

## **Valuing visitors' Preferences for the conservation of Moeyungyi Wetland Wildlife Sanctuary, Myanmar**

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### **Abstract**

Protected areas are essential for conserving biodiversity, promoting ecotourism, and providing sustainable development. Despite their importance, protect areas receive inadequate funding to meet their objectives. Moeyungyi Wetland Wildlife Sanctuary (MWWS) is located on the southern part of Bago Region. It is designated as a wildlife sanctuary in 1988 and Ramsar site in 2004. It is also denoted as Important Bird Area (IBA). The study's main objective is to estimate economic values for the conservation of MWWS through visitors' willingness to pay (WTP). A stated preference method, contingent valuation, is used to assess visitors' WTP towards the conservation of MWWS. The entry fee is as a payment vehicle for WTP. A pre-test with an open-ended WTP question is conducted to determine the respondents' understanding of the questionnaire's content, WTP scenario, and bidding amount used in formal test. A face-to-face interview is applied in the formal survey in which double bounded dichotomous choice format of contingent valuation is used to generate respondents' willingness to pay. The primary respondents are 300 local visitors. The questionnaire is composed of four sections:(1) visitors' socioeconomic or demographic characteristics (2) their knowledge, purpose, and activities in MWWS, (3) their perceptions towards the conservation of MWWS; (3) presenting WTP hypothetical market to estimate WTP and describing reasons for their WTP contribution. The study results will contribute policymakers and park managers to assess visitors' WTP for the conservation of MWWS, determine the influencing factors for their WTP, and set appropriate entry fees for MWWS.

**Keywords:** Protected Area, Moeyungyi Wetland Wildlife Sanctuary, Willingness to pay, Contingent Valuation, entry fee

**JEL Codes:** Q24, Q26, Q51, Q57

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## 1. Introduction

Myanmar's protected areas (PAs) play a vital role in conserving biodiversity and ecosystem services, supporting sustainable development and climate stability, and reducing poverty and natural disaster (Forest Department, 2015). There are 44 protected areas (PAs), covering 5.85% of Myanmar's total land area by April 2019. Myanmar's government dedicates to expanding the PAs network to 10% of the total land area by 2030 (MOECAAF and MOHT, 2015).

Union budget and externally financed projects are primary financing mechanisms for PAs. Union budget contributes an average amount of 0.79 million US\$ per year, while external projects provide an average 1.1million US\$. PAs have received 25-26 US\$ per  $km^2$  per year, which is relatively low when compared to budgets of between 38-896 US\$ in other Southeast Asian countries (Emerton, Kyin, & Tizard, 2015). Thus, PAs have received insufficient funding to undertake conservation and management activities.

Moeyungyi Wetland Wildlife Sanctuary (MWWS) is one of 44 protected areas in Myanmar. It provides various ecosystem services: supporting services such as habitat for migratory water birds; provision services such as fish, lotus stalk for waving textile, regulating services flood protection; and cultural services such as ecotourism (Peh et al., 2015). However, MWWS face with serious threats such as electric shock fishing, overusing of water, bird hunting and trapping with nets; species trade and land encroachment by paddy fields, etc (BANCA, 2014).

MWWS is under the management authority of the Nature and Wildlife Conservation Division of the forest department. MWWS has received an average budget of 19, 826 US\$ between 2010-2015. MWWS is one of the 21 designated ecotourism sites in Myanmar, where 7031 domestic visitors and 303 international visitors visited in 2014 (MOECAAF and MOHT, 2015). The entry fee is set as 500 Myanmar Kyats (approximately 0.4 US\$) for local visitors and 1 US\$ for international tourists. Forest Department contracted the private company, Shwe Pyi Aye travel & tour company to develop ecotourism in MWWS and operated as a joint venture with the department since 1998. The company operates ecotourism activities such as constructing boardwalks for birdwatching, providing restaurants and accommodation for visitors, collecting entry fees, etc.

All PAs' earnings are submitted to the central treasury, and then the central government allocates budget for PAs annually. According to (draft) rules and regulations for the conservation of biodiversity and protected areas (2018), income from payment for ecosystem services, entry fees, and user fees within protected areas is allocated for its conservation purposes by 30% (Forest department, 2018). Thus, it is necessary to set an appropriate entry fee for each protected area through visitors' willingness to pay. Research for MWWS is conducted on local people's attitudes (Tun, 2018) and their willingness to pay (Hnin, 2019). Thus, there is a limitation of study to assess visitors' willingness to pay for conservation of MWWS using contingent valuation.

The main aim of the study is to evaluate economic values for the conservation of MWWS. The research is focused on visitors, mostly local visitors who visit MWWS. The contingent valuation method is used to estimate visitors' willingness to pay for the conservation of MWWS. The specific research objectives are: (1) to determine the factors influencing the visitors' willingness to pay (2) to estimate willingness to pay

of visitors; (3) to make suggestions for decision-makers and park managers about appropriate entry fee to contribute to the conservation of MWWS.

## **2. Contingent Valuation Method**

Contingent valuation method (CVM) is a stated preference method to measure maximum individual willingness to pay (WTP) for non-market goods such as biodiversity, ecotourism resources, protected areas, etc. (ICEM, 2003; Wrobel & Kozlowski, 2011). It can estimate an individual's hidden but real economic values for environmental goods using a hypothetical market (Hoevenagel, 1994; Mmopelwa, Kgathi, & Molefhe, 2007). The hypothetical market in CVM is composed of three parts: (1) description of ecosystem services which are required to conserve with the hypothetical scenario; (2) form and frequency of payment method; (3) question to generate respondent's WTP (Martin-Lopez, Montes, & Benayas, 2007). The form of the payment is an entry fee, tax, voluntary donation, user fee, etc. in terms of the one-time or monthly payment. CVM uses open-ended questions, single-bounded or double bounded dichotomous choice questions, payment card or bidding game to generate respondent's WTP.

Researchers use CVM to evaluate various environmental goods and services because it does not rely on real market conditions. It uses the hypothetical market to elicit the willingness to pay of visitors. It can measure non-use values such as option value, bequest value, and existence value. However, there are several biases while using CVM to elicit willingness to pay of respondents. According to Venkatachalam (2004), these biases are: (1) hypothetical bias when there is a disparity between hypothetical and real market; (2) strategic bias in which WTP is not truly revealed because of free-riding; (3) elicitation bias obtained from elicitation techniques; (4) information bias based on the information in valuation scenarios; (5) sequencing bias in which WTP of ecosystem services varies per changes in valuation order; and (6) embedding effects occurs when there is no variation in WTP of environmental goods and services according to their scope (Mmopelwa, Kgathi, & Molefhe, 2007).

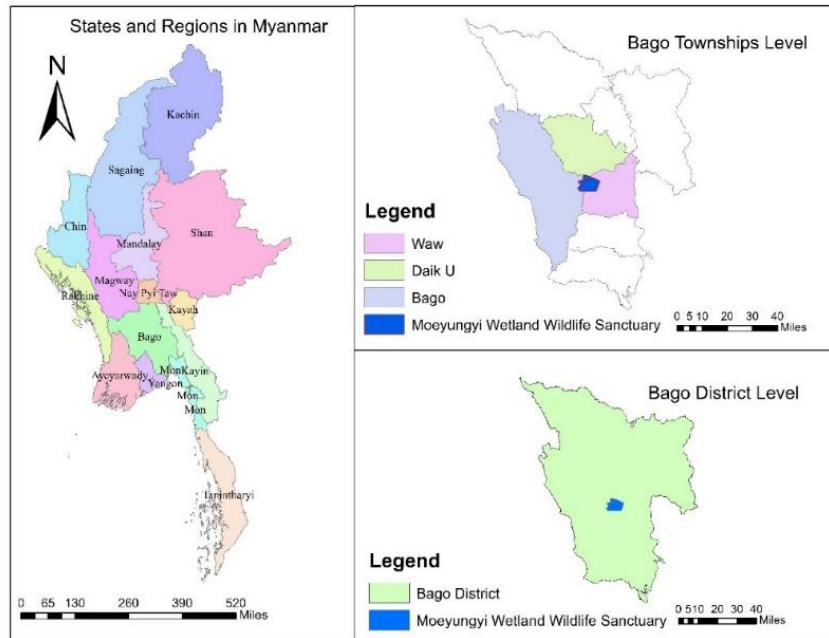
CVM has been applied in various studies such as wetland conservation (Hammit, et al, 2001; Kwak & Yoo, 2007), marine ecosystem (Adriana Ressurreição et al, 2011; Schuhmann et al, 2019), ecotourism (Getzner, & Thapa, 2015; Baral, Stern, & Bhattarai, 2008) and air quality (Guo, Wang, & Zhang, 2020).

## **3. Economic valuation of Moeyungyi Wetland Wildlife Sanctuary: methodology**

### **3.1. Description of study area**

Moeyungyi Wetland Wildlife Sanctuary (MWWS) is situated in the southern part of Bago Region; the western and southwestern part belongs to Bago township and the eastern and southern part to Waw Township. The northern boundary demarcates between the wetland and Daik U township (BANCA, 2014). The area of MWWS is 10,360 ha. Freshwater marshes cover 82% of the total area, and the lake permanently covers 10% and the remaining space is paddy field in the dry season (Peh et al, 2015). Moeyungyi wetland is designated as a wildlife sanctuary in 1988 to protect seasonal migratory birds and native bird species from conserving the wetland habitat ecosystem. It is also designated as a Ramsar site in 2004, thus becoming the very first Ramsar site among 99 wetlands in Myanmar. It is also denoted as an important bird area (IBA) with high tourism value (Ministry of Environment, Japan, 2004; BANCA, 2014).

Moeyungyi wetland is a shallow rectangular human-made reservoir. It provides favorable habitats for over 20,000 migratory waterbirds, including the globally threatened Baer's Pochard *Aythya baeri*, Sarus Crane *Grus Antigone*, and Greater Spotted Eagle *Aquila clanga*, as well as more than 1% of the regional population of the Northern Pintail *Anas acuta* from October to March. It is an essential site for protecting native turtle species such as the Burmese Eyed Turtle *Morenia ocellata* which is recorded as vulnerable according to IUCN Red List status and Burmese Flapshell Turtle *Lissemys scutata* (Forest Department, 2014)



**Fig. 1. Location of Moeyungyi Wetland Wildlife Sanctuary, Myanmar**

### 3.2. Survey design to elicit visitors' willingness to pay

There are two steps in the survey: pre-test and formal test. The pre-test is conducted utilizing open-ended WTP question. The pre-test's purpose is to ascertain visitors' understanding of the questionnaire's content and structure, contingent valuation scenario, and a range of bidding amounts for the formal test.

A face-to-face interview is used for the formal test as it guarantees data quality and quantity even though it is more time-consuming than other means (Bateman I.J et al, 2002); (Mei Kuang Siew et al, 2015). It will be conducted on 300 local visitors between December and January. Simple random sampling is used to select respondents for survey. The entry fee is set as a payment vehicle in this study to generate visitors' WTP. A double-bounded dichotomous choice question is used for the WTP question.

The questionnaire is composed of five main sections as following. The first section of the questionnaire explains the purpose of the survey and relates to the respondents' socioeconomic and demographic characteristics. The second part of the questionnaire concerns with respondents' knowledge, experience, purpose in MWWS. The third section explore respondents' perceptions on the conservation of MWWS. The fourth section is concerned with WTP related questions, including WTP scenario, hypothetical market, estimation of WTP, and reasons for positive or negative WTP.

### 3.3. Willingness to pay econometric model

Given the entrance fee is proposed as a payment vehicle to elicit WTP for the conservation of MWWS, respondents have binary choice i.e., yes or no, for the proposed entrance fee. It is accepted that respondents will maximize their utility to accept the proposed entrance fee for conservation (Hanemann, 1984).

$$v(I, Y-A; S) + \varepsilon_1 \geq v(0, Y; S) + \varepsilon_0 \quad (1)$$

where,  $v$  is indirect utility function,  $Y$  is income,  $A$  is the proposed entrance fee,  $S$  is socioeconomic or demographic characteristics and other factors influencing respondents' WTP, and  $\varepsilon_0$  and  $\varepsilon_1$  are identical, independently distributed random variables with zero means.

The utility difference is ( $\Delta v$ ) is described as follows.

$$\Delta v = v(I, Y-A; S) - v(0, Y; S) + (\varepsilon_1 - \varepsilon_0) \quad (2)$$

Binary choice dependent variables require a qualitative choice model for the dichotomous choice format of CVM. Thus, the logit model is used in this study. The probability of accepting the proposed entrance fee by respondents is described using the logit model as follows (Hanemann, 1989 ; Wang & Jia, 2012).

$$P_i = \frac{1}{1 + (\exp\{-(\alpha - \beta A + \gamma \chi)\})} \quad (3)$$

where,  $\alpha$  is a constant,  $\beta$  is a coefficient of entrance fee  $A$ ,  $\gamma$  is the vector of corresponding slope parameter, and  $\chi$  is the vector of other explanatory variables influencing the response.

$WTP_{median}$  and  $WTP_{mean}$  are estimated according to equation (4) and (5) (Hanemann, 1989).

$$WTP_{median} = (\alpha + \chi \gamma) / \beta \quad (4)$$

$$WTP_{mean} = (1/\beta) \ln(1 + \exp(\alpha + \chi \gamma)) \quad (5)$$

#### 4. Conclusion

MWWS gives a wide variety of ecosystem services which are important for the existence and well-being of human beings. It provides supporting services such as habitat for fauna and flora; provision services such as food, regulating services flood control; and cultural services such as ecotourism. However, there are serious threats which impose adverse effects for the sustainability of MWWS. This study will explore the preference or willingness to pay of on-site users i.e. visitors to conserve MWWS and provide empirical results that will be helpful for policy makers, park managers and to assess visitors' willingness to pay and its influencing factor, set an appropriate entry fee for MWWS. It is expected that visitors' WTP is higher than the current entry fee and socioeconomic factors such as income, occupation, and education will influence the WTP of visitors. Moreover, visitors whose profession is related to environmental conservation groups will pay higher WTP than other visitors.

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