Research Article

Tourism at the Crossroads: An SDG-Based Assessment of Social, Economic, and Environmental Impacts in Coastal Sindhudurg, India

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Abstract: Tourism is widely promoted as a driver of economic growth in coastal regions; but, its contribution to sustainable development depends on how social equity, environmental integrity, and economic benefits are balanced at the local level. This study assesses the multi-dimensional impacts of tourism development in Sindhudurg district, a coastal region of Maharashtra, India, using a Sustainable Development Goals (SDGs)–based indicator framework. The analysis is grounded in the Toolkit for Achieving Sustainable Development through Tourism developed by the United Nations World Tourism Organization and applies 34 SDG-linked indicators across social, environmental, and economic dimensions. Primary data were collected through field surveys conducted in 23 coastal villages across the Devgad, Malvan, and Vengurla tehsils during April 2024. A semi-structured questionnaire and a five-point Likert scale were used to capture local perceptions of tourism impacts.The findings indicate that tourism has generated measurable benefits, including improved infrastructure, digital connectivity, and income opportunities, alongside the return of

migrated youth to the local economy. However, these benefits are unevenly distributed and spatially skewed. Significant deficiencies persist in worker welfare, hygiene standards, disaster preparedness, environmental management, and access to institutional finance for small tourism enterprises. Environmental practices remain largely reactive, with limited adoption of climate resilience measures and decentralized waste management systems. Social impacts reveal weak institutional engagement and limited community participation in tourism governance.The study concludes that without integrated planning, inclusive financial mechanisms, and strengthened local governance, tourism development in Sindhudurg risks reinforcing existing socio-economic inequalities rather than advancing its SDG-aligned sustainability objectives.

Keywords: Coastal tourism; Sustainable Development Goals (SDGs); Tourism impact assessment; Environmental sustainability; Tourism governance

1. Introduction

Tourism is one of the world's largest industries, interconnected with all other life sectors: economic, social, cultural, environmental, and political (UNWTO, 2019). In the recent decade, the growth of tourism in coastal areas has reached its peak due to a distinctive resource combination of land and sea offering diversified cultures and activities (OECD, 2018). The increasing coastal tourism trend involves the physical condition upon the development of tourism capacities and infrastructure. It regards its magnitude and contribution to the well-being of coastal communities worldwide, which are greatly influenced by tourism related to the socio-economic features of the receiving environment. However, the development of tourism is still primarily based on financial resources. At the same time, the environment depends on minimizing effects within the

available budget and addressing the challenges faced by unsustainable growth in coastal communities, which impacts their environment and society.

Tourism is recognized as an agent of social and cultural change (Carter et al., 2004). The socio-cultural theories of Ferdinand Tonnies (Benoist, 1994) and Zygmunt Bauman (Bauman, 1988) imply that tourism represents modernity, making a social structure transition through personal relationships, communication habits, lifestyles, value systems, meanings, and knowledge that drive life change faster than it takes. Social structure changes in the community due to altered perceptions of individual self-interest, leading to freedom from the community's social control. Modern lifestyle and demographic changes, driven by tourists, influence changes in local attitudes and perceptions. Personal interaction shifts from the traditional social network of kinship and being tied together by shared values and interests to the formal interaction of a larger social network whose ties are looser (Reisinger, 2009). One previous study suggested that when there are too many visitors, locals tend to lose their sense of security and community pride.

The local perception change is linked to overall life satisfaction or quality of life, which is influenced by two aspects of wellbeing: the livability of the environment and the utility of life, as well as the person's inner qualities, life-ability, and appreciation of life. Previous studies have uncovered a connection between the perceived economic, social, cultural, and environmental impacts of tourism on local people and their evaluation of material wellbeing, community wellbeing, emotional wellbeing, and health and safety (Kim, 2013). Communities at tourism destinations engage in a trade-off between the perceived benefits of tourism and the adverse social and environmental outcomes of its development (Ionela et al., 2015). The implications of perceived negative and positive impacts of tourism will draw local conclusions based on the relative weighting of the costs and the benefits. Since such studies confirm the importance of understanding local responses and their involvement in tourism to achieve sustainability in destinations (Uslu et al., 2020), the balance of local perceptions of costs and benefits of tourism is a significant factor in the success of the tourism industry. Therefore, understanding local perceptions of tourism development and its impacts can facilitate the appropriate development policy and planning to take place with optimistic benefits and minimized problems (Sharpley, 2014). Over three decades, increasing academic studies of local perceptions of tourism development impact and becoming one of the most researched topics indicate the broader concerns in tourism sustainability issues and the importance of communities in tourism development (Sharpley, 2014).

Few studies have effectively synthesized tourism development, community perceptions, and environmental impacts using tourism-specific sustainable development indicators. This gap limits our understanding of tourism's multifaceted effects and hinders the creation of integrated, politically actionable insights. Employing such indicators could enhance both theoretical frameworks and practical strategies for sustainable tourism.

Thus, this study seeks to fill this gap by basing the indicators of enquiry on the Toolkit for Achieving Sustainable Development through Tourism. The primary purpose of this toolkit is to present a set of tourism-related indicators aimed at assessing the contribution of tourism initiatives to the achievement of the Sustainable Development Goals (SDGs). This standard and integrated set of indicators is essential for effectively monitoring and evaluating the outputs, outcomes, and impacts of tourism activities. The toolkit provides a framework to capture the transformative potential of tourism at various levels, including the broader ripple effects of investments and interventions in the sector, while maintaining alignment with the SDG framework. Furthermore, the indicators correspond

to specific SDG targets. They are systematically categorized into social, economic, and environmental domains, ensuring a comprehensive assessment of tourism's role in advancing sustainable development (Achieving the Sustainable Development Goals Through Tourism – Toolkit of Indicators for Projects (TIPs), 2023).

The study's findings elucidate the multifaceted and diverse influences on local experiences of the impact of tourism development on their livelihoods and well-being, which are spatially skewed. This research aims to illuminate the community's viewpoints on the effects of tourism development, its future orientation towards tourism management and development, its impact on the local economy, the challenges to growth, and its potential to reduce the skewness in tourism growth.

Study Area

Sindhudurg, a coastal district of Maharashtra, is situated in the southwestern part of the state and the southernmost region of the Konkan peninsula. Established in May 1981, the district covers an area of approximately 5,207 square kilometres. It has a population of around 8.5 lakhs, with 12.59% of the population living in urban areas as per the 2011 census.

Recognizing its potential, the Department of Industrial Policy & Promotion (DIPP) of the Government of India declared Sindhudurg as a 'Tourism District' in 2018. To further develop this potential, the district established a working group in 2018, which conducted thorough observations and recommended further initiatives.
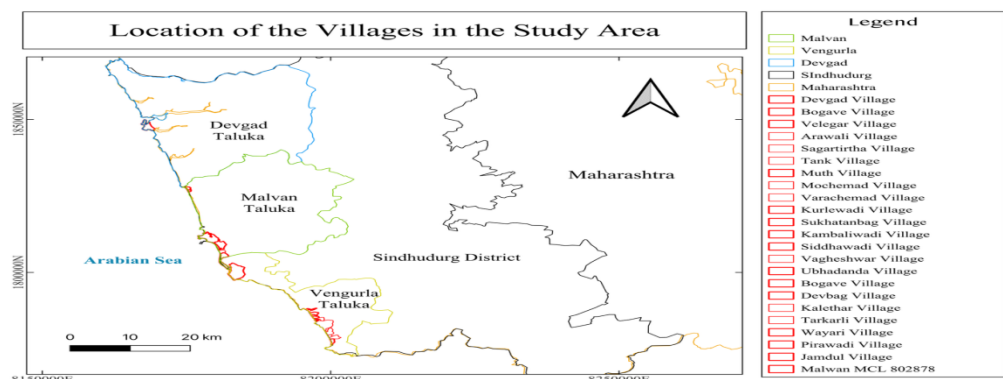
Fig.1

Source. Compiled by the author in QGIS 3.34.

In 2019, Sindhudurg was included in the District Development Plan (DDP) of the Government of India, providing additional support and resources for its development.

The sectoral breakdown of the economy of Sindhudurg reveals that the services sector dominates, particularly in trade, hotels and restaurants, and financial services. These sectors have consistently contributed significantly to the overall GDP of the district. From 2004-05 to 2013-14, their average shares in the overall GDP were 12.8% and 15.7%, respectively.

Table 5.1 lists 23 coastal villages in the Sindhudurg district, detailing their Census 2011 codes, associated beaches, administrative tehsils, and total population. The villages span key tourism nodes across Devgad, Malwan, and Vengurla, encompassing both densely populated settlements like Malwan (18,648) and smaller habitations such as Muth (134). This spatial-demographic overview provides a foundational reference for analyzing

tourism intensity, service provision, and local development dynamics within the coastal belt.

2. Methodology
Criteria and Indicators for Evaluating Tourism Development Impacts
The Toolkit inspired the indicators for evaluating tourism development impacts for Achieving Sustainable Development through Tourism by the United Nations World Tourism Organization (UNWTO), published in 2023, and the aspects of sustainable development (social, environmental, and economic) were inspired.

Table 1: List of villages with their 2011 census codes and total population.					
Sr No.	Census Village code	Village Name	Beach Name	Tehsil	Total Population (Numbers)
1	566311	Devgad	**Devgad**	**Devgad**	2471
2	566505	Jamdul	**Achara**	Malwan	249
3	566506	Pirawadi		Malwan	581
4	802878	Malwan (MCL)	**Malwan**	Malwan	18648
5	566597	Wayari	**Tarkarli**	Malwan	2892
6	566598	Tarkarli		Malwan	1780
7	566599	Kalethar		Malwan	449
8	566605	Devbag	**Devbag**	Malwan	2814
9	566668	Navabag	**Sagareshwar**	**Vengurla**	671
10	566669	Ubhadanda		Vengurla	334
11	566670	Vagheshwar		Vengurla	633
12	566671	Siddhawadi	**Vengurla**	Vengurla	592
13	566672	Kambaliwadi		Vengurla	416
14	566673	Sukhatanbag		Vengurla	714
15	566674	Kurlewadi		Vengurla	679
16	566675	Varachemad		Vengurla	702
17	566677	Mochemad		Vengurla	972
18	566678	Muth		Vengurla	134
19	566696	Tank	**Shiroda**	Vengurla	948
20	566697	Sagartirtha		Vengurla	440
21	566699	Arawali		Vengurla	1290
22	566704	Velagar		Vengurla	419
23	566638	Bogave	**Bogave**	Vengurla	955

The SDGs Wedding Cake (The SDGs Wedding Cake, 2016) is represented in the same toolkit.Based on previous studies, the criteria for assessing the impacts of tourism were categorised into three: economic, environmental, and social (Lal, 2020). Thirty-four Sustainable Development Goals (SDGs) targets were incorporated under these three criteria to assess the impacts. These SDG targets were utilised to monitor sustainable tourism impacts at the individual level and subsequently extrapolated to infer the potential impact on the community. The indicators under each target reflect the aspects that individuals from the study area have opinions about. Details of the criteria, indicators, and sub-indicators are described in Table 5.2.

Table 2: Aspect-wise list of SGD indicators and sub-indicators			
Aspects	**SDG Target**	**Indicators**	**Sub-Indicators**
(a)			
1. Economic	8.2	Training and education programmes supporting skilling, upskilling and reskilling of tourism workers	Workers receive quality training for tourism jobs.
	8.3	Number of procedures required to start a business	Number of days required to start a business
	8.5	Number of people switching from a different industry to the tourism industry	Average daily income of tourism workers
	9.3	MSMEs having access to financial services, finance lines, or other finance	Do you have access to a reliable credit facility?
	10.1	Whether there are infrastructures for connection to remote areas	Do you have access to a major road within 5 km?
	12.3	Amount of food waste generated per visitor/guest per day	Amount of food waste generated per visitor/guest per day
	9c	Number of tourism businesses using digital marketing services/platforms	Do your business available on online platform for people's engagement?
(b)			
2. Environmental	6.2	protocols for hygiene and cleanliness standards in tourism destinations	do your employees have access to a separate toilet facility?
	6.3	tourism businesses participating in water conservation programmes	Does your business recycle water?
	13.1	creation or improvement of a tourism crisis management plan/disaster risk management policy or strategy	Does your business have a protocol to follow in the case of a disaster?

	13.3	climate change awareness-raising initiatives from the private sector	Have you conducted any awareness programmes for climate change impact in the destination
	14.5	destination integrated in marine and coastal protected areas	Tourism activities of the destination integrated in marine and coastal protected areas.
	15.3	Percentage of total degraded area due to tourist/visitor use	Percentage of total degraded area due to tourist/visitor use
	5c	Achieve gender equality and empower all women and girls.	Promotion of gender equality and the empowerment
	6.1	Ensure availability and sustainable management of water and sanitation for all.	% of tourism businesses with wastewater treatment
	7.2	increase substantially the share of renewable energy in the global energy mix by 2030.	% of hotels using renewable energy
	14.1	By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.	Coastal pollution levels near resorts
(c)			
3. Social	1.3	(Social Protection Scheme) for tourism workers	Tourism workers have adequate social protections (healthcare, insurance, etc.).
	2.1	local producers supplying tourism businesses	Local businesses are well-integrated into tourism supply chains.
	2.3	Local agricultural/fisheries/forestry/pastoral/food production enterprises MSMEs related to the tourism sector	How many local businesses exclusively supply to tourism demand?
	3.3	protocols for hygiene and cleanliness standards in tourism destinations	Tourism destinations enforce strict hygiene and cleanliness standards to avoid spread of communicable disease
	3.6	management system to control the inflow of traffic in tourist areas,	Tourist areas have effective traffic control systems.

	3.9	tourism businesses are implementing sustainability policies/measures	Tourism businesses actively adopt sustainability measures.
	4.3	New/improved education and training programmes aligned with the national tourism	are there any tourism specific institute/programme taught?
	5.5	Percentage of women in a leadership position in the sector	Are women the owner of the business?
	11.1	Number of people who live in slums who are now working in new jobs created by the tourism project	Have your standard of living improved because of tourism?
	11.2	Percentage of tourists visiting a destination using public transport	Have you used public transport to reach the destination?
	11.6	Percentage of residents covered by modern energy infrastructure as a result of the tourism development project	Is your house connected with the grid?
	16.1	Number of violent crimes in the tourism destination	Violent crime is a serious problem in tourism zones
	16.3	Number of incidents of non-compliance with laws and regulations by tourists	Do police actively engage in law enforcement in the destination?
	16.6	Percentage of the local community satisfied with their experience with the destination management organization	Is there any kind of destination management body active to manage/regulate tourism affairs?
	11a	Links between urban, peri-urban and rural areas	Do tourists visit nearby rural areas?
	16b	Promote and enforce non-discriminatory laws and policies.	Do local people find it easy to find a job related to tourism?
	5c	Promotion of gender equality and the empowerment	Are there any women's cooperatives active in the destination?

Source: Compiled by the author using Toolkit for Achieving Sustainable Development through Tourism by the United Nations World Tourism Organiation (UNWTO).

Data Collection

The 23 villages across 3 Tehsils (Devbag, Malvan and Vengurla) in Sindhudurg district were selected for this study, as shown in Table 5.1.

The study employed both quantitative and qualitative methods of data collection. A field survey was conducted among the locals in April 2024 to collect socio-economic data and the perceptions of locals.The purposive sampling method was used to collect the data, as purposive sampling is appropriate when the goal is depth and relevance rather than population estimation, because it intentionally selects people who are exceptionally knowledgeable about the phenomenon and can speak to the study's aims (Palinkas et al., 2015; Tongco, 2007). It is also common in tourism stakeholder research, where researchers need informed perspectives from specific groups (e.g., SMEs near attractions, community leaders, local officials); recent open-access studies explicitly adopt purposive sampling for this reason (Achmad, Prambudia, & Rumanti, 2023; Makoni & Tichaawa, 2018; Kusumawardhani & Pradhana, 2024). The sample size of the individuals for interviews was determined using (Yamane,1973). A sample size of 137 individuals (101 locals and 36 tourists) was obtained.

$$n = N / (1 + Ne^2) \qquad (1)$$

Where n = the minimum number of individuals for interviews in the study site; N = total individuals' population (39783) in the coastal communities; and e = accepted margin of error (set at 10% or 0.10; i.e., 90% confidence level). While this method provides a practical estimate for large populations, it assumes purposive sampling and does not explicitly incorporate confidence levels or population variability. These limitations were considered in interpreting the findings.

Data Collection Tools

A semi-structured questionnaire with a mixture of open- and closed-ended questions was used to collect quantitative and qualitative data. The questionnaire consisted of two parts. Part 1, with nine questions, referred to the demographic characteristics of the tourists. Part 2 contained 34 statements relating to the sub-indicators of tourism development impact assessment. A five-point Likert scale was used for measuring the individual's perceptions, thus allowing them to express the extent of their agreement and disagreement with each sub-indicator. The five-point scale allowed adequate interpretation of the individuals' opinions and attitudes, adapted from [McLeod,2020], as shown in Table 5.3.

Table 5.3. Local perception analysis using a weighted average of the five-point Likert scale.

Assessment Range	Interpretation of the Impacts	Evaluation of the Impacts of Tourism Development
3.51–5.00	Perceived positive effects	Good and no need for improvement
2.51–3.50	Perceived neutral effects	Average and acceptable
1.00–2.50	Perceived negative effects	Poor and needs improvement

Source: Adapted from Robinson and Leonard (2016) and Robinson (2020).

3. Results
Demographic Characteristics of the Tourists
Tourists visiting Sindhudurg's coast are predominantly men (26; ~72%), but a significant proportion are women (10; ~28%). Most visitors are in their energetic, mobile years: the largest group is aged 18–35 (19; ~53%), followed by those aged 36–55 (14; ~39%), with a small senior segment (3; ~8%). Many are married (25; ~69%) and usually arrive in small groups of family or friends—typically 4–6 people (25; ~69%). In simple terms, the

dominant travel style is a "weekend family-and-friends getaway": decisions are made collectively, plans are practical, and safety, cleanliness, and ease of travel are highly important. Money and education levels suggest a comfortable, discerning audience. Nearly three in five report monthly household incomes above ₹27,000 (21; ~58%), while another third fall within the ₹9,000–₹26,999 range (13; ~36%). Only a few earn below ₹9,000 (2; ~6%). Education is notable: three-quarters hold a bachelor's degree or higher (27; 75%), with the remainder distributed across secondary education (7; ~19%) and diplomas (2; ~6%). This profile prefers clear information, online booking and payments, responsive service, and curated experiences rather than improvised ones. They also tend to value good design—clean washrooms, reliable signage, lifeguards at popular beaches, shaded rest areas, and efficient waste management. When these basics are met, they are willing to pay for convenience and quality. Trips tend to be short and purposeful. Same-day visits (13; ~36%) and 1–3 day breaks (19; ~53%) dominate; only a few stay 3–7 days (1; ~3%) or more than a week (3; ~8%). This indicates two key points. First, Sindhudurg currently functions as an easily accessible escape rather than a "settle-in" beach holiday destination. Second, visitors try to maximise limited time. Therefore, itineraries and infrastructure should support this: simple parking and last-mile transfers near beaches, quick orientation boards suggesting a two-hour circuit, reliable gear for short water-sports tasters, and fast yet authentic meal options. Clear half-day and full-day packages—such as "Malvan Fort + Tarkarli snorkel + sunset cruise," or "Rock-pooling walk + lighthouse visit + Konkan thali trail"—help visitors see more without the stress of planning. Employment patterns add another dimension. Over half work in the organized private sector (19; ~53%), with notable shares from small enterprises (8; ~22%) and farming (5; ~14%). A smaller proportion are self-employed in the unorganized sector (3; ~8%) or in government jobs (1; ~3%). This mix suggests peak times on weekends and holidays when people have predictable time off. Destination managers can tap into this pattern: focus events on Fridays–Sundays, extend evening hours for food streets and waterfront markets, and increase public transport or parking arrangements on busy days. Conversely, they could offer off-season pricing or weekday perks (e.g., free guided walks at 10 a.m.) to smooth demand. Landownership is nearly evenly split (yes 19; ~53% / no 17; ~47%), hinting at two complementary product lines. For visitors with rural roots or interests, activities linked to nature and community—such as mangrove or backwater canoeing, farm visits, spice-garden tours, or beach clean-up mornings ending with a local lunch—resonate. For urban visitors seeking comfort and novelty, upscale offerings include spotless beachfront amenities, well-organized snorkel or dolphin-watching trips, cafés serving local seafood, and "Instagrammable" viewpoints with safety railings and seating. The key is to blend both: high-quality operations that still feel local, not generic.

Table 3: Demographic Characteristics of the Tourists		
Demographic Variable	**Category**	**Number of Surveys (36)**
Gender	Male	26
	Female	10
Age	18–35 years	19
	36–55 years	14
	Over 55 years	3
Marital status	Single	11
	Married	25

	Others	00
Household size	1–3	10
	4–6	25
	7–9	1
	Above 10	00
Income rate (INR/month)	<9000	2
	9000–26,999	13
	>27,000	21
Level of education	Bachelor's and higher	27
	Diploma	2
	Secondary school	7
	Primary school	00
	Ill-literate	00
Length of stay	More than a week	3
	3-7 days	1
	1-3 days	19
	Same day	13
Profession	Small enterprises	8
	Self-Employed (Unorganised)	3
	Private Job (organised)	19
	Govt. Job	1
	Farming	5
Landholding	Yes	19
	No	17
Source: Compiled by the author from the field survey conducted in 2024.		

Social Impact of Tourism

Table 5.5 presents the social impact assessment of tourism in the study area, measured against relevant SDG targets using a five-point Likert scale. Indicators assessed include workers' social protection (SDG 1.3), hygiene enforcement (SDG 3.3), gender equality (SDG 5.5, 5.c), urban-rural linkages (SDG 11.a), and public safety (SDG 16.1, 16.3). Overall, the results reveal significant dissatisfaction with hygiene conditions, worker welfare, public transport, and law enforcement, with mean scores mostly below 3.0. Positive responses were observed for urban-rural connectivity and modern energy infrastructure (SDG 11.6), suggesting limited but impactful infrastructural benefits from tourism.

				Likert Score				
				1	2	3	4	5
Social Impact Indicators	SDG Target	Mean (Average perception)	SD (Agree/ Disagree level)	Median (Majority Sentiment)	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Tourism workers have adequate social protections (healthcare, insurance, etc.).	1.3	2.37	0.82	2.00	4	71	11	12	2
Local businesses are well-integrated into tourism supply chains.	2.1	3.48	1.22	3.00	4	27	9	37	23
Tourism destinations enforce strict hygiene and cleanliness standards to avoid spread of communicable disease	3.3	1.92	0.84	2.00	35	42	20	2	1
Tourist areas have effective traffic control systems.	3.6	2.34	1.00	2.00	15	57	10	15	3
Tourism businesses actively adopt sustainability measures.	3.9	1.82	0.77	2.00	35	52	10	2	1
New/improved education and training programmes aligned with the national tourism	4.3	2.21	0.78	2.00	12	63	19	4	2

Table 4 Likert score for social impact indictors.

Percentage of women in a leadership position in the sector	5.5	2.82	1.06	3.00	11	31	26	29	3
reduction in slum households due to tourism-led development	11.1	2.81	1.08	3.00	11	32	27	25	5
Percentage of tourists visiting a destination using public transport	11.2	2.02	0.79	2.00	19	69	5	5	2
Percentage of residents covered by modern energy infrastructure as a result of the tourism development project	11.6	3.81	0.97	4.00	4	9	7	62	18
Violent crime is a serious problem in tourism zones	16.1	1.78	0.81	2.00	41	44	12	2	1
Tourists frequently violate local laws and regulations.	16.3	2.17	0.84	2.00	20	50	24	5	1
Percentage of the local community satisfied with their experience with the destination management organization	16.6	2.34	1.13	2.00	22	48	9	16	5
Links between urban, peri-urban and rural areas	11a	3.55	1.01	4.00	4	11	27	42	16
Promote and enforce non-discriminatory laws and	16b	3.24	1.16	4.00	10	18	20	42	10

policies									
Promotion of gender equality and the empowerment	5c	3.01	1.19	3.00	11	32	7	45	5

Source: Likert scores were calculated by the author; SDG indicators were determined by SDG toolkit.

The social impact assessment of tourism in the study area, in alignment with various Sustainable Development Goals (SDGs), reveals a predominantly uneven distribution of benefits, exposing structural deficiencies in the sector's inclusivity and long-term social sustainability. Responses indicate substantial dissatisfaction across several indicators, particularly concerning workers' welfare, hygiene enforcement, governance, and community engagement. For instance, the provision of social protections to tourism workers (SDG 1.3) scored a low mean of 2.37, indicating that homestay owners are often unaware of existing government schemes, and banking institutions frequently deny loans for homestay ventures, leaving workers without social or financial safeguards. This financial vulnerability is compounded by a lack of institutional support, further marginalizing tourism-dependent households.

Hygiene standards (SDG 3.3) and traffic management (SDG 3.6) remain problematic, with over 70% disapproval. These concerns are amplified by local people often managing solid waste themselves in the absence of structured waste collection systems. Additionally, state transport buses do not frequently serve beach areas, affecting accessibility and contributing to unmanaged congestion. Meanwhile, community engagement (SDG 16.6) appears weak; Gram Panchayats are ineffective in soliciting local feedback, especially on solid waste issues, reducing the participatory quality of local governance.

Indicators on education and gender show modest gains. For example, women-run cooperatives ('Bachat Gats') demonstrate localized efforts in financial and skill empowerment, moderately supporting SDG 5.5 and 5.c despite limited policy backing. In contrast, educational alignment with tourism (SDG 4.3) fared poorly, with only 6% satisfaction—partly due to limited awareness and employment-linked education. However, infrastructure growth from tourism has had some indirect benefits, such as enabling students to access online learning, reflecting positive urban-rural linkages (SDG 11.a).

However, disparities remain glaring. The standard of living differs drastically between people living near beaches and those near rivers, indicating spatial inequality. Furthermore, "party tourists" do not engage meaningfully with the local community, weakening cultural exchange and social cohesion. Despite high tourism absorption capacity, fragmented public services and weak institutional responsiveness continue to undermine the sector's potential to deliver on its social SDG commitments.

Environmental Impact of Tourism
Table 5.6 outlines the environmental impacts of tourism through SDG-linked indicators such as sanitation (SDG 6.2), disaster preparedness (SDG 13.1), climate education (SDG 13.3), and integration into marine/coastal protected areas (SDG 14.5). Performance was generally weak, with most indicators scoring below the neutral threshold. Particularly low scores were seen in disaster risk planning and climate action awareness, while the integration of tourism into protected coastal areas showed relatively strong approval (mean 3.62). The results point to fragmented and reactive environmental practices that lack cohesive planning and community-based resilience measures.

Environmental Impact Indicators	SDG Target	Mean (Average perception)	SD	Median	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
Table 5: Likert score for environmental impact indicators.									
Protocols for hygiene and cleanliness standards in tourism destinations	6.2	2.17	0.99	2.00	24	51	11	12	2
Local food suppliers integrated into tourism value chains	2.1	2.96	1.04	3.00	4	37	25	27	7
Creation or improvement of tourism crisis management plan/disaster risk management policy or strategy	13.1	2.22	0.61	2.00	5	72	20	2	1
Tourism companies educate staff/visitors about climate action	13.3	2.15	0.84	2.00	15	66	11	5	3
Destination integrated in marine and coastal protected areas	14.5	3.62	0.77	4.00	5	2	20	72	1
Tourism development has caused significant land degradation	15.3	2.71	1.02	3.00	12	33	29	24	2
Promotion of gender equality	5c	3.85	1.13	4.00	5	12	7	45	31

	SDG Target	Mean (Average perception)	SD	Median	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
and the empowerment									
% of tourism businesses with wastewater treatment	6.1	2.45	1.13	2.00	15	53	12	12	8
% of hotels using renewable energy	7.2	3.12	1.10	3.00	9	21	26	37	7
Coastal pollution levels near resorts	14.1	3.3	1.05	4.00	7	17	22	47	7
Source: Likert scores were calculated by the author; SDG indicators were determined by SDG toolkit									

The environmental assessment reveals that while tourism has potential for sustainability integration, current practices are reactive rather than proactive. Hygiene and cleanliness protocols (SDG 6.2) scored poorly, with a mean of 2.17, underscored by the finding that rainwater harvesting is rarely practised. This reflects both a lack of infrastructure and environmental education. Disaster risk planning (SDG 13.1) also shows deficits, which align with field observations that tourism infrastructure is not resilient to natural disasters, leaving communities vulnerable to climate events.

Some signs of environmental co-benefits emerge. Coastal conservation (SDG 14.5) shows promise, particularly with the presence of a government-funded diving centre at Tarkarli, suggesting marine ecosystem-based tourism is being explored. However, solid waste issues persist—especially in small land parcels owned by local homestay operators, where space constraints hinder waste segregation and disposal. Meanwhile, infrastructure limitations restrict the adoption of sustainable waste or water management, worsening pressure on coastal ecosystems.

Public transport inaccessibility (SDG 11.2) further exacerbates the environmental impact, encouraging private vehicle use. Governance limitations are also evident: the Maharashtra Maritime Board, while overseeing beach activity, lacks an integrated environmental strategy, resulting in sporadic enforcement. While there is moderate engagement in coastal protection, land degradation and localized pollution remain under-addressed, with respondents expressing concern about tourist-induced ecological disruption.

In conclusion, the environmental performance of tourism in the region reflects a fragmented and under-regulated system. Without systemic planning—such as mandatory rainwater harvesting, resilient infrastructure, and decentralized waste management—the long-term ecological resilience of the region remains in jeopardy.

Economic Impact Indicators	SDG Target	Mean (Average perception)	SD	Median	Strongly Disagree %	Disagree %	Neutral %	Agree %	Strongly Agree %
Table 6: Likert score for economic impact indicators.									

								re e %
Workers receive quality training for tourism jobs.	8.2	2.57	0.83	2.00	4	51	31	12	2
Bureaucratic hurdles make it hard to launch tourism businesses.	8.3	2.76	1.11	2.00	4	57	5	27	7
Number of people switching from a different industry to the tourism industry	8.5	3.22	0.97	4.00	5	22	20	52	1
MSMEs tourism businesses can easily access loans/grants	9.3	2.32	0.97	2.00	15	57	11	15	2
Tourism generates excessive food waste per visitor.	12.3	3.15	1.13	3.00	5	31	20	32	12
Number of tourism businesses using digital marketing services/platforms	9c	3.71	1.19	4.00	7	13	9	44	27
Whether there are infrastructures for connection to remote areas	10.1	3.61	0.92	4.00	1	12	27	45	15
Wage gap between local and migrant tourism workers or male and female workers	10.2	2.83	1.10	3.00	13	28	25	31	3

Source: Likert scores were calculated by the author; SDG indicators were determined by the SDG toolkit.

Table 5.7 assesses the economic impact of tourism using indicators related to decent work (SDG 8.2, 8.3, 8.5), MSME access to finance (SDG 9.3), digitalization (SDG 9.c), and regional equity (SDG 10.1, 10.2). While there is moderate satisfaction with digital marketing use and infrastructure development, critical gaps remain in financial inclusion, vocational training, and wage parity—especially for local and female workers. Most economic indicators hover near or below the neutral mark, indicating uneven distribution of benefits and limited structural support for inclusive economic growth through tourism.

The economic impact analysis of tourism in Sindhudurg indicates an expanding sector with inclusivity challenges. While transitions into tourism (SDG 8.5) and digital engagement (SDG 9.c) are evident, structural barriers persist. For example, the return of migrated youth to work in tourism indicates positive labour absorption; however, job switching among locals due to seasonal staff shortages and a lack of training reflects poor vocational development (SDG 8.2). Likewise, entrepreneurial indicators (SDG 8.3) are hindered by difficulties in business expansion, which are further exacerbated by limited access to capital and a lack of government support, particularly for homestay owners.

Access to finance remains a critical issue. Banks do not provide loans on homestays or small land holdings (less than 2 acres), making it nearly impossible for small business owners to scale up. This explains the dismal rating for financial inclusion (SDG 9.3). Consequently, only a few benefit from the high profit margins in tourism, and most economic gains concentrate among a limited group. These findings echo concerns of inequality (SDG 10.2), particularly where land ownership is concentrated within a few communities, leaving others unable to benefit from tourism-led growth.

However, infrastructure improvements such as digital connectivity through tourism investment have enabled online education and commerce, aligning with SDG 10.1. Tourism also appears to contribute indirectly to household incomes—disposable income has increased in the region, and artisanal products made from coconut residue, though lacking promotion, hint at untapped creative economies.

Large hotels face operational constraints due to a lack of autonomy in service delivery (e.g., alcohol regulations) and inadequate government subsidies. These factors make the region less competitive compared to Goa, discouraging high-end tourism investment. Despite high absorption capacity in the sector, fishing and agriculture remain secondary and inconsistent income sources, leaving tourism as the dominant but structurally imbalanced livelihood pillar.

4. Conclusion

The tourism landscape in Sindhudurg, as examined through the Sustainable Development Goals (SDGs), presents a paradox of high potential and deep structural challenges. While the region has witnessed measurable benefits—such as increased disposable income, digital connectivity aiding education, and the return of migrated youth—these gains are unevenly distributed and fragile. Social indicators reveal a community that remains only partially integrated into the tourism economy. Limited awareness of government schemes among homestay owners, lack of social protection for workers, and poor institutional engagement—evident in the Gram Panchayat's inadequate feedback mechanisms—underscore the disconnect between tourism governance and grassroots realities. Environmental indicators reflect reactive rather than proactive measures; the neglect of rainwater harvesting, non-resilient infrastructure, and over-reliance on locals for waste management exemplify a fragmented environmental strategy. Although initiatives like the government-funded diving centre at Tarkarli and the involvement of women in "Bachat Gats" signal positive strides, they remain sporadic and poorly scaled. Economically, the tourism sector is expanding yet exclusionary. Homestays and micro-entrepreneurs face constraints due to limited access to formal credit, banks' reluctance to lend on small land parcels, and insufficient promotional support for local crafts, such as coconut residue artefacts. Additionally, big hotels face operational restrictions and fewer subsidies compared to neighbouring Goa, weakening the region's competitiveness. Seasonality shifts in tourist arrivals, particularly the decline in summer and post-monsoon peaks, further exacerbate the economic volatility.

To shift from fragmented development to sustainable and inclusive tourism, a multi-pronged approach is necessary. First, targeted awareness campaigns and handholding support are needed to ensure that homestay operators and small entrepreneurs can access government schemes and training programs. Second, financial institutions must adopt inclusive credit appraisal models that accommodate small landholders and informal operators. Third, local governance structures such as Gram Panchayats must institutionalize participatory planning and establish feedback loops for effective service delivery, especially in solid waste management and public safety. On the environmental front, mandatory rainwater harvesting norms, investment in climate-resilient infrastructure, and a decentralized waste management system should be implemented. Education linked to tourism vocations and promotion of circular economy models like artisanal coconut crafts can bridge the social and economic gaps. Finally, coordinated efforts between the Maharashtra Maritime Board, local tourism bodies, and civil society actors are essential to mainstream best practices and monitor progress against SDG targets. Only through such systemic, inclusive, and locally informed reforms can Sindhudurg harness the full potential of tourism as a sustainable development catalyst.

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