

ECOTOURISM VALUATION THROUGH CONTINGENT VALUATION METHOD (CVM) IN THE REVITALIZATION OF THE KEMBAR TERPADU BEACH ECOTOURISM FACILITY, PURING, KEBUMEN REGENCY

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Abstract

Beach ecotourism is a part of ecotourism itself because this concept have a very close relationship and one of the types of ecotourism that is based on coastal and marine natural resources. There is a beach ecotourism with independent management system for the operational and does not yet have a fixed ticket price for visiting this beach ecotourism. This beach ecotourism namely Kembar Terpadu Beach Ecotourism. Kembar Terpadu Beach Ecotourism was chosen for this research due to the background of being one of the newer beach ecotourism sites in Kebumen regency and it's currently in the process of obtaining certification as an ecotourism beach with independently managed by the villagers as local community. Aims of this research are to analyze several key investment value for facilities revitalization, average value of WTP, the total value of WTP, determining recommended new ticket price for Kembar Terpadu Beach Ecotourism, and also analyze the financial feasibility (*B/Cratio* and NPV) for Kembar Terpadu Beach Ecotourism's priority facility revitalization. Several revitalization plan divided by three Bids (Waste Disposal, Parking Lot, and Child's Playground) with level of Bids Value are Rp. 5,000, Rp. 10,000, and Rp. 20,000. The value of *B/Cratio* on this research is 1.39 explained the total benefits obtained are greater than the total costs incurred for the project revitalization of Kembar Terpadu Beach Ecotourism. *B/Cratio* Value >1, it can be concluded that Kembar Terpadu Beach Ecotourism revitalization project is worth to implementing revitalization and this project has a very profitable economic value with assuming an interest rate of 5% for 5 years and Payback Period 2.95 years (for investors, the profit is reflected in the Net Present Value, which is Rp. 154,663,572 (IDR). Limitation of this research is Kembar Terpadu Beach Ecotourism is facing challenges due to lack of official ecotourism certification. This certification is important for branding, marketing, and attracting eco-conscious tourists. The analysis of tourist numbers is based on estimates and may not accurately reflect fluctuations. More detailed data is needed for better planning. The potential impacts of revitalizing parking and children's areas are not fully explored. Future research should assess their influence on tourist experience, capacity, and revenue.

Keywords: Willingness to Pay, Contingent Valuation Method, Ecotourism, Ticket Price, B/CRatio, Facilities Revitalization

INTRODUCTION

Ecotourism involves traveling to natural areas to support environmental conservation and the welfare of local communities (The Ecotourism Society, 1990). Initially, it attracted nature-loving tourists who valued sustainability and cultural preservation, and it has grown in popularity due to its appeal to tourists (LindungiHutan, 2023). Beach ecotourism, a subset of ecotourism, focuses on coastal and marine environments, aiming to promote responsible tourism and environmental conservation while benefiting local communities (Agus et al., 2019; Fadrika et al., 2007).

The potential of beach ecotourism lies in its ability to attract tourists by showcasing pristine natural resources (Utami & Santoso, 2019). Key principles of beach ecotourism include

environmental sustainability, nature conservation, and sustainable resource management, while also attracting tourists who contribute to the local economy (Yulianda, 2007). Kebumen Regency, located in Central Java, has significant potential for beach ecotourism development, offering a variety of attractions for tourists (Aji & Saputra, 2019). This region's diverse beach destinations, management structures, and pricing vary, reflecting differences in attractions and local approaches to beach ecotourism.

Table 1. Beach Ecotourism Distribution at Kebumen Regency

Num	District	Beach Ecotourism Name	Main Attraction	Type of Management	Ticket Price (IDR)
1	Mirit	Laguna Lembupurwo	Laguna and Mangrove	Village Government	Rp. 5,000
		Wuni Melodi	Artificial Agro	POKDARWIS	Rp. 3,000
2	Ambal	Ambal	Environment Recreation	POKDARWIS	Rp. 5,000
		Mliwis	Cemara Udang Trees	POKDARWIS	Rp. 5,000
3	Buluspesantren	Setrojenar	Panoramic Sunset	Village Government	Rp. 5,000
4	Petanahan	Pandan Kuning	Child Playground	BUMDES	Rp. 10,000
		Cemara Sewu	Cemara Udang Trees	BUMDES	Rp. 5,000
5	Buayan	Karangbolong	Cave	Private and Government	Rp. 5,000
		Menganti	Water Rides	Perhutani	Rp. 20,000
6	Ayah	Logending	Mangrove Forest	Dinas Pariwisata Kebumen	Rp. 5,000
		Pecaron	Camping Ground	Perhutani and Private	Rp. 10,000
		Surumanis	Camping Ground	Perhutani	Rp. 10,000
7	Puring	Lumut	Live Music and Panoramic	Village Government	Rp. 5,000
		Suwuk	Aircraft Swimming Pool	Dinas Pariwisata Kebumen	Rp. 5,000
		Kembar Terpadu	Sea Turtle Conservation	Villagers	None

Source : Data Processed, 2024

Among the beach ecotourism location listed in Table 1, Menganti Beach has the highest entrance fee of IDR 20,000 managed by Perhutani, with water rides as its main attraction. In contrast, Kembar Terpadu Beach Ecotourism, an independently managed site, does not yet have a fixed ticket price. Kembar Terpadu Beach was chosen for this research because it is a newer site in Kebumen Regency, currently seeking ecotourism certification. Managed by the local community, its main attractions include turtle conservation and beach environmental education. The beach operates independently, with a financial system supported by local SMEs, which ensures that maintenance and development are not reliant on the local government. Also this beach has a profit-sharing arrangement with local vendors, and strict rules are in place regarding beach area boundaries.

Pre-survey conducted on March 26th revealed that the beach's management faces challenges with environmental cleanliness and inadequate facilities, such as a lack of waste disposal bins, limited parking, and an underdeveloped playground for children. Focus group discussion on June 22nd identified that the beach management has developed a financial plan for revitalizing these facilities, but there are difficulties in prioritizing the improvements and setting ticket prices to fund them. These challenges highlight the need for this research, as improving beach management and facilities is essential for boosting tourism, as noted by Suryahani et al. (2020).

Kembar Terpadu Beach Ecotourism faces challenges with environmental cleanliness and insufficient facilities, such as a lack of waste disposal bins, limited parking, and an underdeveloped children's playground. These issues contribute to littering and hinder the overall visitor experience. Additionally, there is a need to establish a fixed entrance fee for the beach. However, to address these challenges, the beach management has developed a financial plan for revitalizing facilities, including waste disposal, parking, and the playground.

Prioritizing these upgrades and determining ticket prices to fund the revitalization remains a challenge, to guide this process, the environmental valuation method (de Brito et al., 2018) is being used, which assigns monetary values to environmental goods and services. Contingent Valuation Method (CVM), a survey-based approach, is employed to assess public preferences and determine the value of these environmental improvements (Hasibuan, 2014; Limaiei et al., 2016). The method measures public willingness to pay (WTP) for the revitalization, which helps inform decision-making regarding the ticket price and facility priorities at Kembar Terpadu Beach Ecotourism.

Based on the formulation of the problem, the objectives of this research are as follows:

1. To analyze several Cost Benefit value for facilities revitalization at Kembar Terpadu Beach Ecotourism
2. To analyze the average value of WTP on Kembar Terpadu Beach Ecotourism's facility revitalization
3. To analyze the total value of WTP on Kembar Terpadu Beach Ecotourism's facility revitalization
4. To determine recommended new ticket price for Kembar Terpadu Beach Ecotourism
5. To analyze the financial feasibility (*B/Cratio*, NPV, and Payback Period) for Kembar Terpadu Beach Ecotourism's priority facility revitalization?

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

Demand theory is an analysis in economics that explains the theory that explains the relationship between goods demanded by consumers and the price of goods or services in the market (Sukirno, 2013). Demand is also influenced by many factors such as the price of goods demanded, prices of other goods, income, preferences, future forecast and others. The law of demand, states that if the price of a good rises, then the quantity of goods demanded falls, named *ceteris paribus* i.e. if other things remain (Mankiw, 2012).

Consumer surplus is the gap between the highest price a consumer is willing to pay for a product and the actual price they pay in the market, reflect to additional benefit or satisfaction consumers receive by purchasing a product at a lower price than they were prepared to pay (Boediono, 1993). The formula for consumer surplus is (maximum price willing to pay - actual price). In this research, consumer surplus is defined as the maximum willingness of tourists to pay for entrance tickets, while the actual price is the new ticket price after conducting WTP analysis.

Tourism development based on clear planning and management to effectively utilize the potential of tourist destinations and improve community welfare. If this tourism are properly managed, tourism can bring substantial benefits to both the broader population and local communities (Fyka et al., 2018). Tourism contributes to economic growth by creating job and business opportunities, increasing income for individuals and the government, particularly at the regional level (Wulandari, 2019). The government plays a key role in community empowerment through tourism, as outlined in Law No. 10 of 2009 (replacing Law No. 9 of 1990), which highlights tourism's positive impacts on welfare, poverty reduction, and environmental preservation.

Ecotourism is an effective tool for combining conservation, community support, and sustainable travel, aimed at preserving natural areas while benefiting local communities and tourists (McMaster et al., 2013). It promotes responsible tourism that supports environmental conservation and the well-being of both local communities and visitors. Kembar Terpadu Beach Ecotourism, established in 2017, is a popular conservation area for both domestic and international tourists. Ecotourism activities in this area are growing as awareness of nature conservation increases (Pickering & Hill, 2007).

RESEARCH METHODS

This research is quantitative, following the positivist philosophy, which aims to examine specific populations and samples, using data collection instruments and analysis (Sugiyono, 2013). The research was conducted at Kembar Terpadu Beach Ecotourism in Puring District, Kebumen Regency, Central Java, from July to October 2024. The data was primary from social and economics tourists as respondent and secondary data from Statistics Indonesia (BPS), and documents from the archives of the Kembar Terpadu Beach Ecotourism Secretariat provided by Kembar Terpadu Beach Ecotourism Management, books, and journals.

The area hosts various activities, including recreation, events, and turtle conservation attractions. The population for this research consists of 18,000 tourists per year (latest data at 2023) from Kembar Terpadu Beach Ecotourism Secretariat Archive. Using the Taro Yamane formula (Yamane, 1967), a sample was drawn. The sampling technique used was random sampling,

specifically stratified random sampling, ensuring equal opportunities for all members of the population to be selected. Criteria for inclusion were tourists aged 18 or older who had visited Kembar Terpadu Beach Ecotourism at least once (Dewy, 2018).

Based on this approach, the number of samples to be analyze uses the Taro Yamane formula as follows:

$$n = \frac{N}{1+N(e^2)} \dots\dots\dots(1)$$

Population N = 18,000 Tourists per Year
 Margin of Error $e = 9.96\% = 0.0996$

$$= \frac{18,000}{1 + 18,000 (0,0996^2)}$$

$N = 100$

Based on the Taro Yamane formula with a margin of error of 9.96%, the sample size for this research was determined to be 100 respondents. The respondents were tourists aged 18 or older (excluding beach management) who had visited Kembar Terpadu Beach Ecotourism at least once. This age criterion ensures respondents can provide valid answers, as it is assumed they have income and experience with the destination. The respondents were selected from those engaging in recreational activities at the beach.

Key information sources for this research include the Cleaning Service Division (providing data on waste disposal plans), the Vehicle Management Division (providing data on parking lot development), and the Conservation Division (providing data on playground facilities). These divisions coordinate with the Equipment and Business Development Divisions, which are responsible for progress reports to Mas Jani, the Spatial Planning Manager, and Muji Arisono, the Chairman of Kembar Terpadu Beach Ecotourism Management.

Cost-Benefit Analysis (CBA) is a systematic method used to evaluate the strengths (benefits) and weaknesses (costs) of activities. According to Susilowati et al. (2018) in their research on the "Economic Valuation of Tourism Attraction of Jatijajar Cave in Kebumen Regency," the key components of costs include Initial Investment Cxosts, Operational and Maintenance Costs, and component of benefit include Retribution Income.

Table 2. Breakdown of the Cost of Benefits to be used

Analysis	Description	Information
Cost	Initial Investment Costs, Operational	Accounting
	Costs & Maintenance	Techniques
Benefit	Retribution Income	Analyze with Contingent Valuation Method

Source: Interview Result on Kembar Terpadu Beach Ecotourism Management, 2024

The Contingent Valuation Method (CVM) is a direct approach used to assess the economic value of non-market goods by eliciting individuals' Willingness to Pay (WTP). This method helps estimate the monetary value of public goods not traded in the market (Hanley & Spash, 1993). According to Hanley and Spash (1993), the steps involved in implementing CVM are: Constructing a Hypothetical Market, Determining the WTP Bid Value, Estimating the average WTP value, and Estimating the total WTP value.

This research estimates the average Willingness to Pay (WTP) to determine a new ticket price for Kembar Terpadu Beach Ecotourism. Respondents were asked if they agreed to ticket prices that reflect the benefits of added facilities, such as waste disposal, parking, and playgrounds. If a

respondent agreed, they were guided to select a price based on their WTP, starting with an initial bid derived from a Cost-Benefit Analysis. The initial bid represents a basic ticket price with three bidding levels, making it easy for respondents to understand and state their WTP. The minimum multiple for determining the maximum WTP value is based on research by O'Brien and Thondhlana (2019).

The average value of WTP is estimated using the following formula:

$$EWTP = \frac{\sum_{i=1}^n W_i}{n} \dots\dots\dots(2)$$

Information:

EWTP = Estimated WTP average

W_i = WTP value (i)

n = number of respondents

I = The first respondent who is willing to pay (I = 1,2..... n)

Total WTP represents the economic value generated from the new ticket price at Kembar Terpadu Beach Ecotourism. It is calculated by multiplying the average WTP by the number of tourists. According to the management, holiday visitors make up 70% of the number of visitors during long holidays, while weekday visitors account for only 30%.

To calculate the total value of WTP are use this following formula:

$$\text{Total WTP Value} = \text{Mean Value} \times \text{Number of Tourists/Year} \dots\dots\dots(3)$$

Financial feasibility analysis is essential for evaluating the viability of a project, assessing its profitability and potential returns to justify investment. Commonly used financial metrics include Benefit-Cost Ratio (B/C_{Ratio}), and Payback Period (Johannes et al., 2018). Consumer surplus, as defined by Boediono (1993), is the benefit consumers receive when they pay less than the maximum price they are willing to pay. This difference represents the additional satisfaction or utility gained from the transaction. Three financial feasibility metrics are commonly used for this purpose are Net Present Value (NPV), Benefit-Cost Ratio (B/C_{ratio}), and Payback Period.

1) Net Present Value (NPV)

NPV measures the net present value of a project, taking into account the time value of money. The criteria for financially feasible continuing are shown by (NPV > 0) and not worth to continue if (NPV < 0). The NPV formula is:

$$\text{Net Present Value (NPV), } NPV = PV_{benefits} - PV_{costs} \dots\dots\dots(4)$$

2) Benefit-Cost Ratio (B/C_{ratio})

B/C_{Ratio} is a ratio that compares the present value of benefits to the present value of costs associated with a project or revitalization. The criteria for financially feasible continuing are shown by (B/C_{ratio} > 1) and not worth to continue if (B/C_{ratio} < 1)

$$B/C_{ratio}, B/C_{ratio} = \frac{PV \text{ benefits}}{PV \text{ costs}} \dots\dots\dots(5)$$

3) Payback Period

Payback period is the length of time it takes for a project to recover its initial investment. The criteria for financially feasible continuing are shown by shorter payback period is generally preferred, as it indicates a faster return on investment. However, the acceptable payback period depending on standards at the specific project.

$$\text{Payback Period} = \frac{\text{Initial Investment Cost}}{\text{Net Present Value}} \dots\dots\dots(6)$$

Consumer surplus is a concept in economics that measures the benefit consumers receive when they purchase a product for less than the maximum price they are willing to pay (Boediono, 1993). This difference represents the additional satisfaction or utility gained from the transaction.

To calculate the consumer surplus are use this following formula:

$$\text{Consumer Surplus} = \text{maximum price willing to pay} - \text{actual price} \dots\dots\dots(7)$$

RESULTS AND DISCUSSION

1. Research Location Overview

Kembar Terpadu Beach Ecotourism, located in Tambakmulyo village, Puring, Kebumen Regency, Central Java, features turtle conservation attractions. Inaugurated in 2017, it is managed by the Tambakmulyo community under the Ngadimulyo farmer organization, which also contributes to the management team. Below is the organizational structure of Kembar Terpadu Beach Ecotourism Management.



Figure 1. Kembar Terpadu Beach Ecotourism Organizational Structure

Kembar Terpadu Beach Ecotourism covers 2 kilometers of beach with white sand and ornamental plants. It prohibits swimming but hosts baby turtle release events for environmental education. The area offers affordable food stalls, which are located away from the beach to protect the environment. Adequate bathroom and prayer room facilities are available at multiple points along the beach.

However, key issues include the absence of a fixed ticket price, inadequate waste disposal facilities, and the need for improvements in the playground and parking lot. Waste disposal issues arise from a lack of proper facilities, causing tourists to improperly dispose of waste, which impacts cleanliness. The playground is poorly located near plants and the beach, making it unsafe for children. Parking is also limited, with separate spaces for two- and four-wheeled vehicles but lacking coverage and security.



Figure 2. Kembar Terpadu Beach Ecotourism Main Area, Cleanliness Signage, Playground, and Parking ticket

2. Respondent's Socio-Economic Characteristic

According to interviews with 100 respondents whom had visited Kembar Terpadu Beach Ecotourism at least once. The socio-economic conditions of the respondents were assessed based on parameters such as gender, occupation, income, and distance from the beach ecotourism site. The following is Socio-Economic Characteristics of Kembar Terpadu Beach Ecotourism Respondents.

Table 3. Socio-Economic Characteristics of Respondents

No.	Socio-Eco Type	Description	Frequency
1.	Gender	Male	47
		Female	53
2.	Occupation	Teacher	18
		Student	20
		Self Employed	11
		Security Officer	2
		Private Employees	10
		Motocycle Taxi	4
		Merchant	10
		Housewives	8
		Civil Officer	17
3.	Income	100,000 – 1,100,000	32
		1,100,000 – 2,100,000	27
		2,100,000 – 3,100,000	11
		3,100,000 – 4,100,000	20
		4,100,000 – 5,100,000	10
4.	Distance Range (Km)	0 – 10	15
		10 – 20	14
		20 – 30	11
		30 – 40	11
		40 – 50	10
		50 – 60	10
		60 – 70	5
		70 – 80	4
		90 – 100	1
		0 – 10	15
5.	Distributin of WTP	Bids 1 (Waste Disposal)	77
		Bids 2 (Parking Lot)	14
		Bids 3 (Playground)	9

Source: Data Processed, 2024

3. Cost Benefit Analysis of Kembar Terpadu Beach Ecotourism Revitalization Plan

Cost Benefit Analysis (CBA) is essential for understanding tourists' perspectives on the revitalization plans and determining a new entrance ticket price for Kembar Terpadu Beach Ecotourism. The analysis focuses on initial investment, operational, and maintenance expenses, while the primary revenue source is ticket sales. Muji Arisono, the Chairman of the beach's management, highlighted ongoing issues such as inadequate facilities, including waste disposal, parking, and the children's playground, all of which require improvements for better environmental sustainability. Effective ecotourism management must address these facility shortcomings to ensure long-term success and sustainability (Suryahani et al., 2020).

Table 4. CBA for Waste Disposal Revitalization

Analysis	Description	Information
Cost	Initial Investment Costs, Operational Costs & Maintenance	IDR 7,600,000 (Monthly) IDR 91,200,000 (Annually)
Benefit	Retribution Income	IDR 5,000

Source: Data Processed, 2024

Table 5. CBA for Parking Lot Revitalization

Analysis	Description	Information
Cost	Initial Investment Costs, Operational Costs & Maintenance	IDR 15,200,000 (Monthly) IDR 182,400,000 (Annually)
Benefit	Retribution Income	IDR 10,000

Source: Data Processed, 2024

Table 6. CBA for Playground Revitalization

Analysis	Description	Information
Cost	Initial Investment Costs, Operational Costs & Maintenance	IDR 30,400,000 (Monthly) IDR 364,800,000 (Annually)
Benefit	Retribution Income	IDR 20,000

Source: Data Processed, 2024

4. Contingent Valuation Method of Kembar Terpadu Beach Ecotourism Revitalization Plan

Revitalization plan for Kembar Terpadu Beach Ecotourism in this research uses the Contingent Valuation Method (CVM) with a Willingness to Pay (WTP) approach. CVM creates a hypothetical market by presenting several scenarios for the revitalization of the ecotourism site. During the fourth pre-survey on April 14th, Kembar Terpadu Beach Ecotourism Management discussed revitalization plans, which include the installation of trash bins, improvements to the parking lot, and the construction of a children's playground. These proposed improvements will be evaluated through a bidding process for tourists, with specific bid values attached to each facility enhancement.

Figure 3 are facilities plan that are the bid value for bidding to Kembar Terpadu Beach Ecotourism tourists.



Figure 3. Bids Value for Facilities at Kembar Terpadu Beach Ecotourism

Bidding process in this research, focused on waste disposal, parking lot improvements, and the children's playground area at Kembar Terpadu Beach Ecotourism, aims to improve the tourist experience and protect the environment. Data from the Kembar Terpadu Secretariat Archive (2023) and secondary data on annual tourist numbers (18,000 tourists per year or 1,500 tourists per month) were used to estimate the bidding values for these revitalization projects. Three bidding level starts from IDR 5,000 based on secondary data from the secretariat archives Kembar Terpadu Beach Ecotourism Management on July, 2024. The next level is a multiple of IDR 5,000 with a doubling factor to IDR 10,000 and the maximum value is IDR 20,000 assuming the doubling is the minimum multiple to find the maximum value based on Willingness to Pay value proposition research by O'Brien and Thondhlana (2019).

The following table is presented three value of WTP bidding about Kembar Terpadu Beach Ecotourism revitalization plan:

Table 7. First Bid: Waste Disposal through Trash Bins at 20 Points

Objective	Tourist Impact	Bid Calculation	Value on Tourist Visit
To improve waste disposal by placing trash bins at 20 strategic points that are frequently visited by tourists.	Availability of trash bins at 20 points can significantly reduce littering and waste pollution, thereby improving the site's appeal. This would promote cleanliness and awareness of proper waste disposal, contributing to the site's sustainability.	Each trash bin (100L Capacity, H 44cm, Dia 58cm) costs IDR 380,000 (includes installation, monthly maintenance, and transport cost). Total cost for 20 bins: IDR 7,600,000 per month, and IDR 91,200,000 per year	Cost per tourist for First Bid: IDR 7,600,000 / 1,500 tourists/month = IDR 5,000/tourist

Source: Analysis Result, 2024

Table 8. Second Bid: Parking Lot Improvisation

Objective	Tourist Impact	Bid Calculation	Value on Tourist Visit
To ensure vehicles are parked at a safe distance from the beach ecotourism area and preventing environmental damage and improving organization.	Parking facilities can be crucial for maintaining the integrity of an ecotourism area. Proper parking ensures	Total cost 1 unit = IDR 15,200,000 (include installation, monthly maintenance, transport cost, and etc) = IDR 15,200,000 per month = IDR 182,400,000 per year	Cost per tourist for First Bid: IDR 15,200,000 / 1,500 tourists/month = IDR 10,000/tourist

This includes creating better parking facilities with security and cleaner areas for vehicles.	vehicles don't pollute or damage sensitive areas, such as beach areas ecosystems.
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Source: Analysis Result, 2024

Table 9. Third Bid: Child’s Playground			
Objective	Tourist Impact	Bid Calculation	Value on Tourist Visit
To provide a designated area for children to play safely, preventing them from damaging plants or disturbing sensitive coastal ecosystems.	This helps in protecting the natural environment while ensuring a safe space for children to enjoy, reducing the risk of environmental damage and enhancing the family-friendly aspect of the site. This would be a separate area near the beach.	Total cost = 1 unit = IDR 30,400,000 = IDR 30,400,000 per month (include installation, monthly maintenance, transport cost, and etc) = IDR 364,800,000 per year	Cost per tourist for First Bid: IDR 15,200,000 / 1,500 tourists/month = IDR 10,000/tourist

Source: Analysis Result, 2024

An overview of the scenario of the revitalization at Kembar Terpadu Beach Ecotourism can be seen in Figure 4.



Figure 4. Aerial Photo and Revitalization Scenarios

5. Average Value of Willingness to Pay for Kembar Terpadu Beach Ecotourism's Facility Revitalization

The estimated average WTP value is calculated based on the distribution of WTP data collected from respondents. The results of the estimated average WTP value to be seen in Table 10 with result:

Table 10. Result of Estimated Average WTP Value

Average Value of Willingness to Pay			
Num.	Retribution	Number of Respondent	Total
1.	IDR 5,000	77	IDR 385,000
2.	IDR 10,000	14	IDR 140,000
3.	IDR 20,000	9	IDR 180,000
	Total	100	IDR 705,000
		Mean	IDR 7,050

Source: Analysis Result, 2024

The average WTP value is IDR 7,050 reflects public support for the revitalization of Kembar Terpadu Beach Ecotourism. This value suggests moderate public acceptance, offering valuable insight into the economic feasibility of the project. For comparison, a research by Susilowati et al. (2018) on Jatijajar Cave tourism in Kebumen found average WTP is IDR 17,000. Both ecotourism location share similar demographic profiles, particularly the large number of students among respondents, many of whom opted for the lowest bid due to limited income.

6. Total Value of Willingness to Pay for Kembar Terpadu Beach Ecotourism's Facility Revitalization

The concept of Willingness to Pay (WTP) is a crucial economic tool for assessing the value tourists place on environmental and recreational services. For Kembar Terpadu Beach Ecotourism, the WTP value indicates the potential revenue from revitalization efforts aimed at enhancing the beach's offerings. Based on data from the Kembar Terpadu Beach Ecotourism Management archives (2022-2023), the site attracts approximately 18,000 tourists per year. The total WTP value is calculated as follows:

$$\begin{aligned}
 \text{Total WTP Value} &= \text{Mean Value} \times \text{Number of Tourists/Year} \\
 &= \text{IDR } 7,050 \times 18,000 \text{ tourists/Year} \\
 &= \text{IDR } 126,900,000
 \end{aligned}$$

Based on the calculation from Formula (3), total Willingness to Pay (WTP) for the revitalization of Kembar Terpadu Beach Ecotourism is IDR 126,900,000 per year. This revenue represents the potential income from tourists who are willing to contribute to the improvements, including waste disposal, parking lot upgrades, and the development of a children's playground. These funds can be reinvested into further facility improvements, environmental conservation, and educational programs focused on nature conservation and local culture. When compared to similar studies, such as the research by Susilowati et al. (2018) on Jatijajar Cave tourism in Kebumen Regency, which reported a total WTP of IDR 5,231,410,000, the WTP for Kembar Terpadu Beach is notably lower. This discrepancy may be attributed to the more complex and developed infrastructure at Jatijajar Cave, which includes accommodations, restaurants, pedestrian paths, and souvenir shops, whereas Kembar Terpadu Beach Ecotourism primarily focuses on enhancing basic environmental facilities like waste disposal and maintaining the sustainability of the beach area.

7. Financial Feasibility (B/C Ratio and Payback Period) for Kembar Terpadu Beach Ecotourism's Facility Revitalization

Benefit-Cost Ratio (B/CRatio) is a key metric for evaluating the feasibility of the revitalization plan. According to Johannes et al. (2018), a B/CRatio greater than 1 indicates that the benefits outweigh the costs, making the project worth pursuing. In this research, the total Willingness to Pay (WTP) is IDR 126,900,000 is used as the total benefit from the revitalization plan for Kembar Terpadu Beach Ecotourism. The total costs for the revitalization plan include Initial Investment Costs, Operational Costs, and Maintenance Costs, with an estimated monthly cost of Rp. 7,600,000 (IDR), which interpreted to IDR 91,200,000 annually. The first bidding scenario, with a ticket price of IDR 5,000 was chosen by the majority of respondents, and it forms the basis of the cost-benefit analysis. This research focuses on the financial feasibility of the first bid, which is the development of waste disposal facilities at Kembar Terpadu Beach Ecotourism.

According to Mas Jani, the Spatial Planning Officer for Kembar Terpadu Beach Ecotourism, the following information regarding the costs and potential financial impact of this facility will help assess its viability: "Based on our internal meeting, the total benefit of the planned investment has been calculated over the entire lifespan of revitalization. This investment life is set at 5 years, with all costs accounted for in year 0, which represents the year construction begins. To ensure accurate financial analysis, we've applied a 5% yearly interest rate (i) to determine the present value of all future costs and benefits. By utilizing this approach, we can better assess the overall profitability and sustainability of the ecotourism project over its intended lifecycle. Our decision to account for the costs all at once in year 0 reflects a common practice in project evaluation, simplifying the financial planning process and allowing for clearer comparison with expected benefits over the 5-year period".

First estimation for financial feasibility is analyze the Present Value of Benefits (PV of Benefits), the result are:

- Total WTP (Benefits) = Rp. 126,900,000
- i (Interest Rate) = 5% = 0.05
- N (Investment Life) = 5 years

$$\begin{aligned}
 &= PV_{\text{benefits}} = 126,900,000 \times \left(\frac{1}{1+0.05} \right)^1 + \left(\frac{1}{1+0.05} \right)^2 + \left(\frac{1}{1+0.05} \right)^3 + \left(\frac{1}{1+0.05} \right)^4 + \left(\frac{1}{1+0.05} \right)^5 \\
 &= 126,900,000 (0.9524 + 0.9070 + 0.8638 + 0.8220 + 0.7835) \\
 &= 126,900,000 \times 4.3287 = 549,016,812 \\
 &= PV_{\text{benefits}} = \mathbf{Rp. 549,016,812}
 \end{aligned}$$

The result shown PV Benefits for Kembar Terpadu Beach Ecotourism Revitalization is Rp. 549,016,812. After analyze the Present Value of Benefits (PV of Benefits), next step is analyze the Present Value of Costs. Based on Formula (3), the result are:

- Total Costs = Rp. 91,200,000
- i (Interest Rate) = 5% = 0.05
- N (Investment Life) = 5 years

$$\begin{aligned}
 &= PV_{\text{costs}} = 91,200,000 \times \left(\frac{1}{1+0.05} \right)^1 + \left(\frac{1}{1+0.05} \right)^2 + \left(\frac{1}{1+0.05} \right)^3 + \left(\frac{1}{1+0.05} \right)^4 + \left(\frac{1}{1+0.05} \right)^5 \\
 &= 91,200,000 (0.9524 + 0.9070 + 0.8638 + 0.8220 + 0.7835) \\
 &= 91,200,000 \times 4.3287 = 394,353,240 \\
 &= PV_{\text{costs}} = \mathbf{Rp. 394,353,240}
 \end{aligned}$$

The result shown PV Costs for Kembar Terpadu Beach Ecotourism Revitalization is Rp. 394,353,240. After analyze the Present Value of Costs (PV of Costs), next step is analyze the Net Present Value (NPV). Based on Formula (4), the result are:

$$NPV = 549,016,812 - 394,353,240 = \mathbf{Rp. 154,663,572}$$

The result shown NPV for Kembar Terpadu Beach Ecotourism Revitalization is Rp. 154,663,572. After analyze the Net Present Value (NPV), next step is analyze the Benefit Cost Ratio (B/CRatio), the result are:

- = $PV_{\text{benefits}} = \text{Rp. } 549,016,812$
- = $PV_{\text{costs}} = \text{Rp. } 394,353,240$

$$B/Cratio = \frac{549,016,812}{394,353,240} = 1.39$$

The result shown $\left[\frac{B}{C} \right]$ _ratio for Kembar Terpadu Beach Ecotourism Revitalization is 1.39. After analyze the Benefit Cost Ratio ($\left[\frac{B}{C} \right]$ _ratio), last step is analyze the Payback Period. Based on Formula (6), the result are:

Initial Investment Cost = $7,600,000 \times 12 \text{ (month)} \times 5 \text{ (year)} = \text{Rp. } 456,000,000$

$$\text{Payback Period} = \frac{456,000,000}{154,663,572} = 2.95 \text{ years}$$

Based on the analysis above, the value of B/Cratio is 1.39. This means that the total benefits obtained are greater than the total costs incurred for the revitalization of Kembar Terpadu Beach Ecotourism. B/Cratio Value >1 , it can be concluded that Kembar Terpadu Beach Ecotourism revitalization project is worth to implementing revitalization and this project has a very profitable economic value with assuming an interest rate of 5% for 5 years and Payback Period of 2,95 years (for investors, the profit is reflected in the Net Present Value, which is Rp. 154,663,572) so the quality of the environment both from this beach ecotourism and the surrounding area becomes more sustainable.

8. Determine Recommended New Ticket Price for Kembar Terpadu Beach Ecotourism's Facility Revitalization

The first Bid in this research focuses on waste management by placing trash bins at 20 key points in Kembar Terpadu Beach Ecotourism to maintain cleanliness and promote proper waste disposal among tourists, from the 100 surveyed tourists, 77 tourists (mainly students) were willing to pay for this initiative, demonstrating the high value they place on environmental improvements. The total Willingness to Pay (WTP) for this initiative is IDR 126,900,000, which reflects the collective contribution of tourists willing to support waste management efforts. The average WTP is calculated at IDR 7,050 per tourist, with the first Bid offering a minimum price is IDR 5,000 per tourist.

Some tourists are willing to pay more, indicating strong support for the initiative and a positive response to environmental improvements. This difference between the WTP and the minimum price leads to a consumer surplus, which represents the added value or satisfaction tourists receive from the enhanced services at the ecotourism site. This consumer surplus further supports the justification for a new ticket price, reflecting both the willingness of visitors to contribute and the environmental benefits they receive. The visual representation of the consumer surplus can be seen through the following curve.

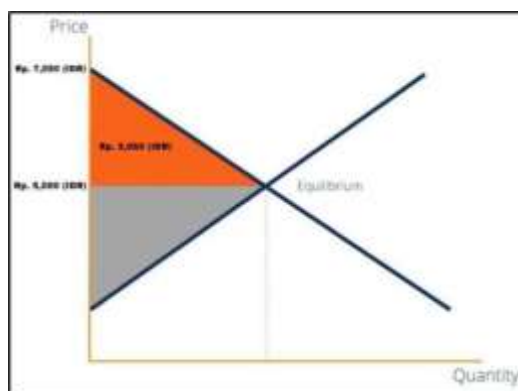


Figure 5. Kembar Terpadu New Ticket Price Consumer Surplus Curve

This graph illustrates consumer surplus, the difference between what consumers are willing to pay for a service and what they actually pay. It represents the additional benefit or satisfaction gained when consumers pay less than their maximum willingness to pay. In this study, the consumer surplus at Kembar Terpadu Beach Ecotourism is IDR 2,050. This indicates that, on average, tourists are willing to pay IDR 2,050 more than the current ticket price of IDR 5,000 (IDR). This suggests that the current pricing strategy is beneficial and creates added value for consumers. The average WTP is IDR 7,050. The current ticket price is IDR 5,000. The consumer surplus per person is IDR 2,050. With an estimated 18,000 tourists per year, the total consumer surplus is IDR 36,900,000 annually, indicating that tourists receive more value than they pay for. This finding is consistent with the research by Wijayanti et al. (2022) on the environmental valuation of Rowo Jombor Reservoir Ecotourism, where a consumer surplus of IDR 2,700 was identified. This research shows that consumer surplus positively impacts infrastructure revitalization efforts and encourages environmental sustainability. In conclusion, the consumer surplus analysis highlights the economic benefit of the current pricing strategy and its potential to support further development and sustainability at Kembar Terpadu Beach Ecotourism.

CONCLUSION AND LIMITATION

Conclusion

Based on the analysis of environmental valuation through the Contingent Valuation Method (CVM) for the revitalization of Kembar Terpadu Beach Ecotourism in Tambakmulyo Village, Puring, Kebumen, several key conclusions were drawn:

Revitalization Scenarios: research evaluated three revitalization scenarios based on the Benefit-Cost Analysis (CBA):

- Bid I: Waste Disposal
- Bid II: Parking Lot Improvements
- Bid III: Children's Playground

Willingness to Pay (WTP): This research found an average WTP of IDR 7,050, leading to a total WTP value of IDR 126,900,000 annually, reflecting the public's support for the beach's revitalization. The study also recommended a new ticket price of IDR 5,000, which aligns with the average WTP.

Financial Analysis:

1. Present Value of Benefits (PV Benefits): IDR 549,016,812 over 5 years, discounted at 5% annually.
2. Present Value of Costs (PV Costs): IDR 394,353,240 (IDR) over 5 years, discounted at 5% annually.
3. Net Present Value (NPV): IDR 154,663,572, indicating that the project is expected to be profitable.
4. Benefit-Cost Ratio (B/C Ratio): 1.39, which suggests a high return on investment, as the benefits significantly outweigh the costs.

Consumer Surplus: The average consumer surplus is IDR 2,050, indicating that tourists are receiving more value than they are paying for, creating an additional benefit of IDR 36,900,000 annually for the 18,000 tourists visiting the beach each year. The financial and environmental analyses show that the Kembar Terpadu Beach Ecotourism revitalization project is financially viable and environmentally beneficial. The B/C ratio and positive NPV indicate a highly profitable and sustainable project.

Limitation

Kembar Terpadu Beach Ecotourism has not yet received official ecotourism certification, which could delay its branding and marketing as a recognized ecotourism destination. Certification is critical for attracting environmentally-conscious tourists and ensuring the project aligns with sustainability and conservation standards. The analysis relied on estimates of tourist numbers based on typical busy and quiet days, which may not fully capture seasonal or day-to-day fluctuations. More detailed data collection is recommended for more accurate long-term planning.

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