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Linking Marginality and Ecology: Environmental Awareness Among the Meo Community Through A Socio-Demographic Lens

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Abstract

This study investigates the intersection of socio-demographic characteristics and environmental awareness within the marginalized Meo Muslim community of Nuh district, an area marked by socio-economic deprivation and ecological vulnerability. The primary objective was to assess how variables such as education, income, occupation, gender, and access to environmental information influence awareness levels in a context of historical marginalization. Employing a quantitative, cross-sectional design, data were collected from 150 participants selected through purposive and snowball sampling. A structured, culturally adapted questionnaire captured socio-demographic profiles and environmental awareness, with analysis involving descriptive statistics, Chi-square tests, and multiple regression modeling. Findings reveal a predominantly low level of environmental awareness, with 55.3% of participants scoring low, 36% moderate, and only 8.7% high. Education and access to information emerged as significant positive predictors ($p < 0.05$), while income and age showed no significant influence when other variables were controlled. Gender and age disparities were evident, with men and younger participants demonstrating comparatively higher awareness. The results underscore the critical role of formal education and information dissemination in fostering ecological consciousness in marginalized rural settings. The study concludes that targeted, culturally grounded awareness programs integrating traditional ecological knowledge with modern environmental education are essential to address both social inequities and environmental challenges in the Meo community.

Keywords: *environmental awareness, meo community, socio-demographic, marginalization*

INTRODUCTION

The term environment originates from the French word environ, which translates to "surroundings." Societies have developed in response to their prevailing environmental conditions; consequently, aspects such as lifestyle, clothing, dietary habits, language, and cultural festivities vary significantly across different environments(U. Das, 2022). The term marginalized refers to individuals or communities positioned at the lower end of the hierarchy with limited access to economic, social, cultural resources, or power(Varghese & Kumar, 2022). A direct connection between ecological and social marginality can be understood by looking at how biological importance and life regulation function within living systems(Callo-Concha et al., 2014). The indigenous knowledge and management practices of forest and tree resources for cultural and religious purposes are embedded within the intricate social structures of the region(Neelameghan & Chester, 2006). Communities frequently possess underutilized and overlooked resources that can be effectively leveraged in collaboration with governmental agencies, public health initiatives, and non-governmental organizations to mitigate environmental risks(Perez-Ramos et al., 2021).

The interaction between humans and the environment has emerged as a critical contemporary concern, driving global efforts toward achieving sustainable development at both local and international levels(Araújo, 2012) Establishing positive and reciprocal relationships between communities and their

surrounding environments serves as a critical foundation for promoting territorial development, guiding pathways toward sustainable and locally grounded progress(Galderisi et al., 2025). An individual's environmental awareness reflects their perceptions, emotional responses, and sensitivity toward ecological issues, including environmental degradation(Singh et al., 2024). Environmental sociology acknowledges the interdependence between human societies and ecosystems, emphasizing the ecological limitations that shape social dynamics(Rocha, 2018). Marginalized communities are often designated as sacrifice zones under the guise of economic necessity, resulting in their disproportionate exposure to environmental degradation and associated hazards(Willett et al., 2020). Environmental injustices manifest through locally specific contexts, yet they commonly align with broader axes of social differentiation such as race, ethnicity, gender, age, socioeconomic status, and geographic location(Nixon, 2013).

The linkage between marginality and sustainability highlights how socially and economically marginalized communities often face disproportionate environmental burdens while having limited access to resources that support sustainable development(Ravikiran, 2023). In developing nations, participatory conservation efforts have faced criticism primarily due to the exclusion of marginalized communities, resulting in an inequitable distribution of benefits(Dahal et al., 2014). Marginalized communities often face environmental injustices, as they are disproportionately burdened by ecological degradation and denied participation in conservation or environmental governance(Lohani et al., 2025). Environmental awareness is shaped by multiple socio-demographic factors, including education, income, occupation, gender, and community-specific experiences with ecological stress(Kollmuss & Agyeman, 2002). In marginalized rural settings, access to environmental knowledge is often constrained by infrastructural deficits and limited formal education(Adger, 2006). Nuh district (formerly Mewat) is among India's most underdeveloped regions and is classified as an ‘aspirational district’ by the Government of India due to its poor indicators in health, education, and infrastructure(NITI Aayog, 2025). The Meo Muslim community, which constitutes the majority population in the district, experiences multiple forms of marginalization, characterized by limited access to education, widespread poverty, and inadequate representation in political and administrative structures(Government of India, 2006).

The purpose of this study is to examine the relationship between socio-demographic characteristics and environmental awareness within the Meo community of Nuh district, Haryana. By situating this investigation within the broader context of marginality and ecological vulnerability, the study aims to uncover how factors such as education, income, occupation, gender, and access to resources influence environmental perceptions and behaviors among a historically marginalized population. This research seeks to contribute to a more nuanced understanding of the intersection between social exclusion and ecological consciousness, particularly in regions facing compounded socio-economic and environmental challenges.

MATERIALS AND METHODS

Study settings

This research was carried out in Nuh district (formerly Mewat), Haryana**,** a region predominantly inhabited by the Meo community, known for its distinct cultural identity and historical marginalization(Meena & Singh, 2025). The district is home to approximately 1.1 million people, a significant majority of whom belong to the Meo community(Government of India, 2025). The Meo community, also referred to as Mev or Mewati Muslims, perceive themselves as a distinct ethno-cultural group with a unique socio-cultural identity(Kukreja, 2020). The district is marked by low human development indices, including poor literacy rates, inadequate infrastructure, gender disparities, and high poverty. Ecologically, Nuh suffers from severe groundwater depletion, poor waste management systems, deforestation, and increasing vulnerability to climate-induced stress.

Study design and sample size

A quantitative, cross-sectional survey research design was adopted to investigate the relationship between socio-demographic characteristics and environmental awareness within the Meo community. The research focused on identifying the extent and determinants of low environmental awareness and the factors influencing the community’s interaction with their ecological surroundings. The study aimed to gather primary data from individuals in the Meo community using standardized tools and statistically robust techniques to ensure validity and reliability. A total of 150 participants were selected using a combination of purposive and snowball sampling techniques to ensure representation from diverse socio-

economic backgrounds, education levels, and areas within the district. This approach was suitable for accessing participants in a culturally sensitive and socially close-knit community. The sample size (N=150) was adequate for conducting basic inferential statistical analysis, including subgroup comparisons and regression modeling.

Data collection and techniques

Data for the study were collected through a structured questionnaire designed to capture both socio-demographic information and levels of environmental awareness. The questionnaire was developed in English and translated into Hindi and the local Mewati dialect to ensure clarity and cultural relevance. It included closed-ended questions and Likert-scale items to quantify participants' knowledge, attitudes, and practices related to environmental issues. The tool was pre-tested to improve reliability and was administered through face-to-face interviews, considering the low literacy levels in the study area. This approach helped ensure accurate data collection and allowed participants to engage with the questions more effectively.

Statistical analysis

Statistical analysis was conducted using IBM SPSS Statistics version 27.0.1 to examine the relationship between socio-demographic variables and environmental awareness among the Meo community. Descriptive statistics were computed to summarize respondent characteristics and awareness scores. Inferential analysis involved Chi-square tests to assess associations between categorical socio-demographic variables (education, income, gender, age, and access to environmental information) and awareness levels. Pearson's correlation was used to evaluate relationships between continuous variables such as income and awareness scores. Multiple linear regression modeling was employed to identify significant predictors of environmental awareness, with education, income, age, and access to information as independent variables. The regression model's explanatory power was assessed through the coefficient of determination (R^2) and overall model significance using the F-test, while individual predictors were evaluated using standardized coefficients (β) and corresponding p-values. Statistical significance was determined at a 95% confidence level ($p < 0.05$).

Results

Table 1: Socio-demographical variables of the participants

Source: Primary survey by authors

Variable	Category	Frequency	Percentage (%)
Gender	Male	87	87.5%
	Female	63	42%
Age	18–30 years	36	24%
	31–45 years	73	48.6%
	46–60 years	25	16.6%
	Above 60 years	16	10.6%
Education	Illiterate	82	54.6%
	Primary	37	24.6%
	Secondary	18	12%
	Graduate and above	13	8.6%
Occupation	Agriculture	81	54%
	Wage labour	37	24.6%
	Government/Private Job	11	7.3%
	Others	21	14%
Monthly Income	Below ₹5,000	28	18.6%
	₹5,001–₹10,000	52	34.6%
	₹10,001–₹15,000	47	31.3%
	Above ₹15,000	23	15.3%

The study comprised a total of 150 participants from the Meo community (table 1). The gender distribution revealed a male majority, with 58% male and 42% female participants, reflecting potential gendered dynamics in access to and engagement with environmental knowledge. In terms of age composition, the largest proportion of participants (48.66%) fell within the 31–45 years category, indicating a relatively mature and economically active population. This was followed by the 18–30 years group (24%), 46–60 years (16.66%), and those above 60 years accounting for 10.66%. This age range suggests that most participants are likely to be involved in household and community decision-making, which may influence environmental attitudes and practices. The educational profile of the sample showed a significant level of marginality. More than half of the participants (54.66%) were illiterate, and only a small percentage had completed graduate-level education or above (8.66%). Participants with primary education constituted 24.66%, while those with secondary education made up 12%. This skewed educational distribution is indicative of limited formal education within the community, which may hinder access to environmental information and awareness programs.

Regarding occupational engagement, a majority (54%) were involved in agriculture and allied activities, highlighting the agrarian base of the community. An additional 24.66% worked as wage labourers, while a smaller portion was engaged in government or private sector jobs (7.33%). The remaining 14% were classified under other informal sectors, such as small trades or household-based work. These occupational patterns align with the rural and economically constrained character of the region. The monthly income distribution further reflects the socio-economic vulnerabilities of the participants. Around 53% earned ₹10,000 or less, with 18.66% earning below ₹5,000 and 34.66% falling in the ₹5,001–₹10,000 bracket. Another 31.33% earned between ₹10,001–₹15,000, while only 15.33% had incomes above ₹15,000. This low-income profile, combined with high levels of illiteracy, underscores the intersection of economic and informational marginality, both of which are critical in shaping environmental awareness and behavior.

Table 2: Gender-wise environmental awareness

Gender	Frequency (n)	Percentage (%)	SD	Mean awareness Score	Awareness Level
Male	87	58%	3.2	16.1	Moderate Awareness
Female	63	42%	2.9	14.8	Low Awareness

Source: Computed by authors

The analysis of gender-wise environmental awareness reveals a clear disparity between male and female participants (table 2). Males, comprising 87.5% of the sample, achieved a mean awareness score of 16.1 (SD = 3.2), which corresponds to a moderate level of environmental awareness. In contrast, females, accounting for 42% of the sample, recorded a mean score of 14.8 (SD = 2.9), indicating a low level of awareness. This variation in awareness levels suggests that male participants possess a relatively higher degree of environmental understanding compared to their female counterparts. The difference in scores may be attributed to factors such as differences in access to environmental education, information exposure, or levels of participation in environmental activities. These findings highlight the need for gender-sensitive environmental awareness initiatives, particularly aimed at enhancing women's engagement and knowledge in environmental issues to promote inclusive and balanced environmental responsibility.

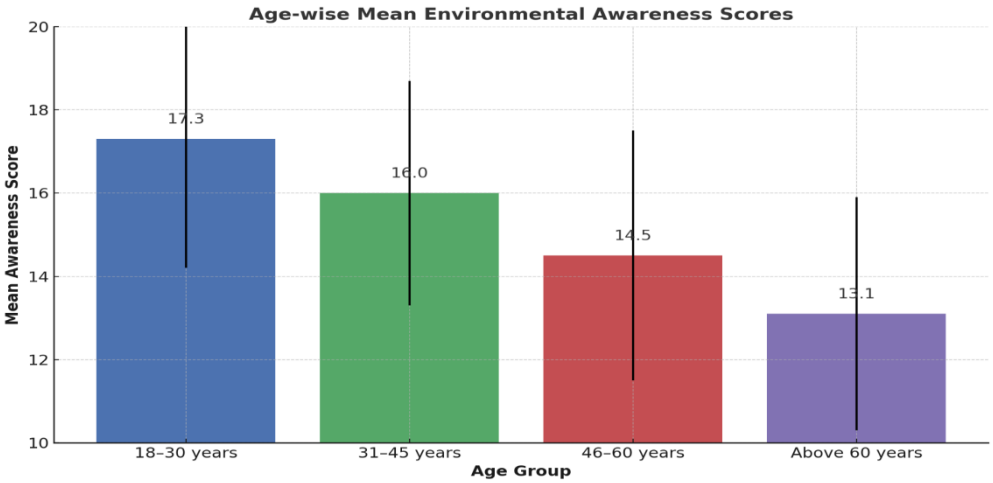


Table 3: Age-specific wise environmental awareness

Source: Computed by authors

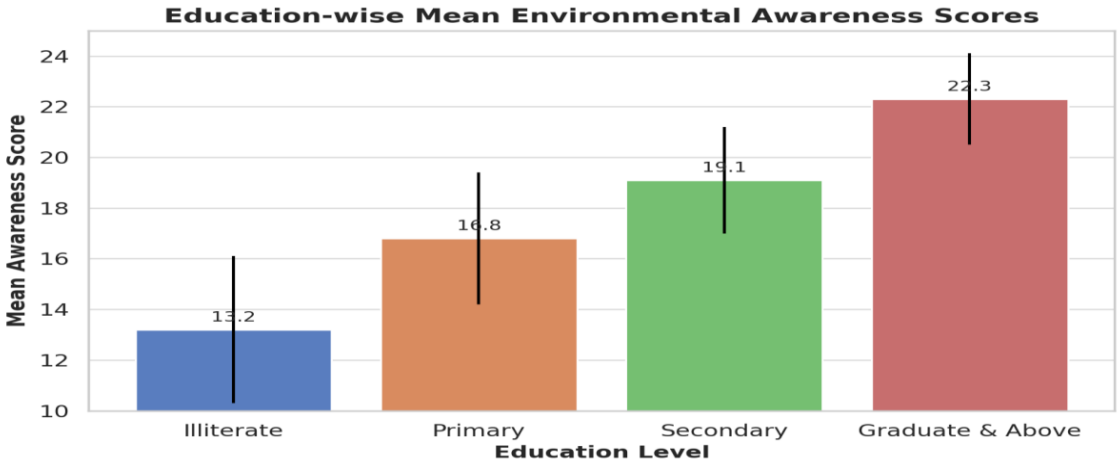
The table 3 reveals generational disparities in environmental awareness among participants. The 18–30 years group (24%) demonstrates moderate awareness (M = 17.3, SD = 3.1), likely due to better access to education and digital platforms. The 31–45 years cohort, though comprising the largest share (48.6%), shows slightly lower awareness (M = 16.0, SD = 2.7), possibly limited by educational and informational constraints. Awareness further declines among the 46–60 years (M = 14.5, SD = 3.0) and 60+ years groups (M = 13.1, SD = 2.8), both falling in the low awareness category. These results suggest a downward trend in awareness with increasing age, highlighting the need for targeted interventions, particularly for older adults, while reinforcing environmental education among the youth (figure 1)

Figure 1: Mean Environmental Awareness Score by Age Group

Figure 1 explains that environmental awareness is highest among younger respondents and gradually decreases with age. Participants aged 18–30 years record the highest mean awareness score (17.3), followed by the 31–45 years group (16.0). The scores further decline in the 46–60 years group (14.5) and are lowest among those above 60 years (13.1). The error bars reflect the variation in awareness within each group, suggesting that while younger individuals tend to be more informed and conscious about environmental issues, awareness diminishes progressively in older age groups.

The analysis of environmental awareness across different education levels indicates a positive relationship between educational attainment and awareness scores (see figure 2). Participants with no formal education (illiterate), comprising 54.6% of the sample, reported the lowest mean awareness score of 13.2 (SD = 2.9), categorized as low awareness. Those with primary education (24.6%) had a moderate awareness level with a mean score of 16.8 (SD = 2.6). Participants with secondary education (12%) showed a further increase, recording a mean score of 19.1 (SD = 2.1), also within the moderate range. The highest

Age Group	Frequency (n)	Percentage %	SD	Mean Awareness Score	Awareness Level
18–30 years	36	24%	3.1	17.3	Moderate Awareness
31–45 years	73	48.6%	2.7	16.0	Moderate Awareness
46–60 years	25	16.6%	3.0	14.5	Low Awareness
Above 60 years	16	10.6%	2.8	13.1	Low Awareness



scores were observed among individuals with graduate-level education and above (8.6%), who demonstrated a high awareness level with a mean score of 22.3 (SD = 1.8).This pattern suggests that higher education is strongly associated with greater environmental awareness, likely due to enhanced access to information, critical thinking skills, and exposure to environmental discourse. The findings underscore the importance of integrating environmental education across all educational levels to promote broad-based environmental consciousness.

Figure 2: Mean enviornmental awareness score education wise

The analysis of environmental awareness by income levels shows a progressive increase in awareness scores with rising income (See figure 3). Participants earning below ₹5,000 reported a mean awareness score of 13.6 (SD = 2.8), indicating low awareness. Those with incomes between ₹5,001–₹10,000 had a slightly higher score of 15.1 (SD = 2.7), still within the low awareness category. Participants earning ₹10,001–₹15,000 demonstrated a moderate awareness level with a mean score of 17.4 (SD = 2.6). The highest level of environmental awareness was observed among individuals with incomes above ₹15,000, who recorded a mean score of 20.3 (SD = 2.2), classified as high awareness.The findings suggest that income is positively correlated with environmental awareness, possibly reflecting differences in access to education, information, and participation in environmental initiatives. These results point to the need for targeted awareness efforts among lower-income groups to foster equitable environmental engagement.

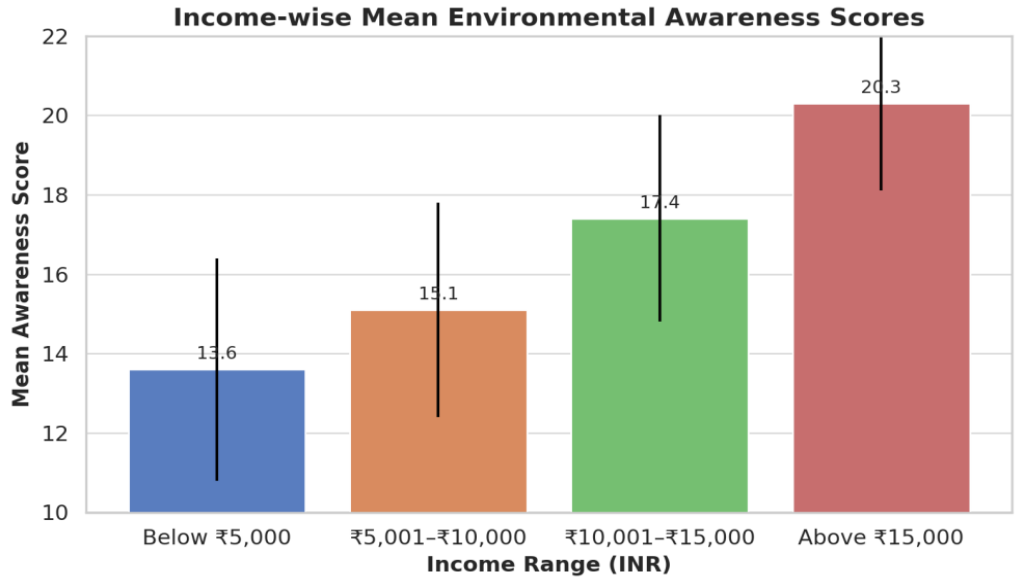


Figure 3: Mean environmental awareness score through Income-wise

Association between socio-demographic variables and environmental awareness

The Chi-square test results provide key insights into how certain socio-demographic variables are associated with varying levels of environmental awareness among the Meo community**.** The association between education level and environmental awareness is statistically significant (χ^2 = 10.83, p = 0.028).

This indicates that individuals with higher levels of formal education are more likely to exhibit greater environmental awareness. This finding underscores the pivotal role of educational attainment in shaping ecological consciousness within the community. The relationship between monthly income and awareness level was found to be not statistically significant ($\chi^2 = 6.29$, $p = 0.179$). This suggests that income alone does not predict environmental awareness, possibly due to limited exposure to awareness programs or environmental education across all income groups within the Meo population. Access to Information × Awareness Level

A statistically significant association was observed between access to environmental information and awareness ($\chi^2 = 13.24$, $p = 0.004$). This implies that individuals with greater access to information—such as through media, educational institutions, or community programs are more likely to demonstrate higher environmental awareness. This finding highlights the importance of strengthening information dissemination mechanisms to enhance awareness.

Table 4: Chi-square Associations of Socio-Demographics with environmental Awareness

Association	χ^2 (Chi-square)	p-value	Significance
Education × Awareness Level	10.83	0.028	Significant
Income × Awareness Level	6.29	0.179	Not significant
Access to Info × Awareness	13.24	0.004	Significant

Sources: Computed by authors

The regression model significantly predicts environmental awareness among Meo participants, with an R^2 value of 0.29, indicating that approximately 29% of the variance in awareness scores is explained by the four socio-demographic variables included in the model. The model is statistically significant overall ($F(4, 145) = 13.98$, $p < 0.001$), validating its explanatory power. Education emerges as a significant positive predictor of environmental awareness. For each unit increase in educational attainment, awareness scores increase by 2.12 points on average. This underscores the strong role of formal education in enhancing ecological understanding within the Meo community. Access to environmental information is also a highly significant predictor, with the strongest coefficient among all variables. Individuals with better access to information sources (e.g., media, community programs, school education) show markedly higher awareness levels, indicating that information accessibility is critical for raising awareness in this marginalized group. Although income shows a positive relationship with awareness, it is not statistically significant at the 0.05 level.

Table 4: Regression Coefficients for Predictors of Environmental Awareness

Predictor	Coefficient (β)	p-value	Significance
Education	+2.12	0.002	Significant
Income	+1.05	0.065	Not Significant
Age	+0.78	0.121	Not Significant
Access Info	+3.76	0.001	Significant

Source: computed by authors

This suggests that financial status alone does not meaningfully influence environmental awareness in the Meo community, possibly due to uniformly low socio-economic conditions across the sampleAge is also found to be a non-significant predictor, indicating that environmental awareness does not vary consistently with age when other factors (like education and information access) are controlled. The findings highlight that education and access to environmental information are key drivers of awareness among the Meo population. In contrast, income and age do not significantly contribute to variations in

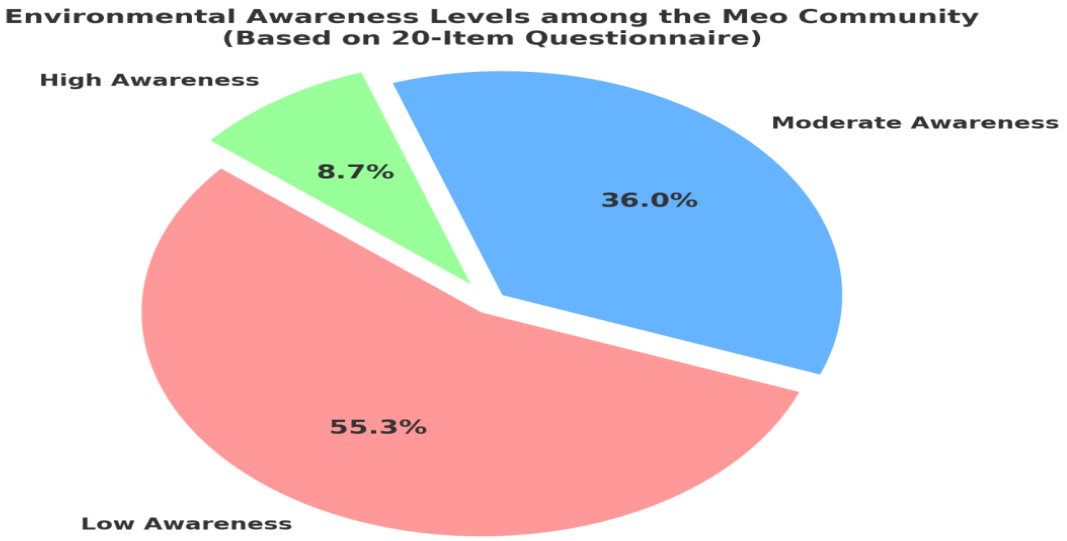
awareness. These insights stress the importance of education-based interventions and improved communication strategies to enhance environmental consciousness in socially and economically marginalized communities like the Meos.

Figure 4: Distribution of Environmental Awareness Levels among the Meo Community

The distribution of environmental awareness levels among the Meo community, as depicted in the pie chart, reveals a predominantly low level of ecological consciousness. Based on responses to a structured 20-item Likert-scale questionnaire, 55.3% of participants fall under the low awareness category. This majority segment indicates limited familiarity with key environmental issues, such as pollution, conservation, climate change, and sustainable practices. This low level of awareness can be attributed to a combination of factors such as low educational attainment, limited access to information, and socio-economic marginalization. A smaller proportion, 36.0%, demonstrated moderate awareness. These individuals appear to possess partial knowledge of environmental concerns but may lack consistent engagement or deeper understanding. Their awareness might stem from limited schooling, community-level exposure, or incidental access to media. However, the moderate level still reflects a gap in comprehensive understanding that needs to be addressed through targeted educational efforts. Only 8.7% of participants achieved high awareness scores, indicating a small, informed subgroup within the community. These individuals are likely to have received higher education, better access to information, and exposure to environmental discourse. The stark contrast between this group and the majority highlights the unequal distribution of environmental knowledge within the Meo population.

DISCUSSION

Marginalized communities especially those living in ecologically and socioeconomically disadvantaged areas are often develop specialized knowledge systems that are overlooked by formal environmental education (e.g., low income, limited schooling). While urban studies such as those in Sylhet City (Bangladesh) show that higher income and formal education correlate strongly with environmental concern these models may not adequately address the Meo community's context(Alam & Zakaria, 2013). Despite socio-economic constraints, Meo women and men likely possess sophisticated ecological understanding, embedded in lived experiences and collective memory.Studies of indigenous and tribal communities across India demonstrate the value of traditional ecological knowledge (TEK). For instance, the Tangkhul Nagas interpret environmental changes through bio-indicators, modifying agricultural practices



accordingly(Horam, 2023). In the Eastern Himalayas and Northeast India, communities integrate ethno biological wisdom into biodiversity conservation and environmental learning(T. M. Das et al., 2025; O'Neill et al., 2017). Among the Santhals, environmental perception is deeply entangled with cultural narratives and myths, contributing to sustainable resource management(Majumdar & Chatterjee, 2021). These findings offer a strong comparative basis for appreciating the Meo community's ecological awareness, grounded in cultural norms, ritual knowledge, and adaptive practices. While governmental initiatives such as India's National Green Corps promote environmental awareness through school eco-

clubs they often neglect the nuanced, place-specific knowledge held by marginalized communities. The Bishnoi community of Rajasthan integrates environmental stewardship into early socialization processes, wherein ecological responsibility is imparted to children through ritual practices and religious instruction. Protection of wildlife and sacred flora, such as the Khejri tree, is framed as a core tenet of spiritual and cultural identity, reinforcing conservation ethics from a young age(Bikku, 2025). The Meo's ecological understanding is likely transmitted orally, tied to land-use patterns, seasonal cycles, and religious practices elements underrepresented in formal curriculam. In Meghalaya, despite the advent of religious conversions, both Christian and indigenous tribal communities have sustained the conservation of sacred groves, shifting the emphasis from traditional spiritual significance to their ecological functions, such as the provision of clean air, water, and biodiversity conservation(Bharath, 2024)

This study stands out for several reasons: it foregrounds TEK from a historically marginalized community; it challenges assumptions that formal schooling is the sole pathway to environmental awareness; and it emphasizes the value of qualitative, context-driven data in understanding environmental engagement.The study demonstrates methodological rigor and scholarly relevance. Additionally, it responds to growing calls for inclusive, culture-sensitive environmental research and policy frameworks.

CONCLUSION

This study critically examined the interplay between socio-demographic characteristics and environmental awareness within the Meo community of Nuh district, a historically marginalized and ecologically vulnerable population. The findings reveal a multidimensional picture of environmental awareness shaped by educational attainment, gender, income, age, and access to information. The most significant predictors of environmental awareness were found to be education and access to environmental information. Individuals with higher levels of education consistently demonstrated elevated awareness scores, underscoring the transformative potential of formal education in enhancing ecological understanding. Similarly, access to informational resources—whether through media, institutions, or community programs—proved to be a strong determinant of awareness. These findings resonate with prior literature affirming that marginalized communities, when equipped with the right knowledge systems, are capable of informed ecological engagement.

The overall distribution of awareness levels, where over half the participants demonstrated low environmental awareness which raises concerns about the ecological vulnerabilities of this population in the face of climate change, groundwater depletion, and unsustainable resource use. However, the presence of a small but informed subgroup mainly those with higher education and media exposure signals an opportunity for community-led awareness dissemination. This research contributes to the broader discourse on environmental justice and social equity by foregrounding the lived experiences and cognitive landscapes of a minority Muslim community in rural India. It challenges deficit-oriented narratives and instead calls attention to the untapped potential of traditional ecological knowledge (TEK), local resilience, and participatory environmental action. The study affirms the value of integrating place-based knowledge with formal education systems to design inclusive, sustainable, and community-specific environmental strategies.

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