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Recreational Use Value of Hlawga Park, Myanmar; an Application of Travel Cost Method

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မြန်မာနိုင်ငံ၊ လှော်ကားဥယျာဉ်၏ အပန်းဖြေဝန်ဆောင်မှုတန်ဖိုးကို ခရီသွားကုန်ကျစရိတ်နည်းလမ်းအား အသုံးပြု၍ ခန့်မှန်းတွက်ချက်ခြင်း

ဝေဖြိုးသူ၊ မဟာသိပ္ပံကျောင်းသား
ဒေါက်တာ စံသွင်၊ ဒု-ပါမောက္ခချုပ်
ကျော်သူမိုး၊ လက်ထောက်ကထိက
ဖြူဖြူဟန်၊ လက်ထောက်ကထိက
သစ်တောနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာတက္ကသိုလ်

စာတမ်းအကျဉ်း

ဤသုတေသနစာတမ်းသည် လှော်ကားဥယျာဉ်၏အပန်းဖြေဝန်ဆောင်မှုတန်းဖိုးကို တစ်ဦးတစ်ယောက်ချင်းစီ၏ ခရီးသွားကုန်ကျစရိတ်နည်းလမ်းကို အသုံးပြု၍တွက်ချက်ခဲ့ပါသည်။ ဤသုတေသနစာတမ်း၏ရည်ရွယ်ချက်ကို ရရှိရန်အတွက် Negative Binomial Regression Model (NBRM) ကို အသုံးပြုခဲ့ပါသည်။ (NBRM) သည် consumer surplus ကို ခန့်မှန်းရာတွင် အခြားသော model များထက်သင့်လျော်သောကြောင့် ရွေးချယ်ခဲ့ပါသည်။ လေ့လာမှုတွင် (၃၉၉) မေးခွန်းလွှာကို လာရောက်လည်ပတ်သူများအား ၂၀၁၇ ခုနှစ်၊ မေလ ၁ ရက် မှ ၃၁ ရက်နေ့အထိ လူတွေ့မေးမြန်းခဲ့ပါသည်။ လှော်ကားဥယျာဉ်ကို လာရောက်လည်ပတ်မှုအပေါ် သက်ရောက်နေသော အကြောင်းအရင်းများကိုသိရှိရန် ခရီးသွားကုန်ကျစရိတ်၊ လှော်ကားဥယျာဉ်၏အရည်အသွေး၊ လှော်ကားဥယျာဉ်ကို စတင်သိသော ခုနှစ်နှင့် လည်ပတ်သူများ၏ လူမှုစီးပွားရေးအချက်အလက်များကို မှီခိုခံကိန်းရှင်များအဖြစ် ထား၍၊ လွန်ခဲ့သော ၁၂ လအတွင်းလည်ပတ်မှုအရေအတွက်ကို မှီကိန်းရှင်အဖြစ် အသုံးပြုခဲ့ပါသည်။ သုတေသနစာတမ်းရလာဒ်အရ ခရီးသွားကုန်ကျစရိတ်နှင့် လွန်ခဲ့သော ၁၂ လ အတွင်းလည်ပတ်မှုအရေအတွက်သည် ဆယ်နွယ်မှုတစ်ခုရှိကြောင်းတွေ့ရှိရပါသည်။ ဆန်းစစ်လေ့လာမှုရလဒ်များအရ တစ်ဦးတစ်ယောက်ချင်းစီ၏ consumer surplus တန်ဖိုးသည် ၂၄,၀၄၉.၀၇၉၈ ကျပ် (၁၇.၆၁ ဒေါ်လာ) ဖြစ်ပါသည်။ လှော်ကားဥယျာဉ်၏ အပန်းဖြေဝန်ဆောင်မှုတန်ဖိုးသည် ၁၁,၅၄၃,၇၅၀,၆၉၇ကျပ် (၈,၄၅၀,၇၆၉.၁၇၇၉ ဒေါ်လာ) ဖြစ်ပါသည်။ သုတေသနစာတမ်း၏ရလာဒ်များအပေါ်အခြေခံ၍ အပန်းဖြေခြင်းတွင် ပြည်သူလူထု၏ ပညာရေးသည်အရေးပါကြောင်းနှင့် ဥယျာဉ်တွင် လာရောက်လည်ပတ်သောဧည့်သည်များအတွက် ဝန်ဆောင်မှုများထပ်မံဖြည့်စွက်ရန်လိုအပ်ပါကြောင်း လေ့လာတွေ့ရှိရပါသည်။

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Abstract

In this research paper, the recreational use value of the Hlawga Park was calculated by using Individual Travel Cost Method (ITCM). Negative Binomial Regression Model was used because it has been found plausible among other models to estimate consumer surplus. For this purpose, 399 on-site questionnaires were administered to the visitors via face-to-face interview between May 1 and May 31, 2017. Travel costs, site quality, year of acquaintance to the site, socio-economic variables of visitors such as sex, marital status, education, age and monthly income level, were taken as the independent variables in the Hlawga Park demand function, while the total number of visits during the last twelve months was selected as the dependent variable. The study indicates that there is a relationship between travel costs and number of visits during the last twelve months. In these economic analysis results, the individual consumer surplus was known as 24,049.0798 Kyats (17.61 dollars). The recreational use value of Hlawga Park was estimated as 11,543,750,697 kyats (8,450,769.1779 dollars). Based on the study results, the study recommended the following; public education on the importance of recreation and provision of additional facilities and services at the park.

Keywords: Individual Travel Cost Method, recreational use value, the individual consumer surplus

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1 Introduction

Protected areas (PAs) are cornerstones for biodiversity conservation (Allendorf, 2007) and are the major means of reducing deforestation (Andam et al., 2008). Myanmar is one of the biodiversity hotspots in the world, and its protected areas play a crucial role in conserving the country's rich biodiversity (Myers et al. 2000).The number of protected areas (PAs) in Myanmar has 40, covering 5.79% of total land area of the country (Nature and Wildlife Conservation Division, 2017). Protected areas (PAs) in Myanmar can be categorized into national park, marine national park, wildlife sanctuary, nature reserve, and zoo park (Htun, 2011). These protected areas include four national parks, one marine national park, one mountain park, one park, three bird sanctuaries, two protected areas, one nature reserves, one elephant range and twenty-six wildlife sanctuaries.

As an economic entity, protected areas are subjected to a number of market failures because of positive externalities in the form of ecosystem services. Recreation and tourism are one of the many benefits associated with parks and protected areas. Most protected areas allow for recreational and tourism activities with the exception of areas managed for strict wilderness and nature protection. Some of these activities will yield indirect returns in the form of increased regional economic activity. Nature-based tourism provides a specific way for people to come into direct contact with nature (Centre STCR, 2008). And, protected area tourism offers significant opportunities to educate visitors about the values of biodiversity (Bushell R, 2016).

Protected areas (PAs) in Myanmar are facing with several threats that range from small scale (hunting and wildlife trade, fuel wood collection, extraction of non-wood forest products, etc.,) to large scale (permanent human settlements and land reclamation, geological exploration by large companies, expansion of roads, lack of awareness and conservation ethic, disposal of toxic chemicals into water bodies, etc.,).

Hlawga Park is one of the forty protected areas (PAs). It is not free from these growing threats to the protected areas (PAs). In Hlawga Park, the threats facing are land encroachments, empty matchboxes, pieces of rubber tyres, used carbide, cartridges, and hunting. Protected areas (PAs) are being threatened because many people do not know the economic values associated with protected area. In many cases, even the economic values associated with protected areas far exceed the monetary gains and profits from the direct exploitation of forest resources in formal markets (Ankomah and Adu, 2014).

Tourism receipts compromises only a small portion of the economic value generated by the parks and undermines their actual economic values. The knowledge of the actual values of these services, typically recreation value is important for a variety of reasons (Fausold, and Lilieholm, 1999). There is a high probability of underestimating and undervaluing natural resources because many goods from the natural environment are not traded in markets and so have no market price (Ankomah A., and Adu, K.O., 2014). Consequently, the values of the resources remain ambiguous. Gurluk and Rehber (2008) claimed that the failure to determine the value of the resources existing at a particular site had led to an underestimation of the true value of the resources or it had been considered to have zero value. This in turn, may prompt the decision makers to use the site for other development activities that may result in the damage of the site, (Poor and Smith, 2004)

2 Objectives of the Study

The main purpose of this study is to estimate the recreational use value of Hlawga Park in Myanmar. The specific objectives of the study are:

- To know the factors affecting recreational visits to Hlawga Park
- To estimate the recreational demand function of Hlawga Park and calculate the consumer surplus

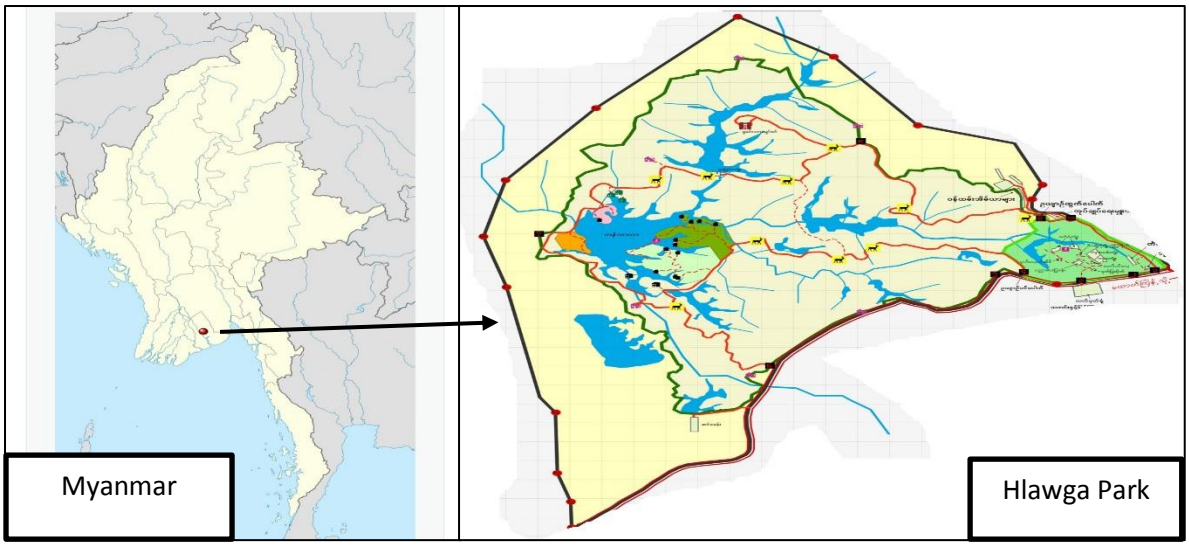
3 Materials and Method

3.1 Study Area

The study is conducted in Hlawga Park. It is located between 17°02'N and 96°06' E in Mingaladon Township, Yangon Region, Myanmar. It was established in 1982 year. It was opened as a recreational area on September 30, 1989.The Park covers 1540 acres. It is located only 35 km from Yangon. The park is a very popular site for domestic visitors seeking leisure and recreation in a natural setting. Hlawga Park is one of the most popular and well known protected areas in Myanmar. The Park's cool and quiet forests, animal viewing opportunities, recreational options and facilities attract visitors from Yangon looking for rest and relaxation. Hlawga Park has a monsoonal type of climate. The average annual rainfall of the park is about 94 inches (239 cm). The rainy period is between late May and October. The winter period is from November to February (average high: 32C and average low: 18C). The summer period is from March to May (average high: 37C and average minimum: 24C). Its mean relative humidity is 86 percent.

The Park is mainly covered by semi-evergreen forest, mixed deciduous forests, and swamp forests. These habitats support around 295 plant species, including 108 types of trees. *dipterocarps and Lagerstroemia speciosa* are the common tree species. Deciduous species are also found such as teak (*Tectona grandis*) and binga (*Mitragyna roundifolia*). Medicinal plants are sindonma-nwe (*Tinospora cordifolia*) and etc. Bamboo species of the park are Wabo (Dendrocalamus brandisii Kurz), Wanet (*D.longispathus Kurz*) etc. Notable wildlife in enclosures including elephants, bears, macques, and Elda's deer, sambur, hog's and barking deer. Resident and migratory birds are plentiful inside the park. There are also about 200 bird species, 9 species of reptiles, 25 species of mammals, 54 species of amphibians, 23 species of fish and 103 species of butterfly. More of the Park's larger fauna live in captive or semi-captive enclosures.

Hlawga Park receives a large number of visitors in winter and summer because of its scenic beauty. Every year 400000-500000 visitors visit to the park which includes students, small business man, private employee, government employee, etc. Therefore, Hlawga Park yields a range of onsite and offsite benefits. Moreover, it has other economic benefits of ecosystem services such as water purification, soil conservation, carbon sequestration and clean air. Despite the extensive range of economic benefits provided by Hlawga Park, most of these benefits have never been defined in monetary terms.



Source: Nature and Wildlife Conservation Division, 2017

Figure 1. Location of the study area

3.2 Sample Size and Sampling Techniques

Determining the sample size is obviously a crucial issue for a proper and reliable estimation of travel cost model. No specific study has been carried out to address the ideal sample size for travel cost method (Rafiq, 2012). Population of the study includes all the on-site visitors (both domestic and foreign visitors) who visit to Hlawga Park. The sampling unit here was each individual visitor within the population.

It was impossible to investigate each member of the population because it would have been time consuming and very costly. For that matter, it was essential to have a sample that was representative enough of the population. The sample was selected using a simple random method. To achieve the objectives of the survey, the face-to-face interview method was used. The data collection period was from May 1-31, 2017. In this study, the sample size was calculated using the following formula:

$n = N / (1 + N e^2)$

Where,

n = Number of sample

N = Total population

e = Error tolerance

The number of visitors to the Park was 480,008visitors within last twelve months before data collection period. The desired margin of error was set equal to 5%. This margin of error ensures representativeness from the selected population, because the general accepted margin of error for representative samples is 10% or less (Hosking and Preez, 2003). With a confidence level of 95% and 5% margin of error, the sample size was calculated as

$n = N / (1 + N e^2) = 480008/1+480008 (0.05^2) = 399$ visitors

3.3 Travel Cost Method

To estimate the value of goods or services that do not have market prices, non-market valuation methods are normally used, such as: the contingent valuation method; the travel cost method; the hedonic price modelling; and the choice modelling (Nunes and van den Bergh, 2001). However, Travel Cost Method (TCM) was used to achieve the objectives of the study.

The Travel Cost Method (TCM) is the most common indirect method used to estimate the recreational use value of recreational sites. The travel cost method is a non-market procedure which seeks to place a value on recreational sites by using consumption behaviour in related markets (Fleming, Cook 2008). The TCM method was first suggested by Harold Hoteling (1949) in 1930s as a budding tool to determine the value of non-market goods (Ortacesme et al, 2002).

The Zonal Travel Cost Method (ZTCM) and the Individual Travel Cost Method (ITCM) are two forms of travel cost methods (Willis and Garrod, 1991). ZTCM was developed by Clawson and Knetsch in the 1960s (Clawson and Knetsch, 1966). A simplified description of ZTCM is that it evaluates the recreational benefit in a particular area (zone) by multiplying the average cost of a visit to that area by the total number of visits (Anning, 2012). However, the different characteristics of individual visitors affect travel expenditure, so that the aggregated and averaged ZTCM can be inaccurate (Ward and Beal, 2000). Zonal travel cost models are rarely used in current research principally because it assumes the same characteristics of all respondents in the surveyed areas and also it have weak ties to microeconomic theory (Dvořak, 2007). And, the zonal travel cost model is statistically inefficient since it aggregates data from a large number of individual observations into a few zonal observations (Georgiou et al., 1987).

The individual travel cost method (ITCM) defines the dependent variable as the number of site visits made by each visitor over a specific period, for instance, in a year (Twerefou, Adjei Ababio, 2012). ITCM has an advantage in analyzing those sites that have high visitor numbers (Rolfe and Dyack, 2011). The individual travel cost model accommodates individual visitor's inherent variation in socio-economic characteristics and more individual data are available, since the recreation demand is estimated by number of individual number of visits. Heterogeneity in the population that is neglected by the ZTCM is accommodated in the ITCM model. The ITCM also avoids arbitrary zone definitions required in the ZTCM. Finally, the ITCM is better suited to provide inferences about individual consumer behavior. As a result, the ITCM gains better statistical efficiency than the ZTCM (Andualem, 2011). Due to these reasons, ITCM method was chosen. A simple trip generation function of the ITCM can be defined as follows:

$$\mathbf{V_{ij} = f\,(TC_{ij}, X_i)} \quad \text{----------} \quad \mathbf{(1)}$$

Where,

V_{ij} = number of visits made per year by individual i to recreation site j

TC_{ij} = visit costs incurred by individual i to recreation j

X_i = All other socioeconomic variables determining individual i's visits

3.4 Value of Time

The travel time is the natural problem in the application of the travel cost method. The travel time is later converted into a monetary value by applying the opportunity cost of travel time measured in terms of the loss in wages during the travelling period. Application of a fraction of the wage rate to represent the opportunity cost of time varies throughout the literature. Some researchers use varying multipliers of zero, ¼, and ½ times the wage rate to get a range of estimates (Zawacki et al., 2000). However, Amoako-Tuffour and Martinez-Espineira (2008) warn that a zero rate is only plausible for visitors who are students, retirees, unemployed or homemakers. In this study, ½ of the wage rate is used for valuing travel time. The travel time cost is determined using the following formula:

(½X visitors wage per working hour) x (Round trip travel time)

Hourly income is computed by dividing the monthly income of the respondents with the total hours worked in a month. Total working hours are assumed to be eight hours per day based on the Myanmar standard of working time hours. Similarly, Matthew (2013) and Nde (2011) applied the same number of working hours in their study. It is assumed that the respondents work for 31 days in May, which is the month when data collection is conducted. Therefore, the total working hours for May is 248 hours. This assumption is made because in some countries, including Myanmar, Saturdays, and Sundays is a public holiday. In this case, we could assume that the respondents are on paid leave. Likewise, the self-employed visitors are assumed to work eight hours in a day is made to standardize the time cost measurement. In order to obtain the hourly income, the total monthly income is divided by the total number of working hours (248). Next, the hourly income is multiplied by the total round trip travel time that is standardized in hours.

3.5 Multiple Destination Trips

Multiple destination trips are also a problem in the travel cost method. Multiple destination trips refer to trips where an individual has another destination on the way to, nearby, or on the way back home from the recreation site of interest (Loomis et al, 2000). At the moment, there is no commonly accepted methodology for apportioning travel costs for multiple destination trips. Although many recreational trips have a single primary destination, multiple destination trips, where there is a choice about which site to visit, are common. The consumer surplus emanating from multiple destination trips is a larger component of total site value (Mendelsohn et al, 1992).

To treat multiple destination trips in the context of the TCM, several approaches have been implemented in the past. The most common following approaches are (Tourkolias, 2014):

- Using only a part of the total travel cost, which corresponds to the additional expenditures made to visit the area in question from the last stopover;
- Distributing the total travel cost on the basis of the time spent by the visitor at each of the sites visited;
- distributing the total travel cost on the basis of the welfare derived by each of the sites;

Identifying the various profiles of multiple destination trips undertaken by the visitors of the site in question and estimating the demand curve and the recreational value for each of them,

while the recreation use value of the area in question is estimated at a later stage as a percentage of the recreational use value of each type of the multiple destination trips identified.

In the study, Hlawga Park has no close substitutes and a visit to reserve may be considered as a single destination trip. Multiple destination trip issue is ignored and on site time has not been included as a cost. All visitors can be regarded as having Hlawga Park as their sole destination site because there is no other attractive recreational site near the park.

3.6 Individual Travel Cost Model Specification

The basic model to be used in this study depicts the number of visits to Hlawga Park as a function of factors such as the travel cost, gender, age, marital status, educational level, occupation, monthly income, mode of transport, group size, year of acquaintance, perception of park quality, etc. Thus, the model may be specified as follows:

$$V_{ij} = f(TC + AGE + SEX + Y + EDU + MS + OCC + MoT + GS + Year + PQ + \varepsilon i) \quad \text{----------} \quad (2)$$

Where,

V_{ij} = individual i's number of visits to the site j during the last twelve months

TC = individual i's travel cost

AGE = individual i's age

SEX = individual i's gender status

Y = individual i's monthly income

EDU = individual i's education level

MS = individual i's marital status

OCC = individual i's occupation status

MoT = individual i's mode of transport

GS = individual i's group size

Year = individual i's year of acquaintance

PQ = individual i's perception of park quality

ε = error term

There are many common functional forms of the trip generation function in the literature including linear, such as linear, semi-log (log-linear) and double log model. None of these is theoretically superior to the others. There is some consensus that a semi-log gives the best results namely regressing the logarithm of visitation rates against travel cost, etc. (Bann, 1998). In the literature, the most commonly used functional forms for demand functions are the linear and the semi-log functional forms. Thus, from Equation (2) the

specific econometric models used to describe the relationship between individual number of visits during last twelve months and the travel cost as well as other explanatory variables is given by;

$$\mathbf{Ln\ V_{ij} = \beta_0 + \beta_1\ TC + \beta_2 AGE + \beta_3 Y + \beta_4 EDU + \beta_5 SEX + \beta_6 MS + \beta_7 OCC + \beta_8\ MoT + \beta_9\ GS + \beta_{10}\ Year + \beta_{11}\ PQ + \varepsilon_i} \quad \text{----------} \quad \mathbf{(3)}$$

Where the βs are the parameters of the regression and all other variables are as defined.

3.7 Calculation of Consumer Surplus

The idea of consumer surplus (CS) is the main part of the travel cost method. So invariably, the CS represents the recreational use value attached to a recreational site. In ordinary economics terms, the consumer surplus is the difference between the actual price you pay for some good and the maximum price you would have been willing to pay for it other than do without it (Ndichia, 2007). In the context of the TCM, it can then be stated intuitively that the CS is the difference between the total travel costs or expenses incurred by a visitor to a recreational site and the maximum amount he or she was (or would be) willing to spend in order to make the visit or trip (Timah, 2011). In the calculation of consumer surplus, annual number of visits was taken as the dependent variable, while visitors' socioeconomic data and travel features were selected as the independent variables. The travel costs were taken as the travel cost per person, which was obtained from the total travel cost variable, which was divided by the number of individuals in the group. The total travel cost includes the transportation costs, entrance fee, accommodation fee and time cost (exclude on-site time). According to Garrod and Willis (1990), the individual average consumer surplus can be calculated as

$$\mathbf{CS} = \frac{\text{Average of the total annual number of visits}}{\text{Travel cost Applying}} \quad \text{----------} \quad \mathbf{(4)}$$

To obtain the aggregate consumer surplus, the individual consumer surplus has to be multiplied by the number of annual visit.

4 Results

4.1 Descriptive Analytical results

The survey data was collected from 399 respondents (on-site sampled visitors) of the site and no questionnaires were discarded due to incompleteness.

4.1.1 Socio-economic Characteristics

It was observed that 57 percent of respondents were males and 43 percent were females. 58 percent of respondents were married and 42 percent were single. The number of visitors in different age classes is shown in Table 4.1.1. It documents that the two first age classes (18 to 39) have the highest visitors.

Table 4.1.1 Number of visitors in different age classes

Age class	Frequency	Relative Frequency (%)
18-28	156	39
29-39	133	33
40-50	71	18
51-61	28	7
>61	11	3

4.1.2 Education level of sampled visitors

In terms of educational level, 61 percent of the sampled visitors at Hlawga Park attended university education and the trend decreased towards lower levels as shown in Table 4.1.2. So, more educated person is come to the site more than less educated. This study concluded that more educated person have stronger appreciation for leisure and the environment than less educated.

Table 4.1.2 Education level of sampled visitors

Education Level	Frequency	Relative Frequency (%)
Primary Level	10	3
Secondary Level	46	12
High Level	100	25
Graduate Level	236	59
M.sc and above	7	2

4.1.3 Monthly income level of sampled visitors

In monthly income level of sampled visitors, 64 percent of sample visitors had a monthly income between 0 kyats and 300,000 kyats and this range of income related to the people with lower income in Myanmar. It means that most visitors related to the lower income of the country and as the income of people increases from the lower level, the number of visitors decreases. In contrast, the middle and rich people with the income more than 300,000 kyats have a lower frequency (Table 4.1.3).

Table 4.1.3 Monthly income level of sampled visitors

Income Group (Kyats)	Frequency	Relative Frequency (%)
0-150000	109	27.32
150100-300000	144	36.09
300100-450000	39	9.77
450100-600000	51	12.78
600100-750000	10	1.52
>750100	46	11.53

4.1.4 Occupation status of sampled visitors

The results of sample questionnaires show that 39 percent of the visitors to the site are private employees (Table 4.1.4).

Table 4.1.4 Occupation status of sampled visitors

Occupation	Frequency	Relative Frequency (%)
Government staff	31	8
Private staff	157	39
Own business	140	35
Student	26	7
Unemployment	38	10
Pensioner	7	2

4.1.5 Mode of transport of sampled visitors

Results show that 58 percent of sample visitors were used private vehicle to visit the park. In contrast, we realize that the respondents who have private vehicle are visited to the park more than others (table 4.1.5).

Table 4.1.5 Mode of transport of sampled visitors

Mode of Transport	Frequency	Relative Frequency (%)
Own Car	230	58
Public transport	55	14
Taxi	51	13
Rental	18	5
Motorcycle	42	11
Bicycle	2	1
Walking	1	0

4.1.6 Number of visits of the sampled visitors during the last twelve months

55 percent of the visitors have visited the park one time during the last 12 months. 28 percent of the respondents had visited the park two times during the last 12 months. The remaining 14 percent of the respondents had a visitation rate of 3-5 times during the last 12 months. Only 3 percent of respondents have visited the park more than 5 times (table 4.1.6).

Table 4.1.6 Number of visits of the sampled visitors during the last twelve months

Times	Frequency	Relative Frequency (%)
1	220	55
2	110	28
3	28	7
4	11	3
5	17	4
>5	13	3

4.2 Econometric Analysis and Regression Results

The main aim of this study is to numerically estimate the recreational use value of Hlawga Park. The recreation demand function of the site is approximated using the number of visits (V) to the site as dependent variable and the total travel cost (TC) associated with the trip and other socioeconomic variables as independent variables. Total travel cost contains transportation costs of visitors, converting round-trip distance from home to destination site into kyats, entrance fee, accommodation fees and opportunity cost of time. Without estimating travel time for a recreation site, the consumer surplus will be underestimated. In the study, a semi-log functional form for the demand function is used. Therefore, the demand function for the Hlawga Park recreational site has the following form.

$$LnV_{ij} = \beta_0 + \beta_1 TC + \beta_2 AGE + \beta_3 Y + \beta_4 EDU + \beta_5 SEX + \beta_6 MS + \beta_7 OCC + \beta_8 MoT + \beta_9 GS + \beta_{10} Year + \beta_{11} PQ + \varepsilon_i \quad \text{---------- (5)}$$

$$V_{ij} = e^{\beta_0 + \beta_1 TC + \beta_2 AEG + \beta_3 Y + \beta_4 EDU + \beta_5 SEX + \beta_6 MS + \beta_7 OCC + \beta_8 MoT + \beta_9 GS + \beta_{10} Year + \beta_{11} PQ + \varepsilon_i}$$

Where, ε_i is an error term

Estimated demand equation can be;

$Ln\ V_{ij} = \beta_0 + \beta_1\ TC_i$ …linear individual recreational demand

Or

$V_{ij} = e^{\beta_0 + \beta_1 TC_i}$ …. Exponential individual recreational demand

A count data model is used for the econometric analysis because the number of visits is a count data that is integer and non-negative. Among the different count data models, Negative Binomial Model (NBM) was used because the study data was suited with it. The NBM is preferred because the data is the presence of over-dispersion problem. If the data is the presence of over-dispersion problem, poisson model isn't appropriate. Over dispersion problem appears when very few people make higher number of visits and the vast majority makes very few trips. This is reflected by a higher variance of the number of visits than the mean number of visits of sampled visitors. In fact in this study the variance is found to be 6.26 that are higher than the mean 1.96 for the number of visits. Therefore, the data is not free from the problem of over-dispersion and NBM is the appropriate model for the analysis. The regression result of the Negative Binomial Model is presented in the below table.

Table 4.2.1 Negative Binomial Regression Results

Independent Variables	Coef.	Std.Err	z	**P>|z|**
TC	-.0000815**	.0000373	2.18	0.03
Sex	.119268	.0940635	1.27	0.205
Age	-.0023987	.0047595	-0.50	0.614
MS	-.1988424 *	.1113272	-1.79	0.0704
Edu	-.1214068	.0851137	-1.43	0.514
Occ	-.0577533	.0943307	-0.61	0.540
Y	6.77e-07 ***	2.05e-07	3.30	0.001
MoT	.0356105	.1292539	0.28	0.783
GS	-.0087276	.0075034	-1.16	0.245
Year	-.0052662	.0060836	-0.87	0.387
PQ	.0766406	.0831404	0.92	0.357
Constant	11.35576	12.24673	0.93	0.354
lnalpha	-1.51898	.1767549	N/A	N/A
alpha	.2189352	.0386979	N/A	N/A

Number of obs = 399

Log likelihood = - 629.902

LR $chi^2(11)$ = 22.16

Pseudo R^2 = 0.0174

Prob > chi^2 = 0.0219

Notes: * Significant at 10% level; ** significant at 5% level; *** significant at 1% level

4.3 The factors determine the recreational demand of Hlawga Park

Number of people visiting a recreation site (V_{ij}) is affected by number of the factors such as socioeconomic and demographic factors, travel costs, mode of transport, year of acquaintance to the site, quality of the site, group size of the visitors. The regression results indicate that travel cost, marital status and monthly income of visitors are significant variables that affect the recreational demand of Hlawga Park, while the remaining variables were found to be insignificant in determining recreational demand of the site.

The independent variable, travel cost (TC) is the main important variable in the demand functions shows a negative and significant effect at 5% significant level. It has a negative coefficient of 0.0000815. This is consistent with the demand theory which stipulates that when the price of travel increases then the number of visits will decrease. When TC increases by 1000 kyats the number of visits to the site will decrease by 0.001 %. This means that people living closer to the site made many trips while those living far from the site made fewer trips. This finding is consistent with the empirical works of most researchers such as Amenu Daba Waktola (2014) in economic valuation of the recreational use value of Babogayya Lake (Bishoftu town): Application of the Individual Travel Cost Method (ITCM) carried out in Ethiopia.

Visitors' monthly income is the other significant independent variable at 1% level of significance. If the monthly incomes of the respondents increase by one unit, the number of visits decreases by $6.49e^{-07}$ percent. As visitors' monthly income increases to higher level, people may also prefer clean and attractive environment during their time of visits.

Marital status was included as an independent variable in the study (dummy variable: 0 if the visitor is single and 1 if married). However, the divorce and widow group of the respondents were not included in the sample. It significantly determines the number of visit at 10 percent level.

4.4 Demand Function and Value Estimation

The demand function of Hlawga Park recreation site is constructed by relating number of visits with travel cost (TC). The linear semi-log demand function is as follows:

$$Ln\ V_{ij} = \beta 0 + \beta_1 TC_i \quad \text{----------} \quad (6)$$

Or

$$V_{ij} = e^{\beta_0 + \beta_1 TC_i}$$

Where;

V_{ij} = individual i's number of visits to the site

TC_i = individual i's travel cost

β_0 = constant term

β_1 = coefficient of travel cost

Thus the demand function estimated for the Hlawga Park recreational site is the following;

$$Ln\ V_{ij} = 11.36 - 0.0000815\ TC_i$$

Or

$$V_{ij} = e^{11.36-0.0000815\ TC_i}$$

The area under the demand curve represents consumer surplus. The consumer surplus represents the recreation use value of the park based on the model specified in equation 5. In this study, the mean number of annual trip per person was found 1.96 times per year. According to the equation (4), individual average consumer surplus can be calculated;

Consumer Surplus (CS) = 1.96/0.0000815

= 24049.0798 Kyats = 17.61 dollars

*(taking the November 16, 2017 exchange rate where 1 USD = 1366 kyats)

To obtain the aggregate consumer surplus, the individual consumer surplus of 24049.0798 Kyats (17.61 dollars) has to be multiplied by the number of annual visits. With the number of visitors to the park reaching 480,008 for last 12 months before the data collection period, it implies that the aggregate consumer surplus for the Hlawga Park in 2016-17, representing the recreational use value in this case, was 11,543,750,697 kyats (8,450,769.1779 dollars). A probable cause for the high consumer surplus could be the low travel cost coefficient, since the consumer surplus is calculated by dividing the average number of visits made to the park by the travel cost coefficient. Therefore, a low travel cost coefficient will result in a high consumer surplus. However, the study is represented only the recreational use value of the park, excluding the other economic values of the park.

5 Conclusion and Recommendation

There are many protected areas such as national parks, wildlife sanctuaries and forest recreation areas used for tourism and recreation purposes in Myanmar. The economic values provided from these PAs need to be known for their future protection, planning and management. In this research, Hlawga Park was selected because it is one of the most visited recreation sites in Myanmar. This study found a negative relationship between travel costs and number of visits during last twelve months, and monthly income had a negative relationship with number of visits during last twelve months. On the other hand, age and education were found not to be significant in influencing individuals' number of visits. According to the descriptive statistics, the majority of visitors' ages belong to two middle age classes (18 to 39 years). So, the authorities of the recreational site should provide more facilities based on the interest of this group of people. It was found that visitors with university degrees were the highest in numbers for visiting recreation sites. This is an indication that there is a direct relationship between education level and number of visitors to the park. It is clear that if we want to get an appropriate level of tourism industry, we should enhance the level of people's education. And, the improvement of eco-environmental resources/ services can be the most significant factor which could be effective in visiting the park, in addition to the costs and users income. Accessibility of enough public transportation facilities can persuade much more visitors to visit the area. The Individual Travel Cost Method (ITCM) was used to numerically estimate the recreational use value of this site. According to the regression results, the current recreational use value of Hlawga Park was

11,543,750,697 kyats (8,450,769.1779 dollars). Therefore, expenditures must be incurred to ensure the continued provision of the ecosystem services.

However, the research had problems related to the calculation of the opportunity cost of travel time as there is no standard for calculating it to suit local circumstances. Visitors have many types of automobiles with different ages, brands, motor volumes; types of gasoline consumed and associated costs. There is no standard value in Myanmar for full car running costs. According to local conditions in Myanmar, standard values for full car running costs and for the value of time should be developed.

In conclusion, it was recommended that the Travel Cost Method can be used to evaluate environmental goods and services that do not have a market price such as recreation sites in Myanmar. It is important to note that the travel cost method only estimate the use value of sites. Further research is necessary to determine the non-use values of Hlawga Park. This could be done using stated preference techniques, such as with contingent valuation or choice experiments.

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