

ANALYSIS OF THE DEVELOPMENT OF SITU GUNUNG NATURE TOURISM THROUGH ECONOMIC VALUATION WITH AN APPROACH TRAVEL COST METHOD (TCM)

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Abstrak

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Conservation forest areas serve not only to protect ecosystems but also hold significant economic value through their utilization as nature-based tourism destinations. This study aims to estimate the economic value of tourism at the Suspension Bridge area in Situ Gunung, Sukabumi, using the Travel Cost Method (TCM). This method assesses visitors' willingness to pay by analyzing travel expenditures, visit frequency, and demographic characteristics as proxies for the benefits derived from their visits. Primary data were collected through questionnaires distributed to 100 respondents and analyzed using descriptive and quantitative methods. The results show that the majority of visitors used private vehicles (50%) and rental cars (25%), with an average travel cost of IDR 307,819.96 per person per visit. Most visitors were male, aged between 20 and 30 years, and had a monthly income exceeding IDR 7,000,000. Additionally, 63% of respondents were repeat visitors, indicating a high level of satisfaction. Based on the assumption of 104,940 visits in 2024, the estimated annual economic value of tourism in the Suspension Bridge area amounts to IDR 32,302,525,860. These findings highlight the substantial economic contribution of nature-based tourism in the area and underscore the importance of sustainable management to support environmental conservation and local community empowerment.

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INTRODUCTION

Forest areas not only serve as ecosystem protectors but also have great potential as nature tourism destinations. Protected forest areas, with their biodiversity and unique landscapes, offer a unique appeal to people seeking tranquility and natural beauty. The trend of nature-based tourism has seen a significant increase in recent years, along with growing public

awareness of the importance of conservation and the need for green open spaces (Pickering & Hill, 2007). Activities such as hiking, cycling, camping, and other adventure activities have become popular forms of recreation. However, although nature tourism provides economic and social benefits, high visitor numbers without sustainable management can have negative environmental impacts, such as pollution, habitat destruction, and pressure on ecosystem carrying capacity (Rosalinao & Grilo, 2011). Therefore, integrated planning and management are needed to maintain a balance between economic interests and environmental sustainability.

The Mount Gede Pangrango National Park (TNGGP), particularly the Situ Gunung utilization zone, is a concrete example of the utilization of conservation areas for nature tourism activities. The granting of business permits for the management of nature tourism facilities, as stipulated in the Minister of Environment and Forestry Regulation No. 3 of 2021 concerning Business Licensing for the Business of Nature Tourism Environmental Services Facilities (PB-PSWA), opens opportunities for the private sector to play a role in providing tourism facilities. PT Fontiss Aquam Vivam (PT Fontiss), as the holder of the nature tourism management permit in the Situ Gunung area, has developed various attractions, one of which is *the Situ Gunung Suspension Bridge*, which is the longest suspension bridge in Southeast Asia and a leading tourist icon of the area.

Since PT Fontiss began operating, tourist visits have increased significantly, despite a decline during the COVID-19 pandemic. According to TNGGP statistics from 2024, the number of visits reached over 160,000 in 2022. This high visitor demand demonstrates that nature tourism has become a necessity for the community, particularly among urban communities in Jakarta, Bekasi, and Tangerang, which dominate the visitor profile. However, the high number of visits also presents new challenges, such as increased waste generation, vehicle pollution, and overcrowding in certain areas.

Accessibility is a crucial issue in managing the Situ Gunung tourist area. Roads to the tourist area are still narrow and limited, and the lack of public transportation forces visitors to rely on private or rental vehicles. Meanwhile, movement within the area via local transportation such as motorcycle taxis and public transportation offers economic opportunities for the local community, but also poses risks to environmental quality. To understand the economic contribution of nature tourism and as a basis for formulating sustainable management policies, an approach is needed that can quantitatively assess the area's economic value. One relevant method is the Travel Cost Method (TCM), which measures the non-market economic value of a tourist destination based on visitor expenditure and preferences. This method assesses willingness to pay (WTP) through an analysis of travel costs, visit frequency, and visitor characteristics as proxies for satisfaction or benefits.

This study aimed to determine the economic value of the Situ Gunung tourist area using the Travel Cost Method (TCM) approach. This study is important for providing an argumentative basis for developing conservation-based nature tourism and as a consideration for managers and the government in formulating policies that support environmental sustainability and local community empowerment.

RESEARCH METHOD

This study uses a quantitative approach with the aim of obtaining an overview of the economic value of the Situ Gunung tourist area, particularly the Suspension Bridge tourist attraction. The quantitative approach was chosen because it is able to provide causal explanations, generalize results, and predict events based on objectively measurable variables. The types of data used in this study include primary data and secondary data. Primary data were obtained by distributing questionnaires to tourists who directly visited the Suspension Bridge area at the Situ Gunung State University Resort. The questionnaires included information on respondent characteristics, travel costs, frequency of visits, modes of transportation used, and expenses while at the tourist location. Meanwhile, secondary data were obtained from relevant agencies such as the Gunung Gede Pangrango National Park Office, including data on tourist

visits in the last five years, zoning information, and a general overview of the Situ Gunung area. This research was conducted in the 213.21-hectare tourism utilization zone within the Situ Gunung State University Resort area, focusing on the 102.76-hectare Suspension Bridge area managed by PT Fontis Aquam Vivam, based on SK.2/1/KLHK/2020. The research lasted for four months, from March to June 2025.

The population in this study is all tourists who visited the Situ Gunung area in 2025. Based on data on the number of visitors in 2024 of 104,940 people, the number of samples was determined using the Slovin formula with an error rate of 10%, so that a minimum sample of 100 respondents was obtained. The main instrument used was a closed-ended questionnaire modified from Siswanto (2012), which covered various topics such as respondent characteristics, visit information, travel itineraries, travel expenditures, activities at tourist sites, and assessments of tourist attraction management. In addition, structured interviews were conducted to gather additional information from visitors, particularly regarding their motivations for visiting and their perceptions of the value of the benefits gained from visiting the location.

In this study, the main variable analyzed is the economic value of the tourism area, specifically the indirect use value in the form of recreational benefits from the Suspension Bridge. This variable is measured using the Travel Cost Method (TCM) approach, which calculates total tourist expenditure during a trip, including transportation costs, entrance tickets, consumption, and other expenses. Data obtained from the questionnaire were processed using descriptive statistical analysis techniques to describe the characteristics of the respondents, and an economic valuation analysis based on the TCM approach.

The steps in the TCM analysis refer to the approach developed by Dixon et al. (1996), Widada (2004), and Hufschmidt et al. (1987), namely by estimating the number of visits per 1,000 residents from the tourist origin zone, calculating travel costs from each zone, and estimating the consumer surplus obtained. This consumer surplus is an indicator of the economic value of the tourist area being studied. The results of this analysis are expected to provide an objective picture of the economic value of the Situ Gunung tourist area, particularly from a visitor perspective. The research findings can also inform more sustainable, data-driven decisions about managing the tourist area.

RESULTS AND DISCUSSION

Situ Gunung is a leading tourist destination within the management of the Mount Gede Pangrango National Park (TNGGP) and boasts historic value and extraordinary natural beauty. According to historical records published in the Java Bode on November 30, 1888, Situ Gunung has been known since the 19th century as *mooi bergmeer*, or "beautiful mountain lake." This indicates that Situ Gunung's appeal is not new, but has long been a focus of attention.

Administratively, the Situ Gunung area covers a total area of approximately 2,092 hectares, with a tourism utilization zone of 213.21 hectares. Various natural tourist attractions are available within it, such as Situ Gunung Lake, Sawyer Waterfall, Twin Waterfall, camping ground, and the most popular is the Situ Gunung suspension bridge. The area zoning is shown on the map (Figure 4.1) as a reference in conservation-based management and sustainable tourism. Based on Government Regulation No. 36 of 2024 concerning Non-Tax State Revenue (PNBP) rates, the Situ Gunung tourist attraction management sets different rates for weekdays and weekends. Prices also differ based on visitor category (general public, school, university students). This demonstrates that management has considered market segments in pricing, ensuring access remains open to all groups.

Interestingly, since the issuance of the Decree of the Head of the Investment Coordinating Board (BKPM) No. SK.2/1/KLHK/2020, a portion of the tourism utilization area, covering an area of 102.76 hectares, has been developed in collaboration with the private sector, PT Fontis Aquam Vivam. The business permit granted is for 55 years to provide natural tourism facilities. This marks the existence of a *public-private partnership* in the management

of conservation destinations, as a strategy to support the development of facilities without sacrificing the values of nature conservation. PT Fontiss has developed various tourism facilities and programs, such as a suspension bridge, flying fox, glamping area, amphitheater, and even tour cars and motorcycle taxis. These facilities enhance the quality of service and visitor experience. Despite being impacted by the COVID-19 pandemic, tourism activity has shown an upward trend since reopening. This confirms that innovation in management (especially tourism infrastructure development) has a positive impact on tourist interest.

The Situ Gunung Suspension Bridge is a major attraction, with its 535-meter length and 150-meter height making it the longest suspension bridge in Southeast Asia. Access to the bridge requires an additional fee of Rp 100,000, in addition to the entrance fee. This access system is supported by barcode bracelets that serve as electronic tickets, visitor insurance, and proof of claims for tour drivers.

PT Fontiss's tourism management model is integrated. All tourism services—from tickets and transportation to food and souvenirs—are controlled within a single, structured management system. Local partners, such as tour van drivers, motorcycle taxis, and canteen vendors, are empowered with a *shift work system* and a wristband-based incentive scheme. This exemplifies community-based ecotourism, where local residents are involved in supporting the tourism sector. Other tourist facilities, such as the zipline (Rp150,000), the Ancient Valley expedition (Rp350,000), and various glamping packages, demonstrate that management has shifted toward *value-based tourism*, offering not only views but also experiences and education. In this regard, the presence of tour guides is crucial, as they can provide added value to visitors through historical and conservation information. Thus, the management of Situ Gunung tourism can be said to have successfully combined nature conservation, infrastructure development, and community empowerment, creating a model for sustainable conservation-based tourism. This success is also due to the synergistic collaboration between the government (TNGGP), the private sector (PT Fontiss), and the surrounding community.

Table 1. Frequency Distribution Based on the Characteristics of Suspension Bridge Visitors in the Situ Gunung Tourist Area, Sukabumi – West Java in 2025

No	Visitor Characteristics	f	%
Gender			
1	Man	53	53.0
2	Woman	47	47.0
Age (years)			
1	< 20	10	10.0
2	20–30	36	36.0
3	31–40	34	34.0
4	41–50	10	10.0
5	51–60	7	7.0
6	> 60	3	3.0
Marital status			
1	Marry	39	39.0
2	Not married yet	61	61.0
Region of Origin			
1	Sukabumi	17	17.0
2	Cianjur	5	5.0
3	Bogor	13	13.0
4	Jakarta	35	35.0
5	Bandung	7	7.0
6	Other Cities	23	23.0
Last education			
		f	%

1	JUNIOR HIGH SCHOOL	7	7.0
2	SENIOR HIGH SCHOOL	23	23.0
3	Vocational	15	15.0
4	Bachelor	49	49.0
5	Postgraduate	6	6.0
Work		f	%
1	Students	12	12.0
2	Civil Servants/TNI/POLRI	10	10.0
3	Businessman	12	12.0
4	State-Owned Enterprise/Regional-Owned Enterprise Employees	7	7.0
5	Private employees	49	49.0
6	Other	10	10.0
Income per month (Rp)		f	%
1	< 2,000,000	13	13.0
2	2,000,000 – 2,999,999	5	5.0
3	3,000,000 – 3,999,999	12	12.0
4	4,000,000 – 4,999,999	9	9.0
5	5,000,000 – 6,999,999	15	15.0
6	> 7,000,000	37	37.0
7	Other	9	9.0
Number of Dependents		f	%
1	Own	44	44.0
2	Do not have	56	56.0
Resources		f	%
1	Social media	61	61.0
2	Internet	23	23.0
3	Friends/Siblings	15	15.0
4	Travel agency	1	1.0
Mode of Transportation Used		f	%
1	Private vehicle	50	50.0
2	Vehicle Rental	25	25.0
3	Train	18	18.0
4	Public transportation	5	5.0
5	Ship	1	1.0
6	Travel	1	1.0

Based on Table 1, the majority of visitors to the Suspension Bridge were male (53%), with the dominant age groups being between 20–30 years (36%) and 31–40 years (34%). Most respondents were single (61%) and came from Jakarta (35%) and various other cities. Forty-nine percent of respondents had a bachelor's degree, indicating that visitors have a high level of education. In terms of occupation, the largest number of visitors came from the private sector (49%), followed by students and entrepreneurs (12% each). Respondents' monthly income varied, with 37% of visitors having an income more than Rp. 7,000,000. Most respondents have no dependents (56%). The most dominant source of tourist information came from social media (61%), while the primary mode of transportation used was private vehicles (50%), followed by rental vehicles (25%) and trains (18%). This indicates that accessibility and the role of digital media significantly influence interest in visiting the Suspension Bridge tourist attraction.

The Economic Value of Tourism Based on the Travel Cost Method (TCM), Determination of the economic value of tourism in the Situ Gunung Suspension Bridge tourist area is carried out using the Travel Cost Method (TCM) approach. This method is based on the

actual expenses incurred by tourists to access and enjoy tourist attractions. The costs calculated in this method include: transportation costs, entrance ticket costs, consumption costs during the trip, accommodation costs (if any), costs for using public facilities (toilets), purchasing souvenirs or gifts, documentation, and other unexpected costs. The visitors who responded to this study came from various regions, both within West Java Province and outside the province, such as North Sumatra. These differences in origin influence the variation in travel costs for each individual. Therefore, the analysis was conducted based on the average travel costs for each visitor's region of origin. Details of average travel costs based on visitor origin are presented in Table 2 below:

Table 2. Average Travel Costs Based on Tourist Origin

No	Visitor Origin	Number of Tourists (People)	Average Travel Cost (Rp)
1	Sukabumi	18	958,000
2	Cianjur	5	1,834,000
3	Bogor	21	1,770,000
4	Jakarta	16	3,138,000
5	Bandung	8	1,887,996
6	Karawang	5	2,388,000
7	Depok	8	1,888,000
8	Bekasi	15	1,938,000
9	Garut	3	1,492,000
10	Medan	1	13,488,000
Total		100	30,781,996
Average Individual Cost per Visit (Rp)			307,819.96

Source : 2025 Questionnaire, processed data

From Table 2, it can be seen that the average travel cost incurred by individuals per visit to the suspension bridge tourist location is Rp307,819.96. This value is obtained from the total travel costs of 100 respondents from various regions divided by the number of respondents. Differences in regional origin have a significant impact on cost fluctuations, where visitors from Medan spend the highest amount of Rp13,488,000, while local visitors such as those from Sukabumi only spend Rp958,000.

Based on the average individual costs, an estimate of the annual economic value of the Suspension Bridge tourism was made using the 2024 visitor data as an approximation to the number of visitors in 2025. The calculation of the estimated economic value is presented in Table 3 below:

Table 3. Estimated Economic Value of Tourism in 2025 Based on Average Travel Costs

Code	Variables	Mark	Information
A	Average individual cost per visit	Rp307,819	Average costs incurred by tourists per visit
B	Assumption of number of tourist visits in 2025	104,940 people	Based on the number of visitors in 2024 (source: BBTN Gede Pangrango data)
C	Estimated annual economic value (A × B)	Rp32,302,525,860	Estimated total value based on 2024 data

Source : 2025 Questionnaire, processed data

By multiplying the average individual cost of Rp307,819 by the total number of visitors in 2024, which is 104,940 people, the estimated economic value of tourism in the Suspension Bridge area is Rp32,302,525,860 per year. This value shows the potential direct economic benefits from tourist activities in the area and can be used as an indicator of the contribution of the tourism area to the local economy and conservation management.

Transportation is a vital element in supporting tourism activities. Based on the results of a study of 100 respondents visiting the Suspension Bridge in the Situ Gunung Nature Tourism Area, it was found that as many as 50% of visitors used private vehicles, 25% used rental vehicles, and 15% used trains. This choice of transportation mode reflects visitors' preferences for flexibility, time efficiency, and comfort during travel. Private vehicles are the dominant mode because visitors feel they can manage time and costs directly, and consider practicality and safety factors.

Travel Time to Situ Gunung, most visitors come from the Greater Jakarta area and West Java, with a predominance of visitors from Jakarta (35%), Bogor (17%), and Sukabumi (17%). Good accessibility to the location is a determining factor in the high number of visits. Although road conditions sometimes experience congestion, especially on weekends and holidays, visitors still choose to travel by private vehicle because they consider it part of the tourist experience. According to Hidayat and H (2017), traffic congestion is caused by various factors, such as inadequate road infrastructure, high vehicle volumes, and minimal traffic monitoring. Therefore, the role of the government and management in improving road quality and traffic engineering is crucial to supporting the smooth flow of tourism.

Visit Frequency : Data shows that 63% of visitors are repeat visitors, while 37% are first-time visitors. This indicates a strong revisit intention among tourists, which can be triggered by satisfaction with the facilities and services provided. Zeithaml (2018) stated that *revisit intention* is a crucial indicator of consumer behavior, indicating that visitors not only plan to return but are also willing to recommend the site to others. At Situ Gunung, management collaboration with private entities such as PT Fontiss has also played a significant role in improving the quality of the tourist experience and sustainably increasing visitor numbers.

CONCLUSION

The results of the study indicate that the financing of tourist trips to the Situ Gunung Suspension Bridge tourist area is largely supported by the use of private and rental motorized vehicles, with a total percentage reaching 75%. Traffic jams during the trip are not a significant obstacle because visitors have prepared travel time, logistics, and travel agendas well. Most visitors are male (53%), with a dominant age range between 20-30 years (36%) and have an income above Rp7,000,000 per month (37%). This indicates a strong economic capacity to finance travel and a willingness to pay the set price. As many as 63% of respondents are repeat visitors, indicating a good level of satisfaction with the tourism experience obtained.

The economic value of tourism calculated using the Travel Cost Method (TCM) approach shows that the average cost incurred by one visitor for one visit is IDR 307,819.96. If multiplied by the total number of visitors to the Situ Gunung tourist area in 2024 of 104,940 people, the estimated economic value is IDR 32,302,525,860 per year. These results indicate that tourism activities in the Suspension Bridge area have significant economic value and have the potential to make a major contribution to increasing local community income, regional economic growth, and strengthening the sustainability of the nature-based tourism sector if managed optimally.

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