Estimation of Willingness to Pay for Entrance Fee of the U Bein Bridge in Amarapura

Yin Myo Oo[1]

ABSTRACT

This study aims to estimate the willingness to pay visitors for the entrance fee of the U. Bein Bridge in Amarapura. Visitors' willingness to pay an entrance fee as a payment mechanism for conservation was calculated using the contingent valuation method (CVM). To determine willingness to pay, a single-bounded dichotomous choice contingent valuation approach was used with four bids for entrance fees: 500Ks, 600Ks, 1000Ks, and 1500Ks for local visitors, and below 1 US dollar, 1 US dollar, 2 US dollars, and 3 US dollars for foreigners. The majority of tourists are willing to contribute to conservation efforts in the Bridge area. According to the results of the binary logistic regression analysis, visitors' mean willingness to pay an entrance fee for the U Bein Bridge is 908 Kyats per person. The aggregate monetary value of visitors' recreation at the cultural service in 2018- 2019 was 109.78 million Kyats. Age, education level, monthly income, visit time, and attitudes have positive and significant impacts. On the other hand, the bid amount has a negative impact on willingness to pay. This means that the higher the bid amount, the less likely visitors are to be willing to pay towards conservation.

Keywords: willingness to pay, entrance fee, Binary logistic regression analysis, contingent valuation method

I. INTRODUCTION

Amarapura Township is home to the Taung Thaman Lake, situated in Mandalay City's southern part in Myanmar's upper reaches. Mandalay City was the historical capital of Myanmar during the Konbaung Dynasty periods of 1783–1821 and 1842–1859. Agriculture, weaving, and tourism are the main economic sectors in Amarapura. In addition, the well-known Taung Thaman Lake and the beautiful and historic U Bein Bridge serve as major attractions for local and foreign visitors worldwide.

The Taung Thaman Lake is the largest freshwater lake located in Amarapura Township. The lake is a popular tourist day-trip destination from Mandalay, and the historic U Bein Bridge spans it. U Bein Bridge, built in the mid-nineteenth century, is home to the

[1] Professor, Dr., Department of Economics, Yangon University of Economics

world-famous 1.2km (0.75 miles) wooden bridge that crosses the lake. Its construction began when the capital of the Ava Kingdom moved to Amarapura. The bridge has 1086 pillars and four rest areas and has become a well-known recreation center. It is generally utilized as an essential passageway by local people and has become one of the region's most famous and photographed tourist destinations.

Taung Thaman Lake and U Bein Bridge are well-known for their structure and their importance to the local community. It supports the livelihoods of local farmers, vendors, and other tourism-based businesses. Tourists usually come here to watch the beautiful sunset, walk along the central passageway, or sightsee the iconic view from boats on the lake. The best time to visit Taung Thaman Lake and the U Bein Bridge is in November and May. The bridge's massive pillars rise above the water and serve as a pathway for all during the dry months of March and April. However, the lake's water level frequently floods the top of the U Bein Bridge due to monsoon rainfall throughout August and September. The majority of visitors to U Bein Bridge come during and after the summer, particularly during festival seasons. Many visitors were from Yangon, Bago, Nay Pyi Taw, the USA, Italy, Korea, Japan, and worldwide. Consequently, the beauty of the lake and the wooden bridge has become one of the best places to view a natural sunset. Moreover, both the lake and the bridge are still beautiful and popular places among the natural beauties of Myanmar.

However, floods, droughts, waste disposal, and pollution are wreaking havoc on the U Bein Bridge. The lake is now highly polluted, and the bridge is deteriorating due to the government's and the local population's carelessness. The lake water and nature have recently destroyed several pillars and floors of the bridge. Some pillars were replaced with concrete, but many old floors remained. As a result of the pollution caused by garbage, plastic, and other things, the sides of Taung Thaman Lake near the U Bein Bridge have degraded. Therefore, all of these waste disposal and pollution issues pose serious challenges and concerns for the lake and bridge, resulting in a negative impact on the lake ecosystem, a decrease in water quality, and the surrounding area.

Consequently, pollution and environmental degradation have become increasingly significant. As a result, the U Bein Bridge conservation area's long-term survival and preservation are crucial. Furthermore, conservation of cultural heritage is essential for recreation on this bridge. Therefore, it is necessary to promote attitudes, knowledge, and awareness, collect funds, and collaborate to implement conservation measures. This necessitates the cooperation of the local government and the understanding and value placed

by the residents who rely on the lake area. Currently, the public is unwilling to pay for the bridge's preservation.

Therefore, the awareness and knowledge gaps must be measured. In addition, this study is required to investigate the monetary values of the bridge and people's attitudes toward these values to contribute to some of the expected positive outcomes of the U Bein Bridge and its surrounding area. Therefore, the objectives are to analyze the visitors' mean willingness to pay an entrance fee for the U Bein Bridge and the aggregate value of their recreational activities.

II. METHODOLOGY

2.1 Data Sources

This study examines the contingent valuation method (CVM) to estimate the value of cultural services for recreation using a non-market-based approach. The willingness to pay (WTP) of visitors to protect the U Bein Bridge in Amarapura Township, Mandalay Region, is included in the valuation (direct and indirect use values). The study period was between 2018 and 2019. The study applies a quantitative approach based on primary and secondary data. Primary survey data was used with the contingent valuation method and binary logistic regression. The study area mainly focuses on Amarapura Township, where a visitor survey was conducted. Information from visitors is collected using a systematic sampling method. A binary logistic regression analysis was conducted to identify the factors that affect visitors' willingness to pay. [2]

A total of 400 visitors were selected using a questionnaire. Visitors that were interviewed included 300 locals and 100 foreigners. Local visitors include undergraduate university students, government servants, merchants, and restaurant owners at Yadanabon University, as well as households in the townships of Maha Aungmye, Patheingyi, Aungmyethazan, Myothit, Chanmyathazi, Chanayethazan, and Pyigyidagun, and civil society organizations from Mandalay Region, Yangon, Bago, Nay Pyi Taw, Sagaing Region, Kachin, and the Shan States. Foreigners interviewed came from the United States, Italy, Korea, Austria, Poland, Norway, Japan, Argentina, Russia, the United Kingdom, Hong Kong, France, and other countries. In addition, weekend and holiday visitors were investigated because tourism is more intense during those periods.

The secondary data was collected from the General Administrative Department, Ward and Village Tract Administration Office, and the Mandalay City Development Committee (MCDC).

2.2. Data Collection Techniques

The Contingent Valuation Method estimated willingness to pay for the U Bein Bridge entrance fee. The CVM method has been widely used to value various environmental goods and services in developed and developing countries. CVM has been effectively applied to a wide range of water-related challenges, including water supply and tourism. The contingent value survey must be well-designed, pre-tested, and implemented to obtain relevant data and meaningful results.

The CVM method is composed of five steps. The first step is to identify the valuation issue. The next step is to make preliminary decisions about the survey. The third step is the survey, which is created using multiple processes. The fourth step is survey implementation, with the initial task being to select the survey sample. The final stage is to compile, evaluate, and report the results. The CV approach begins with initial interviews and focuses group discussions (FGDs) with the General Administration Department, Ward and Village Tract Administrative Office, tourists, and community leaders. In addition, individuals will be interviewed about their willingness to pay the conservation program entry fee for the U Bein Bridge. A single-bounded dichotomous choice contingent valuation method was used using thirty bids in this survey to answer the willingness to pay questions. The thirty bids are offered in the range of 100 to 3000Ks. The draft questionnaire was created to collect thirty bids and was based on information from the General Administrative Department, Ward, and Village-Tract Administrative Office. Visitors can also hold a conversation to explain the CV scenario, environmental conservation program, payment mechanism, and draft questionnaire. Face-to-face interviews with respondents were undertaken during that period. For the first time, a draft questionnaire was distributed to 50 visitors during the pre-test. Some interviewees responded to concerns about conservation and entry fees by stating that they could only pay once. Based on the frequency of the pre-test, four bids for entrance fees were chosen: 500Ks, 600Ks, 1000Ks, and 1500Ks for local visitors; and below 1 USD, 1 USD, 2 USD, and 3 USD for foreigners. Some people responded negatively to the proposed bid, asking for their preferred amount.

The survey questionnaire was divided into three sections: Section I contains socioeconomic data; Section II includes visitors' perception and travel information about the

U. Bein Bridge, and Section III consists of information about a U. Bein Bridge conservation program. In addition, these sections have a technique for eliciting respondents' preferences, along with a follow-up question.

III. RESULTS AND FINDING

The results and findings are presented in this section. The findings involve investigating factors that affected the conservation of the bridge area.

3.1. The Socioeconomic Characteristics of Visitors

The average age of visitors is over 38 years old. In terms of marital status, 279 respondents (69.7%) are single, while 121 visitors (30.3%) are married. In terms of education, 364 (91.0%) of total visitors have a bachelor's degree or higher, while 36 (9.0%) do not. The average household size has 4 to 5 people. According to the livelihood/occupation survey findings, 326 respondents (81.5%) are workers, while 74 visitors (18.5%) are dependents. In terms of monthly earnings, 130 visitors (32.5%) earn more than 600,000 kyats, while 114 (28.5%) earn between 400,001 and 600,000 kyats. Only 97 (24.3%) of all respondents earned between 200,001 and 400,000 kyats each month.

3.2 Perception and Travel Information on the U Bein Bridge

According to the findings, 389 (97.3%) visitors identified the U Bein Bridge as a heritage site. More than half of respondents said they came back frequently. The average number of visits to the lake area per year is two to three for many locals. Only 175 (43.7%) tourists are unaware of the lake's environmental status. Most visitors preferred the lake area's peacefulness, scenic beauty, picnics, and bird watching. More than half of the visitors recognized the value of the bridge and lake site. Among the inconveniences, 106 (54.1%) of 196 tourists highlighted dryness and pollution at the lake site. Only 154 (38.5%) of respondents visited the lake and bridge with friends, while 113 (28.3%) traveled with family and friends. The average number of family and friends is three to four. Around 211 (52.8%) of total respondents indicated they arrived to enjoy the beauty of the bridge and lake. Visitors to the U. Bein Bridge spend 2 to 3 hours photographing, cycling, walking for pleasure, and sightseeing. The majority of tourists expressed a desire to visit again.

3.3 A Conservation Program for the U Bein Bridge Area (Willingness to Pay)

It is assumed that there is no WTP for conservation programs, and the factors influencing this negative aspect of the WTP are examined. The investigation is based on the willingness of visitors to pay an entrance fee for the U Bein Bridge. Only 313 tourists (78.3%) are willing to pay the U Bein Bridge entrance fee, whereas 87 (21.7%) are unwilling to pay. As a result, most respondents were found to be willing to support the Bridge conservation program.

Different perceptions emerge in the U Bein Bridge area conservation program about respondents' willingness to conserve and their willingness to pay. The four characteristics: to protect the Lake environment, to prevent encroachment of humans and businesses, to preserve cultural heritage sites in the Bridge, and to manage sustainable development in the Bridge environment of the conservation program of the U Bein Bridge area regarding WTP are derived from this information. And four factors are investigated: it is primarily the government's responsibility, this activity wastes money, the project cannot be adequately implemented due to inefficiencies in the public sector, and poverty alleviation is more critical than bridge conservation of unwillingness to pay.

The highest proportion of visitors willing to preserve cultural heritage sites in the Bridge was shown to be 39%, followed by 21% willing to manage sustainable development in the Lake environment and another 21% who were willing to prevent human and business encroachment. It is the government's main responsibility, more than half of all respondents said. Only 33.3% of visitors stated that the project could not be properly implemented due to the inefficiency in the public sector. (3.5%) of visitors believe that poverty alleviation is more important than bridge conservation. The majority of visitors (58.3 %) were also satisfied with paying for the WTP for conservation programs. As a result, the average ratio of 50% of the total number of visits was calculated using the results of the follow-up certainty percentage of "yes" responses.

3.4 Binary Logistic Regression Analysis

Based on the literature, the following relationship examines visitor attitudes, knowledge, and awareness towards conservation. The study was established with three structural equations.

(1) (MWTP) Mean Willingness to Pay = β_0/β_1

where: β_0 is a constant number that serves as a dependent variable coefficient (WTP), and β_1 is an independent variable coefficient (bid amount). The bid variable was the single determinant factor in this function.

(2) (Aggregate WTP) Aggregate Willingness to Pay

= M (WTP) ×% HHPV × NHH

where: M (WTP)=expected to mean willingness to pay, % HHPV= % of responders who rated themselves positively or said 'yes,' NHH=total number of respondents.

The following empirical binary logistic model can describe the willingness to pay for a change in environmental quality in this study. In addition, binary logistic regression analysis is performed to determine the regression coefficient, and a P-value is also determined.

When comparing the means of two groups, this technique is appropriate. One group is a dependent variable in this study, whereas the other is an independent variable. Using SPSS Statistical Software, binary logistic regression is performed between the dependent variable (WTP) and eleven independent factors.

(3) Willingness to Pay for Entrance Fees of Visitors

$$\text{Log}\left(\frac{\Pr(WTP=1)}{1-\Pr(WTP=1)}\right)=\beta_0+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\beta_4 X_4+\beta_5 X_5+\beta_6 X_6+\beta_7 X_7+\beta_8 X_8$$

$$+\beta_9 X_9+\beta_{10} X_{10}+\beta_{11} X_{11}+\varepsilon_i$$

where: WTP = The dependent variable, 1 corresponds to a "yes" response, and respondents' willingness to pay for a conservation program.

X_1 = Bid Amount, X_2 = Age, X_3 = Marital Status, X_4 = Education Level, X_5 = Household Size, X_6 = Main Occupation, X_7 = Income, X_8 = Distance/Visit Time, X_9 = Attitude concerning government future plan, X_{10}=Attitude concerning public awareness, and X_{11} = Perception of Conservation program are the independent variables. ε_i is error term.

3.5 Results of Binary Logistic Regression

(1) Estimation of Visitors' Mean Willingness to Pay an Entrance Fee

The regression results with only the bid price are shown in Appendix-1. The bid variable was significant at 5% and with a negative coefficient.

The formula calculates its mean WTP as a constant (β_0) divided by the bid amount (β_1).

Visitors' MWTP = β_0/β_1 = .908/.001 = 908 Kyats

This means that the visitors' mean willingness to pay for an entrance fee to U Bein Bridge is 908 Kyats per person.

(2) Estimation of Visitors' Aggregate Willingness to Pay an Entrance Fee

The aggregate WTP, or the value of recreation of U Bein Bridge visitors, is calculated from the mean (WTP). Regarding the results of the follow-up, a certain percentage of "yes" responses are used, with an average ratio of 50% of the total number of respondents in each. Taung Thaman Lake receives approximately 123,000 international visitors per year, according to the Ward and Village-Tract Administration Office (2018–2019). (Ei Myat Mon, 2019).

Aggregate Willingness to Pay of visitors=Mean WTP × % of the total number of visitors who answered 'yes'(NV).

Aggregate WTP = MWTP × % NV

AWTP of Visitors = 908Ks × 50% of (118,800+123,000)

= 908Ks × 120,900

= 109,777,200 million Kyats per year

= (109.78) million Kyats per year

As a result, the aggregate monetary value of the recreation of visitors to the U Bein Bridge in 2018–2019 was 109.78 million Kyats.

(3) Factors Influencing Visitors' Willingness to Pay

The results of the binary logistic model's socioeconomic, location, and attitudinal characteristics and the bid amount of willingness to pay among visitors are shown in Appendix-2.

The results indicated that the bid amount has a negative effect on the willingness to pay among visitors. This implies that the higher the bid amount, the lower the visitors' willingness to pay for conservation is expected to be. The coefficients of age, education level, monthly income, visit time, and attitudes (government future plans, public awareness, and perception of conservation programs; to preserve cultural heritage sites in bridge environments; and to manage sustainable development in bridge environments) have positive and statistically significant effects on willingness to pay. Household size, main occupation, and marital status did not influence visitors' willingness to pay.

IV. CONCLUSION

According to the study, most visitors are willing to pay an entry fee for the U Bein Bridge to support the proposed Bridge area conservation program. According to Binary Logistic Regression results, the mean WTP of visitors to the U Bein Bridge entry fee was 908 Kyats/person, and the aggregate WTP for visitors was 109.78 million Kyats/year. At various

significance levels (1%, 5%, and 10%), only 8 out of the 11 hypothesized explanatory variables were statistically significant in explaining the WTP. The Binary Logistic Regression study found that the bid amount has a negative coefficient and is a crucial factor influencing willingness to pay. Age, education level, monthly income, visit time, and attitudes (government future plans, public awareness, and perception of conservation programs) are significant in affecting willingness to pay with positive impacts. Based on these findings, it is possible to conclude that the surrounding communities significantly contributed to the economic value of the Bridge environment. Household size, main occupation, and material status were insignificant and irrelevant in affecting visitors' willingness to pay.

Using CVM, this study determined how much money stakeholders are willing to pay for the cultural heritage site in the bridge environment. CVM approaches have been shown to provide more benefits than evaluating different attributes of environmental goods. Another aspect of the study is the careful design of the payment vehicle, which should capture the respondents' contributions to decrease the number of non-responses. As a result, site-specific investigations are still needed throughout the region. This is to provide information to policymakers while considering various conservation alternatives. Locals hold the lake in high regard, and U Bein Bridge considers it part of Myanmar's national heritage. The environment around the Bridge and Lake must be preserved and conserved for that reason alone.

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