



DOES THE ECONOMIC VALUE OF THE PRAMBANAN TEMPLE REFLECT ITS HERITAGE VALUE?

Nabila Wahyu Mulia*¹⁾, Norma Ayu Elvina¹⁾, Sahira Marisa Nurarti¹⁾, Depri²⁾

¹⁾ Faculty of Economics and Business, Universitas Sebelas Maret, Indonesia

²⁾ Faculty of Economics and Business, Universitas Andi Djemma, Indonesia

*Corresponding author: nabila.wahyum@student.uns.ac.id

ARTICLE INFO

ABSTRACT

Article history

Received : 13 Maret 2024

Revised : 24 June 2024

Accepted : 24 June 2024

Keywords

Prambanan Temple;

Heritage;

Economic Value;

Travel Cost Method

JEL classification

D61; N93; Q51; Z12

This study aims to estimate the economic value of the Prambanan Temple tourist attraction using the Travel Cost Method (TCM). The visitor willingness to pay for entrance tickets is used to reflect the economic value of the Prambanan Temple's cultural heritage, assessed with the Individual Travel Cost Method (ITCM) approach. The analysis utilizes Ordinary Least Squares (OLS) regression. The study included 186 respondents. Total visitor willingness to pay for the Prambanan Temple is Rp 10,747,976 (\$688.57), with an average visitor willingness to pay of Rp 57,753 (\$3.70) per visit. The current entrance ticket price is Rp 50,000 (\$3.22). This suggests that the value of the Prambanan Temple's cultural heritage to visitors is higher than the current ticket price. The consumer surplus generated by the 186 respondents is Rp 1,399,358 (\$89.65), with a consumer surplus per individual of Rp 7,492 (\$0.48).

This is an open-access article under the [CC-BY 4.0](https://creativecommons.org/licenses/by/4.0/) license.



1. INTRODUCTION

The historical and cultural value of a region can be represented through cultural assets inherited from previous generations, such as historical buildings, artworks, or traditions (Mekonnen et al., 2022). These cultural assets passed down by ancestors can serve as sources of knowledge, identity, and tourist attractions for both local and international communities (Bedate et al., 2004). The international reputation showcased through world heritage sites by the United Nations Educational, Scientific and Cultural Organization (UNESCO) is one way to preserve and maintain global cultural sites, as well as to significantly increase the number of tourist visits (Binarti et al., 2021). UNESCO states that Prambanan Temple is one of the Hindu temple complexes located in the Central Java Province, characterized by unique temples adorned with reliefs depicting the Ramayana epic. It is dedicated to three great Hindu deities (Shiva, Wishnu, and Brahma) and includes three temples dedicated to the animals that serve them, which was designated as a World Cultural Heritage Site by UNESCO in 1991.

The charm of Prambanan Temple Tourist Park establishes it as a premier national tourist destination, with an annual visitation exceeding two million people. The increasing visitation intensity at Prambanan Temple holds a significant potential to diminish its unique cultural heritage value. According to damage reports from the Prambanan Temple Tourist Park (TWC) management, frequent damages include broken stair stones, stupas, and temple reliefs. These damages are attributed to the overwhelming visitor volume and the behavior of visitors who disregard the preservation of the temple, such as engaging in vandalism and littering. The rise in visitation intensity at Prambanan Temple can be managed by increasing the entrance ticket price. The management of Prambanan Temple Tourist Park (TWC) implemented a ticket price increase in 2021 by IDR 25,000 or \$1.61.

Table 1. Table Pricing for admission to Prambanan Temple

	2021	2022
Domestic tourists in Indonesia		
Children	Rp 20.000 (\$ 1,29)	Rp 25.000 (\$ 1,61)
Adult	Rp 40.000 (\$ 2,58)	Rp 50.000 (\$ 3,22)
Foreign tourists		
Children	Rp 130.500 (\$ 9)	Rp 217.500 (\$ 15)
Adult	Rp 261.000 (\$ 18)	Rp 362.500 (\$ 25)

Source: Injourney Destination Management, 2023

Prambanan Temple plays a significant role in enhancing local community income through sustainable and high-quality tourism. This supports Sustainable Development Goal (SDG) number 15, which aims to protect, restore, and promote the sustainable use of terrestrial ecosystems. This research aims to demonstrate that sustainable terrestrial ecosystems can be maintained through the environmentally friendly preservation of historical and cultural heritage sites. Additionally, this study contributes to achieving SDG number 16, which pertains to peace, justice, and strong institutions. The research can raise public awareness about the importance of preserving cultural heritage in the form of spiritual sanctuaries and intangible assets as essential aspects of maintaining Indonesia's national identity and integration.

The negative impact in the form of a decline in the cultural heritage value of the Prambanan Temple can be anticipated through the calculation of the Willingness to Pay (WTP) and Travel Cost Method (TCM) incurred by visitors in visiting the Borobudur Temple site. Willingness to Pay (WTP) is an estimate of the amount that visitors to Prambanan are willing to pay as a form of commitment and support in maintaining the sustainability of the cultural heritage value of Prambanan Temple. The higher the travel costs incurred by visitors, the higher their awareness to preserve and responsibly maintain the authenticity of Prambanan Temple during their visit. This study aims to measure the economic value of the cultural heritage of Prambanan Temple through an analysis of willingness to pay using the travel cost method economic approach.

2. RESEARCH METHODS

This study utilized primary data sources, employing data collection techniques through direct interviews and questionnaires. The questionnaire was designed by the researcher, integrating preferences from two journals: (Cetin et al., 2021) and (Makwinja et al., 2022). The direct interviews were conducted with visitors of the Prambanan Temple, involving a question-and-answer session to gather personal information about the visitors' characteristics and their impressions or feedback regarding their visit to Borobudur Temple. The online questionnaire method targeted individuals who had visited Prambanan Temple within the last year. Random sampling was used, and the sample size was determined using the Slovin's formula by calculating the number of samples divided by the population size with a significance level of 0.05%.

A total of 86 individuals were interviewed directly at the Prambanan Temple tourist site, and 100 individuals completed the online questionnaire.. The data analysis techniques used were the Willingness to Pay (WTP) estimation and the Travel Cost Method (TCM).

The Willingness to Pay (WTP) is utilized to estimate the nominal amount that tourists are willing to pay as a form of appreciation and support for preserving the historical value of Prambanan Temple. The average WTP is estimated by calculating the net WTP of each respondent using the following formula (Zhao & Chan, 2023); (Hassin et al., 2021):.

$$EWTP = \sum_{i=1}^n W_i$$

Where as:

EWTP : average WTP value of visitors
W_i : amount of WTP willing to be paid
i : respondent willing to pay
n : number of respondents

The Travel Cost Method (TCM) is a non-market valuation technique used to assess the economic value of public goods such as public parks, cultural heritage sites, and forests (Jaung & Carrasco, 2020). The travel expenses of tourists can be measured using an Ordinary Least Squares (OLS) regression equation that includes one dependent variable and six independent variables. The dependent variable in this study is the frequency of visits, while the independent variables consist of income, education level, travel costs, distance, duration of visits, and age. The following equation represents the regression model used in this study:

$$FV_t = \beta_0 + \beta_1 LnEC_i + \beta_2 LnEDU_i + \beta_3 LnINC_i + \beta_4 LnTD_i + \beta_5 LnST_i + \beta_6 LnAGE_i + i$$

Where as:

FV_t : Visit Frequency
EC_i : Expenditure Cost
EDU_i : Education Level
TD_i : Travel Distance
ST_i : Visit Duration
AGE_i : Age

3. RESULTS AND DISCUSSION

The sample consists of 186 respondents, primarily aged between 14 and 25 years (50%). The majority of respondents (54.8%) have completed their education up to the high school level. In terms of occupation, 44% are students, followed by civil servants (17.7%). More than half of the respondents (59.1%) reported an income level between \$64.61 and \$323.03. Regarding the reasons for visiting Prambanan Temple, 77% of respondents were motivated solely by leisure.

Table 2. Table Characteristics of The Respondents

	Characteristics of Visitors	Quantity (Individual)
Gender	Male	53
	Female	133
Age	< 14	1
	14-25	93
	26-34	23
	35-45	21
	47-52	26
	53-60	20
	65-78	3

Education	Elementary school	4
	Junior high school	5
	Senior high school	102
	Bachelor's degree/Diploma	75
Place of residence	Java	155
	Outside of Java	31
Occupation	Fresh Graduate	1
	Student	82
	Civil servant	33
	Private sector employee	24
	Laborer	5
	Entrepreneur	17
	House-wife	24
Income	< 1 million rupiah (\$64.61)	55
	1 million rupiah (\$64.61)- 5 million rupiah (\$323.03)	110
	5 million rupiah (\$323.03) - 10 million rupiah (\$646.05)	17
	> 10 million rupiah (\$646.05)	4
Reasons for visiting	Engaging in employment	3
	Enjoying the view	27
	Leisure activities	145
	Educational endeavor	7
	Other	4
Modes of Transportation	Tour bus	81
	Public transportation	22
	Car	47
	Motorcycle	36

Source: Processed data, 2023

The estimated total willingness to pay (WTP) for the 186 respondents for entrance to Prambanan Temple is IDR 10,747,976 or \$688.57, with an average willingness to pay of IDR 57,753 or \$3.70 per person per visit, using the EWTP (Equivalent Willingness to Pay) method. This indicates that visitors are committed to supporting the sustainability of the cultural heritage value of Prambanan Temple by paying an entrance fee of IDR 57,753 or \$3.70. The average total willingness to pay from the survey of 186 respondents can be used to estimate consumer surplus. Consumer surplus is calculated as the difference between what consumers are willing to pay for goods and services and what they actually pay. PT WTC (Wisata Taman Candi) Prambanan has set the entrance fee for Prambanan Temple at IDR 50,000 or \$3.22.

The total consumer surplus can be calculated by subtracting the actual ticket price paid by the 186 respondents from their total willingness to pay. As a result, the total consumer surplus for the 186 respondents amounts to IDR 1,399,358 or \$89.65, which is calculated as IDR 10,747,976 (\$688.57) - (186 x IDR 50,000 (\$3.22)), with an average consumer surplus per person of IDR 7,492 (\$0.48). This average surplus is derived from IDR 57,753 (\$3.70) - IDR 50,000 (\$3.22). From these surplus results, it can be concluded that respondents are willing to allocate additional funds to pay for the cultural and economic value of the Prambanan Temple amounting to IDR 57,753 or \$3.70

Table 3. Ordinary Least Squares (OLS) Regression Results

Variabel	Coefficient	Std. Error	t- statistic	prob
Constant	-0.919016	0.762549	-1.205189	0.229700
LN_EC	0.048275	0.234661	1.482500	0.140000
LN_EDU	-0.033054	0.032564	-0.140859	0.888100
LN_INC	0.090020	0.234661	1.741250	0.083400
LN_TD	0.004223	0.051699	0.144946	0.884900
LN_ST	0.037931	0.029137	0.388537	0.698100
LN_AGE	-0.214242	0.122577	-1.747890	0.082200
R-square	0.044001			
Sig.F	0.22743			

Source: Processed data, 2023

The regression equation derived from the Ordinary Least Squares (OLS) regression test can be written as follows:

$$FV_i = -0.919016 + 0.048275LnEC_i + (-0.033054)LnEDU_i + 0.090020LnINC_i + 0.004223LnTD_i + 0.037931LnST_i + -0.214242LnAGE_i + i$$

The results of the Ordinary Least Squares (OLS) regression indicate the influence of variables EC (travel costs), EDU (education level), INC (income level), TD (travel distance), ST (time spent), and AGE (age) on FV (Frequency of Visits) to Prambanan Temple. The variables travel costs (EC), income level (INC), and age (AGE) have a significant impact on visit frequency. Economic factors such as travel costs (EC) and income level (INC) play a crucial role in influencing tourists' decisions to visit Prambanan Temple. The higher the income level, the greater the likelihood that tourists can afford the travel costs to reach Prambanan Temple. Age significantly affects visit frequency, indicating that tourists' preferences and needs vary depending on the age group. On the other hand, the variables education level (EDU), travel distance (TD), and time spent visiting Prambanan Temple (ST) do not have a significant impact on visit frequency, as shown by the results of the Ordinary Least Squares (OLS) regression.

4. CONCLUSION

Based on research conducted on the economic value analysis of the cultural heritage site, Prambanan Temple, using the travel cost method, it can be concluded that the total Willingness to Pay (WTP) of visitors to Prambanan Temple is \$688.57, with an average WTP based on the EWTP method of \$3.70 per visit per individual. The total consumer surplus is approximately \$89.65, with an average consumer surplus per individual of \$0.48. The regression results from Ordinary Least Squares (OLS) indicate that the variables of travel cost (EC), income level (INC), and age (AGE) have a significant impact on the number of tourist visits to Prambanan Temple. On the other hand, the variables of education level (EDU), travel distance (TD), and time spent (ST) do not have a significant effect on the number of tourist visits to Prambanan Temple.

5. REFERENCES

- Bedate, A., Herrero, L. C., & Sanz, J. Á. (2004). Economic valuation of the cultural heritage: Application to four case studies in Spain. *Journal of Cultural Heritage*, 5(1), 101–111. <https://doi.org/10.1016/j.culher.2003.04.002>
- Binarti, F., Triyadi, S., Koerniawan, M. D., Pranowo, P., & Matzarakis, A. (2021). Climate characteristics and the adaptation level to formulate mitigation strategies for a climate-resilient archaeological park. *Urban Climate*, 36(November 2020), 100811. <https://doi.org/10.1016/j.uclim.2021.100811>

- Cetin, N. I., Bourget, G., & Tezer, A. (2021). Travel-cost method for assessing the monetary value of recreational services in the Ömerli Catchment. *Ecological Economics*, 190(April 2020), 107192. <https://doi.org/10.1016/j.ecolecon.2021.107192>
- Hassin, N. H., Abang Jais, D. A. N., Abas, M. A., Hamzah, Z., Muhammad Noor, A. N., Hussin, H., Abdullah, M., Koshy, N., & Alhaji Dauda, S. (2021). Local visitors' willingness to pay of entrance fee at Taman Negeri Gunung Stong, Kelantan. *IOP Conference Series: Earth and Environmental Science*, 842(1). <https://doi.org/10.1088/1755-1315/842/1/012050>
- Jaung, W., & Carrasco, L. R. (2020). Travel cost analysis of an urban protected area and parks in Singapore: a mobile phone data application. *Journal of Environmental Management*, 261(January), 110238. <https://doi.org/10.1016/j.jenvman.2020.110238>
- Makwinja, R., Mengistou, S., Kaunda, E., & Alamirew, T. (2022). Willingness to pay for the ecological restoration of an inland freshwater shallow lake: case of Lake Malombe, Malawi. *Heliyon*, 8(1), e08676. <https://doi.org/10.1016/j.heliyon.2021.e08676>
- Mekonnen, H., Bires, Z., & Berhanu, K. (2022). Practices and challenges of cultural heritage conservation in historical and religious heritage sites: evidence from North Shoa Zone, Amhara Region, Ethiopia. *Heritage Science*, 10(1), 1–22. <https://doi.org/10.1186/s40494-022-00802-6>
- Zhao, W., & Chan, C. S. (2023). What interpretation service are cultural tourists willing to pay for? A choice-experiment approach for cultural heritage sites in China. *Tourism Management Perspectives*, 46(February), 101091. <https://doi.org/10.1016/j.tmp.2023.101091>