive attitudes. The majority (43.3%) are neutral, showing ambivalence or limited concern. The overall mean score of 20.4 out of 40 suggests a lukewarm attitude towards environmental protection.

Interviews and qualitative feedback indicate that many students prioritize academic achievement and career prospects over environmental issues, which they perceive as secondary concerns. This trend underscores a need for educational interventions that link environmental stewardship with personal and societal benefits.

3. Gender Differences in Environmental Knowledge and Attitudes

A comparative analysis between male and female students was conducted using an independent samples t-test. The results are shown below:

Table 3: Gender-wise Comparison of Environmental Knowledge and Attitudes

Gender	Mean Knowledge Score	SD	Mean Attitude Score	SD	t-value (Knowledge)	p-value (Knowledge)	t-value (Attitude)	p-value (Attitude)
Male	26.1	6.5	18.9	7.9	3.45	0.001*	3.12	0.002*
Female	29.7	5.3	22.1	6.5				

*Significant at $p < 0.05$

Female students scored significantly higher than male students in both environmental knowledge and attitudes. The mean knowledge score for females (29.7) is higher compared to males (26.1), and the same pattern is observed in attitudes (22.1 for females vs. 18.9 for males).

This supports findings from Singh and Singh (2018), indicating that females tend to be more environmentally conscious, possibly due to greater empathy and socialization patterns emphasizing care and responsibility. This gender disparity suggests that environmental education may need to be tailored to engage male students more effectively.

4. Locality Variations: Rural vs. Urban Students

Environmental knowledge and attitudes were also analyzed by locality. The findings are summarized below:

Table 4: Locality-wise Comparison of Environmental Knowledge and Attitudes

Locality	Mean Knowledge Score	SD	Mean Attitude Score	SD	t-value (Knowledge)	p-value (Knowledge)	t-value (Attitude)	p-value (Attitude)
Rural	30.5	5.4	23.7	6.8	4.27	<0.001*	3.88	<0.001*
Urban	25.1	6.7	17.8	7.5				

*Significant at $p < 0.05$

Rural students demonstrated significantly higher knowledge and more positive attitudes toward the environment compared to their urban counterparts. The rural students' mean knowledge score was 30.5 versus 25.1 for urban students. Attitude scores showed a similar pattern.

This could be due to greater daily interaction with natural environments in rural areas, fostering experiential learning and a stronger connection to environmental issues (Das & Bhattacharya, 2019). Urban students may have less direct contact with nature and more distractions, contributing to lower environmental awareness.

5. Influencing Factors on Environmental Awareness and Attitudes

Several factors were identified through qualitative feedback and correlational analysis to influence environmental awareness and attitudes among students:

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Table 5: Correlation Between Influencing Factors and Environmental Knowledge and Attitudes

Influencing Factor	Correlation with Knowledge (r)	Correlation with Attitudes (r)	Interpretation
Exposure to Nature	0.48**	0.52**	Positive moderate correlation
Parental Influence	0.39**	0.41**	Positive moderate correlation
School-based Environmental Programs	0.56**	0.58**	Strong positive correlation

Note: **$p < 0.01$

- Exposure to Nature: Students with frequent access to natural environments, such as gardens, forests, or agricultural fields, showed significantly higher environmental knowledge and more positive attitudes.
- Parental Influence: Parental awareness and encouragement of environmentally friendly practices at home correlated moderately with students' awareness and attitudes, suggesting family plays a key role in environmental socialization.
- School-based Environmental Programs: Participation in school eco-clubs, workshops, and awareness campaigns had the strongest positive impact, highlighting the effectiveness of formal environmental education.

The study reveals a nuanced picture of environmental awareness among secondary school students in Uttar Dinajpur. While the overall knowledge level is moderate, attitudes toward conservation are less encouraging, indicating a disconnect between knowing and caring. This gap underscores the critical need to enhance environmental education not just by imparting knowledge but by fostering intrinsic motivation and values supporting sustainability.

Gender differences suggest female students are more engaged with environmental issues, aligning with existing literature on gendered environmental attitudes. Targeted strategies to raise awareness and positive behaviors among male students could help close this gap.

Locality-based differences point to the importance of environmental context. Rural students benefit from direct interactions with nature, which enriches their environmental understanding. Urban education programs must incorporate innovative approaches to simulate these experiences and connect students with nature despite urban constraints.

The strong influence of exposure to nature, parental involvement, and school programs highlights the multi-dimensional nature of environmental socialization. Environmental education efforts should therefore be holistic, involving families and communities alongside schools to create supportive environments for sustainable behaviors.

Furthermore, the prioritization of academic achievement over environmental concerns reveals a broader societal challenge. Schools and educators need to integrate environmental learning with academic goals, demonstrating how environmental stewardship contributes to health, economic stability, and quality of life

V. CONCLUSION

The present study reveals that secondary school students in Uttar Dinajpur exhibit a moderate level of environmental knowledge, indicating a basic understanding of key environmental concepts and issues. However, their attitudes towards environmental conservation are comparatively less favorable, reflecting a need for greater motivation and engagement with environmental causes. This attitudinal gap suggests that knowledge alone is insufficient to foster genuine concern and proactive behaviors toward environmental sustainability.

Gender and locality emerged as significant factors influencing students' environmental awareness. Female students consistently demonstrated higher levels of both environmental knowledge and positive attitudes compared to their male counterparts. This disparity may be attributed to social and cultural factors that encourage greater empathy and responsibility among female students. Similarly, students from rural areas showed superior environmental knowledge and more favorable attitudes than those from urban areas, likely due to their closer interaction with natural surroundings and greater exposure to environmental challenges in their communities.

These findings highlight the necessity for targeted environmental education initiatives tailored to address the specific needs of different demographic groups. Schools should develop inclusive curricula and experiential learning

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opportunities that actively engage all students, particularly males and urban youth, to cultivate a stronger environmental ethic. In addition, involving families and communities in environmental programs can reinforce positive behaviors beyond the classroom.

In conclusion, fostering eco-friendly behavior among students requires a multifaceted approach that combines knowledge acquisition with attitude change and practical action. By implementing comprehensive and context-sensitive environmental education programs, educators and policymakers can nurture environmentally responsible citizens who contribute to sustainable development in Uttar Dinajpur and beyond.

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