



Natural Resources for Eco-Tourism Development in Da Nang City and Development Solutions

Hoang Sy Nguyen¹, Tran Hai Dinh², Hoang Sy Ngoc³, Nguyen Thi Thuc Trang⁴

^{1,2,3}National Academy of Public Administration, Vietnam

⁴People's Committee of Dien Ban town, Quang Nam province

ABSTRACT

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This article delves into the abundant natural resources within Da Nang City that hold immense potential for the development of ecotourism. Da Nang's unique geographical and ecological diversity, encompassing mountainous terrains, coastal areas, and rich biodiversity, presents a compelling backdrop for sustainable tourism ventures. The article explores various development solutions, encompassing strategic planning, community engagement, infrastructure development, environmental conservation, and marketing strategies, that can effectively harness these resources. Emphasis is placed on the need for responsible tourism practices, biodiversity preservation, and partnerships between stakeholders to foster a harmonious coexistence of tourism and environmental preservation. The insights provided serve as a valuable reference for policymakers, researchers, and practitioners seeking to promote ecotourism as a means of sustainable development in the vibrant city of Da Nang.

KEYWORDS:

Ecotourism; Natural Resources; Da Nang City; Sustainable Development; Environmental Conservation

1. INTRODUCTION

Da Nang, despite its modest geographical expanse, harbors substantial potential for the cultivation of ecotourism endeavors. This potential is manifest in the form of its diverse ecosystem, comprising two nature reserves and one landscape protection area, as well as the allure of its ecological landscape, which encompasses river systems, streams, and topographic features like mountain passes (An & Duong, 2022). The outcome of an appraisal of natural resources conducted to facilitate ecotourism development in Da Nang reveals that the Son Tra Peninsula sub-region garners highly favorable evaluations, while the two western mountainous sub-regions earn favorable assessments, and the coastal plain sub-region receives somewhat less favorable consideration for ecotourism development (An & Duong, 2022). The evaluation of these resources is instrumental in delineating spatial allocations for ecotourism development. Nevertheless, to foster the sustainable progression of ecotourism, the

formulation of comprehensive policies is of paramount importance from the outset (Le Tan et al., 2021).

Furthermore, throughout the implementation process, the concerted engagement of local authorities, investment entities, and notably, the resident community, is indispensable to ensure that ecotourism adheres to principled guidelines and restrictions, thereby minimizing adverse impacts on the natural environment (An & Duong, 2022; Thang & Thanh, 2023).

Da Nang, a locale that has long featured in discussions of tourism, is typically characterized by its youthfulness and the bounteous natural endowments bestowed upon it, including expansive, scenic beaches, meandering rivers, and majestic mountains (Pham & Truong-Dinh, 2018). Nevertheless, in the quest to make Da Nang an even more alluring destination, it becomes imperative to supplement and enhance existing resources while simultaneously conceiving novel tourism products that resonate with the preferences of discerning tourists (Pham & Truong-Dinh, 2018). Ecotourism, a genre that commands the attention of tourists and researchers alike, assumes a distinctive position by not only affording tourists immersive experiences but also instructing them in the art of venerating nature and safeguarding fragile ecosystems (An & Duong, 2022; Pham & Truong-Dinh, 2018). The assessment of natural resources stands as a pivotal underpinning for spatial

Corresponding Author: Hoang Sy Nguyen

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planning and the formulation of strategies governing the exploitation of territorial natural assets for the advancement of ecotourism. Despite its abundant potential, the progression of ecotourism in Da Nang has been relatively sluggish, failing to fully align with the region's latent prospects (Ngoc, Tien, Hieu, & Trang, 2023).

Resource assessment, regardless of context, emerges as a cornerstone for spatial planning, integral to the development of economic sectors, and particularly germane to the field of tourism (Huy & Khin, 2015). Presently, in a milieu wherein the natural environment bears the brunt of adverse human economic activities, ecotourism has emerged as a domain best suited to fulfill the requisites of sustainable development (Tien et al., 2019). This genre of tourism is distinguished by its principled mission to revere nature and shield the ecosystem from the deleterious influences and impacts of human intervention. In essence, it necessitates that visitors shoulder a shared responsibility for nurturing harmony between communities and perpetuating the livelihoods of indigenous populations in the vicinity of these natural realms (Dinh Thi Phuong Anh, 1997).

Da Nang stands as a city replete with salient assets in the realm of natural resources, owing to its pivotal central location within the central region, the multifaceted topography and hydrology it presents, a temperate climate that does not verge on extremity, a wealth of biodiversity ensconced within its two nature reserves and one landscape protection area, as well as a plethora of characteristic ecosystems primed for exploitation, investment, and the cultivation of ecotourism (Dinh Thi Phuong Anh & Le Vu Khoi, 2003). The assessment of tourism resources, particularly those of a natural provenance, assumes a preeminent role in furnishing a scientific foundation for the formulation, planning, and subsequent development of ecotourism within the city, especially during the current juncture.

2. ECOTOURISM DEVELOPMENT RESOURCES OF DA NANG CITY

2.1. The hilly area

Northern and Northwestern hilly sub-regions

The Northwest sub-region encompasses segments of the Ba Na - Nui Chua Nature Reserve and the Nam Hai Van Landscape Protection Area, both renowned for their rich and varied ecosystems. Within the Ba Na - Nui Chua Nature Reserve, an impressive inventory has documented 626 distinct animal species alongside 793 valuable plant species (Ba Na - Nui Chua Special Use Forest Management Board, 2015). Similarly, the Nam Hai Van Landscape Protection Area boasts 26 rare and precious genetic resources in addition to 101 species of endemic plants unique to Central Vietnam (Dinh Thi Phuong Anh & Le Vu Khoi, 2003). The ecological landscape within the Northwest Subregion is characterized by a combination of lowland subtropical evergreen closed

forests and tropical monsoon closed evergreen forests, each characterized by a diverse structural framework and species composition (Le Ba Thao, 1997).

Moreover, the coastal delta sub-region exhibits a diverse topographical profile, featuring medium mountain peaks, numerous rivers, and streams that hold considerable appeal for tourists, including the Luong Stream, Bac River, Nam River, Vung Bot River, and segments of the Cu De River basin. Notably, the Hai Van Pass is internationally acclaimed as one of the top 10 most scenic coastal roads globally. Nestled at the base of the Hai Van Pass is Nam Chon Bay, replete with fine white sands (Nguyen Khanh Van, 2008). However, it is important to acknowledge that the Northwest Sub-region primarily consists of medium and low mountains, characterized by significant topographical dissection and steep gradients ranging from 10 to 200, resulting in challenging terrain for navigation (People's Committee of Da Nang City, 2020). The climate in the Northwest sub-region predominantly features low to medium mountain climate characteristics, with annual precipitation levels ranging from 2,500 to 4,500 millimeters and average annual temperatures ranging between 18 and 24 degrees Celsius, which decrease with increasing altitude (Nguyen Khanh Van, 2008).

The mountainous sub-region of the Southwest

The southwestern sub-region comprises a substantial portion of the Ba Na - Nui Chua Nature Reserve, which is renowned for its elevated biodiversity and documented presence of numerous rare and precious species. Specifically, this reserve has registered the existence of 56 distinct animal species and 12 plant species, some of which are listed in the Vietnam Red Book of 2007 (Ba Na - Nui Chua Special Use Forest Management Board, 2015). The predominant ecosystem within this sub-region predominantly encompasses subtropical lowland subtropical rainforests and tropical rainforest closed evergreen forests. The topographic diversity present in this region serves as a catalyst for the formation of a multitude of landscapes, imbued with inherent ecological value, conducive to eco-tourism activities (Hoang Thi Kieu Oanh, 2019). These locales include the Ba Na Peak, Mo Stream, Hoa Stream, Ngam Doi Stream, Nam River, May Treo Waterfall, and Sky Well, all of which are exceptionally well-suited for activities such as picnicking, camping, and nature exploration (An & Duong, 2022). However, it is imperative to acknowledge that the predominant topographical features of the southwestern sub-region are characterized by low and medium hills marked by steep gradients, thereby presenting challenges for tourism development (Hoang Thi Kieu Oanh, 2019). Moreover, this sub-region is noteworthy for its diverse terrain, resulting in a rather unique climatic regime. Specifically, the southwestern sub-region exhibits a propensity for heavy rainfall, exceeding 4,500 millimeters annually, with the summit of Ba Na Peninsula registering precipitation levels surpassing 5,000

millimeters annually (An & Duong, 2022). Simultaneously, the adjacent peaks and slopes within this region experience relatively high annual rainfall exceeding 3,000 millimeters, coupled with average annual temperatures ranging from 20 to 24 degrees Celsius. Conversely, the hilly areas situated to the East and Southeast of the sub-region undergo a gradual reduction in annual rainfall, measuring less than 3,000 millimeters, alongside elevated average annual temperatures exceeding 24 degrees Celsius (An & Duong, 2022).

2.2. Coastal plains and peninsulas

Coastal plain sub-region

The coastal plain sub-region predominantly encompasses various wetland ecosystems, prominently featuring natural aquatic habitats situated within the Cu De River, Han River, Cau Do - Cam Le River, and Tuy Loan River systems. Furthermore, this sub-region encompasses approximately 30 lakes and lagoons, which play pivotal roles in water regulation, microclimate modulation, and the formation of the regional landscape. The biotic composition of these ecosystems is predominantly constituted by freshwater fish species (Le Tan et al., 2021). Geographically, the coastal plain sub-region exhibits a variable topographic profile, characterized by hilly terrain in its western expanse, while the majority of its area consists of flat, low-lying plains (People's Committee of Da Nang City, 2020). City biodiversity conservation project to 2030, vision to 2045, issued together with Decision No. 3410/QD-UBND dated September 14, 2020, Da Nang.). The ecological character of the coastal plain sub-region is intimately linked to its hydrological features, notably encompassing water bodies such as the Cu De River, Tuy Loan River, Hoa Trung Lake, and the Phuoc Nhon Mineral Water Point, all of which hold significant potential for tourism development. The most renowned attractions within the coastal plain sub-region include illustrious beaches such as My Khe and Non Nuoc. Climatically, this sub-region is distinctly tropical, typified by an average annual temperature of 25.7 degrees Celsius, an average annual precipitation ranging from 2,200 to 2,700 millimeters, an annual average of 168 rainy days, and an average humidity level of approximately 82% (Nguyen Khanh Van, 2008).

Son Tra peninsula sub-region

The Son Tra sub-region exhibits a diverse ecological landscape, prominently featuring the Son Tra Nature Reserve, renowned for its rich biodiversity, encompassing 985 varieties of higher plants, among which 22 are categorized as rare species. Additionally, this reserve houses 174 animal species, of which 15 hold the distinction of being precious genetic resources. Notably, the sub-region is home to a heritage tree in the form of a giant banyan tree, and it serves as habitat for the brown-shanked douc langur, an exceedingly rare and captivating animal species. Moreover, the coastal delta sub-region within this locale boasts thriving coral

ecosystems, boasting 177 species, spanning 17 distinct families (Dinh Thi Phuong Anh, 1997).

In terms of topographical attributes, the Son Tra semi-continental sub-region is characterized by low mountainous terrain replete with natural attractions, including the Ban Co Peak, meandering streams, and picturesque beaches such as Tien Sa Beach, Bai Dai Beach, Rang Beach, and Bac Beach, all of which possess considerable tourist appeal. The climatic conditions prevailing in the Son Tra sub-region are characterized by an average annual temperature of 25.6 degrees Celsius, an average annual sunshine duration of 2,273 hours, an annual average rainfall of 2,456 millimeters, and a relative humidity level averaging 85% (Dinh Thi Phuong Anh, 1997).

2.3. Favorability of natural resources for ecotourism in Da Nang City

The Northwestern sub-region exhibits a favorable disposition for the development of ecotourism. Notably, recent initiatives in this sub-region have resulted in the exploration of various ecotourism destinations, including the Cu De River basin encompassing establishments such as Yen Retreat and An Nhien Farm, the Luong Stream, and farmstay accommodations situated at the base of the Hai Van Pass (Thu & Dinh, 2022). It is worth highlighting that while several appealing ecotourism destinations, such as Bac River, Nam River, and Vung Bot, exist in this sub-region, their organization has been impeded by challenges related to inconvenient transportation infrastructure, resulting in a predominantly self-discovered modus operandi (Le Tan et al., 2021).

Moreover, the Ba Na - Nui Chua nature reserve area predominantly comprises special-use forests, characterized by a challenging topography that has thus far deterred ecotourism development. Within this sub-region, there is potential for various forms of ecotourism, including forest-based eco-tourism integrated with biodiversity exploration, volunteer-driven ecotourism initiatives, eco-lodges, and ecotourism programs with a healthcare component for the infirm (Ngoc et al., 2023).

The Southwest Sub-Region: An Apt Locale for Ecotourism

The Southwest sub-region represents a favorable landscape for the promotion of ecotourism. This sub-region currently serves as the site for numerous ecotourism destinations, such as the Suoi Hoa ecotourism area, Ngam Doi, Hoa Phu Thanh, Lai Thieu, and the Nui Than Tai hot spring park (Peterek et al., 2020). Notably, the Ba Na peak, while being the most popular tourist attraction in the sub-region, has undergone a construction process that has had a detrimental impact on the natural environment (Holladay et al., 2022).

Furthermore, ecotourism destinations located within the Ba Na - Nui Chua nature reserve, such as the May Hanging Waterfall and Gieng Troi, remain largely

unexplored due to the formidable and challenging terrain (Holladay et al., 2022). Similar to the Northwestern sub-region, the Southwest sub-region offers diverse avenues for ecotourism, encompassing forest eco-tourism intertwined with biodiversity exploration, volunteer-driven ecotourism initiatives, eco-lodges, and ecotourism opportunities intertwined with medical support for those in need.

The Sub-Coastal Delta: Limited Ecotourism Prospects

In contrast, the Sub-Coastal Delta sub-region presents a less conducive environment for ecotourism development. The principal trend in this sub-region is the emergence of marine ecotourism, primarily focused on swimming activities exclusively available at My Khe and Non Nuoc beaches. Although the region boasts scenic beaches, their accessibility for public use is obstructed by the proliferation of resorts (Holladay et al., 2022).

Noteworthy ecotourism destinations in this sub-region include Yen Retreat in Hoa Bac commune and the Phuoc Nhon hot spring in Hoa Khuong commune. Plans to harness the potential of the Tuy Loan River for tourism purposes face numerous challenges, resulting in a lack of supporting tourism products. This sub-region exhibits potential for agricultural ecotourism and lake-based ecotourism, albeit on a relatively smaller scale (Holladay et al., 2022).

The Son Tra Sub-Region: A Prime Eco-Tourism Destination

In contrast, the Son Tra sub-region emerges as an exceedingly favorable environment for ecotourism pursuits. Positioned as an attractive tourist destination within Da Nang city, this sub-region boasts a multitude of ecotourism sites, including Vong Canh Hill, Ban Co Peak, the Helipad, the Giant Banyan Tree, Son Tra Tinh Vien, and various bathing spots along the peninsula's shoreline. The ease of transportation within the Son Tra peninsula, facilitated by comprehensive investment, augments the attractiveness of this region (Holladay et al., 2022).

Moreover, coral diving activities have been introduced, albeit with limited effectiveness due to their adverse impact on coral reefs. This sub-region offers a diverse range of ecotourism opportunities, encompassing forest eco-tourism intertwined with biodiversity appreciation, volunteer-driven ecotourism initiatives, and ecotourism programs dedicated to the preservation of coral ecosystems.

In conclusion, the preliminary stage of resource assessment stands as an indispensable prerequisite before the formulation and execution of development plans across various economic sectors. The outcomes of resource assessment serve to delineate the distribution of natural resources within a given geographical territory, consequently influencing the suitability of each area for distinct economic activities based on their inherent natural characteristics.

3. ECOTOURISM DEVELOPMENT PROJECTS ARE UNDERWAY

In the strategic trajectory of Da Nang's tourism development, spanning from the present to 2025, with a vision extending to 2030, the Department of Tourism has meticulously delineated a spatial framework for tourism expansion. This framework is characterized by an orientation that accentuates the convergence of mountainous and maritime elements (Thang & Thanh, 2023). Notably, it designates Son Tra, Ba Na, Hai Van, and Ngu Hanh Son as pivotal focal points, encompassing these locales to craft an encompassing tourism region that orbits around the core of the central city. This approach, in essence, imposes restrictions on the spatial domain allocated for tourism development within the central urban precinct (Holladay et al., 2022).

The blueprint for tourism product development, aligned with this spatial strategy, underscores four principal categories: high-end beach resort tourism, travel, shopping, entertainment, seminars, and conferences, cultural, historical, spiritual, ecological, village, and craft village tourism, and urban tourism synergistically linked with the central city as the regional nucleus.

Historically, Da Nang has primarily concentrated on the exploitation of maritime tourism, with visitors predominantly engaging in aquatic activities and visiting extant monuments and scenic sites within the city center. Consequently, the city's tourism sector aspires to diversify its offerings by investing in and fostering products related to craft villages, community engagements, and harnessing the inherent strengths of the local populace (An & Duong, 2022).

Among the projects ratified and issued by the City People's Committee, there are noteworthy initiatives such as the "Development of Community Tourism at Tho Quang - Man Thai Beach" and "Developing Nam O Community Tourism." These projects, for the most part, focus on development orientations, managerial solutions, infrastructure investments, and the delineation of service zones aimed at infusing vibrancy into the tourism landscape (An & Duong, 2022). These enhancements encompass recreational, entertainment, and shopping opportunities tailored to cater to the diverse needs of tourists. In tandem, these initiatives seek to mobilize community participation in the tourism sector, thus contributing to the augmentation of local incomes and the overall development of the regional economy (Holladay et al., 2022).

Within the framework of the "Developing Community Tourism at Tho Quang - Man Thai Beach" project, this locale is envisaged to be structured into service clusters encompassing beachside coffee and bar facilities, traditional massage services, beachside gastronomy, souvenir shops, experiential activities simulating the life of fishermen (comprising activities such as crafting bottle baskets, weaving baskets and nets, casting nets, and fishing alongside

fishermen), the art of arranging basket boats, themed souvenir photography zones, event and community activity areas, marine sports, and entertainment services, encompassing coral diving experiences, and seafood culinary offerings (An & Duong, 2022).

Similarly, the "Developing Nam O Community Tourism" project seeks to introduce tourism products that encompass experiences such as observing sunrise and sunset while navigating Nam O Bay aboard basket boats, swimming at Nam O Beach, embarking on educational tours to understand the historical narrative of local monuments, exploring the snail museum, partaking in cultural activities, visiting traditional craft villages, savoring local Nam O cuisine, experiencing homestay accommodations within local residences, touring mural-adorned villages, engaging in leisurely walks, and exploring the Nam O rapids (Holladay et al., 2022).

In closing, Da Nang's strategic vision for tourism development, charted until 2025 with a vista stretching to 2030, revolves around an intricate spatial strategy and diversified product offerings. This approach aims to optimize the potential of mountainous and maritime elements while preserving the integrity of the central city, thus positioning Da Nang as a dynamic and multifaceted tourism destination.

4. SOLUTIONS TO EFFECTIVELY EXPLOIT RESOURCES FOR ECOTOURISM DEVELOPMENT IN DA NANG CITY

In order to effectively leverage the available resources for the advancement of ecotourism within the confines of Da Nang City, the imperative dictates the adoption of a multifaceted approach (Pham & Truong-Dinh, 2018). This approach should holistically encompass sustainable strategizing, active community participation, the progressive development of infrastructural facets, and an unwavering commitment to environmental conservation (Holladay et al., 2022). Presented below are the salient and academically-styled solutions that warrant consideration:

Strategic Planning and Zoning: Deliberate upon the formulation of an all-encompassing ecotourism master plan, characterized by the meticulous identification and prioritization of ecotourism sites (Pham & Truong-Dinh, 2018). This endeavor should be founded upon an intricate appreciation of the innate natural, cultural, and historical attributes pertinent to each locale. Pledge allegiance to the enactment of zoning regulations designed to safeguard ecologically sensitive areas, while concurrently allocating specific zones that are expressly earmarked for ecotourism development.

Infrastructure Development: Channel resources into the critical domain of infrastructure development, encompassing the enhancement of roads, trails, visitor centers, and sanitation facilities (Pham & Truong-Dinh, 2018). These investments are poised to substantially augment both

the accessibility and overall quality of the visitor experience. Delineate provisions for the establishment of eco-friendly accommodations, such as eco-lodges or sustainable campgrounds, strategically situated within or in close proximity to ecotourism sites. Such establishments hold the promise of catering to the accommodation requirements of discerning tourists.

Environmental Conservation: Institute stringent environmental regulations, with unwavering enforcement measures aimed at minimizing the ecological footprint associated with ecotourism activities. Facilitate the implementation of waste management and recycling programs, crafted with the intent of preserving the pristine state of ecotourism sites, while concurrently ameliorating pollution-related concerns (Pham & Truong-Dinh, 2018).

Community Engagement: Endeavor to actively engage local communities in the various stages of ecotourism planning and decision-making. Such participation serves as an invaluable conduit for the inclusion of community needs and concerns within the broader ecotourism framework (Pham & Truong-Dinh, 2018). Advocacy and promotion of community-based ecotourism initiatives should occupy a central position, as these initiatives afford local residents the opportunity for active involvement and tangible benefits derived from tourism activities.

Education and Interpretation: The establishment of interpretive centers and the implementation of informative signage at ecotourism sites should be a priority, imparting education to visitors regarding the intrinsic significance of natural and cultural resources (Pham & Truong-Dinh, 2018). Consider offering guided tours, facilitated by knowledgeable local guides capable of furnishing visitors with comprehensive insights into the surrounding environment and indigenous culture.

Biodiversity Conservation: Execute conservation programs aimed at the safeguarding of endangered species and their habitats within ecotourism areas. Extensively support research initiatives dedicated to the monitoring and comprehensive study of biodiversity within these regions, with an overarching objective of contributing to their enduring preservation.

Marketing and Promotion: Formulate a robust marketing strategy that seeks to disseminate Da Nang City's ecotourism potential through diverse channels, encompassing digital platforms, engagement with travel agencies, and active participation in international tourism expos (Pham & Truong-Dinh, 2018). Forge collaborative partnerships with travel influencers and eco-conscious travel organizations, jointly endeavoring to raise awareness and appreciation for the city's ecotourism offerings.

Visitor Management: Act judiciously in the deployment of visitor quotas or time restrictions in ecologically sensitive regions, effecting an imperative measure aimed at mitigating over-tourism and the associated

degradation of fragile ecosystems (Pham & Truong-Dinh, 2018). Champion the cause of responsible tourism practices, where adherence to Leave No Trace principles is zealously encouraged, instilling a conscientious approach amongst visitors to minimize their ecological impact.

Training and Capacity Building: Envisage the rollout of structured training programs designed to elevate the skill sets of local guides, conservationists, and hospitality personnel in the arena of ecotourism management and sustainability. Conceive and administer certification programs, a commendable avenue for recognizing and affirming the dedication of both enterprises and individuals committed to the cause of sustainable ecotourism practices (Holladay et al., 2022).

Monitoring and Evaluation: Inaugurate a systematic monitoring apparatus tasked with the periodic evaluation of the environmental and social ramifications arising from ecotourism activities (An & Duong, 2022). Vigilantly adapt and refine ecotourism strategies based on meticulous feedback and evaluation findings, thereby assuring an ongoing trajectory of progressive refinement.

Public-Private Partnerships: Foster synergistic collaborations and partnerships between governmental entities, private enterprises, and non-governmental organizations. This collaborative endeavor amalgamates their collective resources, expertise, and financial support, thereby catalyzing ecotourism development and conservation efforts.

Financial Incentives: Institute a range of financial incentives, grants, or tax exemptions targeted at businesses and entities that espouse environmentally-friendly practices and make a discernible contribution toward the preservation of ecotourism sites (Pham & Truong-Dinh, 2018). By steadfastly implementing these meticulously conceived solutions, Da Nang City stands poised to harness the inexhaustible wealth of its natural and cultural assets, thereby paving the way for the development of a sustainable ecotourism sector that is inherently congruent with the preservation of the environment and the betterment of local communities (An & Duong, 2022).

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