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WILLINGNESS TO PAY FOR ENVIRONMENTAL SERVICES IN BENDUNG LEPEN COMMUNITY-BASED AGRO-TOURISM (A Contingent Valuation Approach)

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ABSTRACT

Ecosystem service valuation is essential for revealing the real benefits of community-based agro-tourism. It helps communities link environmental sustainability with local economic gains. Hence, this study aims to apply the Contingent Valuation Method, particularly Willingness to Pay (WTP), to capture the local community's views on improving ecosystem services in Bendhung Lepen. A total of 41 residents were used as the sample for this study. Then, we identify the factors that influence WTP. Multiple linear regression was used to analyze these factors. The analysis results show that the average WTP of the local community is IDR 8,414.63 per person. In addition, this study found that levels of education, the number of family members, and knowledge of ecosystem benefits significantly influence the amount of WTP for improving ecosystem services in Bendhung Lepen. The number of family members and education level have a significant adverse effect on WTP, while knowledge has a significant positive effect. The greater the number of family members and the higher the level of community education, the lower the WTP value. On the other hand, communities with higher knowledge of environmental conditions have been shown to have a higher WTP than those without. This finding implies that the local community has not fully supported efforts to improve ecosystem services in the area. Also, it provides insights for developing sustainable funding mechanisms and environmental education strategies in community-based agro-tourism. Institutional support can be provided to educate residents so they can achieve a similar level of environmental knowledge and awareness.

Keywords: community-based; sustainability; tourism; willingness to pay.

INTRODUCTION

The focus on the tourism sector in developing a sustainable tourism industry has become a trend promoted by the United Nations. This is considered an effort to protect the global environment. Therefore, discussions related to the development of a sustainable tourism industry are included in the Global Sustainable Development Goals 2030 (de Araújo et al., 2022). However, these efforts can only be successful if supported not only by government regulations but also by local communities that interact directly with our tourist destinations (Getachew et al., 2021). This is because communities play a crucial role in managing resources at tourist sites, particularly those that use community-based tourism (CBT).

The development of CBT is often associated with its role as a tool for reducing poverty around tourist sites. Furthermore, CBT also aims to ensure equitable community participation and sustainable natural resource management (Akinyemi & Mushunje, 2017). However, CBT often encounters challenges in practice, particularly in financial aspects such as funding and credit. Therefore, assistance from the government and external parties would be invaluable to tourist sites, enabling them to improve services and knowledge through training to enhance managerial skills for residents. One reason CBTs have failed to manage their tourist sites, aside from inadequate managerial skills, is

the lack of understanding among CBT administrators of pricing for each service offered at the site (Müllera et al., 2020).

Yogyakarta, a tourist destination in Indonesia, is known for its numerous tourist villages and hamlets spread across its regencies and cities. To date, 249 tourist villages and 233 tourism awareness groups (Pokdarwis) have been recorded as developing in the Special Region of Yogyakarta. This figure indicates an increasing trend each year. In other words, some of the communities involved in managing tourist villages will be affected socially, economically, and environmentally by their presence. Therefore, developing a sustainable tourism concept is essential to maintaining tourist villages, which serve as progressive economic drivers in the region. Generally, tourist villages will be developed based on the region's potential. For example, with its rich cultural resources, the Special Region of Yogyakarta can leverage this potential to develop educational tourist villages rooted in local traditions. Similarly, villages with potential natural resources can utilize their natural conditions to develop them as tourist attractions. Therefore, it is stated that geographical conditions and local cultural traditions will support the income of local communities surrounding tourist villages (Reni Vitasurya et al., 2018).

In Yogyakarta, there is an agrotourism destination that uses irrigation water from the Gajah Wong River to cultivate tilapia, which is not only sold to local residents during harvest but also provides aesthetic value, and which was later used to build a destination known as Bendhung Lepen. The existence of this tourist location is well remembered by some residents because, before it was developed into a tourist attraction, the village along the irrigation canal was a slum and a dumping ground. Since its conversion into a tourist attraction, the surrounding area has become more organized and cleaner, and there is no longer any littering, especially in the irrigation canal. Residents have committed to jointly maintaining the surrounding environment to keep it as clean as it is today. This indicates an improvement in environmental quality in the area due to the presence of the Bendhung Lepen agro-tourism. Furthermore, there has been an increase in environmental awareness among residents. Given the positive impacts, various efforts are needed to maintain this tourist destination so that it remains intact.

Although Bendhung Lepen has been widely recognized as a successful example of community-based agro-tourism revitalization in Yogyakarta, most existing studies focus primarily on its physical transformation, visitor satisfaction, and community engagement rather than on the economic valuation of its ecosystem services. Another WTP study conducted by Getachew et al. (2021) among local residents aimed to assess the economic valuation of CBT development, focusing on supporting infrastructure for the tourist location. However, research by Khuc et al (2025) focused on tourists' perceptions and their WTP for the development of CBT related to local cultural preservation. Ecosystem valuation is relevant to community-based agro-tourism because it provides a tangible measure of the environmental benefits that support tourism and local livelihoods (Peng et al., 2025). By quantifying the economic value of ecosystem services such as clean water, soil fertility, and landscape beauty, communities can better understand the link between ecological health and tourism sustainability (Gross et al., 2023). This understanding, according to Chen & Costanza (2024), helps guide local decision-making, justify conservation investments, and promote fair benefit-sharing among stakeholders involved in agro-tourism development. Research applying willingness-to-pay (WTP) methods to quantify visitors' monetary support for ecosystem service improvements in Yogyakarta remains limited, leaving a gap in understanding the actual economic value of nonmarket benefits such as water quality, habitat restoration, and waste management. Furthermore, few studies have explored WTP-based mechanisms as sustainable funding options for community-led environmental maintenance. Previous work also tends to be descriptive and lacks robust econometric analysis to identify the determinants of visitors' WTP, while evidence on how such potential funds could be allocated to enhance both ecological and social welfare remains scarce.

One tool for maintaining Bendhung Lepen is to assess residents' Willingness to pay for maintenance costs. The concept of Willingness to Pay (WTP) can be used to describe the value of goods and services that lack market prices, based on the assumption of rational choice (Reynisdottir et al., 2008). In this case, WTP can be used to picture how residents value the existence of Bendhung Lepen. As users of Bendhung Lepen services, the local community must provide an overview of their views on the tourist location. Therefore, this paper aims to estimate the WTP of the community around Bendhung Lepen and analyze the factors that significantly influence WTP. Knowing this, the findings will be a valuable source of literature on WTP for community-based tourist destinations focused on agro-tourism.

MATERIALS AND METHODS

Data Collection

This research was conducted at the Bendhung Lepen agrotourism site in Umbulharjo District, Yogyakarta City. The location was chosen because Bendhung Lepen, originally a neglected irrigation channel, has been transformed into a beautiful community-based agrotourism destination that improves the surrounding community's environmental quality and economy. Data collection was carried out in August 2024.

The data used were primary and secondary. Primary data were collected through interviews with residents in and around Bendhung Lepen using a structured questionnaire. The research instrument was a structured questionnaire containing two main sections: (1) respondents' socioeconomic characteristics and public perception of the environmental quality and tourism of Bendhung Lepen, and (2) an assessment of their Willingness to pay (WTP). The questionnaire was developed based on a literature review and previous research related to the Contingent Valuation Method (CVM) and adapted to the local context of the Bendhung Lepen. Prior to use, the questionnaire underwent a limited pre-test with five respondents outside the research sample to ensure clarity of questions and consistency of answers.

Respondents were selected using purposive sampling, involving residents of Mrican Village who were knowledgeable about the issues in question and directly involved in activities related to the Bendhung Lepen community-based agrotourism. The population consisted of 120 households living in the vicinity of Bendhung Lepen. The minimum number of samples was determined using the Slovin formula, as follows:

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

where, n = sample size, N = population size, e = margin of error

Based on the Slovin formula, the minimum sample size required for this study was 33 households. To increase data robustness and improve sample representativeness, the number of respondents was further set at 41 households, representing approximately 34% of the total population of 120 households residing around Bendhung Lepen. Given the relatively small and well-defined study population, this sample size was deemed adequate to support site-specific valuations and local-level policy analysis. A 15% margin of error was applied, given limited field access and the relatively homogeneous socioeconomic characteristics of the local community.

Most respondents are of productive age, work in the informal sector, have primary to secondary education, and have a monthly household income predominantly in the IDR 1–2 million range. Within the framework of exploratory, community-based contingency valuation research, this approach is used to identify local communities' preferences and perceptions regarding Bendhung Lepen as a basis for formulating environmental management and community-based agro-tourism policies at the local level.

Data Analysis

This research employed a quantitative approach using the Contingent Valuation Method (CVM). According to Fauzi (2014), CVM is an analytical method that relies on survey techniques, so scenario construction in the second stage highly depends on the context being analysed. The estimated values are highly contingent on the scenarios and questions posed. In this study, the CVM method can be divided into four stages:

a) Creating a Hypothetical Market

The hypothetical market is one in which environmental quality differs from the current situation. Respondents previously answered questions about the importance of conservation and the services provided by improving the environmental quality of the Bendhung Lepen. Next, respondents were asked about the environmental conditions of the Bendhung Lepen before it was developed into the Lepen Bendhung.

b) Obtaining Willingness to Pay (WTP) bids

The method used to obtain the WTP value is a bidding game, a WTP elicitation technique that asks respondents to state their WTP using a predetermined bid as a guideline. The initial bid amount was determined based on the results of a preliminary survey on environmental maintenance operational costs. The bid amount used was IDR 5,000 to IDR 20,000 per month. Respondents were

asked to state their Willingness to pay this amount; the bid amount was then increased or decreased to obtain the maximum WTP.

c) Estimating the Average Willingness to Pay (WTP)

The average WTP value is obtained by averaging the bid values obtained from the interviews. The formula for the average WTP value is as follows:

$$\text{Average WTP} = \frac{\sum_{i=1}^{n} WTP_i}{n} \quad (2)$$

Where, WTP_i = WTP bid value of the i-th respondent, n = total sample

d) Determinants of WTP (Regression Analysis)

Factors influencing the WTP value were analysed using multiple linear regression. The Willingness to Pay model for environmental service improvements can be seen in the following equation:

$$WTP_i = \beta_0 + \beta_1 \text{Income}_i + \beta_2 \text{Age}_i + \beta_3 \text{Education}_i + \beta_4 \text{Family Size}_i + \beta_5 \text{Knowledge}_i + \varepsilon_i \quad (3)$$

The operational definitions of each variable are provided in Table 1.

Table 1. Operational definition of variables

Variable	Description	Unit	Expected Sign
WTP	Willingness to pay	IDR/month	
Income	Household income	IDR/month	+
Age	Age of respondent	Years	-
Education	Length of formal education	Years	+
FamilySize	Number of household dependents	Persons	-
Knowledge	Knowledge of ecosystem benefits	1 = Know, 0 = Didn't know	+

The analysis was carried out using SPSS software version 27. To ensure the validity of the model, normality, multicollinearity, and heteroscedasticity tests were carried out as part of the classical assumption test.

RESULTS AND DISCUSSION

Characteristics of Respondents from the Bendhung Lepen Community

Changes in environmental quality resulting from human activities necessitate conservation efforts, including determining the community's Willingness to Pay (WTP) for environmental services. Previous research has shown that WTP is a crucial indicator in assessing community willingness to pay for environmental improvements, highlighting the relationship between environmental quality and community well-being (Xie et al., 2021). The socioeconomic characteristics of the Bendhung Lepen community are important factors in identifying factors influencing Willingness to pay for sustainable environmental improvements. Demographic and economic factors generally influence the level of WTP individuals are willing to pay, with individuals of higher economic status tending to have higher WTP for environmental quality improvements (Marwasta et al., 2024; Qa A'yun & Tiyaningsih, 2023). The socioeconomic characteristics of the community around the Bendhung Lepen are presented in Table 2.

Table 2 shows that the age structure of respondents is dominated by the productive age group, indicating that most community members have high levels of economic and social participation. This demographic indicates a positive potential for community involvement in environmental conservation and community-based tourism development. According to Rajapaksa et al. (2018), this age group tends to show a greater concern for environmental sustainability due to their involvement in decision-making regarding economic activities. Studies show that this age group has a better understanding of environmental issues and the benefits of sustainable ecosystems (Begum et al., 2022). On the other hand, only 14.63% of respondents were under 30, indicating that younger people may be less involved in decision-making related to environmental sustainability. This finding aligns with Gibson et al. (2022), who reported that younger populations tend to prioritise socioeconomic issues over environmental ones.

On the other hand, respondents' education levels indicate that most people around Bendhung Lepen have only completed elementary and junior high school. This pattern reflects the general

characteristics of communities in community-based tourism areas, where limited formal education often leads to a limited technical understanding of environmental issues and the economics of sustainable tourism. This aligns with K. Wang & Zhang (2021), who suggest that low levels of education can hinder individuals' understanding of the benefits of environmental services, leading to less involvement in environmental improvement initiatives. Furthermore, Dincă et al. (2022) demonstrated a relationship between education and environmental attitudes, indicating that higher levels of education correlate with increased environmental awareness. However, a relatively low level of education does not necessarily equate to low environmental awareness, as social values such as cooperation, concern for cleanliness, and attachment to the local environment can serve as substitute factors in shaping pro-environmental behaviour. Some studies have shown that direct interaction with the environment can increase knowledge about environmental sustainability. Developing community-based education and conservation strategies that account for educational backgrounds is crucial to ensuring relevance and achievability of conservation programs (Safitri et al., 2024).

Table 2. Characteristics of respondents from the community around Bendhung Lepen, Yogyakarta

Respondent Characteristic		Number of Respondents	Percentage
Age (Years)	<30	6	14.63
	31–40	10	24.39
	41–50	12	29.27
	51–60	5	12.20
	>60	8	19.51
Education (Years)	< 6	17	41.46
	7-9	9	21.95
	10-12	11	26.83
	13-16	4	9.76
	> 16	0	0.00
Income (IDR/month)	<1 million	12	29.27
	1–2 million	16	39.02
	2–3 million	9	21.95
	3–4 million	2	4.88
	>4 million	2	4.88
Number of Household Dependents (persons)	0	14	34.15
	1–2	17	41.46
	3–4	9	21.95
	5–6	1	2.44
	>6	0	0.00
Knowledge of Ecosystem Benefits	Know	25	60.98
	Did not know	16	39.02

Source: Primary data analysis (2024)

Respondents' financial condition is related to their involvement and contributions to environmental conservation initiatives. Table 1 shows that most respondents have a monthly income between IDR 1 and 2 million (39.02%) and less than IDR 1 million (29.27%). Meanwhile, those earning more than IDR 3 million accounted for only 9.76%. This indicates that most respondents have low incomes, limiting the population's capacity and Willingness to contribute financially to environmental programs (Angessa et al., 2022; Zamzami et al., 2021). Research shows that low income levels correlate with reduced financial contributions to environmental conservation because limited household budgets can hinder spending on environmental initiatives (Kim et al., 2019). However, relatively low incomes do not always hinder community participation in conservation activities, as non-financial involvement, such as community service, environmental education, and cooperation, is often a more prominent form of contribution in local communities.

Community-based ecotourism can benefit communities not only through financial gains but also by increasing awareness of environmental sustainability (Angessa et al., 2022). This phenomenon underscores the importance of designing effective mechanisms for voluntary contributions, such as the Willingness-to-Pay (WTP) model. Furthermore, research indicates that the number of dependents in a family and knowledge of the ecosystem influence WTP. The research results showed that most respondents had between one and two dependents. Theoretically, household size is a factor that influences economic decisions, including the Willingness to pay for environmental activities. Larger family sizes generally limit financial resources for voluntary

contributions (Hill et al., 2016). Households with more dependents tend to have a higher expenditure burden on basic needs such as food, education, and health. So that spending on environmental conservation is not a priority.

Knowledge of ecosystem benefits is crucial for encouraging community involvement in environmental conservation. The study results showed that approximately 61% of respondents had good knowledge of the benefits of the Bendhung Lepen ecosystem, particularly its ecological role in maintaining water quality, controlling flooding, and enhancing the beauty and attractiveness of the tourism industry. This level of knowledge reflects a majority of the community's understanding of the link between environmental sustainability and economic well-being, particularly through the growing tourism activities in the area. A study by Yanes et al. (2019) shows that knowledge increases ecological awareness, thereby supporting increased participation in conservation initiatives. The higher the level of community understanding of the value and function of ecosystems, the greater the possibility that they will actively participate in conservation efforts.

Willingness to Pay for Environmental Services Improvement

The changes occurring at Bendhung Lepen in Yogyakarta demonstrate that environmental improvements can enhance the community's quality of life and boost tourism potential, ultimately benefiting the local economy. This demonstrates a potential willingness to pay (WTP) for environmental services in exchange for the benefits they receive. Research shows that community readiness to invest in the local environment is supported by perceived benefits, including economic, social, and environmental benefits (Prasath et al., 2023; Y. Wang et al., 2020). From an economic perspective, tourism activities such as fishing, fish feeding, culinary experiences, and photography provide local communities with opportunities to earn additional income through interactions and trade with tourists. These economic benefits can encourage communities to support initiatives to preserve environmental resources, thereby fostering greater community participation.

Socially, community initiatives to collaborate on cleaning irrigation canals and managing the environment can foster social bonds. This suggests that social capital can significantly increase community involvement in environmental governance (Wang et al., 202). Therefore, community WTP is reflected in money and can be expressed in terms of time and effort. Environmental benefits include improved irrigation, which reduces littering, and sustainable fish farming practices. This can support the surrounding community's health and enhance the environment's aesthetics. Studies show that ecological awareness of a clean environment encourages communities to engage in environmentally sustainable activities and underpins WTP initiatives. According to Wang et al. (2020) and Prasath et al. (2023), individuals generally support conservation efforts when they recognize the direct benefits to their living conditions and local biodiversity.

Environmental service assessment is a crucial aspect of environmental management, particularly in the context of community willingness to enhance environmental services. Assessment using the Contingent Valuation Method (CVM), which employs a hypothetical market to measure WTP, has proven effective in assessing community appreciation of environmental benefits obtained (Hinlog et al., 2022; Ignatyeva et al., 2022). The distribution of community WTP values in Bendhung Lepen is presented in Table 3.

Table 3. Community willingness to pay for environmental service improvements in Bendhung Lepen

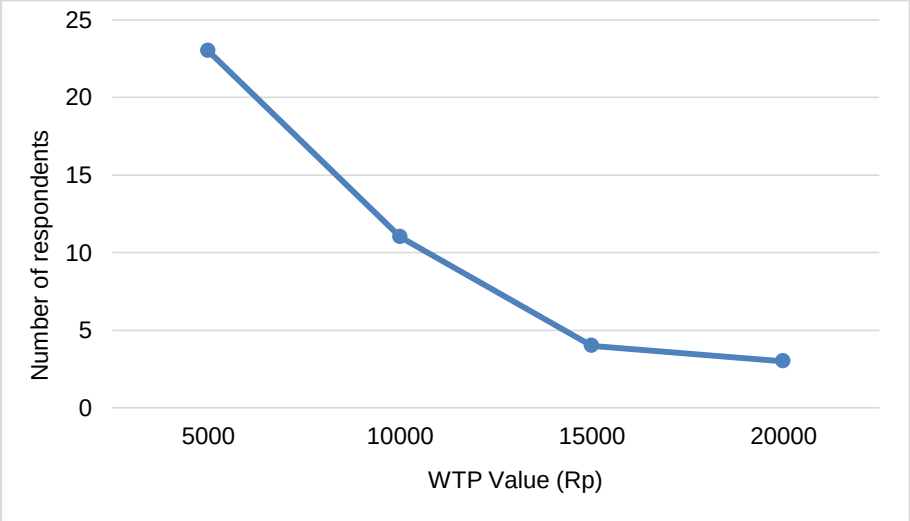
WTP Bid Value (Rp/household/month)	Number of Respondents		Mean WTP (Rp)
	Person	Percentage (%)	
5.000	23	56.10	2.805
10.000	11	26.83	2.683
15.000	4	9.76	1.463
20.000	3	7.32	1.463
Total	41	100.00	8.415

Source: Primary data analysis (2024)

The results of the study indicate that the community's Willingness to pay (WTP) for improving environmental services in the Bendhung Lepen area varies among respondents. The average WTP of Rp8,414.63 per person per month reflects the community's Willingness to make financial contributions to maintain or improve the quality of the ecosystem in the area. The average Willingness to Pay (WTP) obtained in this study not only represents a monetary value but also reflects the community's economic preferences for improving environmental services. From an environmental economic perspective, WTP is generally used as a proxy for valuing public goods and ecosystem services that lack an explicit market price within a contingent valuation framework (Chang & Yoshino, 2017).

Furthermore, various empirical studies on ecosystem service valuation suggest that WTP reflects the community's recognition of the environmental benefits resulting from ecosystem functions and improvements(Khan et al., 2019). In the context of community-based tourism, this assessment can be interpreted as a form of collective community support in maintaining the sustainability of shared environmental resources that contribute to local livelihoods and the quality of tourist destinations

The variation in WTP values indicates that the community's decision to pay is not solely determined by economic capacity but also by perceptions of environmental benefits, social characteristics, and levels of involvement in community-based tourism activities. According to Rajapaksa et al. (2018, past experiences with adverse environmental phenomena can influence knowledge and attitudes toward the environment. Furthermore, K. Wang & Zhang (2021) stated that general environmental knowledge is an important factor influencing pro-environmental behavior. This suggests that the more experience a person has in interacting with environmental issues and the greater their understanding of the importance of environmental protection, the higher the likelihood that they will act in an environmentally friendly manner.



Source: Primary data analysis (2024)

Figure 1. Community WTP curve for improving environmental services at Lepen Bendhung

To clarify the distribution pattern of community preferences and payment behaviour, Figure 1 presents the community's willingness-to-pay (WTP) curve for improving environmental services in the Bendhung Lepen area. This curve illustrates how the proportion of respondents willing to pay changes as the contribution amount increases, thus providing a more in-depth picture of the community's assessment behavior towards environmental services. Figure 1 shows a negative relationship between the WTP offered and the number of respondents willing to pay. The higher the WTP bid, the fewer respondents are willing to pay. This pattern reflects public sensitivity to costs and economic constraints (Gómez et al., 2023).

The downward-sloping WTP curve indicates that although most people are willing to make financial contributions to improve environmental services, there is an economic threshold beyond which participation rates decrease as contributions increase. This pattern aligns with the theoretical characteristics of demand for nonmarket environmental goods, where budget constraints and competing household needs limit individuals' Willingness to pay. Empirical evidence from contingent valuation studies indicates that the WTP curve is generally negatively sloped, suggesting that the higher the value of the proposed offer, the lower the proportion of respondents willing to participate in environmental financing schemes (Larre et al., 2024). In the context of community-based tourism, these findings confirm that the success of community-based environmental management depends on designing contribution mechanisms that are proportional, inclusive, and aligned with local communities' economic capacity, and on institutional governance that can maintain trust and the long-term sustainability of participation.

The community's Willingness to Pay (WTP) patterns identified in this study provide an important basis for policymakers in formulating appropriate strategies to determine contributions and improve the quality of environmental services. Based on the data, the optimal price range is between IDR 5,000 and IDR 10,000. This value maximizes participation and ensures equitable access to

environmental services (Rexhepi et al., 2024). Understanding community WTP through CVM enables the development of targeted environmental policies aligned with community capacity and preferences, thereby encouraging sustainable practices in local ecosystems (Bateman & Kling, 2020; Hinlog et al., 2022).

Factors Affecting Willingness to Pay

Before conducting the multiple linear regression analysis, normality and classical assumption tests were performed to ensure the model's validity. Based on the results of the Kolmogorov-Smirnov normality test, the significance value of Asymp. Sig. (2-tailed) is 0.200 (greater than 0.05). Therefore, based on the Kolmogorov-Smirnov normality test, the data are typically distributed. The results of the multicollinearity test indicate that all independent variables have Variance Inflation Factors (VIFs) below 10 and Tolerances above 0.10, suggesting no multicollinearity among the variables. In addition, the heteroscedasticity test using the Glejser method indicates that there is no significant relationship between the absolute residuals and the independent variables ($p > 0.05$), suggesting that the model is homoscedastic. Thus, the regression model meets all basic assumptions and is suitable for further interpretation.

Table 4. The results of the parameter estimation of factors influencing the WTP value at Bendhung Lepen in 2024

Variables	Estimation parameters	Std. Error	Sig.	VIF
Intercept	4,431	0.936	< 0,001	
Income	0,026	0.127	0,839	1,198
Age	-0,235	0.307	0,452	1,205
Education	-0,406	0.227	0,088*	1,099
FamilySize	-0,344	0.142	0,025*	1,115
Knowledge	0,236	0.069	0,003*	1,155
Sig-F	0,007	R square	0,512	
Asymp. Sig. (2-Tailed)	0,200			

Source: Primary data analysis (2024)

The results of the regression analysis presented in Table 4 indicate that the variables of income, age, education, number of dependents, and knowledge collectively influence the community's Willingness to pay (WTP) for efforts to improve environmental quality in Bendhung Lepen. The coefficient of determination (R^2) of 0.512 indicates that approximately 51.2% of the variation in WTP values is explained by the five independent variables in the model, while the remaining 48.8% is influenced by factors not accounted for in the model. Parameter estimation results are presented in Table 5.

The estimation results indicate that community awareness of ecosystem benefits is important for significantly increasing WTP. Knowledge of the Bendhung Lepen ecosystem's benefits (PME) has a positive effect. Respondents who understood the ecological and economic value of the Lepen Dam such as improved water quality, flood control, and tourist attraction showed a higher willingness to pay. This suggests that increased environmental knowledge can encourage pro-environmental behavior, in line with the environmental knowledge attitude–behavior framework. This demonstrates the importance of educating the community about the benefits of Bendhung Lepen to encourage environmental conservation (An et al., 2024). This finding aligns with other studies suggesting that environmental awareness motivates individuals to financially support environmental conservation efforts(Boateng et al., 2019; Kwon et al., 2023).

Conversely, the household income variable did not have a significant effect as hypothesised. Theoretically, household income positively affects WTP. The analysis results show that the estimated WTP parameter is not statistically significant. This could be due to the relatively homogeneous income levels in the community around Bendhung Lepen, where most respondents are in the lower-middle income group, so differences in economic ability are not particularly striking in influencing payment decisions. According to Huang et al. (2023, the influence of income on WTP can be indirect, especially for communities whose economic activities are closely tied to social dynamics and perceptions of environmental services. Although not statistically significant, the positive direction of this relationship is consistent with economic theory, which suggests that higher income tends to enhance an individual's ability to pay for public goods or environmental services that lack market prices. Similar findings were also reported by Boateng et al. (2019), who demonstrated that income is positively correlated with household willingness to pay for waste management services in Ghana.

Furthermore, the age variable shows an adverse but nonsignificant effect on WTP. This finding aligns with the results of An et al. (2024, who reported that younger respondents are more likely to pay than older respondents. In this study, age did not have a significant effect, which may be due to psychological factors and perceived environmental values that do not always increase or decrease linearly with age. In many cases, older individuals may have significant environmental concerns but are also more cautious about spending money on items perceived as providing no direct benefit (non-use value). Furthermore, differences in experience and economic priorities between age groups may lead to behavioral variations that are not large enough to produce a statistically significant effect.

Interestingly, the estimated results for the education variable in this study show a negative coefficient, indicating that higher levels of education are not always directly associated with higher Willingness to pay. Individuals with secondary formal education predominantly live in the Bendhung Lepen area, and most work in the informal sector, earning limited income. Those with higher education do not necessarily have higher incomes. Consequently, education does not automatically increase economic capacity, and the relationship between education and WTP is negative but not significant. According to Boateng et al. (2019, highly educated people have higher incomes and better socioeconomic status and are therefore more likely to pay for environmental management. According to Bamwesigye et al. (2020) and Chen & Zhang (2023), individuals with higher education may have higher expectations of the government or other entities providing environmental services without directly contributing. Saqib (2004) shows that perceived benefits related to environmental quality can differ across demographic groups.

The number of dependents in the family significantly reduced WTP, suggesting that larger family sizes may limit the use of budgets to support environmental goals. Households with more family members tend to prioritise income allocation to basic needs, such as food, education, and health, leaving less room for environmental contributions. In line with Scarlet et al. (2022) and Makanga & Zahiga (2023), household size influences financial decisions related to environmental contributions. This significant result indicates a substantial appreciation for environmental services among community members, which can be further enhanced through targeted conservation policies and initiatives (Endalew & Wondimagegnhu, 2019; Susanti & Nihayah, 2019).

The results of the regression analysis indicate that environmental knowledge has a more consistent influence on Willingness to pay than most other socioeconomic variables. This finding suggests that community decisions to contribute to the management of environmental services are more influenced by an understanding of ecosystem benefits and the collective value of environmental resources than by economic capacity alone. The insignificance of several socioeconomic variables suggests that interventions focused solely on increasing community income may not be effective in encouraging financial participation. In community-based tourism management, this finding confirms that community involvement in the management of tourism ecosystem services is strongly influenced by social capacity, levels of trust, and the legitimacy of the institutions that regulate such management, so that communities play a role not only as beneficiaries but also as key actors in maintaining the sustainability of the tourism environment.

Based on these findings, it is necessary to design environmental management policies that encourage community participation through community-based financing mechanisms. One relevant approach is the establishment of an environmental fund with a voluntary contribution scheme of approximately IDR 5,000–IDR 10,000 per month, adjusted to the local community's capacity. This fund is managed collaboratively by the community, the village government, and the tourism management group (Pokdarwis) in a transparent and participatory manner. The use of funds is focused on irrigation cleaning activities, waste management, maintenance of tourism facilities, and environmental education, thereby strengthening ecological awareness and expanding community involvement in maintaining the sustainability of the Bendhung Lepen ecosystem.

Overall, this study demonstrates that the valuation of environmental services in community-based tourism areas cannot be understood solely as individual economic decisions, but is also influenced by social conditions, institutions, and shared perceptions of ecosystem benefits. By positioning Willingness to pay within community-based environmental management, this study contributes to the study of environmental economics and sustainable tourism by understanding how nonmarket financing schemes can be tailored to local community capacities. These findings emphasize the importance of participatory and adaptive management approaches to maintaining the sustainability of ecosystem services in tourism destinations that rely on local community involvement.

CONCLUSIONS AND SUGGESTIONS

The results of this study indicate that the average WTP of local communities for improving the Bendhung Lepen ecosystem services is IDR 8,414.63 per person. Factors that significantly influence local communities' WTP include education level, number of family members, and knowledge of surrounding environmental conditions. This study highlights that valuing ecosystem services in community-based agro-tourism contributes not only to environmental conservation but also to the promotion of sustainable tourism and environmental education. By revealing visitors' Willingness to pay for ecosystem improvements, the findings highlight the potential of integrating ecological awareness into local tourism management and policy design. However, this research is limited by its relatively small sample size and case-specific context, which restricts the generalizability of the results. Future studies are encouraged to adopt larger and more diverse samples, as well as comparative analyses across different community-based tourism sites, to deepen understanding of how ecosystem valuation can support long-term sustainability and community empowerment. Also, the practical implications of this research serve as an initial basis for the formulation of payment for ecosystem services, where the community consciously values ecosystem services that have led to better conditions than before.

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