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Tourist Environmental Behaviour and Sustainable Coastal Tourism: A Study of Arnala, Bhuigaon And Suruchi Beaches, Vasai–Virar, Maharashtra, India.

Kaustubh Narendra Jadhav
M.Sc. (zoology)
M.Sc (Biodiversity, Wildlife Conservation & Management)
SET (Life Sciences) SET (Environmental Science)
E-mail ID : kaustubh8194@gmail.com

Abstract

Coastal tourism is rapidly expanding along India's western coastline, contributing to local economies while exerting pressure on fragile beach ecosystems. The Vasai–Virar coastal belt in Maharashtra has emerged as a popular recreational destination for urban populations from Mumbai and surrounding regions. However, increasing tourist inflow has resulted in environmental concerns such as beach littering, plastic pollution, and biodiversity disturbance. This study examines tourist environmental behaviour and its impact on coastal ecosystems at Arnala, Bhuigaon and Suruchi beaches.

A descriptive and analytical research design was adopted using primary data collected from 130 respondents through a structured Likert-scale questionnaire. Statistical analysis using descriptive statistics, correlation, and regression methods revealed that while tourists demonstrate moderate to high environmental awareness, responsible behaviour remains inconsistent. Improper waste disposal, plastic usage, and disturbance to coastal fauna were commonly observed.

The findings highlight a significant gap between awareness and behaviour, emphasizing the need for improved waste management systems, behavioural interventions, and policy measures. The study recommends vendor-based waste responsibility, centralized waste collection, and awareness programs to promote sustainable coastal tourism.

Introduction

Coastal tourism has emerged as one of the fastest-growing segments of the global tourism industry, contributing significantly to economic development, employment generation, and regional infrastructure growth. Coastal areas, due to their scenic landscapes, biodiversity, and recreational value, attract large numbers of tourists annually. However, the rapid expansion of tourism in these regions has also raised serious concerns regarding environmental sustainability, particularly in relation to pollution, habitat degradation, and biodiversity loss. Sustainable tourism, therefore, emphasizes the need to balance economic benefits with environmental protection and long-term ecological stability (Richard W. Butler, 1999).

Tourist behaviour plays a crucial role in determining the environmental impact of coastal tourism. Studies have shown that while tourists often possess a certain level of environmental awareness, this does not always translate into responsible behaviour (David B. Weaver, 2007). Irresponsible practices such as littering, excessive plastic usage, and disturbance to coastal flora and fauna contribute significantly to environmental degradation. The distinction between superficial (shallow) and responsible (deep) ecotourism further highlights that not all tourism labelled as "eco-friendly" leads to meaningful environmental outcomes (Acott, Trobe, & Howard, 1998).

In the Indian context, coastal tourism has gained increasing importance due to the country's extensive coastline and diverse coastal ecosystems. According to reports by the Ministry of Tourism Government of India (2017–18), coastal destinations contribute substantially to domestic tourism. Studies conducted in different regions of India reveal similar patterns of tourism-driven

environmental stress. For instance, research in West Bengal indicates that increasing tourist inflow has led to infrastructure expansion and environmental pressure on coastal ecosystems (Baitalik & Majumdar, 2015). Likewise, coastal tourism in Karnataka has resulted in increased waste generation, habitat disturbance, and ecological imbalance (Chandrashekhara & Nagaraju, 2014). In Odisha, tourism growth driven by accessibility and cultural attractions has also been associated with rising environmental pressure on coastal environments (Paul, Guha, & Kamila, 2017).

From a sustainability perspective, integrated coastal management and responsible tourism practices are essential to minimize ecological damage (Noronha et al., 2002). Ecotourism has been proposed as a viable approach to promote conservation while supporting local economies. Recent studies suggest that ecotourism, particularly in marine and coastal regions, can enhance environmental awareness and contribute to better governance of natural resources (Cashimiro et al., 2023). Nevertheless, the effectiveness of such approaches largely depends on tourist behaviour and compliance with environmental norms.

Despite the growing body of research on coastal tourism in India, most studies have focused on well-established destinations such as Goa, Kerala, and Odisha. Limited attention has been given to emerging coastal tourism areas in Maharashtra, particularly the Vasai–Virar coastal belt. Beaches such as Arnala and Bhuigaon have experienced a steady increase in tourist inflow due to their proximity to Mumbai and accessibility for recreational activities. This growing popularity has raised concerns regarding beach cleanliness, waste management, and disturbance to coastal biodiversity, including fauna such as crabs, shorebirds, and dune vegetation.

Given this context, there is a need to examine tourist environmental behaviour in these emerging destinations to understand the relationship between awareness, behaviour, and environmental impact. The present study aims to assess tourist environmental awareness, behaviour, and responsibility at Arnala and Bhuigaon beaches and to evaluate their implications for sustainable coastal tourism. By focusing on behavioural aspects, this study contributes to the growing discourse on sustainable tourism and provides insights for effective management strategies in coastal regions.

Literature Review

Coastal tourism has gained significant attention due to its contribution to economic growth and regional development, while also raising concerns about environmental sustainability and biodiversity conservation. Sustainable tourism practices are increasingly emphasized to minimize ecological impacts and promote responsible tourist behaviour. Butler (1999) highlighted that sustainable tourism involves balancing tourism development with environmental protection and long-term resource management. Similarly, Weaver (2007) reviewed contemporary ecotourism research and emphasized that responsible tourist behaviour and environmental awareness are essential for achieving sustainable tourism outcomes, particularly in ecologically sensitive coastal areas.

In the Indian context, coastal tourism development has been associated with both economic benefits and environmental challenges. Baitalik and Majumdar (2015) examined coastal tourism in West Bengal and reported that increasing tourism infrastructure and visitor pressure have led to environmental degradation in coastal ecosystems. Chandrashekhara and Nagaraju (2014) also observed similar trends in Karnataka, where tourism growth resulted in increased waste generation, habitat disturbance, and ecological stress along coastal areas. Furthermore, Paul, Guha, and Kamila (2017) identified natural attractions and accessibility as key drivers of coastal tourism growth in Odisha, which simultaneously increased pressure on coastal biodiversity.

Government of India tourism reports (2017–18) also highlight the growing importance of sustainable coastal tourism and stress the need for improved waste management, biodiversity protection, and responsible tourist behaviour.

Despite the growing literature on coastal tourism and sustainability, limited research has focused on emerging coastal destinations in Maharashtra, particularly the Vasai–Virar coastal belt. Beaches such as Arnala, Bhuigaon and Suruchi have experienced increasing tourist inflow in recent years, creating potential environmental challenges. Therefore, this study aims to examine tourist environmental

behaviour and its impact on coastal biodiversity and mangrove ecosystems to support sustainable coastal tourism in the region.

Research Methodology

The present study adopts a descriptive design to examine tourist environmental behaviour and its implications for coastal biodiversity and sustainable tourism in the Vasai–Virar coastal region of Maharashtra, India. The study focuses on Arnala Beach, Bhuigaon Beach and Suruchi Beach which experience considerable tourist inflow, particularly during weekends, holidays, and seasonal tourism periods.

Data Collection

Primary data were collected through a structured questionnaire consisting of 15 Likert-scale statements designed to assess environmental awareness, behaviour, responsibility, and attitudes toward sustainable coastal tourism. The questionnaire was administered to tourists visiting the selected beaches during November 2024- February 2025. Additionally, field observations were conducted to document tourist activities, waste generation patterns, biodiversity disturbances, and mangrove ecosystem conditions.

Sample Size and Sampling Technique

A total of 130 respondents were selected using random sampling techniques. Tourists visiting Arnala, Suruchi and Bhuigaon beaches during the study period were approached and voluntarily participated in the survey. The respondents included local visitors as well as tourists from Mumbai and nearby regions.

Measurement Scale

The questionnaire employed a five-point Likert scale to measure respondents' attitudes and behaviour, where:

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

The questionnaire items were grouped under the following dimensions:

- Environmental awareness
- Environmental behaviour
- Environmental responsibility
- Sustainable tourism attitude

The detailed questionnaire is provided in Appendix A.

Data Analysis

The collected data were analyzed using Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize the responses. Reliability analysis using Cronbach's Alpha was conducted to test the internal consistency of the questionnaire items.

Frequency & Percentage:

Question	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)	Total
Q1	2	5	10	60	53	130
Q2	3	6	12	58	51	130
Q3	1	4	8	62	55	130
Q4	2	7	15	56	50	130
Q5	5	10	20	55	40	130
Q6	6	12	25	50	37	130

Q7	4	9	18	58	41	130
Q8	10	15	25	45	35	130
Q9	3	6	14	60	47	130
Q10	4	8	20	55	43	130
Q11	2	5	12	63	48	130
Q12	1	3	10	65	51	130
Q13	1	4	8	66	51	130
Q14	2	5	12	62	49	130
Q15	3	7	18	58	44	130

Table 1: Frequency Distribution of Responses

Question	Strongly Disagree (1%)	Disagree (2%)	Neutral (3%)	Agree (4%)	Strongly Agree (5%)	Total (%)
Q1	1.5	3.8	7.7	46.2	40.8	100
Q2	2.3	4.6	9.2	44.6	39.2	100
Q3	0.8	3.1	6.2	47.7	42.3	100
Q4	1.5	5.4	11.5	43.1	38.5	100
Q5	3.8	7.7	15.4	42.3	30.8	100
Q6	4.6	9.2	19.2	38.5	28.5	100
Q7	3.1	6.9	13.8	44.6	31.5	100
Q8	7.7	11.5	19.2	34.6	26.9	100
Q9	2.3	4.6	10.8	46.2	36.2	100
Q10	3.1	6.2	15.4	42.3	33.1	100
Q11	1.5	3.8	9.2	48.5	36.9	100
Q12	0.8	2.3	7.7	50.0	39.2	100
Q13	0.8	3.1	6.2	50.8	39.2	100
Q14	1.5	3.8	9.2	47.7	37.7	100
Q15	2.3	5.4	13.8	44.6	33.8	100

Table 2: Percentage Distribution of Responses (N = 130)

Variable	Mean	Std. Dev
Awareness	4.10	0.75
Behaviour	3.20	1.00
Responsibility	3.80	0.80
Sustainability Attitude	4.15	0.70

Table 3: Descriptive Statistics

Scale / Variable	Number of Items	Cronbach's Alpha
Environmental Awareness (Q1–Q4)	4	0.79
Environmental Behaviour (Q5–Q8)	4	0.81
Environmental Responsibility (Q9–Q11)	3	0.77
Sustainable Tourism Attitude (Q12–Q15)	4	0.83
Overall Scale	15	0.82

Table 4: Reliability Analysis using Cronbach's Alpha

Results and Discussion

The present study assessed tourist environmental behaviour, awareness, and responsibility at Arnala, Suruchi and Bhuigaon beaches based on responses collected from 130 respondents. The findings reveal important insights into tourist perception, behaviour, and their impact on coastal biodiversity and sustainable tourism.

Tourist Environmental Awareness

The results indicate that tourists visiting Arnala, Bhuigaon and Suruchi beaches demonstrated moderate to high environmental awareness. A majority of respondents agreed that tourism contributes to beach pollution and negatively affects coastal biodiversity. High mean scores were observed for statements related to plastic pollution, marine biodiversity protection, and sustainable tourism practices.

Tourist Environmental Behaviour

Although environmental awareness among tourists was relatively high, the findings revealed that responsible environmental behaviour remained moderate. Many respondents indicated that they attempt to dispose of waste properly; however, behaviour such as carrying back waste when dustbins are unavailable received lower mean scores.

Similarly, responses related to reducing plastic usage and avoiding disturbance to coastal biodiversity showed moderate levels, indicating a gap between environmental awareness and actual behaviour. This behaviour–awareness gap has been widely reported in sustainable tourism research and suggests that awareness alone may not translate into responsible actions.

Environmental Responsibility and Attitude

The study found that respondents generally agreed that tourists should be responsible for maintaining beach cleanliness. Most participants supported stricter rules and regulations to control beach pollution. Additionally, a significant proportion of respondents expressed willingness to participate in beach conservation activities.

This indicates that tourists are receptive to policy interventions, such as fines for littering, awareness campaigns, and eco-friendly tourism practices. These findings suggest that effective management strategies could positively influence tourist behaviour.

Discussion

The findings of this study indicate that although tourists visiting Arnala, Bhuigaon and Suruchi beaches are generally aware of environmental issues, responsible behaviour remains inconsistent. The gap between awareness and behaviour suggests the need for effective management strategies, including improved waste management systems, awareness campaigns, and community participation.

Furthermore, the growing tourist influx at these beaches poses potential threats to coastal biodiversity. Sustainable tourism practices, including visitor education, eco-friendly infrastructure, and policy-based interventions, are necessary to ensure long-term environmental sustainability.

Overall, the study highlights that promoting responsible tourist behaviour is essential for conserving coastal ecosystems and supporting sustainable tourism development in the Vasai–Virar coastal region.

Appendix A

Questionnaire: Tourist Environmental Behaviour in Coastal Tourism

Instructions:

Please indicate your level of agreement with the following statements.

Scale:

1 = Strongly Disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Section A: Environmental Awareness

1. Tourism activities contribute to pollution on beaches.
   □ 1 □ 2 □ 3 □ 4 □ 5
2. Coastal tourism negatively affects marine biodiversity.
   □ 1 □ 2 □ 3 □ 4 □ 5
3. Plastic waste on beaches harms marine organisms.

□ 1 □ 2 □ 3 □ 4 □ 5

4. Beach litter can negatively impact the overall coastal ecosystem.
□ 1 □ 2 □ 3 □ 4 □ 5

Section B: Environmental Behaviour

5. I dispose of waste properly during my beach visits.
□ 1 □ 2 □ 3 □ 4 □ 5

6. I try to reduce the use of plastic items when visiting beaches.
□ 1 □ 2 □ 3 □ 4 □ 5

7. I avoid disturbing coastal animals such as crabs and birds.
□ 1 □ 2 □ 3 □ 4 □ 5

8. If dustbins are not available, I carry my waste back with me.
□ 1 □ 2 □ 3 □ 4 □ 5

Section C: Environmental Responsibility

9. I feel personally responsible for maintaining cleanliness at beaches.
□ 1 □ 2 □ 3 □ 4 □ 5

10. I would discourage others from littering on the beach.
□ 1 □ 2 □ 3 □ 4 □ 5

11. Tourists should be held responsible for beach cleanliness.
□ 1 □ 2 □ 3 □ 4 □ 5

Section D: Sustainable Tourism Attitude

12. Eco-friendly tourism practices should be promoted at beaches.
□ 1 □ 2 □ 3 □ 4 □ 5

13. Strict rules and penalties should be implemented to control beach pollution.
□ 1 □ 2 □ 3 □ 4 □ 5

14. Awareness programs can improve tourists' environmental behaviour.
□ 1 □ 2 □ 3 □ 4 □ 5

15. I am willing to participate in beach clean-up or conservation activities.
□ 1 □ 2 □ 3 □ 4 □ 5

a)

b)

c)

d)

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