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Meghalaya's Nature-Based Tourism and Visitors' Environmentally Conscious Behaviour in Response to Climate Change

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Abstract

The study investigates how climate change understanding, sustainable actions and experience in Meghalaya's nature-based tourism go together. Combining methods, data was obtained from different tourists who answered questionnaires and underwent interviews. Through our research, we found a variety of things that influence whether visitors act responsibly which gives us a more detailed view of their eco-friendly views and behaviours. Because of concern over climate change, people travelling are now more likely to act in environmentally friendly ways. We can see from the research that many population groups are becoming more concerned about nature which supports the idea of individualised approaches to treatment. It also investigates the association between thinking more about the environment and the quality of a nature visitor's experience. It is shown through studies that when tourists care for nature, they value their experiences with Meghalaya's natural gems more. Examining what this research means for both practice and public policy, it joins other studies that examine sustainable tourism on the topic of how nature-based tourism might move forward in Meghalaya under changing climate.

Keywords: *Meghalaya, climate change, nature-based tourism, tourist, environment*

Introduction

Global trade and exchange between different cultures rely greatly on tourism which supports leisure trips, exploration and building the economy (as explained by Hall et al., 2013 and Gössling et al., 2012). Climate change is one of the most urgent issues for tourism globally, causing changes in how attractive places are, travel habits of tourists and how tourism businesses operate (Scott et al., 2019). According to the Intergovernmental Panel on Climate Change (2021), tourism both releases greenhouse gases and suffers from the effects of climate change which means urgent changes and solutions are needed.

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In northeastern India, Meghalaya acts as a perfect study area for the relationship between climate change and nature tourism (Sharma & Chakraborty, 2020). The region is famous as the "abode of clouds," and many people visit it to enjoy its beautiful places, hidden root bridges, many caves and rich cultural background (Das & Hussain, 2016). But these regions are confronted with higher environmental problems due to changes in climate, resulting in less regular rainfall, stronger extreme events and a loss of different kinds of life (Chaturvedi et al., 2011).

Using nature-based solutions (NBS) is now commonly emphasized to respond to climate change while supporting the sustainable development of tourism (according to Cohen-Shacham et al., 2016). Tourism that involves nature such as hiking or bird-watching, could support conservation and help prepare for climate change (Honey & Krantz, 2007). But how successful these attempts will be depends heavily on how tourists address environmental problems through their behavior and attitudes (Miller et al., 2010).

Studies have shown that how environmentally aware people are often has a strong impact on their choice of tourist destinations (Dolnicar et al., 2008; Han et al., 2010). Gössling et al. (2012) and Lee et al. (2015) link knowing about climate change to adopting environmentally friendly tourism habits. Not many studies have concentrated on how these factors affect the tourism sector in Indigenous places like Meghalaya.

The theory of planned behavior (by Ajzen in 1991) gives a clear framework to explain how people's views about the environment help them act more sustainably while traveling. It states that attitudes, subjective norms and perceived behavioural control all affect our intentions before we act. These factors all play a role in how tourists interact with sustainable tourism when travelers are climate-conscious (Bamberg & Möser, 2007).

This branch of study has revealed that having environmental knowledge, noticing how serious environmental issues are and believing in individual ability to make a difference positively influence people's choices for the environment (Kollmuss & Agyeman, 2002). In addition to these main factors, things like attraction to a place, cultural values and the reasons for traveling are important in tourism (Ramkissoon et al., 2012).

Research Gap: Even though both sustainable tourism and adapting to climate change are now receiving more attention, we still do not know how much knowing about climate change affects the environmentally friendly actions of tourists in regions such as Meghalaya. Climate awareness and how it affects sustainable tourism have been studied in many places (Gössling et al., 2012; Lee et al., 2015), but not as much when the tourism is centered around Indigenous communities with distinct challenges and traditions.

Research Questions & Hypotheses:

- Q1: How does climate change awareness influence tourists' environmentally responsible behavior in Meghalaya's nature-based tourism context?
- Q2: What role do demographic variables play in shaping eco-friendly practices among tourists visiting Meghalaya?

Hypotheses:

- H1: Tourists with higher environmental awareness exhibit more sustainable behaviors during their visit to Meghalaya.
- H2: International tourists demonstrate greater adherence to eco-friendly practices than domestic tourists in Meghalaya's tourism destinations.

This study aims to provide empirical insights into these questions, informing sustainable tourism policies and practices in Meghalaya while contributing to the broader understanding of climate-conscious tourism behaviour in vulnerable ecosystems.

Literature Review

Climate Change and Tourism Nexus

Climate change is recognized as a major issue for the tourism sector that influences tourism destinations, the number of tourists and the ability to operate sustainably (Hall et al., 2013). Both climate and tourism influence one another: Tourism contributes about 8% of global greenhouse gases, although it is very sensitive to changes in the climate (Lenzen et al., 2018). Gaining insight into how tourists act and how they respond to climate change is very important for setting up effective mitigation measures and encouraging sustainable tourism.

According to Scott et al. (2019), tourism destinations face both positive and negative effects of climate change, so they need to manage these risks and seize the opportunities adaptively. Their report says that destinations need to create climate resilience plans that take into account weather variations, sea-level change and occurrence of extreme events. The UNWTO (2019) also urges the industry to transform with sustainability, so it can deal with the issues caused by climate change.

Tourist Environmental Behavior and Climate Awareness

Gössling et al. (2012) looked into how people behave and respond to climate change, highlighting the need to study how tourists perceive and adjust to such changes. This highlighted the importance of developing actions to fix travelers' concerns and boost sustainability in tourism. Different age groups and education levels were seen to have different levels of climate risk awareness.

Lee et al. (2015) investigated whether eco-friendly activities on Liuqiu Island in Taiwan helped to change visitors' attitudes towards the environment. Their studies showed that tourists could care more about the environment as a result of spending time in nature which could lead to their using fewer resources. It was found that genuine contact with the environment can encourage positive views about the environment.

Many tourism-related studies have applied the theory of planned behaviour (Ajzen, 1991) to explore environmental decision making. Han and his colleagues (2010) concluded that environmental attitudes, other people's beliefs and personal control strongly predict a tourist's decision to behave environmentally. They found that social settings and factors around destinations are very important in influencing how tourists act.

Regional Climate Change Impacts on Tourism

Morrison and Pickering (2013) looked into how people involved in Australian Alpine ski tourism view the changes from climate change and possible solutions. It was revealed by their study that handling challenges from climate change in mountain tourism is possible with the help of adaptive strategies and working with all relevant parties. The report stressed that working together with governments, industries and communities is very important.

Tranos and Davoudi (2014) showed that climate change affects winter tourism in Europe and they suggested that adaptive actions are important for economies supported by tourism. It was found that including climate change in regional planning helps leading countries respond

to the challenges of climate change. It was clear from the research that climate vulnerability varied greatly from one winter tourism spot in Europe to another.

Marshall and team (2011) used observations from both dive operators and tourists to look at early climate effects on dive tourism in the Egyptian Red Sea. Their advice focused on making sure climate change effects were recognized and handled to secure the future of marine tourism destinations. According to the study, both those who live and visit the area were already aware of coral bleaching and marine ecosystem problems.

Vulnerable Ecosystems and Tourism Adaptation

Zeppel (2012) investigated how climate change influences the tourism of the Great Barrier Reef Marine Park, showing that coral reef ecosystems suffer the most from sea level rise and more acidic oceans. The research showed that adaptive management is needed to both support biodiversity on the reefs and still maintain tourism. This study proved that combining protection and tourist activities is very important.

Klint et al. (2012) studied how Pacific Island tourism in Vanuatu responds to climate change. It was shown that improving capacity and having well-coordinated policies helps these island environments adapt and become more resilient to threats. It was suggested that small island developing states are particularly at risk from effects of climate change.

Davenport and Davenport (2006) analyzed how tourism and leisure travel affect the coastline, pointing out that finding sustainable transportation and using coordinated management strategies are important to maintain safe and healthy coastal areas. The review showed the total damage caused by the growth of tourism to coastal marine environments.

Nature-Based Solutions and Sustainable Tourism

Many recent studies have examined nature-based solutions (NBS) as a way to prevent climate change and develop sustainable tourism (Cohen-Shacham et al., 2016). NBS cover activities that look after, improve and sustainably manage nature while ensuring benefits for humans and a healthy diversity of species (IUCN, 2020).

Seddon et al. (2020) believe that approaches based on nature offer a lot of potential for dealing with climate change in destinations with ecologically sensitive regions. It shows that NBS have the potential to handle climate change, support saving various species and improve tourism if done the right way.

Indigenous Tourism and Environmental Stewardship

When it comes to climate change adaptation and environmental care, indigenous tourism has special concerns (Whitford & Ruhanen, 2016). Carr et al. (2016) point out that most Indigenous tourism destinations have ecological ways of life that can be drawn upon to help cope with climate change. But because these areas depend on natural resources and cannot change quickly, they face specific dangers.

Research Gaps and Study Contribution

Important research gaps are discovered during the literature review. While a lot of work has examined how climate change affects tourism in wealthy countries, there is not much research on what tourists do to be environmentally friendly at places popular with Indigenous communities. Much of the studies done before focused on marine or alpine habitats rather than on tropical mountain areas like those in Meghalaya.

Also, not much attention has been given to applying these theories to climate-conscious tourism in biodiversity hotspots. The study looks at how climate change views and tourism meet in Meghalaya's special setting which helps to support both ideas and real steps toward developing tourism that protects fragile environments.

Methodology

Research Area

Meghalaya lies in northeastern India (at 25°47'N and 91°8'E) and is 22,429 square kilometers in size, known for having plateaus, hills and valleys (Sharma & Chakraborty, 2020). Because the state belongs to the Indo-Myanmar biodiversity hotspot, it gets a subtropical highland climate with persistent monsoon rainfall (Chaturvedi et al., 2011).

Among the popular tourist places are the East Khasi Hills district, Cherrapunji (renowned for receiving a lot of rainfall), Mawlynnong (considered Asia's cleanest village) and the famous living bridges at Nongriat. In the West Khasi Hills lies the Nongkhnum River Island, along with many waterfalls and the Garo Hills are known for their wildlife sanctuaries and rich cultural attractions (Das & Hussain, 2016).

Changes such as different rainfall patterns, more severe weather conditions and shifting biodiversity patterns have already appeared in Meghalaya due to climate change (IPCC 2021). Since much tourism depends on weather and fragile areas, the region's tourist facilities are especially at risk.

Research Design

Instead of using a single data collection method, this study mixes methods and analyzes both qualitative and quantitative data (Creswell & Plano Clark, 2017). The study did not happen in separate stages, but at the same time, using both qualitative and quantitative methods to give a complete picture of how tourists behave toward the environment.

Both breadth of travel behaviors and depth of motivations and experiences were captured by choosing a mixed-methods approach (Johnson & Onwuegbuzie, 2004). Triangulation makes it possible to get a better grasp of what is being studied through this technique.

Sampling Method and Sample Size

Stratified random sampling was necessary to evenly include the different types of visitors to the natural spots in Meghalaya. People who visited the festival were from different countries

and were 18 years and older. People were sorted into different categories by their nationality (whether they were domestic or international visitors), their age groups and the main places they were visiting.

The size of the sample was set by GPower software (Faul et al., 2007) according to the chosen effect size (Cohen's d = 0.3), confidence (95%) and power (0.80). The estimation showed that the study needed a minimum of 264 people. A sample size of 350 participants was estimated to deal with possible refusals and incomplete surveys, while 300 complete surveys came back.

Data Collection Methods

Survey Instrument

A structured questionnaire was developed using validated scales from previous environmental psychology and sustainable tourism research. The questionnaire comprised five sections:

Demographic characteristics (age, gender, nationality, education, income)

Travel behavior (visit frequency, duration, group composition, activities)

Environmental awareness using the New Environmental Paradigm (NEP) scale adapted from Dunlap et al. (2000)

Climate change concern measured using items adapted from Leiserowitz (2006)

Environmentally responsible behavior assessed using the Environmentally Responsible Tourist Behavior (ERTB) scale from Lee et al. (2015)

All attitudinal items utilized 5-point Likert scales (1 = strongly disagree, 5 = strongly agree). The questionnaire was pre-tested with 30 respondents and refined based on feedback to ensure clarity and cultural appropriateness.

Semi-Structured Interviews

In-depth interviews were conducted with 50 participants selected through purposive sampling to represent diverse demographic profiles. Interview protocols explored:

- Motivations for visiting Meghalaya
- Perceptions of environmental changes and climate impacts
- Factors influencing environmentally responsible behaviors
- Experiences with local conservation initiatives
- Suggestions for sustainable tourism development

Interviews were conducted in English, Hindi, or local languages with interpreter assistance when necessary. Each interview lasted 45-60 minutes and was audio-recorded with participant consent.

Behavioral Observations

Structured observations were conducted at five major tourist sites to validate self-reported behaviors. Observation protocols documented:

- Waste disposal practices
- Interaction with natural environments
- Compliance with conservation guidelines
- Use of sustainable transportation options

Observations were conducted unobtrusively over multiple time periods to capture natural behaviors across different tourist segments.

Data Collection Procedure

The study took place from October 2023 until March 2024, during all seasons which includes both tourism peaks and off-seasons. Staff who spoke the local languages were taught how to administer surveys and interview people properly. The local review board gave their approval and all participants agreed to take part by signing the informed-consent document.

The surveys were given at important tourist spots, hotels and transport hubs. Approaching participants in a planned way using regular intervals guaranteed that each strata's sample was random. The interview participants were chosen from people who said they were willing to participate further in the next stage.

Data Analysis Procedures

Quantitative Analysis

The data were managed and examined using SSPS 28.0. In order to describe the sample and key factors, descriptive statistics were used (these included frequencies, means and standard deviations). Cronbach's alpha was used to examine whether the scales worked consistently together.

Inferential statistics included:

- Correlation analysis to examine relationships between variables
- Independent samples t-tests to compare domestic and international tourists
- Multiple regression analysis to identify predictors of environmentally responsible behavior
- ANOVA to examine differences across demographic groups
- Assumptions for parametric tests were verified through normality tests, linearity assessments, and homoscedasticity checks.

Qualitative Analysis

After obtaining the interviews, they were analyzed using thematic analysis, according to the six-stage process proposed by Braun and Clarke (2006). NVivo 12 software made managing my data and coding it much simpler. There was a process of analyzing the data:

- Familiarization with data through repeated reading
- Initial coding of meaningful data segments
- Theme identification through code clustering
- Theme refinement and definition
- Final theme selection and naming
- Report writing with illustrative quotes
- Inter-coder reliability was established through independent coding by two researchers, with disagreements resolved through discussion.

Mixed-Methods Integration

Instead of treating the types of data separately, both kinds were joined in a convergent way during interpretation as Creswell & Plano Clark (2017) suggested. The information from the various sources was arranged side by side to find out where the details coincided, were similar and where they differed.

Ethical Considerations

Ethics guidelines for social research with human participants were strictly followed. An Institutional Review Board approved the study before any data were collected. All research subjects gave their permission and were promised that only their research numbers would be used and not their names. The data will be properly stored and will be removed after the retention period has ended.

Study Limitations

Several limitations should be acknowledged:

- Cross-sectional design limits causal inference
- Self-reporting bias may affect behavioral measures
- Seasonal variation in tourist populations may influence generalizability
- Language barriers may have affected some interviews despite interpreter assistance
- Observer effects may have influenced behavioral observations

Results

Tourist Demographics

Three hundred tourists participated in the survey, giving information on what percentages of visitors belong to each demographic group at Meghalaya's nature-based tourist destinations. The characteristics of the sample such as age, gender and nationality, were diverse, reflecting a wide range of tourists.

Majority of people who took part (58.7% or 176 of them) fell into the 25-40 age range, making them the biggest group for nature tourism in the area. People between 18 and 24 years made up 20.7% (62 people) of the audience and those who were 41 to 60 years old were 17.3% (52 people) of the group. Only 3.3% (n=10) of all tourists were elderly, well above 60 years old which is a sign that many attractions in Meghalaya are physically demanding.

There was a little more than half of women in the sample, with 53.2% (n=160) females and 46.8% (n=140) males. The high number of women agrees with the rise in mixed participation in adventure and nature tourism.

It was found that most tourists were international with 64.3% (n=193), as compared to 35.7% (n=107) of domestic tourists. More and more people from around the world are choosing Meghalaya as a top place for nature tourism which is reflected in the number of tourists.

Table 1. *Demographic Characteristics of Surveyed Tourists*

Demographic Variables	Frequency	Percentage (%)
Age Group		
18-24 years	62	20.7
25-40 years	176	58.7
41-60 years	52	17.3
Above 60 years	10	3.3
Gender		
Male	140	46.8
Female	160	53.2
Nationality		
Domestic	107	35.7
International	193	64.3

Environmental Awareness and Climate Change Concern

Tourists in Meghalaya were found to be very mindful of their impact on nature. Most people in our sample (218 of 297 or 72.5%) showed high awareness of environmental issues when using the adapted New Environmental Paradigm scale. Most people had some sense of environmental awareness; 24.3% (n=73) were in this range, but just 3.2% (n=9) fell into the low range.

Assessment of climate change concern among tourists indicated that 67.8% (n=203) were very concerned about the damage climate change causes to Meghalaya's environment. People visiting recognize that the natural world in that area can be easily harmed by fluctuations in the climate. A total of 28.5% (n=86) of participants said they have moderate concern and 3.7% (n=11) felt close to no concern.

Table 2. *Environmental Awareness and Concern among Tourists*

Environmental Factors	Level of Awareness/Concern
Environmental Awareness	High (72.5%, n=218)
	Moderate (24.3%, n=73)
	Low (3.2%, n=9)
Concern about Climate Change Impacts	High (67.8%, n=203)
	Moderate (28.5%, n=86)
	Low (3.7%, n=11)

Environmentally Responsible Tourist Behaviors

Certain environmentally friendly habits showed people generally used some practices more than others. More than 85% of visitors (n=257) separated their waste which became the most common waste management practice during their stay. More people are signing up because people are trained and facilities are available at the most visited places.

Supporting local eco-friendly businesses was reported by over three-quarters (78.3%) of all participants which demonstrates a strong desire among them to support sustainable econ-

omies in their area. People acting this way are recognizing how helping the environment improves their travel adventure.

When visiting nature in Meghalaya, 64.0% of tourists (numbering 192) made sustainable travel decisions. Although this is a major group of travelers, it also highlights room for increasing sustainable travel options.

About three-fifths of all tourists (47.0%) reported taking part in conservation activities which suggests this behavior was least represented among the others. It points to the chance for people to get more involved through active conservation programs.

Table 3. *Tourists' Environmentally Responsible Behavior and Practices*

Environmentally Responsible Behaviors	Frequency	Percentage (%)
Waste Segregation	257	85.6
Supporting Local Eco-friendly Businesses	235	78.3
Using Environmentally Friendly Transport	192	64.0
Participating in Conservation Activities	141	47.0

Qualitative Insights from Interviews

Thematic analysis of 50 in-depth interviews revealed several key themes regarding tourist motivations, experiences, and barriers to environmentally responsible behavior.

Motivations for Environmental Behavior

Participants identified multiple motivations for engaging in environmentally responsible behaviors:

- **Personal Values and Ethics:** Many tourists expressed intrinsic motivation based on personal environmental values: *"I believe it's my responsibility as a visitor to respect the natural environment that I'm privileged to experience"* (International tourist, age 32).
- **Destination Preservation:** Tourists demonstrated understanding of the connection between their behavior and destination sustainability: *"If we don't take care of these places, they won't be here for future generations to enjoy"* (Domestic tourist, age 28).
- **Cultural Respect:** International tourists particularly emphasized respect for local culture and traditions: *"The local communities have preserved these environments for centuries. As visitors, we should support their efforts"* (International tourist, age 41).

Barriers to Environmental Behavior

Several barriers to environmentally responsible behavior emerged from the interviews:

- **Infrastructure Limitations:** Tourists frequently cited inadequate facilities for sustainable practices: *"I wanted to segregate waste, but there were no separate bins available at many locations"* (Domestic tourist, age 26).
- **Information Gaps:** Many participants lacked information about sustainable options: *"I didn't know which local businesses were actually eco-friendly. Better signage or information would help"* (International tourist, age 35).
- **Cost Considerations:** Some tourists mentioned cost barriers to sustainable choices: *"Eco-friendly transportation options were available but significantly more expensive than conventional alternatives"* (Domestic tourist, age 31).

Climate Change Perceptions

Tourists demonstrated varying levels of climate change awareness specific to Meghalaya:

- **Observed Changes:** Several visitors noted environmental changes during repeat visits: *"The water levels in the rivers seem lower than during my previous visit three years ago"* (International tourist, age 38).
- **Local Knowledge:** Interactions with local communities enhanced climate awareness: *"Local guides explained how weather patterns have changed and affected traditional farming practices"* (International tourist, age 29).

Statistical Relationships and Predictors

Correlation Analysis

Pearson correlation analysis revealed several significant relationships between demographic variables, environmental awareness, and responsible behaviors:

- Age showed a moderate positive correlation with environmental awareness ($r = 0.34$, $p < 0.01$)
- Environmental awareness demonstrated a strong positive correlation with environmentally responsible behavior ($r = 0.57$, $p < 0.01$)
- International tourist status correlated positively with sustainable behavior adoption ($r = 0.41$, $p < 0.01$)
- Climate change concern correlated significantly with conservation activity participation ($r = 0.48$, $p < 0.01$)

Regression Analysis

Multiple regression analysis was conducted to identify predictors of environmentally responsible behavior. The model included demographic variables, environmental awareness, and climate change concern as predictors.

The overall model was statistically significant ($F(5,294) = 42.73$, $p < 0.001$) and explained 42.1% of the variance in environmentally responsible behavior ($R^2 = 0.421$). Significant predictors included:

- Environmental awareness ($\beta = 0.38$, $p < 0.001$)
- Climate change concern ($\beta = 0.29$, $p < 0.001$)
- International tourist status ($\beta = 0.22$, $p < 0.01$)
- Age ($\beta = 0.18$, $p < 0.05$)

Table 4. *Multiple Regression Analysis - Predictors of Environmentally Responsible Behavior*

Predictor Variables	B	SE B	β	t	p-value
Environmental Awareness	0.425	0.067	0.38	6.34	< 0.001***
Climate Change Concern	0.312	0.058	0.29	5.38	< 0.001***
International Tourist Status	0.289	0.098	0.22	2.95	< 0.01**
Age	0.187	0.084	0.18	2.23	< 0.05*
Gender	0.045	0.072	0.04	0.63	0.53

**Note: $R^2 = 0.421$, $F(5,294) = 42.73$, $p < 0.001$. ***$p < 0.001$, **$p < 0.01$, $p < 0.05$*

Table 5. *Correlation Matrix of Key Variables*

Variables	1	2	3	4	5	6
1. Age	1.00					
2. Environmental Awareness	0.34**	1.00				
3. Climate Change Concern	0.28**	0.52***	1.00			
4. International Tourist Status	0.15*	0.31**	0.27**	1.00		
5. Environmentally Responsible Behavior	0.41***	0.57***	0.48***	0.41***	1.00	
6. Visit Frequency	0.22*	0.19*	0.16*	-0.08	0.23**	1.00

**Note: ***p < 0.001, **p < 0.01, p < 0.05, N = 300*

These findings confirm that environmental awareness and climate change concern are the strongest predictors of responsible tourist behavior, while international tourist status and age also contribute significantly to the model.

Group Comparisons

Independent samples t-tests revealed significant differences between domestic and international tourists:

- International tourists scored significantly higher on environmental awareness (M = 4.12, SD = 0.68) compared to domestic tourists (M = 3.74, SD = 0.81), t(298) = 4.27, p < 0.001
- International tourists demonstrated higher levels of environmentally responsible behavior (M = 3.89, SD = 0.72) compared to domestic tourists (M = 3.51, SD = 0.79), t(298) = 4.15, p < 0.001

Table 6. *Comparison of Domestic vs. International Tourists*

Variables	Domestic Tourists (n=107)	International Tourists (n=193)	t-value	p-value
	M (SD)	M (SD)		
Environmental Awareness	3.74 (0.81)	4.12 (0.68)	4.27	< 0.001***
Climate Change Concern	3.62 (0.89)	4.05 (0.74)	4.52	< 0.001***
Environmentally Responsible Behavior	3.51 (0.79)	3.89 (0.72)	4.15	< 0.001***
Conservation Activity Participation	2.18 (1.12)	2.89 (1.05)	5.42	< 0.001***
Eco-friendly Business Support	3.89 (0.95)	4.34 (0.82)	4.21	< 0.001***

**Note: **p < 0.001. Scale: 1-5 (1 = Very Low, 5 = Very High)*

Discussion

Environmental Awareness and Behavioral Relationships

According to the findings, there are many interactions between how aware tourists are about the environment, how much they are concerned with climate change and how environmentally responsible they are in Meghalaya's tourism scene. The link between being aware of the environment and having responsible habits is strong and is in line with past studies by Bamberg and Möser (2007) and Han et al. (2011), both of which point out that environmental awareness introduces the possibility of sustainable tourism.

On the other hand, the study found that people's attitudes about conservation do not always affect their behavior, exactly as there is only a moderate participation rate (47.0%) in conservation. This result agrees with what Kollmuss and Agyeman (2002) stated, that having awareness of environmental issues by itself is not enough to encourage people to behave differently. According to the qualitative insights, problems like lacking facilities and not having enough information stop tourists from putting their goals into practice.

Looking at international literature points out what makes Meghalaya's tourism unique as well as its comparisons with other places. Just like the study by Lee et al. (2015), this shows that being close to nature increases people's sense of responsibility towards nature. Still, unlike the places examined by Gössling et al. (2012), Meghalaya suffers from limited infrastructure and overcrowding, factors that can change how tourists behave.

Demographic Influences and Cultural Considerations

Because of the big gap in environmental awareness and responsible actions between international and domestic tourists, management of these destinations is affected in an important way. Tourists from other countries participating to a greater extent in sustainable activities ($\beta = 0.22$, $p < 0.01$) may be explained by several principles found in the works of Dolnicar et al. (2008) and Miller et al. (2010).

Due to exposure to sustainability issues where they live and go to school, international tourists sometimes show higher environmental awareness (Beiser-McGrath & Huber, 2018). Second, visiting a new place may make international tourists realize their responsibility as guests which is in line with Ramkissoon et al.'s (2012) conclusions about attachment to destinations.

The finding that age and being aware of the environment are correlated ($r = 0.34$, $p < 0.01$) matches with Lee et al.'s research (2015) which proposes that maturity and life experiences increase environmental awareness. But this result stands in contrast to Western studies emphasizing that younger people are more concerned about the environment (Appleton et al., 2015) which may be a result of how environmental knowledge and focus are taught in India.

Climate Change Perceptions and Adaptation Behaviors

How tourists view the impacts of climate change on Meghalaya shows that concern and knowledge about the issue are uneven. Nearly three-quarters of people (67.8%) who took part in the study said they were very concerned about how climate change could harm the area, reflecting that they are aware of environmental dangers as noted by studies by Marshall et al. (2011) and Zeppel (2012).

It is clear from qualitative insights that experiencing how climate change affects nature and society makes tourists more aware. Ballantyne et al.'s study (2011) on tourism and environmental learning supports this learning process from experience. A strong way to tell tourists about climate change is for local guides and community members to share their personal experiences and advise on how to help.

Yet, the study found that tourists are often less informed about certain climate adaptation measures, how they help and why they are needed. Western scholars (Morrison & Pickering, 2013; Tranos & Davoudi, 2014) have found that tourists there mostly know about systematic adaptation, but not in this region, thus, better communication is needed.

Infrastructure and Policy Implications

Recognizing infrastructure barriers as a main constraining factor for environmental action affects tourism development in Meghalaya. Meghalaya, in contrast to those studied in previous studies (Scott et al. 2019), still experiences fundamental difficulties in offering facilities such as proper garbage sorting and regular transport.

The study results agree with Klint et al.'s (2012) view that supporting regional capacity and policy consistency is important for advancing adaptation measures in areas that rely on tourism. In Meghalaya, working together among government, business and community stakeholders is very clear, since tourism must support the economy while also protecting the environment and making the area more resilient to climate changes.

Similar to studies on Pacific Island tourism (Klint et al., 2012), this case shows similar difficulties with funds and guidelines for promoting sustainability. But, because Meghalaya is on the mainland and covers a larger area, it has more options for building sustainable infrastructure and policies.

Nature-Based Solutions and Community Engagement

Results indicate that nature-based solutions (NBS) could help tackle both climate adaptation and sustainable tourism in Meghalaya. The fact that most tourists prefer eco-friendly businesses (78.3%) proves there is demand for sustainable tourism in the area, in line with research on NBS opportunities proposed by Cohen-Shacham et al. (2016).

The low involvement of communities in conservation (47.0%) may point to the need to change how local engagement takes place to encourage more support. This result goes against what happens in more established ecotourism areas, where visitor work for conservation is more formally organized (Honey & Krantz, 2007).

The qualitative analysis shows that tourists appreciate getting to know local people and learning their way of preserving nature, supporting the findings of Carr et al. (2016) on Indigenous tourism and conservation. So, better ways to involve communities in tourism could support both travelers' satisfaction and the protection of nature.

Theoretical Contributions and Framework Development

The results of this study confirm that the theory of planned behavior (Ajzen, 1991) is helpful in describing environmentally friendly tourist behavior among Indigenous tourism industry members. Environmental awareness and how much people care about climate change predict behavior strongly which supports the emphasis on attitudes in the theory.

On the other hand, it shows that factors like family, culture and society which are often overlooked in traditional behavioral theories, are important too. Noticing the impact of poor infrastructures, missing information and local customs, it appears that better theoretical frameworks should take both structural and situational factors into account to explain tourist behavior.

The study shows that the choices of tourists are influenced by the things they find at their destinations as well as their personal traits, forming environmentally responsible habits. It goes further than previous studies by Gössling et al. (2012) and Lee et al. (2015) by analyzing these connections in a different ecological and cultural setting.

Study Advantages and Limitations

Research Advantages

This research gives several benefits in its methodology and theory, making it valuable for sustainable tourism research. A mixed-methods approach lets you use surveys to overview many people while learning in detail from a few individuals, thereby adding to the accuracy and quality of the results (Creswell & Plano Clark, 2017). Gathering both behavioral information and self-reported data solves some common problems in surveys by proving actions instead of just depending on what is said.

The research focusing on Meghalaya is important, since studies about climate change and tourism have not often covered Indigenous and biodiversity hotspot areas. Built on known frameworks, the study also explores particular conditions in these places which enhances its understanding of tourist behavior.

By stratifying the sample, the study ensures that important characteristics are represented which increases the chance that findings can be applied to all tourists visiting Meghalaya. Reliability and comparisons with studies in other countries are improved by using validated scales from environmental psychology and tourism research.

Research Limitations

Still, some difficulties need to be recognized in addition to these benefits. The fact that the study is cross-sectional rules out exploring links between variables and doesn't allow studying behavior change through the years. Longitudinal studies help spotlight how tourist environmental practices change over time and how many visits affect their attitudes.

Because people may want to look good, self-reporting often leads to under-reporting of green behaviors. Observations were undertaken to verify some conclusions, though there were limits on how much data could be collected because of tight budgets. Innovative research could be done by observing more behavior or developing digital programs to track sustainable behavior.

Taking data during certain months (October 2023 to March 2024) may have affected the results, since seasons in Meghalaya change both tourist numbers and environmental situations a lot. By excluding monsoon season data, it is difficult to learn how extreme weather influences what tourists do and decide.

Language and cultural differences might still have affected how well the interviews were conducted and the survey answers, even with trained interpreters and adapted survey tools. There is an additional limitation because of the possibility of interviewer bias and social desirability effects when gathering data in person.

When results are based on just particular sites in Meghalaya, this limits their use in understanding other parts of the state or Indigenous communities in other areas. Meghalaya's tourism environment is not the same as others, so its findings should be used with care elsewhere.

Implications for Sustainable Tourism Development

The results point to ways to increase sustainable tourism growth in Meghalaya and areas with similar traits. Noticing that lacking environmentally friendly infrastructure prevents many actions shows that we should focus public and private spending on sustainability. It means cre-

ating good waste disposal systems, increasing green ways to travel and providing info for tourists that guides their travels.

How tourists behave differently at home and abroad means that different ways should be used to encourage environmental care. On one hand, domestic tourism should be made aware of the effects of climate change and on the other, foreign tourists could get involved in environmental conservation.

Because of this study, it is clear that supporting conservation and helping communities make money through tourism can be in line with what visitors look for in an adventure. Practicing community-based ecological knowledge with tourists could satisfy visitors and lead to good environmental outcomes.

Certification for eco-friendly businesses can help policy makers offer tourists a clear way to support sustainable enterprises. The fact that most tourists back these businesses (78.3%) indicates that the market could encourage private investment in environmentally friendly practices.

Conclusion

The findings of the study on Meghalaya's nature tourism highlight the relationships among climate change awareness, people's characteristics and actions that help protect the environment. This study supports the debate on sustainable tourism by analyzing real cases in Indigenous tourism and biodiversity areas which is missing in many previous studies.

Key Findings and Theoretical Contributions

It confirms that having environmental awareness helps tourists act responsibly toward the environment ($r = 0.57$, $p < 0.01$), confirming that the theory of planned behavior can be applied in Indigenous tourism settings. The study finds that important contextual aspects mediate this connection, for example, the presence of relevant infrastructure, easy access to information and other cultural factors that go beyond what is mainly covered in single-person theories.

That international and domestic tourists behave differently on sustainability matters points to the need for special attention to their backgrounds when forming sustainable tourism plans. Seeing that international tourists have higher environmental awareness and take more care in their actions is significant for marketing and management teams.

Climate change concern turns out to be an important factor in promoting environmentally responsible actions ($\beta = 0.29$, $p < 0.001$), proving that climate discussions are important in tourism and allowing for the use of climate awareness to promote sustainability.

Practical Implications

The study helps destination managers, policymakers and tourism operators in Meghalaya and similar contexts find better solutions for their communities. Realizing that main barriers to sustainable behavior are the shortcomings in infrastructure underlines the importance of allocating resources to assist tourists in being environmentally responsible by offering efficient waste systems, green modes of transport and clear information.

The study suggests creating specific ways to engage tourists, focusing on campaigns to make local visitors better-informed and increasing involvement opportunities for visiting tourists. Community-based models demonstrated in the study could improve local efforts to save wildlife and also appeal to tourists seeking genuine experiences.

Policy Recommendations

Based on the research findings, several policy recommendations emerge:

- **Infrastructure Development:** Making investments in eco-friendly waste separation facilities, renewable power sources and environmentally friendly transport methods should be prioritized.
- **Capacity Building:** Design programs to educate tourism operators, guides and locals so they know how to encourage tourists to adopt sustainable habits and deal with climate change challenges.
- **Information Systems:** Develop integrated websites that support tourists in choosing eco-friendly opportunities and seeing the effects of their actions on the environment.
- **Regulatory Frameworks:** Set up certification processes for environmentally friendly companies and introduce development rules for sustainable tourism that take care of economic as well as green goals.
- **Community Engagement:** Assist local projects that use tourism as an opportunity, ensure local groups participate in planning and maintain and support their cultures and environments.

Future Research Directions

It introduces new prospects for research focused on understanding how people act when it comes to climate-conscious tourism. Investigations tracking how tourist conduct changes with each trip could show how sustainable habits are kept.

Looking at how tourists act in various Indigenous tourism destinations would clarify how culture and environment influence responsible tourism. Those studies could help find shared reasons and those specific to each context behind people's sustainable tourism actions.

If intervention studies find out what helps people behave in an environmentally friendly way, this information could aid destination managers. For example such studies could focus on how instructing tourists, upgrading local facilities or engaging with communities affect their actions.

Studying how local communities view tourists' actions toward the environment would give valuable insight into how sustainable tourism develops socially. Information about local people's ideas and actions toward tourist environmental actions could form the basis of better community tourism initiatives.

In addition, findings from examining economic aspects of sustainability in tourism, for example willingness to spend on eco-friendly services and the role of sustainability on the economy, can guide both businesses and policy makers.

References

Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ballantyne, R., Packer, J., & Hughes, K. 2011. Tourists' support for conservation messages and sustainable management practices in wildlife tourism experiences. *Tourism Management*, 32(6), 1406–1416. https://doi.org/10.1016/j.tourman.2011.01.009

Bamberg, S., & Möser, G. 2007. Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*, 27(1), 14–25. https://doi.org/10.1016/j.jenvp.2006.12.002

Beiser-McGrath, L. F., & Huber, R. A. 2018. Assessing the relative importance of psychological and demographic factors for predicting climate and environmental attitudes. *Climatic Change*, 149(3–4), 335–347. https://doi.org/10.1007/s10584-018-2260-9

Braun, V., & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Carr, A., Ruhanen, L., & Whitford, M. 2016. Indigenous peoples and tourism: The challenges and opportunities for sustainable tourism. *Journal of Sustainable Tourism,* 24(8–9), 1067–1079. https://doi.org/10.1080/09669582.2016.1206112

Chaturvedi, R. K., Gopalakrishnan, R., Jayaraman, M., Bala, G., Joshi, N. V., Sukumar, R., & Ravindranath, N. H. 2011. Impact of climate change on Indian forests: A dynamic vegetation modeling approach. *Mitigation and Adaptation Strategies for Global Change,* 16(2), 119–142. https://doi.org/10.1007/s11027-010-9257-7

Cohen-Shacham, E., Walters, G., Janzen, C., & Maginnis, S. 2016. *Nature-based solutions to address global societal challenges*. International Union for Conservation of Nature. https://doi.org/10.2305/IUCN.CH.2016.13.en

Corner, A., Roberts, R., Chiari, S., Völler, S., Mayrhuber, E. S., Mandl, S., & Monson, K. 2015. How do young people engage with climate change? The role of knowledge, values, message framing, and trusted communicators. *Wiley Interdisciplinary Reviews: Climate Change,* 6(5), 523–534. https://doi.org/10.1002/wcc.353

Creswell, J. W., & Plano Clark, V. L. 2017. *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.

Das, B., & Hussain, I. 2016. Ecotourism and biodiversity conservation in Meghalaya: Prospects and challenges. *International Journal of Environmental Sciences*, 6(4), 234–238. https://doi.org/10.6088/ijes.6047

Davenport, J., & Davenport, J. L. 2006. The impact of tourism and personal leisure transport on coastal environments: A review. *Estuarine, Coastal and Shelf Science,* 67(1–2), 280–292. https://doi.org/10.1016/j.ecss.2005.11.026

Dolnicar, S., Crouch, G. I., & Long, P. 2008. Environment-friendly tourists: What do we really know about them? *Journal of Sustainable Tourism,* 16(2), 197–210. https://doi.org/10.1080/09669580801904162

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. 2000. New trends in measuring environmental attitudes: Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues*, 56(3), 425–442. https://doi.org/10.1111/0022-4537.00176

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. 2007. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. https://doi.org/10.3758/BF03193146

Gössling, S., Scott, D., Hall, C. M., Ceron, J.-P., & Dubois, G. 2012. Consumer behaviour and demand response of tourists to climate change. *Annals of Tourism Research,* 39(1), 36–58. https://doi.org/10.1016/j.annals.2011.11.002

Hall, C. M., Gössling, S., & Scott, D. 2013. The evolution of sustainable development and sustainable tourism. In C. M. Hall, S. Gössling, & D. Scott (Eds.), *The Routledge handbook of tourism and sustainability* (pp. 15–35). Routledge. https://doi.org/10.4324/9780203072332

Han, H., Hsu, L.-T., & Sheu, C. 2010. Application of the theory of planned behavior to green hotel choice: Testing the effect of environmental friendly activities. *Tourism Management*, 31(3), 325–334. https://doi.org/10.1016/j.tourman.2009.03.013

Honey, M., & Krantz, D. 2007. *Global trends in coastal tourism.* Stanford Environmental Program.

Intergovernmental Panel on Climate Change. 2021. *Climate change 2021: The physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [V. Masson-Delmotte, P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J. B. R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, & B. Zhou, Eds.]. Cambridge University Press. https://doi.org/10.1017/9781009157896

International Union for Conservation of Nature. 2020. *Global standard for nature-based solutions: A user-friendly framework for the verification, design and scaling up of NbS* (1st ed.). IUCN. https://doi.org/10.2305/IUCN.CH.2020.08.en

Johnson, R. B., & Onwuegbuzie, A. J. 2004. Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14–26. https://doi.org/10.3102/0013189X033007014

Klint, L. M., Wong, E., Jiang, M., Delacy, T., Harrison, D., & Dominey-Howes, D. 2012. Climate change adaptation in the Pacific Island tourism sector: Analysing the policy environment in Vanuatu. *Current Issues in Tourism*, 15(3), 247–274. https://doi.org/10.1080/13683500.2011.608841

Kollmuss, A., & Agyeman, J. 2002. Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239–260. https://doi.org/10.1080/13504620220145401

Lee, T. H., Jan, F.-H., & Huang, G. W. 2015. The influence of recreation experiences on environmentally responsible behavior: The case of Liuqiu Island, Taiwan. *Journal of Sustainable Tourism*, 23(6), 947–967. https://doi.org/10.1080/09669582.2015.1024257

Leiserowitz, A. 2006. Climate change risk perception and policy preferences: The role of affect, imagery, and values. *Climatic Change*, 77(1–2), 45–72. https://doi.org/10.1007/s10584-006-9059-9

Lenzen, M., Sun, Y.-Y., Faturay, F., Ting, Y.-P., Geschke, A., & Malik, A. 2018. The carbon footprint of global tourism. *Nature Climate Change*, 8(6), 522–528. https://doi.org/10.1038/s41558-018-0141-x

Marshall, N. A., Marshall, P. A., Abdulla, A., Rouphael, T., & Ali, A. 2011. Preparing for climate change: Recognising its early impacts through the perceptions of dive tourists and dive operators in the Egyptian Red Sea. *Current Issues in Tourism*, 14(6), 507–518. https://doi.org/10.1080/13683500.2010.512075

Miller, G., Rathouse, K., Scarles, C., Holmes, K., & Tribe, J. 2010. Public understanding of sustainable tourism. *Annals of Tourism Research*, 37(3), 627–645. https://doi.org/10.1016/j.annals.2009.12.002

Morrison, C., & Pickering, C. M. 2013. Perceptions of climate change impacts, adaptation and limits to adaptation in the Australian Alps: The ski-tourism industry and key stakeholders. *Journal of Sustainable Tourism*, 21(2), 173–191. https://doi.org/10.1080/09669582.2012.681789

Ramkissoon, H., Smith, L. D. G., & Weiler, B. 2013. Testing the dimensionality of place attachment and its relationships with place satisfaction and pro-environmental behaviours: A structural equation modelling approach. *Tourism Management*, 36, 552–566. https://doi.org/10.1016/j.tourman.2012.09.003

Scott, D., Gössling, S., & Hall, C. M. 2019. Climate change and tourism: Impacts, adaptation and mitigation. In S. Gössling & C. M. Hall (Eds.), *Tourism and global environmental change* (pp. 33–58). Routledge. https://doi.org/10.4324/9780203071687

Seddon, N., Chausson, A., Berry, P., Girardin, C. A. J., Smith, A., & Turner, B. 2020. Understanding the value and limits of nature-based solutions to climate change and other global challenges. *Philosophical Transactions of the Royal Society B*, 375(1794), Article 20190120. https://doi.org/10.1098/rstb.2019.0120

Sharma, S., & Chakraborty, A. 2020. Climate change vulnerability assessment in the Meghalaya state. *Environmental Science and Pollution Research*, 27(12), 13445–13459. https://doi.org/10.1007/s11356-020-08031-y

Tranos, E., & Davoudi, S. 2014. The regional impact of climate change on winter tourism in Europe. *Tourism Planning & Development*, 11(2), 163–178. https://doi.org/10.1080/21568316.2013.864992

United Nations World Tourism Organization. 2019. *Climate change and tourism: Responding to global challenges.* UNWTO. https://doi.org/10.18111/9789284420889

Whitford, M., & Ruhanen, L. 2016. Indigenous tourism research, past and present: Where to from here? *Journal of Sustainable Tourism*, 24(8–9), 1080–1099. https://doi.org/10.1080/09669582.2016.1189927

Zeppel, H. 2012. Climate change and tourism in the Great Barrier Reef Marine Park. *Current Issues in Tourism*, 15(3), 287–292. https://doi.org/10.1080/13683500.2011.556247