

THE TREND OF GREEN TOURISM DEVELOPMENT IN CAT BA: A MODEL COMBINES CONSERVATION AND SUSTAINABLE ECONOMIC DEVELOPMENT

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Abstract: Cat Ba, a part of the World Natural Heritage Ha Long Bay - Cat Ba Archipelago, is under significant pressure from the rapid growth of tourism activities. Green tourism development is not only a global trend but also an essential solution to ensure the balance between natural resource conservation and sustainable economic growth. This study focuses on analyzing the current situation and proposing a green tourism model for Cat Ba. Key aspects include green planning, investment in sustainable infrastructure, and leveraging the role of local communities.

Keywords: Green tourism, conservation, sustainable development, Cat Ba.

XU HƯỚNG PHÁT TRIỂN DU LỊCH XANH TẠI CÁT BÀ: MÔ HÌNH KẾT HỢP BẢO TỒN VÀ PHÁT TRIỂN KINH TẾ BỀN VỮNG

Tóm tắt: Cát Bà, thuộc Di sản thiên nhiên thế giới Vịnh Hạ Long - Quần đảo Cát Bà, đang chịu áp lực đáng kể từ sự gia tăng nhanh chóng của các hoạt động du lịch. Phát triển du lịch xanh không chỉ là xu hướng toàn cầu mà còn là giải pháp cần thiết nhằm đảm bảo sự cân bằng giữa bảo tồn tài nguyên thiên nhiên và phát triển kinh tế bền vững. Nghiên cứu này tập trung phân tích hiện trạng, đề xuất mô hình du lịch xanh tại Cát Bà. Các nội dung trọng tâm bao gồm quy hoạch xanh, đầu tư vào hạ tầng bền vững và phát huy vai trò của cộng đồng địa phương.

Từ khóa: Du lịch xanh, bảo tồn, phát triển bền vững, Cát Bà.

1. Introduction

Amidst global climate change and environmental degradation, sustainable

tourism development has emerged as a top priority for localities and nations worldwide. As a UNESCO-recognized

world biosphere reserve, Cat Ba is not only ecologically valuable but also plays a critical role in the marine economic development strategy of Hai Phong city and Vietnam. However, unchecked tourism activities have led to increasing pollution, depletion of natural resources, and adverse impacts on local communities. These issues pose significant challenges to conservation efforts and threaten the sustainability of both the tourism industry and local economic development in the region.

Sustainable development in this context requires close coordination among local governments, communities, and businesses to effectively implement green growth models in tourism. This approach aims to create solutions that simultaneously protect natural resources and promote local economic growth.

This paper focuses on key aspects of the green tourism model, including planning, green infrastructure investment, and community participation, to achieve a harmonious balance between conservation and economic development. Through practical analyses and theoretical models, the study provides a comprehensive perspective on the potential and challenges of building a green tourism development strategy in Cat Ba. It also proposes policies and practical solutions to effectively leverage the region's potential while ensuring a balanced development of economic benefits and environmental protection.

2. Literature Review

2.1. *Green Tourism and Principles of Green Tourism*

- *Green Tourism*: Green tourism emphasizes ensuring sustainable development in the tourism sector by optimizing the use of natural resources, minimizing negative environmental impacts, and encouraging active participation from local communities. According to the United Nations World Tourism Organization (UNWTO), green tourism not only supports local economic development but also contributes to preserving cultural identity and biodiversity.

In 2021, the Prime Minister of Vietnam approved the “**National Green Growth Strategy for the 2021-2030 period with a vision to 2050.**” This strategy underscores the promotion of green transition through initiatives such as developing green lifestyles, producing green tourism products, applying tourism models aligned with green growth, and issuing green tourism labels for tourism businesses. Additionally, the **Vietnam Tourism Development Strategy to 2030** highlights the goal of sustainable tourism development based on green growth principles, maximizing the industry's contribution to sustainable development objectives.

Green tourism is thus defined as tourism activities that minimize negative environmental impacts, contribute to biodiversity conservation, utilize renewable energy, promote natural and

cultural heritage, and develop environmentally friendly tourism products.

- Principles of Green Tourism:

+ **Resource Conservation:** Green tourism development requires the rational management and exploitation of natural resources, protection of ecosystems, and maintenance of biodiversity.

+ **Education and Awareness:** Local communities play a central role in fostering environmental awareness and education.

+ **Application of Green Technology:** Modern technologies such as solar energy, wastewater treatment systems, and green transportation are considered equitable solutions for balancing conservation and development. In the context of Cat Ba, the application of green technology will be pivotal in achieving both economic and environmental objectives.

2.2. Research Overview

- Successful Models from Jeju (South Korea) and Bali (Indonesia)

The success of green tourism in Jeju (South Korea) and Bali (Indonesia) has demonstrated that economic benefits can be achieved while preserving the environment. In Jeju, the implementation of a green public transportation system and sustainable management practices has transformed the island into a prominent international destination (Li & Zhang, 2021). Similarly, Bali has developed eco-resorts integrated with mangrove and coral reef conservation efforts, enhancing environmental awareness among tourists and local residents alike (Nguyen, 2022).

- The Role of Green Tourism

Green tourism plays a crucial role in alleviating the pressure on overcrowded tourist destinations and improving the quality of tourist experiences (Tran Thi Mai An, 2019). For green tourism in regions such as Ha Long and Cat Ba, development strategies must integrate modern technology with community participation (Nguyen Hoai Nam, 2016). This study highlights that establishing natural reserves and implementing incentive policies for green projects can significantly enhance sustainable tourism outcomes.

- Community and Business Contributions to Green Tourism

Both domestic and international studies emphasize that local community involvement is a key factor in the success of green tourism. Communities not only act as custodians of natural resources but also serve as primary beneficiaries of tourism activities. Additionally, tourism businesses must adopt green policies, such as minimizing plastic use, investing in sustainable infrastructure, and facilitating conservation initiatives (Jones & Hillier, 2017).

- Cat Ba's Potential for Green Tourism Development

With its rich ecological and cultural diversity, Cat Ba is an exemplary region with great potential for green tourism. However, achieving sustainable development in the area requires a comprehensive strategy encompassing environmental protection, the creation of

unique tourism products, and community education. Research suggests that improving infrastructure, adopting green technologies, and rational planning can help Cat Ba meet its conservation and economic objectives (UNESCO, 2020).

3. Research Methods

3.1. Data Collection Methods

Primary Data: Surveys were conducted with tourism management officials, business leaders, tourists, and local residents. The survey included both qualitative and quantitative questions aimed at assessing awareness, attitudes, and behaviors toward green tourism. Data were collected through direct interviews and self-administered questionnaires.

Secondary Data: Secondary data were compiled from official reports by the Hai Phong People's Committee, academic research materials, and information from international organizations such as UNWTO and UNESCO. Additionally, data on successful models in Jeju (South Korea) and Bali (Indonesia) were used for comparison and reference.

3.2. Data Analysis Methods

Based on the collected data, an analysis was conducted to evaluate the strengths, weaknesses, opportunities, and challenges of developing green tourism in Cat Ba. Specifically, strengths include a diverse ecosystem and strong community interest, while the major challenges are environmental pollution and the lack of green infrastructure.

International Model Comparison: Data from Jeju and Bali were analyzed and compared to the current situation in Cat Ba to draw lessons and tailor strategies to the local context.

The research methodology is designed comprehensively, combining primary and secondary data collection with both qualitative and quantitative analysis techniques. This ensures that conclusions and proposed solutions are scientifically grounded and practically viable, contributing positively to the development of green tourism in Cat Ba.

4. Results and Discussion

4.1. Challenges to Developing Green Tourism in Cat Ba

Cat Ba is one of Vietnam's unique and attractive tourist destinations, recognized as a UNESCO Biosphere Reserve. Its diverse ecosystems, including mangrove forests, coral reefs, and rich flora and fauna, present significant potential for green tourism development. However, recent data indicate that the rapid increase in unsustainable tourism activities has placed immense pressure on the environment and local communities.

- **Tourism Growth Pressure:** From 2020 to 2023, the Cat Ba tourism market experienced significant fluctuations, reflecting the impact of the COVID-19 pandemic and the strong recovery of the tourism sector.

+ **Tourist Volume:** From 2020 to 2021, the COVID-19 pandemic severely impacted tourism, reducing the number of visitors from

1.5 million in 2020 to only 196,178 in 2021 due to lockdowns and social distancing measures. 2022-2023: With the easing of restrictions, tourism rebounded strongly, with over 2.36 million visitors in 2022, increasing to 3.055 million in 2023. The number is projected to rise to 3.6 million in 2024.

International Tourists, the pandemic caused a sharp decline, with numbers dropping from 130,395 in 2020 to just 3,505 in 2021. By 2023, international arrivals surged to 554,710 and are expected to reach 700,000 in 2024. *Domestic*

Tourists, accounting for the majority of visitors, domestic tourism recovered quickly after the pandemic, with 2.5 million visitors in 2023 and a projected increase to 2.9 million in 2024.

+ Total Tourism Revenue: Tourism revenue clearly reflects the trends in visitor numbers. In 2021, revenue plummeted to VND 168.3 billion, but it rebounded to VND 2,045 billion in 2022 and reached VND 2,770 billion in 2023. Total revenue is projected to grow significantly in 2024, reaching VND 3,295 billion.

Table 1: Statistics on Visitors and Tourism Revenue in Cat Ba (2020-2023)

Indicator	Unit	2020	2021	2022	2023	Projected 2024
1. Total visitors	Visitors	1,500,000	196,178	2,360,000	3,055,000	3,600,000
- International	Visitors	130,395	3,505	82,638	554,710	700,000
- Domestic	Visitors	1,369,605	192,673	2,277,362	2,500,290	2,900,000
2, Total revenue	VND billion	1,025	168,3	2,045	2,770	3,295

(Source: Hai Phong Department of Tourism)

The data shows that Cat Ba tourism has overcome the challenging period of the pandemic, recovered strongly, and is now driving sustainable growth. The increase in international visitors highlights the potential for integration and development of foreign markets, while domestic visitors remain the backbone of the tourism sector. The robust growth in total revenue reflects the effective exploitation of Cat Ba's tourism resources.

However, this growth also exerts significant pressure on infrastructure and natural resources. Areas such as Lan Hạ Bay and Cát Cò Beach frequently experience overcrowding, particularly during the peak season from June to August.

- *Environmental Pollution from Plastic Waste*

A significant amount of plastic waste is generated daily from tourism activities.

Many coastal areas and beaches have accumulated plastic waste, diminishing the scenic appeal and causing severe harm to marine ecosystems. Coral reefs, which play a crucial role in maintaining biodiversity, are experiencing substantial degradation due to improper waste management.

- Wastewater Treatment and Water Pollution

In Cat Ba, many businesses lack systematic waste and wastewater treatment facilities. Wastewater from service establishments is often discharged directly into the sea or absorbed into the soil without proper treatment. Some restaurants even engage in the illegal trade of endangered wildlife, while unauthorized exploitation of valuable ecosystems continues in protected areas. These issues necessitate stringent intervention from environmental management authorities to ensure the sustainability of the region.

Despite having fewer beachfront kiosks compared to other coastal tourist destinations in the central areas of Vietnam, the large number of hotels, guesthouses, and restaurants imposes considerable environmental pressure. Only a small percentage of accommodation facilities have wastewater treatment systems meeting standards, while most existing systems are outdated or nonexistent, resulting in untreated wastewater being discharged directly into the sea. This not only causes severe marine pollution but also negatively impacts the conservation of marine species. Effective environmental

management and strict enforcement are needed to balance tourism development with marine ecosystem protection.

- Degradation of Natural Ecosystems

Mangrove forests in Cat Ba have shrunk from 1,200 hectares to approximately 1,050 hectares between 2015 and 2023, representing a 12.5% reduction. Phù Long mangrove forest, covering nearly 700 hectares and home to 32 plant species, is considered the best-preserved in northern Vietnam. It serves vital functions such as coastal protection, erosion prevention, climate regulation, and biodiversity conservation. It is also a critical habitat for the reproduction and shelter of marine species in Cat Ba Archipelago, a UNESCO Biosphere Reserve.

The primary cause of this decline is land encroachment for infrastructure development and commercial projects. Additionally, coral reef ecosystems are under serious threat, with coverage rates decreasing from 75% in 2010 to 50% in 2023.

- Lack of Sustainable Infrastructure

Despite efforts to invest in tourism infrastructure, many facilities in Cat Ba do not meet sustainable standards. Only about 20% of hotels and restaurants in the area fulfill energy-saving and waste management criteria. Environmentally friendly public transport options, such as electric vehicles or solar-powered boats, remain limited in both quantity and operational scope.

- Community Role in Environmental Management

In 2023, a survey by the Institute for Tourism Development Research revealed that only 40% of local residents participate in environmental protection and conservation activities. This is mainly due to a lack of technical and financial support from authorities, coupled with insufficient collaboration between organizations and local communities.

The challenges facing tourism in Cat Ba highlight the urgent need for adopting a green tourism model to minimize negative impacts and promote sustainable

development. Analyses indicate that the pressures of tourism growth not only affect the natural environment but also reduce visitor satisfaction, potentially diminishing Cat Ba's appeal as a tourist destination in the future.

- Survey Results on Tourists' Readiness for Green Tourism Development in Cat Ba

Tourists: A survey of 400 respondents showed that 80.75% assessed the development of green tourism products in Cat Ba (Hai Phong) as "highly feasible."

Table 2: Feasibility Assessment of Green Tourism Product Development in Cat Ba

Survey Level	Green Tourism Products	
	Number of Respondents	Percentage (%)
Not feasible	11	2,75%
Potential for development	47	11,75%
Highly feasible	323	80,75%
Other opinions	19	4,75%
Total	400	100%

Source: Compiled from survey questionnaires of the research project

Surveying 155 tourists visiting Cat Ba revealed mixed feedback on service quality and environmental awareness at the destination. Notably, 65% of tourists stated that services in Cat Ba were not environmentally friendly. Specific feedback highlighted that many lodging facilities and restaurants lacked effective waste management practices, while single-use plastic bags and bottles remained prevalent. Lan Hạ Bay, a hotspot for visitors, is facing waste accumulation due

to insufficient timely waste management measures.

- Local Community

A survey of 180 local residents in key areas such as Việt Hải Commune, Cat Ba Town, and coastal fishing villages revealed that 70% of respondents recognized the importance of environmental protection. However, only 40% actively participated in conservation activities due to limited governmental support and funding.

The survey results underscore the need to focus on two key aspects to promote green tourism in Cat Ba: improving green tourism infrastructure and services and enhancing the community's role in conservation efforts. Achieving these goals requires close collaboration among government agencies, businesses, and local communities, as well as support from international organizations for resources and expertise.

5. Proposed Model for Green Tourism Development in Cat Ba

Based on the survey results and lessons learned from green tourism models both domestically and internationally, proposed solutions for green tourism development in Cat Ba focus on three main pillars: green planning, green infrastructure investment, and enhancing community engagement. These components are designed not only to capitalize on the unique potential of the region but also to address pressing issues such as environmental pollution, natural resource degradation, and the limited involvement of local communities.

5.1. Green Planning

- Establishing Strict Nature Conservation Zones:

According to surveys, the mangrove and coral reef ecosystems in Cat Ba have suffered significant damage, with mangrove forest areas experiencing alarming declines over the past five years. To protect these ecosystems, strict conservation zones must be designated, and tourist access to sensitive areas should

be restricted. Monitoring should be conducted using modern integrated technologies such as environmental sensors and surveillance cameras to ensure compliance by all stakeholders.

- Developing Green Transportation:

Survey findings reveal that emissions from current transportation methods in Cat Ba are a major contributor to air pollution, negatively impacting tourist experiences. Investing in electric buses for intra-island transportation and solar-powered boats for tourist routes can significantly reduce CO₂ emissions. Additionally, public bicycle docking stations should be established at key tourist attractions to encourage the use of eco-friendly transportation.

5.2. Green Infrastructure Investment

- Building Modern Wastewater and Solid Waste Treatment Facilities: Currently, most plastic waste is neither sorted nor recycled, leading to severe pollution issues. Centralized wastewater treatment plants need to be established in densely populated and tourist-heavy areas such as Cat Ba town and Việt Hải commune. Furthermore, waste collection sites should be equipped with automated waste sorting systems and zero-emission incinerators that meet international standards.

- Promoting Renewable Energy in Hospitality and Service Facilities: Less than 20% of accommodations in Cat Ba currently implement energy-saving solutions. Financial support and tax incentives should be introduced to encourage businesses to invest in solar, wind, and other energy-efficient

technologies. Additionally, adopting green certification programs for accommodations and restaurants can raise awareness and enhance the competitiveness of the local tourism sector.

- *Implementing Decision No. 1746/QĐ-TTg by the Government on Ocean Plastic Waste Management (2019)*: Between 2025 and 2030, the objective is to reduce ocean plastic waste in coastal tourist areas by 80%–100%, eliminate single-use plastics and non-biodegradable plastic bags, and ensure 80%–100% of marine conservation zones are free from plastic waste.

5.3 Enhancing Community Engagement

- *Organizing Education and Training Programs on Green Tourism*: A 2023 survey showed that while 70% of local residents recognize the importance of environmental protection, only 40% actively participate in conservation activities. To address this, training programs should be designed with practical approaches, focusing on specific skills such as waste sorting, mangrove restoration, and guiding eco-friendly tourism practices. Schools and community centers in Cat Ba can serve as key training hubs, supported by the involvement of NGOs and international experts.

- *Encouraging Community-Based Tourism Models*: Community-based tourism models, such as homestays and local-guided tours, have proven effective in Việt Hải commune, where nearly 90% of surveyed tourists rated their experiences highly. Expanding this model requires

providing financial and technical support to local residents and establishing transparent management mechanisms to ensure equitable distribution of economic benefits.

5.4 Integrating Information Technology into Green Tourism Management

The application of information technology in tourism management can optimize efficiency and transparency. Mobile applications that provide information on green tourism destinations, guide visitors on environmental regulations, and alert them to overcrowding in sensitive areas should be developed. Additionally, big data systems can be implemented to track tourist behavior, enabling flexible adjustments in management strategies.

5.5 Strengthening International Cooperation

Collaboration with international organizations such as UNESCO, UNWTO, and regional partners can bring necessary resources and expertise to Cat Ba. Successful green tourism models from Jeju (South Korea) and Bali (Indonesia) serve as exemplary cases that can be adapted to enhance Cat Ba's reputation on the global tourism map.

The proposed solutions are not only feasible but also closely aligned with the realities of Cat Ba, as they are based on survey data and practical lessons learned. If implemented effectively, these solutions will enable Cat Ba to become not only an attractive green tourism destination but

also a significant contributor to the nation's sustainable development goals.

6. Conclusion

Green tourism in Cat Ba is not merely an inevitable trend but also a critical strategy for achieving the dual goals of natural resource conservation and sustainable economic development for Hai Phong City and Vietnam as a whole. With its unique geographic location and outstanding ecological value, Cat Ba has all the prerequisites to become a model for green tourism development in Vietnam. However, the region currently faces numerous challenges, including environmental pollution, tourism overcapacity, and limited community awareness. Therefore, the development and implementation of green tourism models will not only bring economic benefits but also preserve natural heritage for future generations.

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