

Implications of willingness-to-pay of tourists for forest restoration: The case of Mount Arayat Protected Landscape in Pampanga, Philippines

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ABSTRACT. Ecological restoration of protected areas is a key measure to ensure the conservation of critical biological resources and natural assets and provide various environmental and societal benefits. Mount Arayat Protected Landscape is one of the Centers of Plant Diversity in the Philippines. It requires forest restoration as it has long been diagnosed as a degraded resource and a crucial precautionary strategy against decreasing forest cover as influenced by climate change and anthropogenic factors. This study aimed to determine the willingness of tourists to support forest restoration of this protected area through an entrance fee surcharge. The contingent valuation method, using a payment card as an elicitation technique, was employed in this study. Two modes of survey interview were conducted: one through a personal interview and one through an online survey. Results showed that from the 385 responses assessed, 81% of the respondents are willing to pay an additional entrance fee to support forest restoration, with more “yes” responses recorded under the online survey (85%) than in the personal interview (78%). The primary reasons for the respondents’ positive response arise from their non-use value, altruistic value, and bequest value for MAPL. These results imply that increasing the existing entry fee is a feasible and sensible strategy to increase revenue in Mount Arayat Protected Landscape. The computed mean willingness-to-pay (WTP) ranges from PHP 29 (USD 0.52) to PHP 47 (USD 0.85) obtained from the personal interview and online survey. Combining the data for both survey modes, the computed mean WTP was PHP 38 (USD 0.69). Rounding off these estimates, the projected additional revenue from the entrance fee surcharged was from PHP 990,000 (USD 20,000) to PHP 1,650,000 (USD 36,667) annually, assuming a visitation of 33,000 tourists yr⁻¹, as recorded. This could cover the cost of the proposed 500-ha forest restoration program from 9 to 15 years of operation, assuming a PHP 15 M project costs.

Keywords: contingent valuation, fund management, payment card method, protected area, sustainable financing

INTRODUCTION

Mount Arayat Protected Landscape (MAPL) is the first and only legislated protected area in the province of Pampanga, in Central Luzon, in the Philippines. It was popularly known as Mount Arayat National Park before and recently been

reclassified as a protected landscape through Republic Act No. 11684 last April 2022. Its designation as a protected area under the protected landscape category mandates the conservation of its biological resources and the development of its

recreational and ecotourism potential. MAPL has long been recognized as an important habitat of endemic, threatened, and endangered flora and has been selected as one of the 18 Centers of Plant Diversity in the Philippines (Fernando *et al.*, 2009). One of the most notable plant species naturally found here is the *Cycas riuminiana* or *Arayat Pitogo*, an endangered species (Agoo *et al.*, 2010) and the first known species of *Cycas* in the Philippines (Lindstrom *et al.*, 2007). Another is the recently discovered *Pyrostria arayatenensis*, an endemic species belonging to the family Rubiaceae (Suba *et al.*, 2020).

However, MAPL was diagnosed as a degraded resource (David, 1996) characterized by having a severely depleted water supply, eroded stream banks, and large fire-prone cogonal areas. These conditions pose threats to the biodiversity conservation of MAPL. In addition, with the impending development of the area for ecotourism purposes, more intensive anthropogenic activities are expected both in its multiple-use zone and strict protection zone, which increases the pressure on its biodiversity. With this, forest restoration can be considered one of the measures to secure the integrity of its biodiversity. Rebugio *et al.* (2007) described forest restoration as a special type of reforestation that intends to bring back a forest close to the structure and composition of its original state by planting native species found in the same forest through assisted natural regeneration and enrichment planting. It also aims to re-instate a forest's ecological functioning and biodiversity levels, similar to what a target climax forest contains and provides.

The lack of sustainable financing for MAPL hinders the attainment of its management objectives, including effective forest restoration. This study was conducted to determine the willingness of MAPL tourists to support its forest restoration through an entrance fee surcharge and subsequently augment funding for its management. In the study of Amatus & Calderon (2022), it was estimated that MAPL has an annual financing gap of PHP 2.8 M. This was computed by subtracting the estimated financing needs for optimal management (approximately PHP 14.1 M) from the estimated annual available

finances (approximately PHP 10.3 M) for a 10-year management period. Entrance fee collection contributes around 6% of the total available finances, estimated to be PHP 677,810 annually. The conduct and use of WTP studies as the scientific basis for establishing and adjusting entrance fees on site-level protected areas was recommended by Anda & Atienza (2013), along with the cost recovery principle, to aid protected area financing in the Philippines. One example is the work of Calderon *et al.* (2016) assessing the WTP of local and foreign tourists to pay conservation fees for the access of Ifugao Rice Terraces in the Cordillera Region. Based on their analysis, 64% of the residents and 44% of the foreign tourists interviewed were willing to pay conservation fees amounting to an average WTP value of PHP 440 (about USD 10) and PHP 3,124 (USD 71) visit⁻¹, respectively. In a similar study conducted by Apdohan *et al.* (2021), WTP was used to determine the possibility of collection of conservation fees from residents and tourists in the portion of Agusan Marsh Wildlife Sanctuary (AMWS). Results revealed that all respondents were willing-to-pay conservation fees with a mean WTP of PHP 81 to PHP 208 for residents and tourists, respectively. These studies infer that the WTP principle has been widely used to determine the acceptable level of payment for various user-fee schemes to support PA financing. In this study, the same approach was used but using entrance fee surcharge as the payment vehicle. This was conceptualized since increasing entrance fees in site-level protected areas in the Philippines has already been supported by a legal framework as specified under Section 11.2 of the DENR Administrative Order No. 2016-24 or the Revised Rates of Fees for Entrance and Use of Facilities and Resources in Protected Areas. Under this guideline, it is stipulated that the Protected Area Management Board (PAMB), the governing body of each site-level protected area in the Philippines, is allowed to increase their entrance fee by 10% per annum upon approval of the DENR. Hence, the collection of fees considering this payment vehicle is feasible and less complicated in terms of administration. The conduct of this WTP study supports the legal framework of increasing the entrance fee in MAPL by assessing the acceptability of the policy alternative to the target

resource users. In addition, it could provide the managers of MAPL with the appropriate entrance fee surcharge they may impose, which could optimize revenue and, at the same time amenable to the tourists.

METHODOLOGY

The contingent valuation method (CVM) was employed to determine the WTP of tourists for a proposed forest restoration program for MAPL. CVM is used to estimate economic values for all kinds of ecosystems and environmental services but has become a popular method for the valuation of non-market goods and services (Honu 2007). It involves creating a hypothetical market to infer the value of environmental goods or services, usually in monetary terms. CVM has been widely used to estimate the value of biodiversity conservation, but also in determining willingness to pay for forest restoration programs (Brugnaro, 2010; Khuc *et al.*, 2016) and support PA financing in the Philippines (Ballad *et al.*, 2018; dela Vega, 2019; Apdohan *et al.*, 2021; Ureta *et al.*, 2021) and in other countries (Witt, 2019; Aseres & Sira, 2020; Song *et al.*, 2021).

Description of the site

Mount Arayat is a dormant volcano that also serves as one of the biodiversity centers in the region. It is surrounded by a vast plain of rice fields and cities, making it a distinct natural landmark and an iconic natural feature in Pampanga. In 1994, it was designated as a tourist spot through Republic Act No. 7690 and had been considered one of the famous tourist attractions in Central Luzon. The most popular ecotourism spots are the North Peak, South Peak, White Rock, TKO Trail, Station of the Cross, the Resort Area, and Tree House Bike Park.

In terms of area, it covers a total of 3,715 ha, wherein the majority (1,557.47 ha or 42%) is grassland with patches of reforestation area. A quarter (928 ha or 25%) are plantation areas, while only 20% (738 ha) are covered with dense forest. The remaining 13%, or 438 ha, are crop production areas of upland farmers (MANP Management

Plan 2015). The dominant species in these grassland areas are cogon (*Imperata cylindrica*) and *talahib* (*Saccharum spontaneum*), which are prone to fire, especially during summer. There needs to be more up-to-date studies assessing deforestation and land-use change in MAPL. Given this, the effectiveness of conservation efforts in the area is difficult to evaluate. With the anthropogenic pressures brought about by intensifying use of MAPL for various purposes, the environmental and biodiversity integrity of MAPL is at risk, which could be compounded by climate change and global warming.

Survey questionnaire design

A draft questionnaire was created and pre-tested before the survey. The objective of the pre-test is to assess the clarity of information provided, the appropriateness of the questions included, and the soundness of the survey questionnaire. It was also done to verify if the hypothetical scenario is understandable and to solicit bid amounts to be used in the survey. Two modes of pre-testing were employed: respondents' debriefing and experts' opinions. For the respondent debriefing, questionnaires for the pre-test were sent to 30 tourists who had visited Mount Arayat between 2015 and 2019. Meanwhile, experts' opinions were derived from personnel of the Provincial Environment and Natural Resources Office (PENRO) of Pampanga and from people who have background and experience in conducting developing survey questionnaires and valuation studies. After pre-testing, the final survey questionnaire was developed and organized. **Table 1** presents the outline of the survey questionnaire.

Table 1. Outline of the survey questionnaire used in this study.

Section	Title
	Introduction
1	Respondent's Perception on National and Environmental Issues
2	Knowledge, Awareness and Perception about Mount Arayat National Park (MANP)
3	Assessment of the Willingness-To-Pay For Forest Restoration Program in Mount Arayat National Park
4	Socio-Economic and Personal Information of the Respondents

The study's rationale was explained in the introduction part of the survey questionnaire. It contains information about the researcher and the objective of the survey. A possible reward through a raffle was offered to motivate the respondents to participate. The respondents presented the confidentiality clause, as well. Afterward, they were asked to sign the consent form to indicate their willingness to participate in the survey.

The first section assessed the perception and awareness of the respondents about national and environmental issues. The respondents were asked to identify what they perceived as the biggest national and environmental problems and rank them based on the magnitude of impact from a list of options. In the second section, respondents were asked about their knowledge, awareness, and perception of the context of what a protected area is and the designation of MAPL as a protected area. A supplementary question asking the respondents why MAPL was designated as a protected area was also included. This section also includes questions about what they perceive are the most important uses/ benefits provided/ derived by local people (communities living within and near) from MAPL and how the park is being managed.

The WTP assessment was covered under section 3; which provides background information about MAPL, including its ecosystem services and organizational setup. The contingent valuation scenario was presented next, which includes the explanation of why there is a need for a restoration program in Mount Arayat, the activities included in the proposed Forest Restoration Program, why there is a need for financial support, and hypothetical market and payment vehicle. It was explained that the main purposes of the proposed restoration are (a) to increase the forest cover of the park by 15%, (b) to continuously support the survival of wildlife species living therein, and (c) to preserve and improve the aesthetic value of the park. The hypothetical target is to restore 500 ha of forest in MAPL within 10 years, which would need around PHP 15 M in funding.

A Trust Fund for the restoration program of Mount Arayat was proposed as a hypothetical

market and an additional entrance fee on top of the existing entry fee as the payment vehicle. It would be managed by the PAMB and the Protected Area Superintendent (PASu), together with a designated Special Collecting Officer (SCO) from the Provincial Environment and Management Office (PENRO) - Pampanga. It was also explained that the PAMB is the governing body of a protected area and is composed of the head or representative of the Municipal LGU and barangay where the protected area is located, representatives from government agencies such as the Department of Agriculture (DA), Department of Tourism (DOT) and the Department of Environment and Natural Resources (DENR) among others, together with representatives from local communities and academic institutions. The funds collected through this trust fund would be used only for restoration activities.

The payment card method was used to elicit the respondent's WTP value for forest restoration. They were first asked, hypothetically, to participate in a referendum to decide if they want to establish the trust fund. The respondents were then asked to select the value they were willing to pay in maximum from the list of bid amounts. Fifteen bid amounts were presented to the respondents based on the pre-test result. The minimum bid amount on the payment card will be PHP 5, while the max will be PHP 200. Four high-bid amounts will be included (100, 120, 150, and 200). For mid-level bid amounts, five were included (40, 50, 60, 70, and 80). Meanwhile, six low-bid amounts will be used (5, 10, 15, 20, 25, and 30). The respondents were asked about the certainty of their answer, motives for willingness to pay, the reason for non-participation, and relevant opinions to the CV question. Before selecting, the respondents were reminded to consider their income level, consumption, and spending.

The CV question was presented as follows:

1. Are you favor establishing a trust fund for Mount Arayat Restoration Program?
[] Yes [] No
2. If you favor establishing the trust fund, are you willing to pay an additional entrance fee?
[] Yes [] No
3. If you are willing to pay an additional

entrance fee that will be used to establish the trust fund, how much are you willing to pay as an additional entrance fee?

(Select only one from the payment card presented)

(Please consider your income and other fees and expenses you have to spend, like travel and food expenses and fees for the tour guide)

The final questionnaire section asked for the socio-economic information of the respondent, such as gender, age, address, civil status, educational attainment, personal income, household income, ethnicity, occupation, employment status, household size, and the number of earners in the households.

Sampling and survey implementation

Two modes of interviews were used: an online survey and a personal interview. Out of the 409 responses recorded, 385 survey questionnaires were used in the analysis, equivalent to approximately a 5% margin of error given a population size of 33,000 annual tourists. Questionnaires with significant missing data and a high value of residual ($r_i > 2.0$) after regression diagnostics were excluded from the analysis to reduce bias. For the selection of respondents, only those tourists who visited MAPL from 2016 to 2021 were qualified to answer the survey questionnaire. For the online survey, the questionnaire was forwarded and posted on Facebook pages and Messenger of potential tourists. For a personal interview, the survey was conducted in two ecotourism spots in MAPL, specifically in the Mount Arayat Resort Area and in the Tree House Bike Park, both located in Barangay San Juan Bano, Arayat, Pampanga. Tourists were approached, and those who were willing to participate were interviewed. The survey was conducted from May to September 2021.

Statistical analysis

This study used descriptive and regression analysis to summarize and analyze the data using Microsoft Excel, SPSS version 26, and STATA version 15.1. Descriptive statistics, including calculation of frequency count (F), percentage (%), and mean, were conducted to summarize

the socio-economic profile and the awareness and perception of the respondent about the national issues, environmental issues, and the status and management of MAPL. To determine the significant factors influencing the respondent's WTP for forest restoration in MAPL and their mean WTP, interval regression was used. A maximum likelihood interval regression (IR) model was recommended by Cameron & Huppert (1989) for payment card interval data. This model was adopted by Dribek & Voltaire (2017) in their WTP study for beach erosion control in Tunisia using the payment card method. In this study, the same model was used as described by the function:

$$\log WTP_i = X_i' \beta + \varepsilon_i \quad (1)$$

where WTP_i denotes the true WTP for the respondent i

X_i is a vector of explanatory variables
 $\varepsilon_i \sim N(0, \sigma^2)$

The WTP values are transformed into its natural log form since the expected WTP value should be non-negative to accommodate the right-skewed distribution of WTP responses. The interval regression requires two dependent variables representing the interval's lower end (L) and the upper end (U). It assumes that the true WTP of a respondent lies within the reported interval of bid amounts rather than represented by the midpoint value. Since the WTP of an individual (WTP_i) is assumed to fall within the lower end (L_i) and upper end (U_i), the $\log WTP_i$ is therefore found between $\log L_i$ and $\log U_i$. The associated probability function is then:

$$\log L_i < \log WTP_i < \log U_i = P\left(\frac{\log L_i - X_i' \beta}{\sigma} < Z_i < \frac{\log U_i - X_i' \beta}{\sigma}\right) \quad (2)$$

where Z_i is the standard normal random variable.

Meanwhile, the log-likelihood function can be presented as:

$$\ln L = \sum_{i=1}^n \ln [\Phi(Z_{iu}) - \Phi(Z_{il})] \quad (3)$$

where Φ is the cumulative standard normal density function.

Given these functions, the mean WTP can be calculated as follows:

$$\text{Mean WTP} = \exp(\beta_0 + \beta X_i' + \sigma^2/2) \quad (4)$$

where σ^2 is an unbiased estimator of the true population error variance.

RESULTS AND DISCUSSION

Socio-economic profile of the respondents

Most of the respondents were male (63.6%) and single (80.5%). Majority (62.6%) are within the age group of 15 to 24 years old. On average, respondents spent 12 years of schooling, with most (36.6%) being college undergraduates,

while approximately a quarter (23.9%) were college or vocational course graduates (**Table 2**). Students were included as respondents since, based on the visitation record, they represent a large proportion of visitors in MAPL (47%) who are paying a discounted entrance fee of PHP 15 visit⁻¹. Hence, their inclusion, though they may not yet be earning, is necessary to determine the perspective of a major tourist group regarding the possible entrance increase in MAPL. There are also several WTP studies with mostly students and unemployed respondents (Kamri *et al.*, 2017; Palanca-Tan, 2020).

Most of the respondents' (66.8%) household size was between 5 to 9 members, with an average of six household members. Regarding employment

Table 2. Socio demographic characteristics of the respondents.

Socio-demographic profile		Frequency	Percentage (%)	Mean	S.D.
Gender	Female (1)	140	36.4	1.64	0.48
	Male (2)	245	63.6		
Civil status	Married (2)	60	15.6	0.86	0.39
	Single (1)	316	80.5		
Age (in years)	Under 15	9	2.3	21.11	10.75
	15–24	284	73.8		
	25–44	71	18.4		
	45–64	20	5.2		
	65+ years old	1	0.3		
Years of schooling (in years)	below 5 years	1	0.3	12.43	2.76
	5 to 9	32	8.3		
	10 to 14	266	69.1		
	15 and above	31	8.1		
Household size	below 5	103	26.8	5.62	2.92
	5 to 9	257	66.8		
	10 and above	24	6.2		
Ethnicity	Kapampangan	272	70.6	0.71	0.46
	Not Kapampangan	113	29.4		
Educational attainment	Elementary undergraduate (2)	2	0.5	5.84	1.17
	Elementary graduate (3)	4	1.0		
	High school undergraduate (4)	48	12.5		
	High school graduate (5)	78	20.3		
	College undergraduate (6)	141	36.6		
	College/ Vocational Graduate (7)	92	23.9		
	MS/MA/PhD undergraduate (8)	12	3.1		
	MS/MA/PhD graduate (9)	6	1.6		
Employed	Yes (1)	165	42.9	0.43	0.50
	No (0)	219	56.9		

status, 42.9% were employed, while 56.9% were unemployed. Approximately 40.5% of the respondents have a personal income below PHP 10,000. Regarding household income, most of the 62.1% belong to the poor to low-income but not poor class having a monthly household income of below PHP 20,000. Also, 32.9% of respondents belong to lower-middle to middle-income households with a monthly income of PHP 20,001 to PHP 80,000. The remaining 4.90% of the respondents were upper middle earners to wealthy households earning above PHP 80,000 mo⁻¹. In terms of ethnicity, 70.6% were *Kapampangan* or have *Kapampangan* descent. As per the distribution of respondents, most of the respondents (75.1%) reside in the Province of Pampanga (Table 3). Cumulatively, 92.5% were from Central Luzon. Among the town in Pampanga, most respondents were from Magalang (17.92%) and Arayat (16.88%).

Table 3. Distribution of respondents.

Region	Province	Frequency	%
Central Luzon	Pampanga	289	75.1
	<i>Towns: Magalang</i>	69	
	<i>Arayat</i>	65	
	<i>Mexico</i>	30	
	<i>Santa Rita</i>	28	
	<i>Mabalacat</i>	19	
	<i>San Fernando City</i>	15	
	<i>Angeles City</i>	13	
	<i>Candaba</i>	12	
	<i>Others (12 towns)</i>	38	
	Nueva Ecija	31	8.1
	Tarlac	19	4.9
	Bulacan	16	4.2
National Capital Region	Bataan	1	0.3
	Metro Manila	15	3.9
	-	10	2.6
	-	2	0.5
	-	1	0.3
Region 4A	-	1	0.3
Visayas	-	1	0.3
Mindanao	-	1	0.3
Foreign	-	1	0.3

Familiarity of respondents with MANP and its management

Majority of the respondents (89.35% or 344 respondents) stated that they know what a protected area is, while 70.39% (271 respondents) know that MANP is a protected area (Figure 1). When asked why an area is being designated as a protected area, most of the respondents identified the conservation of biodiversity as the main reason, with a significantly higher mean ($\bar{x} = 0.68$) than other presented purposes (Table 4). This implies that most respondents have accurate knowledge about the protected area and its purpose, primarily for biodiversity conservation (Dudley, 2008; Secretariat of the CBD, 2008). Referring to its legal definition under Republic Act No. 11038, the protected area is “identified portions of land and/or water set aside because of their unique physical and biological significance, managed to enhance biological diversity and protected against destructive human exploitation.” This result suggests that the public, particularly tourists, widely recognize the biodiversity conservation function of protected areas. Other main functions of protected areas identified by the respondents were for cultural preservation ($\bar{x} = 0.44$), recreation and ecotourism ($\bar{x} = 0.41$), and site for educational purposes ($\bar{x} = 0.37$) as perceived main purposes of a protected area. This denotes that respondents also recognized other essential functions of protected areas. According to Dudley (2008), protected areas also play a vital role in conserving cultural and spiritual values and provide sites for scientific, educational, recreational, and visitor opportunities.

WTP result

Majority of the respondents (81%) were willing to pay an additional entrance fee to support forest restoration in MAPL (Figure 2). This accounts for 314 out of the 385 survey respondents. More respondents with positive WTP were recorded in online surveys (85%) than in personal interviews (78%). In terms of the distribution of positive WTP responses, there was no obvious response across the 15 bid amounts presented. The same trend was observed in Subade's (2005) work and Dang *et al.* (2021). Nevertheless, the highest number of positive WTP responses was recorded for the

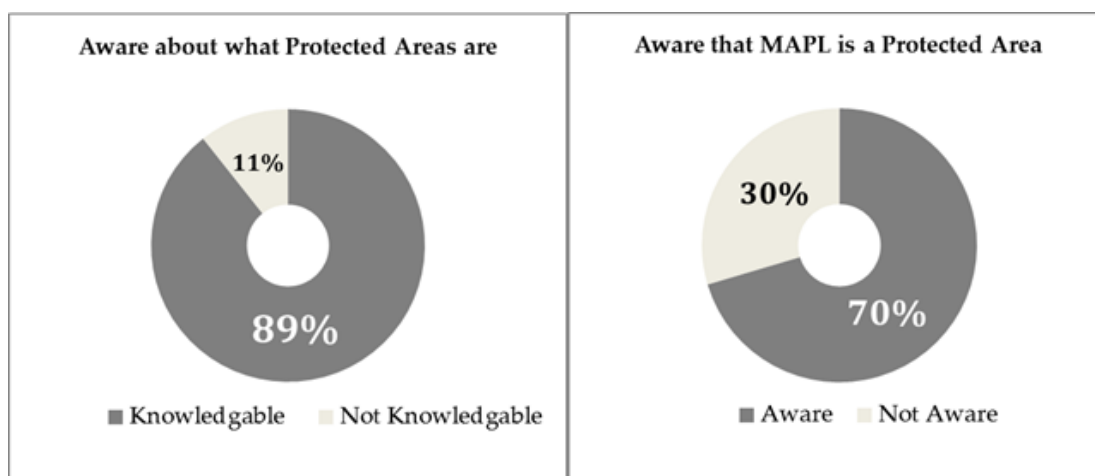


Figure 1. Respondents knowledge and awareness about what protected area is and the designation of MANP as a protected area.

Table 4. Knowledge and perception of respondents about the purpose of designating a protected area.

Purpose	Count	Sum	Average	Variance
Conservation of biodiversity	385	263	0.68 ^a	0.22
Cultural preservation	385	168	0.44 ^b	0.25
Recreation and ecotourism	385	157	0.41 ^b	0.24
Site for educational purposes	385	142	0.37 ^b	0.23
Site for commercial farming	385	88	0.23 ^c	0.18
Plantation and logging	385	74	0.19 ^{cd}	0.16
Site for spiritual retreat	385	40	0.10 ^{de}	0.09
For residential development	385	37	0.10 ^e	0.09
Mining	385	17	0.04 ^e	0.04

bid amounts PHP 50, PHP 10, and PHP 100, with 18%, 16%, and 14%, respectively. A more obvious downward trend in terms of positive WTP responses was observed upon grouping the bid levels into lower-level (PHP 5 – PHP 30), mid-level (PHP 40 – PHP 80), and upper-level (PHP 100 – PHP 200) (**Figure 3**). The highest percentage of positive WTP responses was recorded under lower-level bid amounts. In contrast, the lowest positive WTP responses were observed under high-level bid amounts across the combined data, data from online surveys, and personal interviews. This observation conforms to the economic theory of demand and many WTP studies (Reynisdottir *et al.*, 2008; Mohd Rusli *et al.*, 2009; Adamu *et al.*, 2015; Musa *et al.*, 2020). Specific to the result of the study of Musa *et al.* (2020), it

was observed that the lower the bidding value, the higher the respondent's WTP to contribute to mangrove ecotourism development in Marudu Bay, Sabah, Malaysia. It has long been established that for CVM studies using the WTP format, the probability of willingness to pay decreases as the bid price increases, and vice versa (Loomis *et al.*, 2000).

Respondents' reasons for willingness and non-willingness to pay were also assessed. The primary reasons for respondents' positive WTP were predominantly from their non-use value, altruistic value, and bequest value for MAPL (**Table 5**). Most of the respondents with positive WTP declared interest in supporting the restoration of MAPL to conserve its wildlife

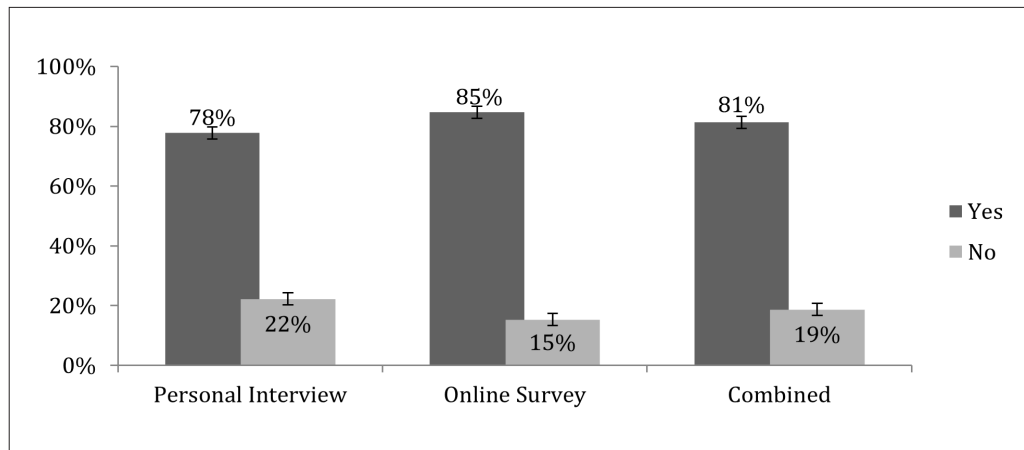


Figure 2. Proportion of WTP responses under personal interview, online survey and combined data.

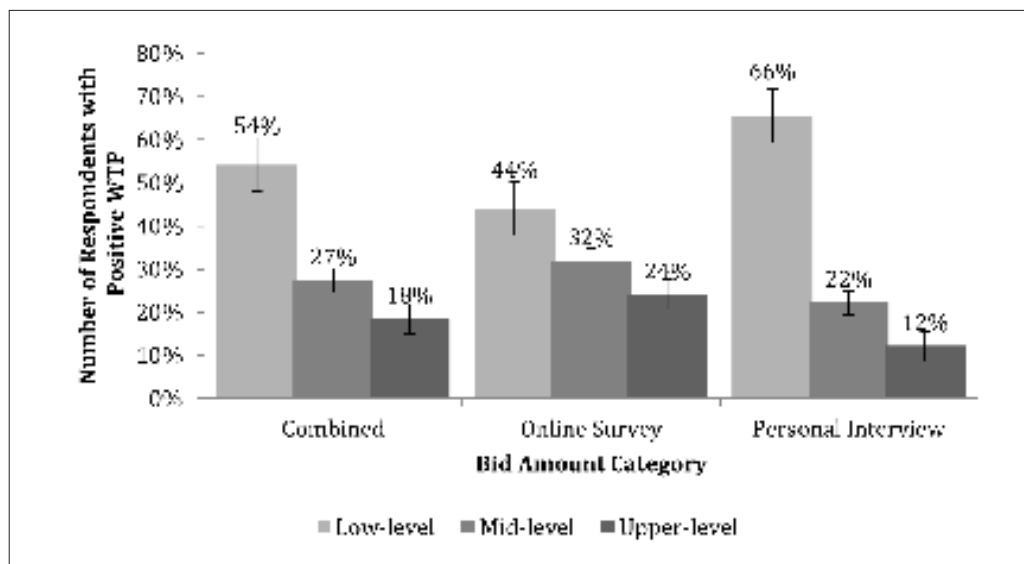


Figure 3. Graph showing the distribution of positive WTP across bid-level class.

species because they believe everyone must conserve nature (48%). Others revealed positive WTP for the future generation to enjoy the beauty of MAPL (46%). In comparison, other justifications were attached to the regulating services (39%) and cultural services (33%) of MAPL and the belief that the funds would be used appropriately (35%). Tourists' identification of the non-use values as their primary motivation to support PA conservation was rational and in consonance with the result of other studies (Togridou *et al.*, 2006; Han *et al.*, 2011; Aseres & Sira, 2020). In the work of Togridou *et al.* (2006), for example, it was highlighted that higher WTP amounts were

associated with the bequest value of visitors to the National Marine Park of Zakynthos in Greece. This result is also supported by Kniivilä (2006), who recognized that the non-use values people, both user, and non-user groups, put on conservation areas, such as PAs, are the key motivation for their willingness to support conservation initiatives.

On the other hand, most of those unwilling to pay for MAPLs' restoration believed that the government should solely fund the restoration of the site (20%) (Table 6). A portion was unwilling to pay since they were already contented with how the MAPL is currently being managed (17%).

Table 5. Motivations/ reasons of respondents for their WTP.

Motivation/Reason	Count	Percentage
For the conservation of wildlife species through forest restoration (Non-use value).	152	48
It is the duty of everyone to contribute for conservation of nature (Altruistic value).	150	48
For the future generation to enjoy the beauty of Mount Arayat (Bequest value).	146	46
To continue to provide flood and landslide protection (Regulating services).	123	39
I believe that the fund will be used appropriately.	109	35
Because I enjoy the recreation activities here (Cultural services).	104	33
Because it is an important cultural heritage site for <i>Kapampangan</i> .	65	21
Because I use resources from Mount Arayat (Provisioning services).	48	15
Because Mount Arayat is an important pilgrim site (Cultural services).	38	12
For better management of MAPL.	2	1
To fund more forest rangers.	1	0
Development of recreation instead of restoration.	0	0

Table 6. Reasons of respondents for their non-WTP.

Reason	Count	Percentage
I think that the government should solely fund the restoration of the site.	14	20
I am contented on how the park is being currently managed.	12	17
I do not believe in the reliability of the trust fund.	11	15
The entrance fee is already high.	10	14
I do not believe that there is a need for forest restoration.	4	6
I prefer supporting ecotourism development rather than restoration.	4	6
I will not benefit from the fee that I will pay.	3	4
My income is too low.	3	4
I do not care about biodiversity in the area.	2	3

Meanwhile, several questions about the reliability of the trust fund (15%), while others believe that the entrance fee is already high (14%). The current entrance fee is PHP 30 for adults, PHP 15 for students, PHP 100 for foreign visitors, and free for persons with disability (PWD) and senior citizens.

Wang & Jia (2012) and Wang & Zong (2018) had similar results in separate WTP studies in two PAs in China. In both studies, tourists' unwillingness to pay for PA conservation was rooted in the respondents' belief that the government has to protect biodiversity and the environment. Meanwhile, respondents' unwillingness to pay due to issues related to the reliability of the trust fund was also valid, as also observed in the works of Subade (2005), Wang & Jia (2012), and Aseres & Sira (2018). This calls for developing appropriate, trustworthy, and transparent fund management systems for any PA financing

mechanism, as supported by the study of Ureta *et al.* (2021). The payment vehicle, including the administration of funds, was discussed, and made as realistic as possible with how a collection of the extra entrance fee will be operated. However, several respondents still raised the reliability of the trust fund as a payment vehicle as reasons for their protest bid. Nevertheless, the feasibility of an entrance fee surcharge in MAPL was still acceptable to tourists, as indicated by a relatively high percentage of positive WTP responses.

Estimation of mean WTP

Separate interval regression analyses were done for combined data and data from online surveys and personal interviews. Thirty variables were included in the model, which includes a set of awareness and perception variables and the socio-economic characteristics of the respondents (Table 7). After running interval regression, the

Table 7. List of variables used in determining the willingness-to-pay of respondents.

No.	Variable	Variable code	Description
1	Respondents perception if environmental degradation is one of the major problem in the country.	ENVIDEG	Dummy; 1– Yes, 0 – No
2	Respondents perception if that climate change is one of the major problem in the country.	CCHANGE	
3	Respondents' perception if Philippines is a biodiversity rich country.	RICHBIO	Likert Scale; 1– strongly disagree, 2 – disagree, 3 – agree, 4 – strongly agree
4	Respondents' perception if Philippines' biological resources are properly and adequately conserved and protected.	CONSERVED	
5	Respondents' perception if it is everyone's duty to help conserve biological resources for current and future use.	DUTY	
6	Respondents' perception if it is the sole responsibility of the government to conserve and protect the country's biological resources.	RESGOVT	
7	Respondents' perception if the government should raise and allocate more funds to deal with biodiversity conservation issues.	RAISEFUNDS	
8	Awareness about protected areas	AWAREPA	Dummy; 1– Yes, 0 – No
9	Awareness that Mount Arayat is a protected area	AWAREMAPL	
10	Respondents perception if MAPL is one of the top tourist destinations in Central Luzon.	SPOT	Likert Scale; 0 – Don't know, 1– strongly disagree, 2 – disagree, 3 – agree, 4 – strongly agree
11	There are many rare and endangered species of plants and animals in MANP.	SPECIES	
12	The conservation and protection of MANP should be improved.	IMPROVE	
13	There is still abundant forest cover.	FOREST	
14	Number of visits in year 2019	V2019	Number of visits (f)
15	Number of visits for the last 5 years	V5YRS	
16	Average length of stay per visit	HSTAY	Number of hours (hrs)
17	Average group size per visit	GSIZE	Group size per visit (n)
18	Gender	GEN	Dummy; 1– Female, 2 – Male
19	Age	AGE	Age (yrs)
20	Civil status	CS	Dummy; 1– Single/ without dependent, 0 – married/ with dependent
21	Educational attainment	EDUC	Dummy; 0 – No formal schooling, 1–Elementary undergraduate, 2 – Elementary graduate, 3 – High school undergraduate, 4 – High school graduate, 5 – College undergraduate, 6 – College/ vocational graduate, 7– MS/MA/PhD undergraduate, 8–MS/MA/PhD graduate
22	Number of years spent in school	YSCHOOL	Years of schooling (yrs)
23	Employment status	EMP	Dummy; 1– Employed, 2 – Unemployed
24	Average personal monthly income	PINCOME	In PHP
25	Average household monthly income	HHINCOME	In PHP
26	Household size	HHSIZE	Number of household members (n)
27	Ethnicity	ETH	Dummy; 1– <i>Kapampangan</i> / with <i>Kapampangan</i> descend, 0 – not <i>Kapampangan</i>
28	Residing in adjacent barangay	BRGY	Dummy; 1– Yes, 0 – No
29	Residing either in the towns of Magalang or Arayat	MUN	
30	Residing either in the Province of Pampanga	PROV	

mean WTP value of respondents was estimated using three different methods: namely, a) linear prediction function, b) conditional expected value method, and c) truncated method (Table 9). The computed mean WTP under combined data and personal interviews were similar across estimation methods, with PHP 38.00 and PHP 29.00, respectively. For the online survey, different WTP estimates were obtained for linear prediction (PHP 43.00), conditionally expected value method (PHP 47.00), and truncated method (PHP 45.00). It was also observed that the mean WTP was parallel with the percentages of positive WTP respondents between the survey modes. Higher positive WTP responses and higher mean WTP were computed for the online survey, in contrast with the result of personal interviews. This resulted in lower positive WTP responses and lower mean WTP. However, the determination of which mode of the interview is more reliable is not included in this study, as well as the factors affecting causing the different WTP estimates between the two modes of the survey. It was shown in the regression result that the regression model for the personal interview and online survey was both robust and acceptable, with p -value = 0.00 and p -value = 0.005, respectively. The WTP estimates obtained from all models were treated as valid. This was supported by the study of Marta-Pedroso *et al.* (2007) and Lindhjem & Navrud (2011), wherein

they observed that the use of online survey as a mode for contingent valuation studies does not produce significantly different results or bias compared to face-to-face interviews in many of the aspects including information additivity effects and protest responses. Nevertheless, an online survey generates a lower response rate and WTP estimates than a personal interview (Marta-Pedroso *et al.*, 2007), which was also observed in this study.

Factor affecting tourist's WTP

The regression analysis result showed different WTP determinants across the models used. Respondents who believed that it is important to improve, protect, and conserve the wildlife species in MAPL (IMPROVE) was the only significant variable identified in both modes of survey and combined data (p -value = 0.05) (Table 8). This suggests that the tourists' perception of the need to conserve and protect wildlife species, with or without using wildlife resources, strongly determines their WTP. This result follows the general findings of Han *et al.* (2011), Pedroso & Kung'u (2019), and Aseres & Sira (2020) identifying the non-use value people put on PAs as a significant factor contributing to tourists' WTP for PA conservation. This is also supported by the study of Tsi *et al.* (2008), wherein individuals' perceived moral obligation

Table 8. Significant determinants of respondents' willingness-to-pay.

Variable	Combined		Personal interview		Online survey	
	Coef.	P>z	Coef.	P>z	Coef.	P>z
1 ENVIDEG	5.10	0.09	-8.24	0.08	9.63	0.01*
3 RICHBIO	-1.09	0.65	-0.22	0.93	-9.00	0.04*
8 AWAREPA	9.30	0.17	-1.13	0.88	54.00	0.00*
12 IMPROVE	8.15	0.00*	8.15	0.00*	8.20	0.04*
16 HSTAY	0.60	0.00*	1.20	0.08	0.63	0.00*
21 EDUC	4.88	0.02*	-0.62	0.83	6.83	0.02*
23 EMP	-10.20	0.01*	-6.34	0.31	-9.61	0.07
27 ETH	-10.34	0.04*	-22.61	0.01*	-5.74	0.34
_cons	-19.63	0.30	30.53	0.24	-77.99	0.01
/lnsigma	3.39	0.00	3.22	0.00	3.34	0.00
sigma	29.77		24.97		28.27	
LR chi2(30)	82.05		43.53		77.78	
Log likelihood	-877.70		-411.81		-431.68	
Prob > chi2	0.00		0.05		0.00	

Table 9. Mean WTP estimates (in PHP) under different estimation methods.

Mode and Method	Obs	Mean	SD	Min	Max
Combined					
Linear prediction	385	38	16.71	-7.35	175.42
Conditional expected value method	385	38	31.55	-7.35	175.09
Truncated method	385	38	29.10	-7.35	175.25
Online survey					
Linear prediction	196	43	17.41	-4.37	175.42
Conditional expected value method	196	47	33.71	-4.37	175.09
Truncated method	196	45	31.00	-4.37	175.25
Personal interview					
Linear prediction	189	29	15.12	-28.91	76.26
Conditional expected value method	189	29	26.73	-28.91	126.55
Truncated method	189	29	24.70	-28.91	120.01

to cooperate in wildlife conservation efforts was identified as a key determinant of WTP.

Length of stay (HSTAY) and educational attainment (EDUC) both have a significant and positive effect on the respondent's WTP (**Table 5**) for combined data and an online survey. This indicates that respondents who stayed longer in MAPL were more likely to pay an additional entrance fee for its conservation, which is also observed in the works of Bhandari & Heshmati (2009) in their WTP study in Sikkim, India. It can be related to the degree of use of the tourist during their visit, with longer stays indicating a higher degree of utilization. Subsequently, the more they utilize the resource, the more likely they support its conservation.

Regarding the effect of education on WTP, respondents with higher educational attainment tend to be more likely to agree to pay additional entrance fees. The positive relationship between the level of education and the willingness of the visitors to pay for the proposed forest restoration in MAPL was in line with the result of several WTP studies for PA conservation (Wang & Jian, 2012; Adamu *et al.*, 2015; Hassin *et al.*, 2020; Xu *et al.*, 2022). A similar result was obtained by Pedroso & Kung'u (2020) as they concluded that education had a positive and significant effect on the WTP of tourists for restoration measures upstream of Masai Mara National Reserve in Kenya. This suggests that education plays an

important role in natural resource conservation, as people with a higher level of education are expected to understand more about the importance of biodiversity conservation and PA management to society. In a study conducted by Eshun *et al.* (2022), they concluded that education, particularly environmental education and awareness of biodiversity conservation, is critical for conserving biodiversity.

However, employment status (EMP) was revealed to have a significant but inverse effect on the odds of WTP as denoted by the negative coefficient (coef. = -10.20, $p > 0.01$). This result was obtained under the combined data. This contradicts several studies that identify employment status as a significant determinant of positive WTP for conservation and improved environmental condition (Maloma & Sekatane, 2014; Pedroso & Kung'u, 2020). Nevertheless, this suggests that positive WTP is more likely for unemployed people. The negative coefficient of employment was also found in the studies of Bateman *et al.* (2006) and Akthar *et al.* (2018). According to Bateman *et al.* (2006), this observation can be due to the trade-off between working and leisure hours, *i.e.*, those employed could be less familiar with and make less use of the environmental goods and services valued. Thus, this denotes that the WTP of respondents does not rely on their capability to pay but on other socio-economic, awareness, and attitudinal factors.

Another unexpected result obtained was the significant but negative effect of ethnicity (ETH) of the respondents to their WTP under combined data (coef. = -10.34, p-value = 0.04) and personal interview (coef. = -22.61, p-value = 0.01). The opposite of this was assumed since MAPL is one of the key cultural sites for *Kapampangan* that is closely linked to their cultural identity (Mallari 2009). In the study of Hoyos *et al.* (2008), the cultural identity of the respondents was found to be a significant factor influencing the WTP of respondents to protect natural resources in Basque Country in Spain. A similar result, but in a cross-country context (Scotland and Denmark), was presented in the paper of Bakhtiari *et al.* (2018). They concluded that people would probably support conservation initiatives in their own country over neighboring countries and that the WTP value for biodiversity conservation people give for a particular site decrease with distance from respondents' home location.

However, the result of this study showed the reverse. It was revealed that non-*Kapampangan* were more likely to pay for MAPLs' restoration than those of *Kapampangan* descent, as indicated by the negative coefficient of the variable ETH. The cross-tabulation (Figure 4) of the ethnicity and WTP showed that non-*Kapampangan* have, in fact, a higher percentage of positive WTP and a lower percentage of negative WTP. Nevertheless,

the effect of ethnicity on respondents' WTP in this study was similar to the result of Apdohan *et al.* (2021) about the WTP of tourists towards the conservation of ecotourism resources in Agusan March Wildlife Sanctuary in Agusan del Sur. In the study, ethnicity was also revealed to have a negative coefficient, expressed as respondents who do not belong to the *Manobo* bloodline wanting to pay more for the conservation of the wildlife sanctuary than the *Manobo* people. Applying the same context in MAPL, this study revealed that respondents with no *Kapampangan* descent have a higher probability of paying extra entrance fees to support the proposed forest restoration in the protected landscape. However, no literature was found directly explaining the probable cause of the negative relationship between ethnicity and WTP for nature conservation. This is true of other sociological and psychological factors that may affect the WTP of people, such as social norms, people's awareness, and subjective perceptions (Faccioli *et al.*, 2020), which may include ethnicity. This was also reiterated by Hoyos *et al.* (2008), stating that although cultural factors were relevant factors that may affect an individual's preferences for nature conservation, there is limited empirical evidence supporting this aspect. The closest we can associate to explaining the negative coefficient of ethnicity was derived from Faccioli *et al.* (2020) study related to the WTP for peatland restoration in Scotland. Based on

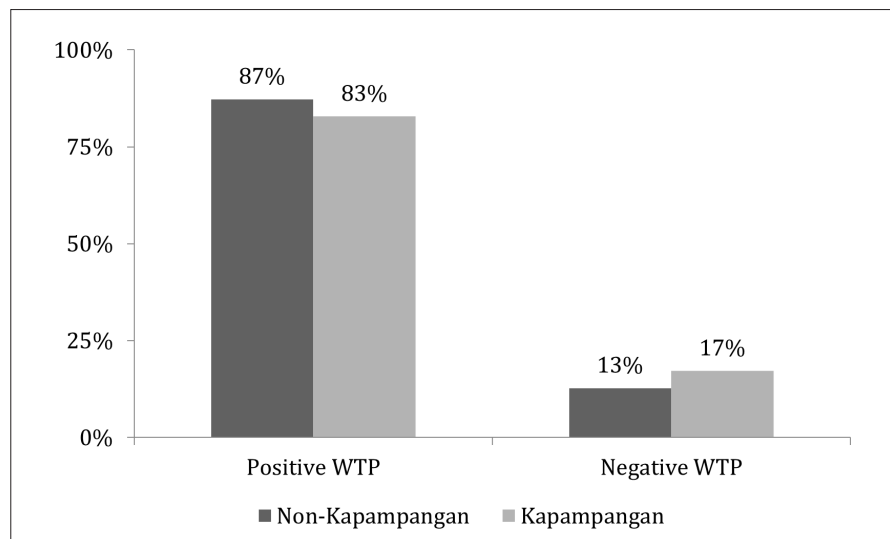


Figure 4. Cross-tabulation of the percentage WTP responses of non-*Kapampangan* and *Kapampangan*.

their study, there is no strong association between place identity and WTP for peatland restoration. More respondents living far from the peatland being valued are willing-to-pay for peatland conservation. Thus, there is no concrete reference yet justifying the negative effect of variable ETH on the respondents' WTP; even MAPL is known to be a cultural identity of *Kapampangan*. Therefore, this aspect is a subject for a more comprehensive study. Yet, according to Dinh (2020), the attitudes of ethnic minorities toward nature conservation are influenced by various socio-economic characteristics, including migration status and resource-use patterns. In addition and based on the online survey, other significant determinants of WTP were the variables ENVIDEG (coef. = 9.63, $p > 0.01$), AWAREPA (coef. = 54.00, $p > 0.00$), and RICHBIO (coef. = -9.00, $p > 0.04$). The coefficient values tells that those who know what protected area were more probably support forest restoration in MAPL in terms of entrance fee surcharge. The positive and significant effect of respondents' awareness of their WTP to support restoration in MAPL coincides with the result of Zydro'n *et al.* (2021), which supports the notion that awareness is a positive and significant determinant of tourist WTP for the improvement of protected areas. The result also showed that those who perceived environmental degradation as one of the government's main problems are more likely to support the restoration program. Tsi *et al.* (2008) also recognized the direct relationship between positive environmental attitudes to individuals' WTP for environmental goods, yet, individual WTP is also affected by personal perception, understanding, and appreciation of the environment.

Surprisingly, those who believe that the Philippines have a rich biodiversity of plants and animals were more likely to deny support, as indicated by its negative coefficient. However, no literature was found supporting this observation. Nevertheless, it can be associated with the idea that since the Philippines was a biodiversity-rich country, the respondents perceived no need to support the proposed restoration anymore. Yet, this aspect needs further review, as well.

Estimating the potential total annual revenue from the mean WTP

The WTP estimates from all the models were used to compute the potential annual revenue from the imposition of the entrance fee surcharge in MAPL. The lower bound estimate was obtained from the WTP estimate of the personal interview, while the WTP estimate from the online survey was used as a higher bound estimate. To simplify computation, values were rounded off. Thus, a minimum of PHP 30, a mid-value of PHP 40, and a maximum of PHP 50 entrance fee surcharge were assumed in this study. Given the visitation of 33,000, as estimated by the Provincial Environment and Natural Resources Office (PENRO)-Pampanga in 2016, the estimated additional revenue for the proposed increase in the entrance fee is PHP 990,000 to PHP 1,650,000 (Table 10). This computation also considers the proportion of adults and student tourists based on 2019 visitation data. It was estimated that 53% of the tourists in MAPL were adults paying a regular entrance fee, while 47% were students paying a discounted fee.

Table 10. Projected revenue (in PHP) based on the proposed increase in entrance fee.

Visitor type	No increase	PHP 30 increase	PHP 40 increase	PHP 50 increase
Adult	524,700	1,049,400	1,224,300	1,399,200
Student	232,650	697,950	853,050	1,008,150
Total	757,350	1,747,350	2,077,350	2,407,350
Projected difference in revenue		990,000	1,320,000	1,650,000
Number of years needed to cover the projected project costs*		15	11	9

CONCLUSION AND RECOMMENDATIONS

This study revealed that increasing the MAPL entry fee is feasible as most of the tourists interviewed (81%) were amenable to an entrance fee surcharge to support the forest restoration program. Likewise, a supporting legal framework already allowed entrance fee increases in site-level protected areas in the Philippines. Their

WTP were primarily motivated by non-use value for MAPL. On the other hand, the perception that it is the responsibility of the government to fund conservation activities was raised as the primary reason for non-WTP. Thirty awareness and perception variables and socio-economic factors were included in the interval regression models used separately for the online survey, personal interview, and combined data. Respondents who are familiar with protected areas believed that environmental degradation is one of the top environmental problems in the country, and those who believed that it is important to protect and conserve the wildlife species in MAPL were likely to support the proposed forest restoration program and pay an entrance fee surcharge. Education and length of stay were also positive and significant determinants of respondents' WTP. However, interestingly, ethnicity, employment status, and those who believed that the Philippines have rich biodiversity showed a significant but negative effect on WTP and required further investigation.

The computed WTP values were approximately PHP 30, PHP 40, and PHP 50 for a personal interview, combined data, and an online survey. Using these WTP value estimates, revenue was expected to increase by at least PHP 990,000 to PHP 1,650,000 annually, assuming a regular visitation of 33,000 tourists yr^{-1} . This could cover the cost of the proposed 500-ha forest restoration program from 9 to 15 years of operation, assuming a PHP 15 M project costs. In addition, considering the COVID-19 pandemic that resulted in the closure of MAPL to tourists for a couple of years, increasing the entrance fee to an acceptable level is justifiable as a strategy to recover revenue loss and subsequently increase revenue to fund other management objectives. Yet, the actual surcharge would depend on what the PAMB would agree upon and recommend. Nevertheless, increasing entrance fees in PAs in the Philippines using WTP studies as a basis provides a scientific framework to capture a portion of the consumer surplus tourists have for protected areas.

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