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Willingness to Pay for Biodiversity Conservation and Well-Being in Bako National Park, Sarawak, Malaysia

Ibrahim, Mohamad Syahrul Nizam[1], Johari, Shazali[2], Md Allwi, Norul Izani[3] & Hassan, Suziana[4*]

[1,3]Faculty of Agricultural Science and Forestry, Universiti Putra Malaysia Bintulu Campus, 97008 Bintulu, Sarawak, MALAYSIA

[2]Faculty of Forestry and Environment, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, MALAYSIA

[4]Faculty of Economics and Management, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, MALAYSIA

*Corresponding Author: suzi_h@ukm.edu.my

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Abstract: Bako National Park (BNP) is Sarawak's oldest and smallest protected area which has high biodiversity conservation value which critical to policy development. The economic valuation using contingent valuation method (CVM) is crucial to estimate non-marketed goods which refer to public willingness to pay (WTP) for conservation efforts in the area. WTP refers to the amount of money a person is willing and able to spend on recreational activities which reflects their awareness towards biodiversity conservation in BNP. Both local community and visitors play an important role in the development of sustainable tourism and human well-being. Thus, the study elucidates the willingness to pay of local community and visitors for conserving biodiversity in BNP. Specifically, the study attempts to look at the maximum price they are willing to pay for a park entrance fee and how it relates to community well-being in the area. The validated questionnaire was distributed to the visitors and local community by simple random sampling technique. Consequently, the maximum price of visitors and local community willingness to pay for biodiversity conservation was MYR100 and MYR50, respectively. Although the prices varied due to their sociodemographic, it still possessed that their willingness to support conservation efforts is in good shape. The community well-being (CWB) constructed indicated a good mean through the dimensions of environment (3.70), neighborhood (3.65), life and social relation (3.92), services and facilities (3.33), education (3.50), economics (3.25) and cultures (3.50). A good level of WTP reflected their awareness of the importance of national park as a key entity in ensuring their well-being through its dimensions. Therefore, it is crucial to understand the challenges faced at the bottom level in the effort towards holistic biodiversity conservation.

Keywords: Willingness to pay, ecocentrism, motivation, economic, community well-being

1. Introduction

Economic value of biodiversity conservation is crucial evidence to support and formulate policies (Abdullah et al., 2015). Contingent valuation method (CVM) is a questionnaire-based approach that is designed to estimate the economic value of non-market goods (Geleto, 2011). One of the most important concepts in CVM is willingness to pay (WTP). WTP is the amount of money that a person is willing and able to pay to enjoy recreational facilities (Ding & Alias, 2014). It measures whether an individual is willing to forego their income to obtain more goods and services and is typically used for non-market goods. The non-use value of natural attractions is defined as the value individuals place on the natural environment irrespective of their use (Dharmaratne et al., 2000). The higher education would imply higher awareness and appreciation for natural resources, which should result in a higher WTP (Brennan et al., 2007). WTP is one of the sources of protected areas and a huge flow of finance has come from individual's WTP (Beumer & Martens, 2013). Thus, WTP can be used as a tool for revising pricing policies in Bako National Park, Sarawak, Malaysia. The optimum pricing

*Corresponding author: suzi_h@ukm.edu.my
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strategy should be a combination of policy objectives and information gathered about visitors' WTP (Cheung et al., 2014; Laarman & Gregersen, 1996).

However, the issue of WTP is not only limited to visitors, but also local community who are directly involved in this occurrence because both stakeholders play huge role towards the development of sustainable tourism and human well-being (Ibrahim et al., 2019). Thus, this study aims to examine the relationship between local community and visitors' willingness to pay for conservation and the community well-being in Bako National Park (BNP). Specifically, it aims to examine the maximum price of their willingness to pay for park entrance fee and its relation to community well-being dimensions in the area.

2. Literature Review

To address the willingness to pay for biodiversity conservation and well-being in Bako National Park, Sarawak, Malaysia, it is essential to consider the factors influencing visitors' attitudes and behaviors towards conservation efforts. Several studies provide valuable insights into the relationship between willingness to pay, biodiversity conservation, and well-being in the context of national parks and protected areas. Researcher, Bhandari & Heshmati (2010) emphasize the significance of willingness to pay for biodiversity conservation, particularly in the context of tourism. Their study highlights the interplay between tourism, willingness to pay, and biodiversity, which is directly relevant to understanding visitors' perspectives in Bako National Park (Bhandari & Heshmati, 2010). While, Nguyen & Jones (2022) shed light on the indirect effects of biodiversity loss on willingness to pay, emphasizing the mediation of attitudes towards conservation. This study provides valuable insights into the complex interrelationships between perceived environmental degradation, economic growth, and nature-based recreation opportunities, which are crucial factors in understanding visitors' willingness to pay for biodiversity conservation in national parks (Nguyen & Jones, 2022).

Meanwhile, Crespo-Cebada et al. (2020), offer insights into visitors' preferences and willingness to pay for biodiversity conservation in natural parks. Their findings indicate a high preference for higher biodiversity levels among tourists, which directly relates to the assessment of willingness to pay for biodiversity conservation in Bako National Park (Cebada et al., 2020). Some of the researcher discusses the measurement of actual expenditures and stated willingness to pay for biodiversity conservation. This study provides a comprehensive perspective on the degree of care for biodiversity conservation, which is essential for understanding visitors' willingness to pay in the context of Bako National Park (Pearce, 2007). For example, Ibrahim et al. (2023) present findings related to public awareness and attitudes towards biodiversity conservation in Gunung Mulu National Park, Sarawak. While not directly focused on Bako National Park, the study's insights into local community attitudes towards biodiversity conservation are relevant for understanding similar dynamics in other national parks in Sarawak, including Bako National Park (Ibrahim et al., 2023).

Moreover, Ghazvini et al. (2020) emphasize the importance of improving visitors' awareness of environmental challenges and acceptable behaviors and activities within national parks. This suggests that management plans should incorporate tourists' environmental concerns to minimize the impact of tourism activities on the natural environment. Additionally, Esfandiar et al., (2020) highlight the positive impact of national park landscape resource conservation policies on social norms and conservation behavior intentions. This underscores the significance of implementing and enforcing conservation policies to shape visitors' behaviors and attitudes towards biodiversity conservation.

Furthermore, Arnberger et al. (2012) stress the importance of understanding visitors' attitudes towards protected area management, indicating that a profound understanding of visitors' attitudes is crucial for the development of acceptable management policies. Amin et al. (2014), also suggest that influencing visitor attitudes and shaping behavior requires further research, indicating the need for ongoing efforts to understand and address visitors' perspectives. In addition, Kholiq & Antriyandarti (2023) provide insights into policy plans for ecotourism development, emphasizing the importance of zoning changes, maximum protection of natural preservation, community empowerment, and the determination of proper strategies for ecotourism development. This suggests that policies should focus on sustainable and community-centred ecotourism development to align with visitors' attitudes and behaviors. Scheepers et al. (2011) advocate for an adaptive management approach to resource use in national parks, emphasizing the importance of greater involvement of local communities in park management. This approach aligns with the idea of incorporating local voices in conservation and development endeavours, as highlighted by He & Guo (2021), to ensure that policies are inclusive and consider the perspectives of local stakeholders.

3. Methodology

The study was conducted in the oldest and smallest Sarawak's national park, Bako National Park (BNP), Kuching (1.7167° N, 110.4667° E) in August 2020. Questionnaires were distributed to a total of 40 respondents comprising of local community and visitors in BNP by simple random sampling. Bell et al. (2022) proposed a sample size of between 25 and 100 respondents for a pilot study. Others mentioned that a selection of 10 to 30 respondents was appropriate for a pilot test (Hill, 1998; Isaac & Michael, 1995). Thus, the sample size for this pilot study was 40 which was within the acceptable number. During the COVID-19 pandemic, number of public visiting BNP was not as many like before. Thus, it was quite challenging to get more respondents involved in this study.

The questionnaire was devised and circulated in bilingual namely Malay and English language in a single set. The questionnaire consisted of three sections which include the sociodemographic, willingness to pay for biodiversity conservation (WTP), and community well-being (CWB). The WTP items were adopted from Mitchell & Carson (2013) by facilitating CVM, which is commonly applied in environmental analyses to estimate the maximum price for willingness to pay for biodiversity conservation by respondents. The structure of this section utilized the double-bounded dichotomous choice questionnaire. Moreover, items for CWB were adapted, revised, and added from some literature, namely Wiseman & Brasher (2008); Norman et al. (1997); Cummins (1996); O'Brien & Lange (1986); and Andrews & Withey (1976). This section was made necessary to the local community and who were requested to respond to the statements by stating their level of satisfaction via a five-point Likert-scale, ranging from 1 "Very dissatisfied" to 5 "Very satisfied".

4. Results

4.1 Socio-Demographic Characteristics of Respondents

There was a total of 40 respondents in this study, 45.0% (n=18) of them were male, while 55.0% (n=32) were female. Majority of respondents were Malays which most of them were local community of Kampung Bako, while the rest were Dayaks (e.g., Iban, Bidayuh), Chinese, and Sikh. More than half (65%) of respondents were visitors, while the remainder (35%) was from the local community. Visitors preferred to come to BNP in a group of friends or family members. The current scenario due to pandemic was very tough for the tourism sector because only local visitors were available, whose numbers were not as high. Since 1995, there were more international tourists visiting BNP than the locals annually.

A total of 92.5% of the respondents were from the B40 group which has a monthly salary of less than MYR4850 according to the income classification set by the Department of Statistics Malaysia. About 50% of respondents have tertiary education such as pre-university, first degree and advanced degree, while the rest received their secondary education such as Malaysian Certificate of Education (SPM), skills certificate and disabling education. The socio-demographic characteristics of respondents is as presented in Table 1.

Table 1: Socio-demographic Characteristics of Respondents

	Demographic background	**Frequency (n)**	**Percentage (%)**
Gender	Male	18	45.0
	Female	22	55.0
Ethnic	Malay	25	62.5
	Iban	5	12.5
	Bidayuh	3	7.50
	Chinese	6	15.0
	Sikh	1	2.50
Income	Less than MYR2500	36	90.0
	MYR2500- MYR4850	1	2.5
	MYR4851- MYR10,959	2	5.0
	More than MYR10,959	1	2.5
Marital status	Married	13	32.5
	Single	26	65.0
	Others (e. g. divorced)	1	2.50
Age	Less than 30	22	55.0
	30-50	13	32.5
	51-74	5	12.5
Level of education	Secondary education	15	37.5
	Skills certificate	4	10.0
	Pre-degree	10	25.0
	First degree	9	22.5
	Postgraduate	1	2.50
	Others (e. g. disabling education)	1	2.50
Status of resident	Local community	14	35.0
	Visitor	26	65.0

4.2 Willingness To Pay for Biodiversity Conservation

Table 2 shows that local community have a higher percentage of willingness to pay (92.9%) for a minimum price of MYR10 than visitors. According to the current rate set by the Sarawak Forestry Corporation, local tourists are charged MYR10, while international tourists are charged MYR20 for the entrance ticket to Bako National Park. However, based on this study, the maximum price that the local community and visitors were willing to pay was MYR50 and MYR100, respectively. The price that tourists were willing to pay was higher than the local community due to their higher monthly income level. They were heterogeneous, indicating that tourists' characteristics were diverse in many aspects (Zaiton et al., 2012).

On the other hand, the local community was homogeneous as they were composed of fishermen and small and medium industry (IKS) entrepreneurs who have limited and almost the same income pattern compared to the tourists. Based on the classification of households in 2020 by the Department of Statistics, Malaysia, they were from the B40 group which has an income of less than MYR4849. In addition, the low-income factor can also affect the affordability by the population to do so (Clark, 2014). Nonetheless, the WTP for a maximum payment rate was commensurate with their current expenses and income, as well as the level of awareness to support conservation efforts which was still in a good shape. Income is a sociodemographic variable that influences individuals' WTP and has been reported in CVM literatures (Adamu et al., 2015). It has a positive impact on the contribution for biodiversity conservation in BNP.

Moreover, education plays a significant role in determining the willingness to pay (Hejazi et al., 2014). All respondents at least obtained a minimum secondary school level education. Thus, there was only a handful or 26.3% (n = 6) that stated the unwillingness to pay, but in fact they have already done so by entering the BNP. It was likely that they were paid by individuals in their group such as friends and family members who also took part in the trip. This also indicated that the level of their trust in the authority that manage the fund for biodiversity conservation efforts was questionable. In communities with low levels of trust, higher frequencies of free-riding behaviours may occur (Jones et al., 2010).

Table 2: Willingness to Pay for Park Entrance Fee

	Local community		**Visitor**	
	Frequency (n)	**Percentage (%)**	**Frequency (n)**	**Percentage (%)**
Are you willing to pay minimum price of MYR10 through entrance fee?				
Yes	13	92.9	21	80.8
No	1	7.1	5	19.2
Maximum price for WTP	MYR50.00		MYR100.00	

Note: MYR1=USD0.21 (updated on 26th June 2023)

4.3 Community Well-Being

Table 3 shows that CWB achieved a good overall mean score of 3.55. In the context of the local community, these CWB constructs were measured using their level of satisfaction on the dimensions of the environment, economy, life and social relations, services and facilities, education, neighbourhood, and culture which is in line with some literature by Wiseman & Brasher (2008); Norman et al. (1997); Cummins (1997; 1996); O'Brien & Lange (1986); and Andrews & Withey (1976).

Table 3: Community Well-Being (n=14)

Dimension	**Mean score**	**Interpretation**
Environment	3.67	Good
Neighbourhood	3.65	Good
Life and social relation	3.92	Good
Services and facilities	3.33	Good
Education	3.50	Good
Economics	3.25	Good
Cultures	3.50	Good
Overall	***3.55***	***Good***

The local communities were still satisfied with their living area which was close to the national park and has been their identity. The passage of time has made their lives as the Bako community to be better than before. Business through a payment imposed on tourists through services such as national park entrance tickets, boat fares, seafood are the main sources of income for the villagers. Their quality of life could also be achieved through a clean environment with good

biodiversity conservation and management. Consequently, most respondents were aware of the importance of conserving BNP in their livelihood as well as expressed their WTP for the purpose of such conservation.

The definition of human well-being is complex and subjective from different perspectives (Clark, 2014). The authority intervention is a mediating factor that influencing the local community's behaviour and supports towards the conservation efforts. For example, if the local community is satisfied with these dimensions of community well-being, then they would realize the importance of sufficient funds in the effort towards conservation. This will enable them to enjoy the benefits of a healthy ecosystem such as fresh air, adequate income, good mental and physical health, and a healthy source of food.

4.4 Relationship Between Willingness to Pay and Community Well-Being Among Public

Biodiversity is an element of human well-being, like social cohesion, happiness, and connections to nature, for some people and some cultures (Naeem et al., 2016). Nature-based recreation can help promote public health by encouraging physical and mental well-being (Townsend, 2006) as well as provide benefits for local community (Ezebilo, 2014). To understand the situation of willingness to pay and well-being, it is very important to elucidate public level of awareness on the importance of biodiversity conservation which is a psychological aspect that needs to be emphasized in creating an effective implementation of a holistic policy or framework. Affective factors play a much larger role than scientific in motivating willingness to pay (Martín-López et al., 2007). WTP for environmental conservation depends highly on to what extend the local community and visitors are aware towards biodiversity conservation. The maximum price that visitors and the local community willing to pay for biodiversity conservation was MYR100 and MYR50, respectively. Although, the prices vary due to their sociodemographic, it still showed their willingness to support conservation efforts was in a good shape. The maximum payment reflects the value of the attributes they perceived individually.

Moreover, in the context of visitors, if they are satisfied with the first visit to BNP through a memorable experience, then they are likely to come again, and it portray their willingness to spend money to see the subjective happiness that they had gained from the trip. This shows that a good experienced utility leads to a good decision utility and their supports towards the conservation effort of this protected area.

BNP requires the cooperation of various stakeholders, especially the local community to sustain biodiversity and then keep on sustain their well-being. As with other approaches, resource and income-based measures have been put forward as concepts and measures of human well-being (Clark, 2014). As a result, the government needs to increase the motivation of the local community to increase their income by adapting to these new norms. This can improve their quality of life through good satisfaction and happiness so that they altogether support towards the conservation of biodiversity in their area continuously.

5. Discussion

It can be summarized that the development of strategies and policies for biodiversity conservation and well-being in national parks, particularly in the context of Bako National Park, Sarawak, Malaysia, should consider several key factors. These are included for example, a visitor awareness and environmental concerns. There must be a strategies and policies should aim to improve visitors' awareness of environmental challenges and promote acceptable behaviors and activities within national parks (Oleśniewicz et al., 2020). This can help minimize the impact of tourism activities on the natural environment and contribute to the conservation of biodiversity. Secondly, the implementation and enforcement of conservation policies. The positive impact of national park landscape resource conservation policies on social norms and conservation behavior intentions highlights the importance of implementing and enforcing conservation policies to shape visitors' behaviors and attitudes towards biodiversity conservation (Canteiro et al., 2018). In future, the policy makers should be more understanding visitor attitudes. A profound understanding of visitors' attitudes towards protected area management is crucial for the development of acceptable management policies. Efforts to influence visitor attitudes and behaviors should be informed by ongoing research to address visitors' perspectives.

Whiles, there must be an effort towards a sustainable and community-centered ecotourism development. Policies should focus on sustainable and community-centered ecotourism development, including zoning changes, maximum protection of natural preservation, and community empowerment. This approach can help align tourism activities with conservation goals and local community interests (Kongbuamai et al., 2020). An adaptive management approach to resource use in national parks, along with greater involvement of local communities in park management, can contribute to sustainable resource use and conservation efforts. Incorporating local voices in conservation and development endeavors is essential for inclusive and effective policies (Théau et al., 2018).

In conclusion, the synthesis of the statements and references underscores the importance of incorporating visitor awareness, implementing conservation policies, understanding visitor attitudes, promoting sustainable ecotourism development, and adopting adaptive management approaches with local involvement in the development of strategies and policies for biodiversity conservation and well-being in national parks, including Bako National Park, Sarawak, Malaysia. These considerations can help ensure that policies align with visitors' attitudes and behaviors while contributing to the conservation of biodiversity and the well-being of both visitors and local communities.

6. Conclusion

The findings suggest that local communities and tourists had a good level of awareness of biodiversity conservation through the value of willingness to pay shown in this study. Compared to previous studies, this study has stated the situation that occurred during the COVID-19 pandemic which showed the value of willingness to pay that is MYR100 and MYR50 for tourists and local community respectively. Considered with this limitation, the maximum price for WTP has also been influenced by the current income of the public during this pandemic season which is more stressful than before. It has posed a challenge to their economic viability due to the difficulty of marketing their services to consumers unlike before. Thus, this study had interesting findings that have not been highlighted by any researchers on the limitations of the pandemic in this area of BNP in understanding the level of WTP which is a measure of non-marketed goods.

Even though this study is only a small scale, the findings might be useful to other relevant stakeholders in understanding the situation at the grassroots level to achieve a holistic management towards sustainable development in terms of economic, environmental, and social. However, it would be fruitful to pursue further research in choice experiment method to estimate the mean of willingness to pay among public in BNP. This method provides more advantages over CVM in the context of overcoming biased for studies on consumers even though both have the same purpose of measuring non-marketed good through consumer preferences, particularly the level of WTP.

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Conflict of Interest

The authors declare no conflicts of interest.

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