

Ecotourism Development Strategy Of Mount Baung Nature Tourism Park, Pasuruan Regency, East Java Province

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ABSTRACT

Developing ecotourism as a transformative tourism model based on nature conservation, environmental education, and improving the welfare of local communities is a key agenda in Indonesian conservation areas. This research aims to formulate an optimal and sustainable ecotourism development strategy in the Mount Baung Nature Tourism Park, Pasuruan Regency, East Java. The method used was descriptive with a mixed approach (qualitative-quantitative), including direct observation, interview surveys with managers and 30 tourists, and document review. Strategy formulation was conducted using a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis and the IFAS and EFAS matrices to evaluate the area's internal and external factors. The research identified significant potential for the Mount Baung National Park, including: biological potential (unique bamboo forests, shade-providing flora, and fauna) and non-biological potential (100-meter-high Coban Baung Waterfall and steep). A site carrying capacity analysis confirmed the area's ideal location for controlled ecotourism. Based on a SWOT analysis, the Mount Baung Nature Tourism Park is located in Quadrant I (Strengths-Opportunities), indicating excellent conditions and the need for an aggressive growth strategy (Growth-Oriented Strategy). The main strategies formulated include protecting and securing the area, restoring the ecosystem, developing educational tourism potential (including Mini Hydro power), enhancing management professionalism, and strengthening partnerships.

Key words: Nature tourism park, Mount Baung, educational tourism, in situ, Pasuruan.

ABSTRAK

Pengembangan ekowisata sebagai model pariwisata transformatif yang berlandaskan konservasi alam, edukasi lingkungan, dan peningkatan kesejahteraan masyarakat lokal menjadi agenda penting di kawasan konservasi Indonesia. Penelitian ini bertujuan merumuskan strategi pengembangan ekowisata yang optimal dan berkelanjutan di Taman Wisata Alam (TWA) Gunung Baung, Kabupaten Pasuruan, Jawa Timur. Metode yang digunakan adalah deskriptif dengan pendekatan campuran (kualitatif-kuantitatif), meliputi observasi langsung, survei wawancara terhadap pengelola dan 30 wisatawan, serta studi dokumen. Perumusan strategi dilakukan menggunakan Analisis SWOT (Strengths, Weaknesses, Opportunities, Threats) serta Matriks IFAS dan EFAS untuk mengevaluasi faktor internal dan eksternal kawasan. Hasil penelitian mengidentifikasi potensi signifikan TWA Gunung Baung, meliputi: potensi hayati (hutan bambu unik, flora peneduh, dan fauna) dan potensi non-hayati (Air Terjun Coban Baung setinggi 100 meter dan tebing curam). Analisis daya dukung tapak menegaskan kawasan ini ideal untuk ekowisata yang terkendali. Berdasarkan analisis SWOT, TWA Gunung Baung berada di Kuadran I (Kekuatan-Peluang), yang mengindikasikan kondisi sangat bagus dan memerlukan strategi pertumbuhan yang agresif (Growth oriented strategy). Strategi utama yang dirumuskan mencakup Perlindungan dan pengamanan kawasan, Pemulihan ekosistem, Pengembangan potensi wisata edukasi (termasuk potensi Mini Hidro), Peningkatan profesionalisme pengelola, dan Penguatan kemitraan.

Kata kunci: Taman wisata alam, gunung baung, wisata edukasi, in situ, pasuruan

INTRODUCTION

Sustainable tourism development is now an increasingly urgent global agenda, driven by increasing awareness of the importance of natural resource conservation and cultural preservation (Gupta et al, 2024). In this context, ecotourism has emerged as a transformative tourism model based

on three main pillars: nature conservation, environmental education, and improving the well-being of local communities (Budiatiningsih et al., 2024).. Ecotourism is defined as responsible travel to natural areas, aimed at conserving the environment and improving the well-being of local residents (Samal dan Das, 2023). In Indonesia, known as a megabiodiversity country (Sanka et al.,

2023), ecotourism is a vital strategy for managing and utilizing conservation areas (Sisriany and Furuya, 2025) such as Nature Tourism Parks (NTP), National Parks, and Nature Reserves wisely and sustainably.

As a province with significant potential in forest, mountain, and marine tourism (Sunarsih *et al.*, 2021), East Java is considered a strategic region for ecotourism development that warrants attention from the central government (Rosyidi, 2018). Consequently, nature tourism within the province has been designed as an integrated component of national development (Hakim *et al.*, 2017). Ecotourism development in this region is directed at managing the potential of forest, mountain, and marine tourism, as explained in the Decree of the Director General of Natural Resources and Ecosystems concerning the Long-Term Management Plan for East Java Province for 2018-2027. However, in its development, many tourism products are still mass-produced and focus on general economic, social, and ecological values. Currently, innovation in sustainable ecotourism models is needed, which maintain the preservation of nature and local culture, often referred to as integrated ecotourism.

The Mount Baung Nature Tourism Park in Pasuruan Regency, East Java Province, is one of the important conservation areas in the eastern region of Java (Joyti and Wagistina, 2023). This Nature Tourism Park has a dual function, namely as a nature conservation area that can be used on a limited basis for tourism and nature recreation. Batur Mount Nature Tourism Park area was designated as a Nature Tourism Forest through the Decree of the Minister of Agriculture Number: 657 / Kpts / Um / 9/1980. Its main attractions are natural attractions in the form of waterfalls (such as Coban Baung which has a height of 100), the potential for special interest activities such as fun rafting on the river, hiking, and camping. The Mount Baung NTP is also a habitat for various species of plants and animals, including unique bamboo stands. The potential natural beauty and biodiversity of the Mount Baung NTP make it a strategic asset for ecotourism development in Pasuruan Regency, and over the past five years, this area has received many tourist visits.

The Mount Baung Nature Tourism Park (NTP) has begun to receive attention from various parties regarding their efforts to protect the area and develop its natural tourism potential (Mediana 2017; Anisa *et al.*, 2023; Triadi *et al.*, 2017). The waterfall located on Mount Baung and the mountain views are one of the tourist attractions on Mount Baung that can be developed as forest ecotourism.

This area is also home to various plants and animals around Mount Baung (Anisa *et al.*, 2023; Ilyasa, 2023). Natural Tourism Park (management must be able to balance strict conservation efforts with the utilization of environmental services that provide economic contributions to the region and surrounding communities. According to Pattiwael (2018), the aspects that need to be considered in conservation-based ecotourism management include economic, social, and environmental sustainability; the formation of local community institutions and partnerships; the development of community-based ecotourism; and the principles of education and nature tourism. Increased tourism activities without careful planning have the potential to cause environmental degradation, a decline in the quality of carrying capacity, and minimal benefits directly felt by the community. The Mount Baung NTP itself is starting to receive attention from various parties related to efforts to protect the area and develop its natural tourism potential.

Research on the ecotourism potential of Mount Baung is currently limited. The ecotourism potential Research on Mount Baung to date has focused on facilities at the waterfall, mountain views, and forests that have potential for bird tourism (Insan *et al.*, 2024; Dinatur, 2021). In addition, research has also discussed the distribution, number, and relationships between bamboo plants in the Mount Baung Nature Tourism Park, East Java (Sofiah *et al.*, 2013). Elsewhere, research has been conducted on how to involve local communities in maintaining the conservation forest in the Mount Baung Nature Tourism Park to reduce deforestation (Warsono, 2014). Furthermore, reports on the ecotourism potential of Mount Baung have been shared online (Ilyasa, 2023; Chanan, 2011; Farqoni *et al.*, 2023). This indicates a gap in the formulation of a comprehensive strategy. Ecotourism represents a significant opportunity to increase tourism sector revenue and employment, particularly for local communities. With increased prosperity, it is hoped that greater awareness of the sustainability of ecotourism sites will emerge. The Mount Baung National Park Long-Term Management Plan has been developed as a guideline for the Nature Conservation Division of East Java for the 2018–2027 period. Therefore, this research is highly relevant for developing an optimal strategy.

Based on the above background, this study aims to analyze internal factors (Strengths and Weaknesses) and external factors (Opportunities and Threats) that influence ecotourism development in the Mount Baung Nature Tourism Park and by the results of this analysis will be used to formulate

alternative strategies for the most optimal and sustainable ecotourism development in the Mont Baung NTP, Pasuruan Regency, East Java Province, with the hope of supporting environmental conservation efforts and increasing community participation and welfare in its management.

MATERIALS AND METHOD

Study Site

This research was conducted at the Mount Baung Nature Tourism Park in Pasuruan Regency, East Java Province, from January to July 2025.

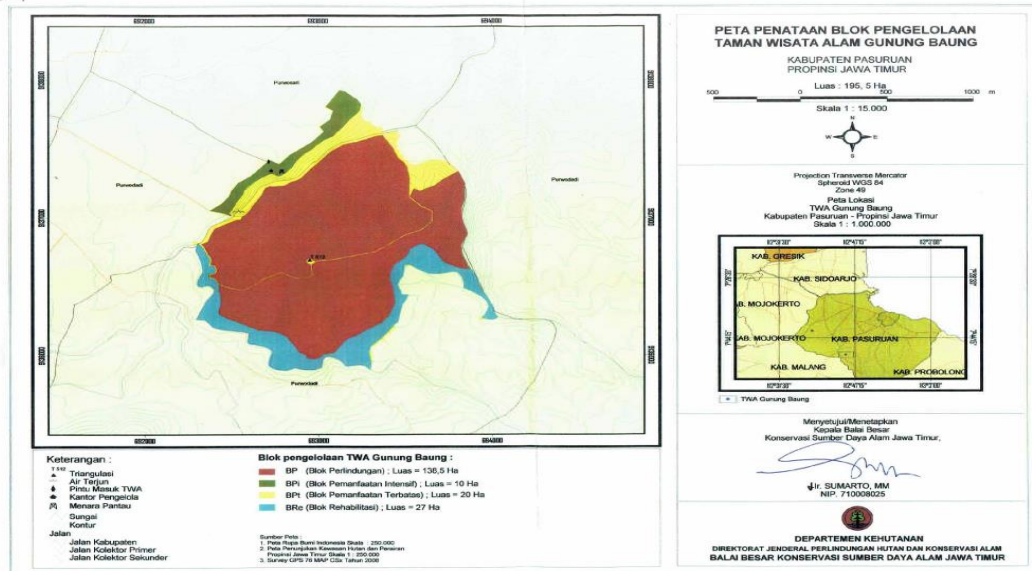


Figure 1. Reserach Location In Mount Baung Nature Tourism Park

Procedure

Data Collection Techniques

Employing a descriptive mixed-methods approach, this study investigated the biotic, physical, and influential factors of ecotourism development in Mount Baung, Pasuruan. Primary data collection involved direct observations of the area's infrastructure and natural attractions, paired with interviews targeting ecotourism managers and 30 local tourists. This was supplemented by secondary data compiled from relevant agency documents, research reports, and academic publications..

Data Analysis.

When organizing ecotourism activities, the carrying capacity of the local area must also be taken into account. The method used to calculate the carrying capacity for developing natural ecotourism is the concept of Area Carrying Capacity (D_y). D_y is the space requirement for the maximum number of visitors that can be physically accommodated in a designated area at a given time without causing disruption to nature and humans. The calculation of D_y is carried out using the following formula (Dauglas, 1995):

$$D(y) = \frac{(D) \times (a)}{(C) \times (TF) \times 43,560 \text{ ft}^2 / \text{Acre}}$$

Where=

- D (y)** = Space Requirements
- D** = Demand (Visitor Capacity)
- A** = Standard Space Requirements per Person
- CD** = Capacity Day (Visiting Days Per Year)
- TF** = Turnover Factor (User Transfer/Change Factor)
- Acre** = $4.646 \text{ m}^2/\text{Ft} = 30 \text{ cm}$

Ecotourism development strategies are determined through a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. This analysis (Ginting et al., 2013) aims to formulate a management strategy by focusing on evaluating the internal (Strengths and Weaknesses) and external (Opportunities and Threats) environmental aspects of the ecotourism location.

This strategy development utilizes the Internal Strategic Factors Analysis Summary (IFAS) Matrix, the External Strategic Factors Analysis Summary (EFAS) Matrix, and the SWOT Diagram Matrix as tools. Each identified SWOT factor is then analyzed by assigning a weight and score (ranking). The weighting ranges from 0 (not important) to 1 (very important), with the requirement that the total weight of all strategic factors add up to 1.

RESULTS AND DISCUSSION

Socioeconomic Characteristics of the Community

The Mount Baung Nature Tourism Park is surrounded by three villages in two sub-districts: Cowek and Lebak Harjo in Purwodadi, and

Kertosari in Purwosari. The following describes the socio-economic conditions of the communities: Lebakharjo covers an area of 828 hectares, Cowek covers 1,009 hectares, and Kertosari covers 385.48 hectares.

Table 1. Village Area, Distance to Subdistrict, and Percentage of Area to Subdistrict

No.	Category	Village		
		Lebakrejo	Cowek	Kertosari
1	Area (km2)	8,28	10,09	3,85
2	Distance to sub-district capital (km)	6	3	2
3	Pr Percentage of sub-district area (%)	10,96	13,35	6,37

Source: Central Bureau of Statistics 2016

Table 2. Population and Population Density

No.	Category	Village		
		Lebakrejo	Cowek	Kertosari
1.	Population (people)	5702	5245	4446
2.	Population density (people/km2)	689	520	1153,36

Source: Central Bureau of Statistics 2016

Table 3. Number of Households and Population by Gender

No.	Category	Village		
		Lebakrejo	Cowek	Kertosari
1	Number of households (KK)	1729	1225	1276
2	Males (People)	2822	2547	2205
3	Females (People)	2880	2671	2241
4.	Sex ratio	0,98	0,96	0,99
5.	Average household size (People)	3,3	4,28	3,48

Source: Central Bureau of Statistics 2016

Table 3 shows that visitors are predominantly students and young adults aged 17–25 with a balanced gender ratio, primarily visiting for educational tourism and recreation. This youthful

demographic underscores the area's high potential as a regional hub for conservation education and low-impact nature tourism.

Table 4. Population by nationality

No.	Category	Village		
		Lebakrejo	Cowek	Kertosari
1	Indonesian Citizens (People)	5702	5245	4446
2	Foreign Nationals	-	-	-
	Total	5702	5245	4446

Source: Central Bureau of Statistics 2016

Although the quantitative percentage of the entire local population directly employed in ecotourism was not explicitly measured, field observations indicate that community involvement is growing. Local residents are integrated into the park's economy primarily through micro-entrepreneurship, operating approximately 67 food stalls and 13 restaurants, as well as managing community-based water distribution organizations (HIPAM) that utilize the area's water services.

Biological Potential; Flora and Fauna of Mount Baung Nature Park As a pristine lowland tropical forest, Mount Baung Nature Tourism Park (NTP) functions as a vital habitat "island" and a center for germplasm preservation amidst surrounding cultivated and urban areas. The botanical potential of this NTP is uniquely characterized by a vast, dense bamboo forest harboring 12 distinct native and introduced species, including Gesing bamboo (*Bambusa arundinacea*) and Ampel bamboo (*Bambusa vulgaris*). Beyond its bamboo ecosystem, the area is rich in shade-

Potential Ecotourism Objects and Attractions

providing and carbon-storing trees. Key large tree species include the Banyan (*Ficus benjamina*), Walikukun (*Schoutenia ovata*), Kepuh (*Sterculia foetida*), Bendo (*Artocarpus elastica*), Gondang (*Ficus variegata*), and Saga (*Abrus precatorius*). Additionally, the park features ecologically significant local species that serve as research focal points, such as *Syzygium pycnanthum* from the Myrtaceae family.

In terms of fauna, Mount Baung NTP supports a diverse array of wildlife. Identified mammals include the barking deer (*Muntiacus muntjak*) and the gray macaque (*Macaca fascicularis*). The park is also a premier location for bird-watching, sheltering 19 families of Aves consisting of 24 genera and 29 species—including notable sightings of the Hornbill (*Buceros rhinoceros*) and Jungle Fowl (*Gallus* sp.)—alongside various herpetofauna (reptiles and amphibians).

Despite facing threats from urban encroachment, the development of ecotourism in Mount Baung NTP provides a positive, non-extractive framework for conservation. Under its official status as a Nature Tourism Park, these protected flora and fauna are safeguarded from commercial harvesting and physical exploitation. Instead, ecotourism shifts the utilization of non-timber forest products (NTFPs) from traditional commodity consumption toward high-value eco-services, scientific research, and educational tourism. Strategically, preserving the dense bamboo canopy and forest vegetation secures the area's microclimate and vital hydrological functions, which directly sustain the community-led water distribution systems (HIPAM) in adjacent villages, blending ecological preservation with community welfare.

Non-Biological Potential

Waterfalls

The Mount Baung Nature Tourism Park offers captivating waterfalls that serve as primary physical attractions for visitors. The most iconic is Coban Baung Waterfall, a spectacular 100-meter-high cascade formed by the confluence of two permanent, year-round rivers: the Welang River and the Beji River. Surrounded by high cliffs covered in lush tropical forest vegetation, it offers a majestic natural atmosphere and an ideal healing spot, though visitors are generally prohibited from swimming in the main pool due to strong currents.

Mountain Scenery

Mount Baung NTP offers a refreshing mountain scenery with a varied topography reaching an altitude of 501 meters asl, providing a cool and tranquil tropical highland atmosphere. Visitors can experience this natural beauty through hiking and trekking trails that showcase lush lowland tropical forests dominated by unique bamboo communities, natural geological formations, and pristine river cliffs. To maximize its scenic potential, the area features strategically located observation towers with panoramic views of the forest canopy and the adjacent Purwodadi Botanical Gardens, complemented by camping facilities that integrate adventure, conservation, and relaxation into a comprehensive nature tourism experience.

Cliffs

Mount Baung NTP holds significant cliff tourism potential for adventure and special interest tourism, particularly around the 100-meter-high Coban Baung waterfall, which is surrounded by steep cliffs of ancient Quaternary rock. While conventional rock climbing routes are limited, these formations offer ideal geological challenges for activities like canyoning, trail running, and extreme hiking within a pristine conservation ecosystem. The development of this adventure-based ecotourism area strictly aligns with the park's conservation mandate, balancing physical challenges and safety with ecological preservation, while the dense forest cover ensures a cool climate and striking visual appeal.

Rivers

Mount Baung NTP offers significant river tourism potential driven by two permanent rivers, the Welang and Beji Rivers, which form the Coban Baung Waterfall and serve as ideal routes for water-based adventure. A key attraction is ecological river rafting, an exciting activity that utilizes the stable year-round water flow while allowing participants to observe the pristine lowland forest, high cliffs, and native wildlife like birds and large bats. Beyond adrenaline-pumping options, the rivers support relaxing activities such as fishing and wading in safe areas, while serving critical hydrological functions by irrigating rice fields and supplying clean water to nearby villages. Ultimately, this river tourism model seamlessly integrates adventure, conservation education, and a deep appreciation for the vital ecological roles of water resources..

Physical Potential

M N VDX ount Baung NTP spans a total area of 197.2 hectares, which includes a 27-hectare Rehabilitation Block (13.69%) dedicated to

restoring past ecosystem degradation.
Geographically situated between 07°VGK FDV

Table 5. Alternative Accessibility to Mount Baung

Alternatives From – To City	Distance (Km)	Time (Minutes)	Vehicle
1. Surabaya – Purwodadi District	65	120	Wheel motor 2/4
2. Purwodadi District – M. Baung	1,5	10	Wheel motor 2/4
3. Malang – Purwodadi District	25	40	Wheel motor 2/4
4. Purwodadi District – M. Baung	1,5	10	Wheel motor 2/4
5. Surabaya – Pasuruan	69	90	Wheel motor 2/4
6. Pasuruan – Purwodadi District	30	45	Wheel motor 2/4
7. Purwodadi District – G. Baung	1,5	10	Wheel motor 2/4

As indicated in Table 5, accessibility is a primary internal strength due to the site's strategic location directly adjacent to the main Surabaya–Malang regional highway. This high connectivity, combined with well-paved roads and close proximity to major urban centers, ensures easy access for both individual tourists and large educational tour groups.

History of the Area

Originally designated as a Nature Reserve covering 195.5 hectares under the 1959 Decree of the Minister of Agriculture, the Mount Baung Forest Area in Pasuruan Regency, East Java, frequently attracted the local community for tourism due to its beautiful waterfall scenery. However, following persistent violations and disturbances from the surrounding community, its status was changed to a Nature Tourism Park (NTP) through the Decree of the Minister of Agriculture Number 657/Kpts/Um/9/1980 on September 11, 1980, legalizing its use based on its rich biodiversity, natural beauty, and unique geology. Later, on March 25, 2014, the forest area of Mount Baung NTP was officially re-designated and expanded to a total area of 197.2 hectares under the Decree of the Minister of Forestry Number SK.1863/Menhut-VII/KUH/2014.

Physical Conditions

Climate, Topography, Soil Type, Geology and Hydrology

Based on the Schmidt and Ferguson classification, the Mount Baung NTP area features a monsoon-influenced Type D climate, characterized by a 76.47% Q value, an average annual rainfall of 2,571.5 mm across approximately 144.20 rainy days, and daily temperatures between 20°C and 23°C. The region experiences a rainy season from

November to April (minimum 100 mm/month) and a dry season from May to October (maximum 60 mm/month). Topographically, the area is predominantly undulating to hilly—with limited flat areas and some steep slopes ranging from 45 to 60 degrees—and spans an elevation between 250 and 501 meters above sea level.

The soil of Mount Baung comprises red-yellow Mediterranean and latosol elements formed from old Quaternary metamorphic deposits, as classified by the Bogor Soil Research Institute in 1966. Geologically, the area's structure is shaped by the Bromo, Lower Quaternary, and Tengger Volcanic rocks, alongside the Welang formation. Hydrologically, the Nature Tourism Park is traversed by two perennial, fast-flowing rivers—the Welang and the Beji—with the Welang River notably hosting the 100-meter-high Baung Waterfall (locally known as Coban Baung).

The towering cliffs surrounding the river enhance the area's non-living natural resources, complementing Baung Waterfall alongside four additional 10-to-20-meter-high waterfalls located along the eastern side's Beji River. These perennial waters offer immense utility for clean water, irrigation, energy source, and fishing, while also supporting river rafting activities where visitors can navigate rocky paths and observe seasonal large bats and various protected animals. However, despite their high ecological and recreational value, these rivers unfortunately face environmental pressures as they also serve as waste disposal sites for surrounding residential and industrial areas.

Current Condition (Area Importance)

Under the 1980 Decree of the Minister of Agriculture, the status of the 195.5-hectare Mount Baung Nature Reserve in Pasuruan, East Java, was officially changed to a Tourism Forest (Taman Wisata). Specifically designated for development in recreation, tourism, education, and culture, the

area's primary management values center on its abundant water assets. Chief among these is the iconic Baung Waterfall, commonly known as Coban Baung, which serves as the park's central attraction alongside several critical internal water sources.

Situated on the west side of the park along the 20-meter-wide Welang River, Baung Waterfall is located at coordinates 9136993.03 N, 692492.66 E (Zone 49 S) at an elevation of 296 meters above sea level. The waterfall itself stands approximately 50 meters high from its pool, maintaining a seasonal water discharge that ranges from 2.7 in the dry season to 5.38 during the rainy season. Because its source originates outside the area and borders local settlements, the river faces frequent community and

industrial waste dumping; while formal water quality metrics have not yet declined, physical field conditions reveal visible garbage and a cloudy, brownish discoloration along the river.

As the premier tourist icon of Mount Baung, the waterfall can be appreciated either from an observation post near the park entrance or up close at its pool via a designated 1,000-meter trail. Beyond this main attraction, a 2014 field inventory identified seven distinct natural water sources situated within the park's Rehabilitation Block. The majority of these vital water sources are directly utilized by local communities across four surrounding villages: Cowek, Kademungan, Kertosari, and Semut.

Table 6. Names of Water Sources and the Amount of Discharge on Mount Baung

No	Name of Water Source	Village Users	Number of Households	Discharge (l/sec)	Description
1	Gambiran I	Kademungan	200	18,54	Already utilized
2	Gambiran II	Kertosari	350	25,7	Already utilized
3	Gambiran III	Semut	92	15,67	Already utilized
4	Gambiran IV	-	-	2,17	Not utilized
5	Waterfall Cowek	-	-	12,96	Already utilized
6	Waterfall Cowek II	Desa Cowek	70	2	Not utilized
7	Benji River Beji	-	-	0,76	Not utilized

Source: Nature Conservation Division of East Java, 2014

Beyond its recreational value, Baung Waterfall is planned as an energy source following a 2016 Water Energy Utilization Business Permit granted to PT. Kanz Capital by BKPM (Letter No. 2/1/IUPEA/PMDN/2016). To strengthen the conservation functions of the area, a five-year Cooperation Agreement (2017–2022) was signed on May 9, 2017 (No. PKS. 32/K.2/TU.2/KSA/5/2017) between the East Java Nature Conservation Division and PT. Kanz Capital to build tourism infrastructure and road access for minihydro construction and operation. This partnership targets four core programs: biodiversity protection, infrastructure development, microhydro educational tourism, and community empowerment. Furthermore, the field inventory confirms that out of Mount Baung's seven natural water sources, five are actively utilized by communities across Cowek, Kademungan, Kertosari, and Semut villages, while the remaining two sources remain unutilized

Non-commercial water utilization activities in the Mount Baung area are legally authorized under four separate permits issued by the Head of the Nature Conservation Division of East Java on August 29, 2014. These permits regulate the

community water management groups (HIPPAM) across four distinct areas: HIPPAM Tirta Sari in Cowek Village (Decree No. SK. 54.1/BBKSD.JAT-2.1/2014) utilizes a water discharge of 6.48 liters/second for 70 people; HIPPAM Kertosari Village (Decree No. SK. 55.1/BBKSD.JAT-2.1/2014) manages a discharge of 12.85 liters/second serving 350 people; HIPPAM Semut Village (Decree No. SK. 56.1/BBKSD.JAT-2.1/2014) channels 7.85 liters/second to 92 households; and HIPPAM Sumber Urip in Kademungan Village (Decree No. SK. 57.1/BBKSD.JAT-2.1/2014) distributes a discharge of 9.27 liters/second to support 200 households.

Carrying Capacity Analysis for Natural Tourist Objects and Attractions Utilization

Mount Baung, as a nature conservation area used for tourism and outdoor activities, must consider its environmental carrying capacity. This is based on the consideration that Mount Baung is a lowland tropical rainforest area, one of the few remaining on the island of Java. The calculation of the carrying capacity of a conservation area for recreational activities as follow:

At Mount Baung, the site's capacity for recreational areas is as follows: The area to be used for nature tourism is 30 ha = 300,000 m², consisting of 10 ha of intensive use and 20 ha of limited use, The total area is 197.5 ha., the annual visitation (CD)

Table 7. Turnover Factor (TF) and Standard Space Requirements (a) for Ecotourism Activities in Mount Baung NTP

No	Activities	TF	a (m ²)
1.	Camping	1,0	10,0
2.	Picnics	1,5	10,0
3.	Infrastructure	1,5	10,0

Based on the carrying capacity calculations, the site's annual visitor capacities vary significantly by zone. The camping area (1,893.5 m²) can accommodate 16,617 people per year, while the larger picnic zone (100,000 m²) supports up to 1,316,363 people per year. Additionally, the infrastructure land area (7,729 m²). Assuming the capacity of facilities and infrastructure (Occupancy 60%) = 101,748 people per year = 167 people per day. Physical adaptations and infrastructure management within the Mount Baung Nature Tourism Park (NTP) mitigate environmental degradation through several key mechanisms based on spatial control and carrying capacity: Spatial Containment via Block Zoning, Designated Tracking and Physical Walkways, and Infrastructure Calibrated to Site Carrying Capacity

Based on the Site Carrying Capacity calculation for activities within the Mount Baung area, the development of Mount Baung tourism is aimed at ecotourism. Ecotourism is a tourism concept that reflects environmental awareness and adheres to the principles of balance and conservation of nature. Generally, ecotourism development should improve the quality of interactions between individuals, improve the standard of living of local residents, and protect the environment. Ecotourism development within the Mount Baung NTP will adhere to ecotourism development standards, including: Utilizing natural resources without damaging the natural environment and encouraging private sector participation in conservation programs; Increasing public understanding and changing public mindsets regarding conservation efforts for natural resources and their ecosystems; Providing economic benefits for area managers, ecotourism organizers, and communities surrounding the natural tourism park area, and having a broad impact on the economy of Pasuruan Regency, East Java Province, and nationally; Building collaboration with local

is assumed to be twice a week, so in 1 year = 12 months = 52 weeks, there are 104 days of visits. The turnover factor (TF) and standard m² space requirements (a) are as follows:

communities to involve the people surrounding the Mount Baung NTP from the planning stage through implementation, as well as monitoring and evaluation of ecotourism development and provide accurate data regarding the potential of the area for tourists, so that the public has the opportunity to enjoy it

Potential Strategy for Developing Mount Baung Ecotourism

The strategic planning process for managing Mount Baung Nature Tourism Park can be approached through a SWOT (strengths, weaknesses, opportunities, and threats) analysis. The SWOT analysis process involves clearly defining objectives for various management alternatives and identifying internal and external factors that support or hinder the achievement of these objectives. The SWOT analysis method can be conducted by reviewing and grouping various aspects that influence these four elements, then applying them in a SWOT matrix format.

The application includes how strengths in the management of the Nature Tourism Park can exploit existing opportunities to gain advantages, how weaknesses in management can be overcome that hinder the utilization of these opportunities, how strengths in management can address emerging threats, and finally, how weaknesses can potentially create new opportunities. SWOT analysis produces options for carrying out activities that respond to the interaction between strengths and opportunities, strengths and threats, weaknesses and opportunities, and weaknesses and threats.

Research Results: Identification of Internal and External Analysis of the Management of the Mount Baung Natural Park

STRENGTH

1. The area has a clear legal status (designation).
2. The area has been organized into blocks.
3. Strategically located and easily accessible.

4. Rich flora (natural forest) and fauna (birds), unique topography, water sources, and microclimate regulation.
5. Potential natural tourist attractions include: waterfalls, four waterfall locations, cliffs along the river, beautiful views, and several unique vegetation types.
6. The Nature Conservation Division of East Java is committed to developing a better and more aspirational management system.
7. The presence of a technical agency for Area Management and other institutions, including the private sector, universities, and NGOs.
8. Permits and collaborations with third parties in natural resource management exist.

WEAKNESS

1. The area database and information are incomplete.
2. There is a 27-hectare degraded area in the Rehabilitation Block.
3. Law enforcement against illegal activities remains weak.
4. The Mount Baung Block does not yet comply with Regulation of P.76 year 2015.
5. Infrastructure is inadequate, both in quantity and quality.
6. Alternative educational tourism activities are still limited.
7. There is no third party holding a Business License (IUPSWA) or Business License (IUPJWA).
8. The management institution has not optimally utilized the tourism area.
9. The number and quality of human resources are limited.
10. The management institution and its human resource performance are not yet professional.

OPPORTUNITIES

1. The existence of local community institutions that support area management.
2. The existence of regulations that support tourism development (Law No. 5/1990, Law No. 5/1994, Law No. 41/1999, Law No. 10/2009, Law No. 32/2104).
3. The Pasuruan Regency Spatial Plan (RTRW) accommodates Mount Baung in spatial planning.

4. The public's tendency to travel is increasing.
5. Alternative tourism based on in-situ conservation.
6. The potential of Mini Hydro as an educational tourism attraction.
7. Entrance fees according to PNPB are still affordable.
8. The existence of third parties interested in submitting IUPSWA and IUPJWA applications.

THREATS

1. The potential for disturbance to the area increases due to settlements directly adjacent to the area and population growth.
2. Weak public awareness of the function of the KK (Family Forest Management Unit).
3. Harvesting of bamboo and bamboo shoots.
4. Hunting of wildlife.
5. Encroachment by the community.
6. Vandalism.
7. Many ODNTN (Natural Conservation Areas) offer attractions similar to ecotourism destinations.
8. Frequently changing regulations regarding IUPSWA and IUPJWA.
9. Competitors in nature tourism.

Through a SWOT analysis, eight strategies were identified to achieve the management vision of Mount Baung NTP, namely:

1. Protection and security of the area
2. Ecosystem restoration
3. Development of educational tourism potential
4. Area planning and evaluation
5. Database development
6. Improving management professionalism
7. Provision of infrastructure
8. Strengthening partnerships

To overcome infrastructure and promotion deficits, management should leverage multi-stakeholder partnerships (government, private sector, and academia) to fund low-impact facilities—such as public amenities and eco-friendly trails—strictly within the carrying capacity of 167 people/day. Concurrently, limited promotion can be resolved via digital marketing, virtual tours, and social media campaigns to showcase Mount Baung's unique biodiversity. This collaborative, digitally driven approach efficiently enhances

ecotourism appeal while maintaining ecological integrity.

Growing demand for environmental education and nature tourism can be leveraged by developing structured conservation programs—such as bird-watching and botanical workshops—utilizing Mount Baung's unique bamboo ecosystem and avifauna habitats to attract academic and eco-conscious tourists while enhancing ecological awareness.

Climate change and market competition can be addressed by strengthening ecosystem resilience through strict zoning enforcement and habitat rehabilitation, while differentiating the NTP as a specialized conservation-education hub utilizing unique biological assets to secure a sustainable market niche.

Strategy and Action Plan

As an elaboration of the strategy, an action plan is determined by considering the relationship between the initial conditions, desired conditions, and the vision and mission of the Mount Baung Nature Tourism Park Management Plan.

Area Protection and Security

Area protection and security aims to safeguard the state's rights over the area and its contents from all disturbances caused by both humans and nature, such as forest product theft, encroachment, waste disposal, fires, and other violations. The action plan to implement this strategy is as follows: first is the the ducation and Socialization, it aims to provide the public and other stakeholders with an understanding of the importance of the Mount Baung area and the regulations surrounding it. These activities are carried out routinely, both formally and informally, second is the empowerment of Forest Police Partner Communities (PPC) and Fire Awareness Communities (FAC) aims to strengthen community-based forest management and protection. PPCs are trained in forestry, tourism, inventory, and outreach to support forest police duties. Third is The Boundary Marker Maintenance, Annual boundary maintenance is conducted to inspect and maintain these markers, providing the necessary data to plan future boundary reconstructions. Fourth is Protection and Security Patrols. Protection and security patrols in the area are carried out as a preventative measure to maintain the area's security from both human-caused and natural disturbances. Fith is Security Operation, was conducted following valid information regarding forestry crimes occurring in the Mount Baung area. This operation was a repressive measure aimed at

law enforcement and the last is Water pollution and waste monitoring, occurs in the Welang River because the river's headwaters are located outside the catchment area, it is conducted annually.

Ecosystem Restoration

Ecosystem restoration aims to gradually recover an ecosystem's dynamic balance, biological resources, and physical environment. Mount Baung contains a 27-hectare damaged area designated as a rehabilitation block. Because ecosystem restoration studies classified this site as moderately damaged requiring enrichment, a restoration strategy has been scheduled for 2018–2021. The implementation action plan is detailed below: first is Preparation of the Annual Work Plan (RKT). Its the annual work plan is prepared at the beginning of the year in which ecosystem restoration is implemented, second is Planting, the planned ecosystem restoration area on Mount Baung is 27 hectares, divided into two planting phases: 15 hectares in 2018 and 12 hectares in 2019. Third is Plant maintenance, it was carried out in years I, II, and III, namely 2018, 2019, 2020, and 2021. And the last is Monitoring and Evaluation, it will be conducted annually until the ecosystem restoration activities are completed in 2021.

Developing Educational Tourism Potential

Educational tourism is a knowledge-focused subset of ecotourism that integrates environmental education into its core framework. Given its status as a Nature Conservation Area (KPA) managed by BBKSDA East Java and its proximity to the Purwodadi Botanical Garden, Mount Baung NTP has strong strategic potential to serve as a natural laboratory and an integrated learning-based ecotourism center. However, its current educational offerings remain underutilized and unorganized. To address this, an inventory is essential to identify viable development sites, ultimately producing a spatial distribution map of the area's educational tourism potential.

First the Masterplan Development, It elaborates on the Area Management Plan, aligned with national tourism planning and regional tourism planning for the management of wildlife sanctuaries, national parks, forest parks, and nature tourism parks. Second DED Preparation, In construction projects, can be understood as the output of a planning consultant, generally used to create detailed plans (working drawings) for civil engineering projects such as buildings, swimming pools, roads, bridges, dams, and other construction projects. The third is Interpretation Program

Development. After identifying educational Natural Tourism Attraction Object (NTAO), an interpretation program was developed, fourth is Visitor Management, is carried out through data collection, ticketing, assistance, and outreach. And the last is promotion, to disseminate information about educational tourism at Mount Baung

Area planning and Evaluation

Area planning is based on Government Regulation Number 28 of 2011, the action plan to implement this strategy is as follows: first is the Area Potential Inventory, is conducted to determine the area's potential, with the aim of obtaining comprehensive area management data, including biological, non-biological, and socio-economic potential of the community. This activity is carried out routinely every year and second is Evaluation and Adjustment of the Long-Term Management Plan. Preparation of Short-Term RP. It is The Long-Term Long-Term Management Plan is a breakdown of the Short-Term Management Plan, and its prepared annually. Management Block Review. The Mount Baung management block was ratified in 2010, it serve as input for proposed block changes. Site Design Review. The site design of Mount Baung was Utilization Block is divided into two areas: a 20-ha public area and a 10-ha business area. To accommodate changing field conditions, an evaluation and adjustment of the Mount Baung site design is necessary.

Partnership.

Optimizing integrated ecotourism development will directly scale up its economic contribution to adjacent communities. Future strategies should prioritize capacity building for local tour guides and establishing organized community culinary spots, transforming visitor spending into sustainable economic welfare for the local population.

Functional suitability evaluations are conducted periodically. Regulation of the Minister of Forestry of the Republic of Indonesia Number P.49/Menhut-II/2014 concerning Procedures for Implementing Functional Suitability Evaluations for Nature Reserves and Nature Conservation Areas is conducted at least once every five years. The ecotourism strategy in Mount Baung NTP achieves a dual benefit of conservation and community welfare. This framework directly transforms tourism revenue into local economic incentives, ensuring community livelihoods drive long-term ecosystem preservation. Implementation success is measured by three compact dimensions: (1) ecological indicators (strict zero-encroachment in the 136.5-ha Protection Block and keeping visitors

under 167 people/day); (2) economic indicators (increased employment of local residents as educational guides and micro-entrepreneurs); and (3) institutional indicators (formalized multi-stakeholder partnerships and operationalization of the eco-friendly mini-hydro facility)

CONCLUSION

The Mount Baung Nature Tourism Park offers a variety of ecotourism opportunities, encompassing both biotic and physical aspects, including residential structures and other facilities adapted to the surrounding landscape. Tourists can engage in activities such as forest trekking, relaxing at waterfalls, enjoying mountain views, taking photos, and sampling local cuisine. Based on the SWOT analysis, ecotourism in the Mount Baung NTP has potential for further development. The Mount Baung Nature Tourism Park possesses strengths and opportunities that can be leveraged to address and mitigate potential weaknesses and potential downsides. A viable strategy is to leverage the area's potential and opportunities for development

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REFERENCES

- Budiatiningsih, M., Ulya, B. N., dan Hulfa, I. (2023). Kontekstualisasi Makna Ekowisata: Studi Kasus Pada Destinasi Ekowisata. *Jurnal Ilmiah Hospitality*. 12(2).
- Chanan, M. (2011). Potensi Karbon Di Atas Permukaan Tanah Di Blok Perlindungan Taman Wisata lam Gunung Baung Pasuruan – Jawa Timur., 6(2):101 – 112.
- Ginting, I. A., Patana, P., & Rahmawaty, R. (2013). Penilaian dan Pengembangan Potensi Objek dan Daya Tarik Wisata Alam di Taman Wisata Alam (TWA) Sibolangit (Assessment and Development of Object Potency and Pull Factor of Ecotourism at Sibolangit Recreational Park). *Peronema Forestry Science Journal*, 2(1):74-81.
- Gupta, R., Mondal, M. E. A., Janardan, M., Kumawat, H., Shekhar, C. (2024). Sustainable Tourism Development: Balancing Economic Growth And

- Environmental Conservation. Migration Letters. 21(87):1240 – 1253
- Ilyasa, Muhammad Hasan (2023) Potensi cadangan karbon tumbuhan di Taman Wisata Alam Gunung Baung Kabupaten Pasuruan. Masters thesis, Universitas Islam Negeri Maulana Malik Ibrahim.
- Insan K, Patabo M, Ferdi M, (2024). Perencanaan Ekowisata Burung di Taman Wisata Alam Gunung Baung Kabupaten Pasuruan Provinsi Jawa Timur. IPB University.
- Isriany, S., Furuya, K. (2025). Does Ecotourism Really Benefit the Environment? A Trend Analysis of Forest Cover Loss in Indonesia. Land, 14 (1237):1-25. <https://doi.org/10.3390/land14061237>
- Joyti., dan Wagistina, S. (2023). Environmental Conservation-Based Sustainable Tourism at Mount Baung Nature Tourism Park, Indonesia, Jurnal Pembangunan dan Alam Lestari. 14(10):28-43. DOI: 10.21776/ub.jp.al.2023.014.01.05 E-ISSN: 2338-1671
- Pattiwael, M. (2018). Konsep pengembangan ekowisata berbasis konservasi di Kampung Malagufuk Kabupaten Sorong. J-DEPACE. Journal of Dedication to Papua Community), 1(1), 42-54.
- Samal, R., dan Dash, M. (2023). Ecotourism, biodiversity conservation and livelihoods: Understanding the convergence and divergence. International Journal Of Geoheritage, 11(1):1-20. <https://doi.org/10.1016/j.ijgeop.2022.11.001>
- Sanka, I., Kusuma, A. B., Martha, F., Hendrawan, A., Pramanda, I. T., Wicaksono, A., Jati, A. P., Mazaya, M., Dwijayanti, A., Izzati, N., Maulana, M. F., Widyaningrum, A. R. (2023). Synthetic biology in Indonesia: Potential and projection in a country with mega biodiversity, Biotechnology Notes, 4: 41-48, <https://doi.org/10.1016/j.biotno.2023.02.002>.
- Sofiah, S., Setiadi, D., Widyatmoko, D. 2013. Pola Penyebaran, Kelimpahan Dan Asosiasi Bambu Pada Komunitas Tumbuhan Di Taman Wisata Alam Gunung Baung Jawa Timur. Berita Biologi 12(2) - Agustus 2013.
- Sunarsih, Rachmawati, R., dan Maspufah, H. (2021) Identification Of Eco-Tourism Potential In Development Area Unit Iv East Java Province. IAR Journal of Business Management, 2(02):01-09. DOI: 10.47310/iarjbm.2021.v02i02.015
- Triadi D., Achad, A., Barkey, R. A. (2018). Strategi pengelolaan kawasan gunung baung. Balai Konservasi Sumberdaya Alam Jawa Timur. Taman Wisata Alam Gunung Baung. Balai KSDA.