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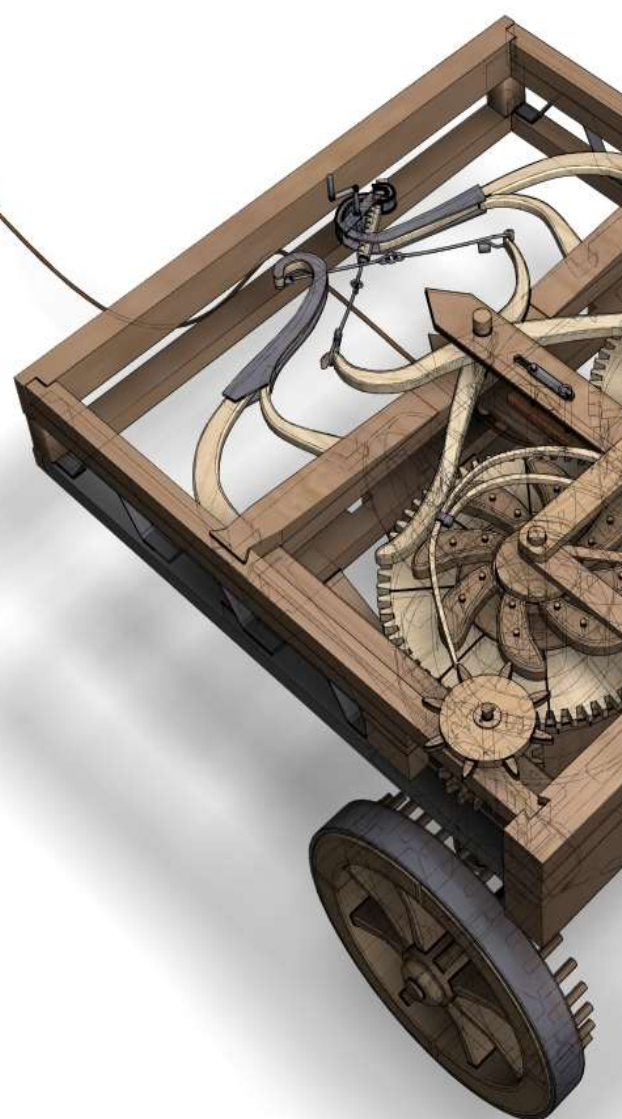
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Economic Valuation of Ayutthaya Historical Park, Thailand

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Abstract:

The objectives of this research were to study the general information of the tourists and the factors affecting the decision of tourists and to assess the economic valuation of the Ayutthaya Historical Park, Thailand. A questionnaire was used to collect data from 400 tourists. The general information of tourists was analyzed using the frequency and percentage. The relationship between the economic and social factors and the visiting ratio was analyzed, as well as the economic valuation assessment of the Ayutthaya Historical Park that was analyzed with the Individual Travel Cost Method (ITCM). The research results indicated that most traveled to experience the arts and culture and make merit. The tourists were impressed with the beautiful ancient remains, which were the arts of Ayutthaya and the peace of the Park. Furthermore, the most influential factors affecting the decision to visit the Ayutthaya Historical Park that had statistical significance were the travel cost and distance. The findings obtained from the economic valuation assessment of the Ayutthaya Historical Park applying the ITCM showed that the consumer surplus was 1,508.40 Baht/person/time, while the economic valuation of the Ayutthaya Historical Park was 1,999,500,930.91 Baht/year. The average visit was 2.61 times per year.

Keywords: tourist; Ayutthaya Historical Park; economic valuation; travel cost method.

JEL Classification: Z32 ; Q15 ; F20.

Introduction

In Thailand, there are five World Heritage Sites that were declared by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as cultural and natural World Heritage Sites. These are the Historic Town of Sukhothai and Associated Historic Towns, Ayutthaya Historical Park, Ban Chiang Archaeological Site, Thungyai-Huai Kha Khaeng Wildlife Sanctuary, and Dong Phrayayen-Khao Yai Forest Complex (Manojanphen 2018).

The Ayutthaya Historical Park, one of the World Heritage Sites of the Thai people, was declared a UNESCO World Heritage Site on 13 December, 1991, by the 15th Session of the World Heritage Committee in Carthage, Tunisia under the regulations and criteria signifying the exceptional uniqueness with the evidence representing the cultures and customs by means of pieces of work, and elegant arts and culture in terms of remarkable architecture, painting, sculpture, exquisite crafts, and literature (Yodtue 2014).

Phra Nakhon Si Ayutthaya province is known as one of the significant economic tourist sites of Thailand that is the pride reflecting the country's historical background to recollect the courageous Thai ancestors. It also receives the highest number of tourists in the region. Moreover, from the trend of the television drama "Buppe Sannivas" the period drama broadcast on Channel 3 in 2018, it presented the historical background during the reign of King Narai the Great of the Ayutthaya Kingdom. The narrative portrays the prosperous era of the abundant natural resources, agriculture, industry, and trading that supported Phra Nakhon Si Ayutthaya to become the trade center of Southeast Asia. Furthermore, the peace, harmony, and unity of the people, the

splendid temples and fortresses presented in the drama generated interest in the audience with around 4,000 people per day visiting the Ayutthaya Historical Park and dressing up in Thai traditional costume. This has also had considerable positive effects on the shops and services in the surrounding areas. During the drama's broadcast time, the economy of Ayutthaya province expanded by 33% that resulted in 2.2% of the expansion of the GDP (Department of Tourism, 2019).

Due to the increasing number of tourists, the traffic congestion around the Ayutthaya Historical Park has become a problem. The people and tourists are encountering difficulty with traffic jams, insufficient parking and other public utilities for tourists, inadequate services, and long queues to enter the sites and use the restaurant services. All these problems have had an enormous impact on the increasing price of the products and services since the demand of the tourists has increased, while the public utilities are limited and shared with the local people.

Nonetheless, the Ayutthaya Historical Park has raised the continuing growth of Thailand's tourism economy after the television drama "Buppe Sannivas (Love Destiny)" that has maximized the number of tourists. However, tourist support and cultural and heritage conservation are the problematic issues. Therefore, the economic valuation of the Ayutthaya Historical Park should be evaluated substantially in a form of currency using the Travel Cost Method (TCM) with the Individual Travel Cost Method (ITCM) in order to analyze the economic worthiness and acquire the information for making decisions on the policy, budgeting, personnel allocation, maintenance management for the ultimate worthiness, and heritage and cultural conservation.

1. Literature Review

Base on the theoretical concepts in economics related to economic valuation of Ayutthaya Historical Park consist of 4 concepts which are as followings:

1) The concept of welfare economics.

Freeman, 1993 referred to in On-saard, 2012. It explains a change in the quality of the environment will change the welfare of the person and the level of personal satisfaction, for example, the service of clean drinking water. Therefore, these services should be in the category of goods and services that a person can seek satisfaction.

2) Environmental valuation concept in tourism valuation.

That is an explanation about one person's consumption will not result in a decrease in the consumption of other people, which can be divided into 3 types. 1. The value arising from use (use value) *i.e.* from direct use (direct use value) and value resulting from indirect use (Indirect use value) 2. The Value that is not caused by use (non-use value) is the value of persistence (existence value) and the value that is preserved for future generations to use (bequest value) 3. The option value is the value that the public cannot benefit from the environment (Isarangkun Na Ayudhya 1998)

3) Environmental valuation by tourism cost method or Individual Travel Cost Method.

Suksu-aut (2009) explained that estimating the demand curve for traveling to a personal economic attraction. It is because in the tourism cost model comprises time variables that there variables included in the constraint equation. Therefore, a method of converting time units into monetary units must be used using an appropriate shadow price.

4) Opportunity cost concept.

The opportunity cost is the value of return from an activity that lost opportunity in choosing an activity, due to Masamae (2011) describes time as valuable and limited. Those who want to travel must sacrifice time from work to earn money, and that time is equal to the amount or income that he should have received in return. The value of opportunity cost is equal to 1/3 of income, consistent with 33 percent of the wage rate (Englin & Shonkwiker, 1995 referred to in Ngamsomsuke, 2006). It is a suitable rate for calculating the time cost of the opportunity cost of the activity and it should be employed in this study.

From the 4 concepts that mentioned above, Suksu-aut (2009) was evaluating the value of recreation and access fees: a case study of Lumpini Park, Bangkok. The purpose of this research is to assess the recreational value of Lumpini Park using the Individual Travel Cost Method. The factors affecting the individual travel cost method are: economic fundamentals travel expenses (Nonthapot 2017; Nonthapot 2021). The results showed that the recreational value of Lumpini Park estimated in 2009 was approximately Baht 2,021.67 million. Similarly, Suthasupa (2005) used the Individual travel cost method (ITCM) with economic fundamentals. The cost of travel is a variable of the economic valuation of Doi Suthep-Pui National Park, Chiang Mai, Thailand the estimated results from the individual travel cost model were as follows: consumer surplus was estimated at baht 13,452.84 per visitor and the recreational value of Doi Suthep-Pui National Park was 54,526.29 million baht per year. In

addition, Masamae (2011) studied the economic valuation of recreational benefits of Sai Khao Waterfall, Sai Khao Sub-district, Khok Pho District. Pattani Province by finding the relationship between social and economic factors and the rate of recreation. Including evaluating the value of recreation using the ITCM were found that the factors affecting the decision to come to Sai Khao Waterfall (Pattani Province of Thailand) recreation were statistically significant, the model was including travel costs and the experience of traveling to Sai Khao Waterfall and the economic value of recreational benefits of Sai Khao Waterfall was estimated at the individual travel cost of 143,113,940 baht/year and the value derived from consumer surplus equal to 6,453,502.36 baht/year.

2. Methodology

2.1 Population Identification and Sampling

The population of this research was Thai tourists from the sample groups, who visited the Ayutthaya Historical Park during July-October 2020 and were selected by the accidental random sampling using Yamane's (1968) method, which was calculated as follows:

$$n = \frac{N}{1 + [N(e^2)]} \quad 2.1$$

where: n = the size of the sample group.

N = the tourists who visited Phra Nakhon Si Ayutthaya province.

e = the error of the sample group.

The size of the population was considered from the number of tourists, who had visited Phra Nakhon Si Ayutthaya in 2019, which was 1,325,572 persons (Department of Tourism, 2018), with the error at 5% or 0.05 (Sihabutr and Nonthapot 2021).

From the above calculation, 400 samples were obtained. A questionnaire was used to collect the data from the tourists who had visited the Ayutthaya Historical Park, and were selected with accidental sampling on the weekend and public holidays during July-October 2020.

2.2 Research Tool

The created questionnaire was used as a tool to interview the sample group. The questionnaire validity was tested with the index of item-objective congruence (IOC) (Rovinelli and Hambleton, 1977). The created questionnaire was tested by five experts and 30 sets were tested before the actual application. The questionnaire was divided into four parts.

Part 1. General information. The questions asked about the general information of the socio-economic characteristics of the sample group, which included the residential area, gender, age, education, occupation, and income.

Part 2. Participation in tourism activities at the Ayutthaya Historical Park.

Part 3. Travel expenses to the Ayutthaya Historical Park, which the questions were about the transportation fee, cost of petrol, cost of the car rent, and other expenses; such as, food and beverages, accommodation, souvenirs, etc. The data were obtained to analyze the economic valuation of the Ayutthaya Historical Park using the ITCM.

Part 4 General opinions and suggestions of the tourists on the management and improvement to enhance the potential of the Ayutthaya Historical Park.

2.3 Data Analysis

2.3.1 Descriptive Data Analysis

To study the general state of the socio-economic characteristics of the tourists who visited the Ayutthaya Historical Park from the answers of Part 1 of the questionnaire, which included gender, age, status, education, income, and occupation, as well as their opinions and suggestions, which were analyzed with frequency and percentage.

2.3.2 Quantitative Data Analysis

To obtain the results of Parts 2 and 3 of the questionnaire, the analysis to determine the factors affecting the travel to visit the Ayutthaya Historical Park by finding the relationship between the economic factor and the number of visiting days using multiple regression analysis, ordinary least squares (OLS) regression, coefficient of determination (R²), adjusted R-squared, t-statistic, standard error, and F-statistic.

$$Q_i = f(G, A, E, O, I, L, TC, X) \quad 2.2$$

The formula was:

$$Q_i = \beta_0 + \beta_1 TC_i + \beta_2 G_i + \beta_3 A_i + \beta_4 E_i + \beta_5 O_i + \beta_6 I_i + \beta_7 L_i + \beta_8 X_i \quad 2.3$$

The variables were:

Q_i = number of times of travel of each tourist (time/year)

G_i = gender, where:

0 = male

1 = female

A_i = age of the tourist (years)

E_i = education, where:

0 = under diploma

1 = equivalent or higher than diploma

O_i = occupation, where:

0 = student

1 = other occupations

I_i = income (Thai Baht)

L_i = distance (kilometer)

X_i = drama watching, where:

1 = watching "Buppe Sannivas"

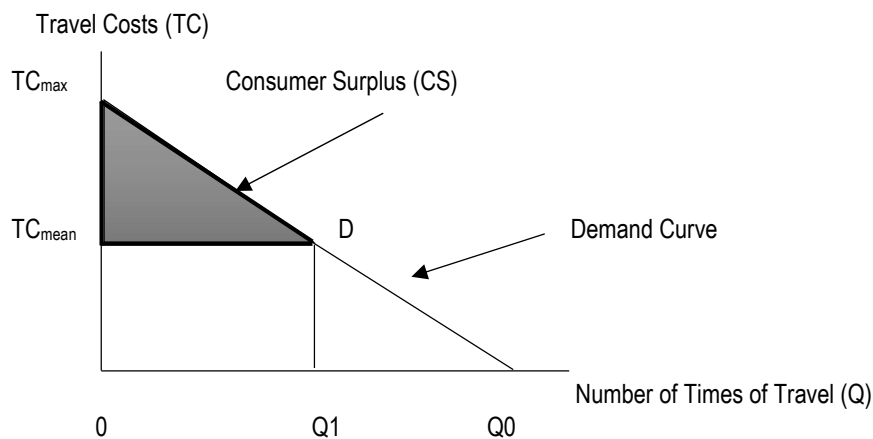
0 = others

TC = travel costs to visit the Ayutthaya Historical Park involving the cost of the vehicle, food and beverages, accommodation, non-travel related costs from the travel, and the opportunity cost at one third of the income (Thai Baht/person/time).

2.3.3 Individual Travel Cost Method (ITCM)

The relationship between the number of times of travel of the tourists and the travel costs of the individual to answer Part 3 of the questionnaire from the consumer surplus (CS) of the tourists visiting the Ayutthaya Historical Park was calculated by the space under the demand curve (Equation 2.4).

Figure 1. The consumer surplus.



where: Q_i = the travel rate of the tourists who visited the Ayutthaya Historical Park.

TC = travel costs to the Ayutthaya Historical Park involved the cost of the vehicle, food and beverages, accommodation, and non-travel related costs from the travel of one tourist (Thai Baht/person/time).

The calculation of the CS of the tourists who visited the Ayutthaya Historical Park is shown in Equation 2.5.

$$CS_i = \int_{TC_i(\text{mean})}^{TC_i(\text{max})} (a_0 - \beta_1 TC) dTC \quad 2.5$$

where: CS_i = the consumer surplus of the tourists who visited the Ayutthaya Historical Park.

$TC_i(\text{max})$ = the highest travel costs of the tourists from the sample group.

$TC_i(\text{mean})$ = the average travel costs of the tourists from the sample group.

a_0 = static demand value calculated from $\beta_0 + \beta_2 G_i + \beta_3 A_i + \beta_4 E_i + \beta_5 O_i + \beta_6 I_i + \beta_7 L_i + \beta_8 X_i$

Then, the average consumer surplus (ACS) from the CS of the tourists who visited the Ayutthaya Historical Park was divided by the average number of individual travel (Q_i) as follows:

$$ACS = \frac{CS_i}{Q_i} \quad 2.6$$

The value acquired from Equation 6 to find the total CS of the tourists who visited the Ayutthaya Historical Park was calculated by multiplying ACS with the number of total tourists (N) during the research period.

$$CS = ACS \times N \quad 2.7$$

where CS was the total consumer surplus (Thai Baht/year).

Therefore, the calculation of the consumer surplus of the tourists who visited the Ayutthaya Historical Park was the economic valuation of such region by estimating the space under the demand curve to explain the satisfaction of the tourists who visited the Ayutthaya Historical Park.

4. Research Results

The general information and the activities participation of the tourists who visited the Ayutthaya Historical Park presented that 246 of them were female (61.5%) while 154 were male (38.5%). Two hundred and forty of them were aged between 18-30 years (60%), 94 were 31-40 years (23.5%), 35 were 41-50 years (8.8%), 22 were 51-60 years (5.55%), and nine were over 61 years (2.2%).

In addition, 266 tourists from the sample group were single (66.5%), while 122 were married (30.5%). Ten were divorced/widowed (2.5%) and only two were separated (0.5%). In terms of education, 209 tourists had a bachelor's degree (52.2%), followed by secondary school, and diploma (19.5% and 16%, respectively).

Furthermore, 151 tourists were employees in private companies (37.8%), while another 103 were students (25.8%) and 52 were merchants or operated their own business. Only three of them were agriculturists (0.8%). The range of income was 10,001-15,000 Thai Baht/month (22.5%), followed by lower than 5,000 Thai Baht/month, and 20,001-25,000 Thai Baht/month (17.8% and 16%, respectively).

Most tourists got the information about the Ayutthaya Historical Park from friends/relatives/family members (42%), followed by social media; such as, Facebook, Twitter, and Instagram (34%), and travel magazines (9%). Almost all of the tourists visited the Ayutthaya Historical Park to appreciate the arts and culture as well as to make merit (32% equally), followed by to trace the drama "Buppha Sannivas" (9%), and to ride an elephant to view the ancient city (7%). They traveled with their family (45%), friends (43.5%), and colleagues (5.5%). Only few traveled alone (2.8%) and/or with an educational group (1.8%).

Most tourists traveled by their personal car (71.8%), followed by motorcycle (9%), train (8.5%), bus (5%), and tour bus (3.8%). The majority of tourists came in a small group with 1-5 members (80%), 6-10 members (14%), 11-15 members (4%), and a group of more than 20 members (2%). Most of them visited as a one-day trip (78%) due to the short time of travel and the convenient transport, whereas only 22% stayed overnight.

The information also revealed that 266 tourists had previously visited the Ayutthaya Historical Park (67%), while 134 tourists visited for the first time (33%). Most of them visited 1-2 times (70.2%), 3-4 times (16.2%), 5-6 times (7.8%), 9-10 times (3%), and 7-8 times (1.8%). The majority of tourists planned to revisit the site (91%), while only few were unsure about the revisit and decided to not revisit (8% and 1%, respectively).

The tourists who did not visit the Ayutthaya Historical Park, 240 tourists, spent their time at home (65%), while 72 tourists worked as usual (18%), and 45 tourists visited other places (11.2%). The majority of tourists, 205 persons, had a high level of satisfaction (51.2%), whereas 144 persons (36%) had the highest level of satisfaction, and 46 persons (11.5%) had a moderate level of satisfaction, respectively. The splendid architecture and uniqueness, peacefulness and convenient facilities, and transportation were the key factors of the highest satisfaction.

3.1 Types of Travel Costs

The average travel costs to the Ayutthaya Historical Park were 215.3 Thai Baht/person/trip, while the average non-travel related costs were 608.69 Thai Baht/person/trip. The travel costs involved the cost of petrol, car rent, and transportation. Simultaneously, the non-travel related costs included food and beverages, souvenirs and accommodation.

Table 1. Average costs of the tourists

Types of Cost	Average Cost (Thai Baht/person)	Minimum Cost	Maximum Cost
Travel costs	215.3	0	1,600
Non-travel related costs	608.69	20	3,500

Source: From the calculation.

Table 2. Statistical analysis results from the ITCM.

Independent Variables	Coefficient	t	Significance (Sig.T.)
Static value	2.14705***	3.911	0.0001
Travel costs (TC)	-0.000355928***	-3.504	0.0005
Gender (G)	0.126846	0.6163	0.5380
Age (A)	0.294283	1.397	0.1631
Education (E)	0.111385	1.182	0.2380
Occupation (O)	-0.105725	-1.283	0.2003
Income (I)	0.107308*	1.847	0.656
Distance (L)	-0.00210562***	-3.875	0.0001
Drama Watching (X)	-0.217144	-1.027	0.3049
F = 6.2925	Sig F = 0.0005	R-squared = 0.114062	Adjusted R-squared = 0.095935

Remark: *** ith a statistical significance at the reliability of 95%.

The analysis results obtained from the ITCM by determining the relationship of all variables indicated that each independent variable had multicollinearity with no relationship with each other. Furthermore, the multiple regression analysis result to determine the relationship between the number of visits and other factors showed that the factors affecting the visit ratio were the travel costs and distance with a statistical significance and reliability at 95%.

- Travel costs (TC) - The number of times of travel to the Ayutthaya Historical Park had a negative relationship with the TC with a coefficient at -0.000355928. That being said, the increasing TC resulted in the decreasing number of times of travel. On the other hand, if the TC decreased, the number of times of travel increased.

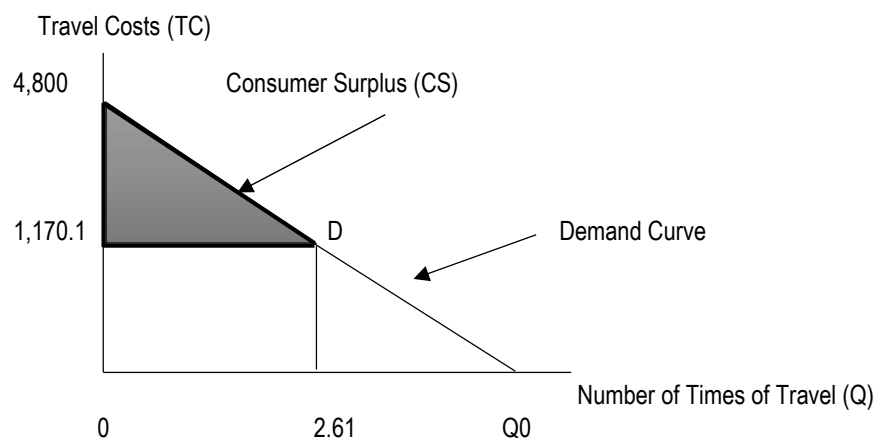
- Distance (L) showed that the number of times of travel to the Ayutthaya Historical Park had a negative relationship with the distance with a coefficient at -0.00210562. That being said, the greater distance was the number of times of travel decreased. Conversely, if the distance was shorter, the number of times of travel increased. Table 3 explained that the maximum TC to the Ayutthaya Historical Park (choke price) was 4,000 Thai Baht/person/trip.

Table 3. Analysis results of the travel cost (TC).

Variable	Average Cost (Thai Baht/person)	Maximum Cost (Thai Baht/person)
TC	1,170.1	4,800

Source: From the calculation with Gretl.

Figure 2. Demand curve showing the relationship between the number of times of travel and travel costs



$$Q_i = f(TC)$$

2.8

$$Q_i = 2.615$$

From the equation showing the relationship between the ITC and the number of times of travel, this determined the space under the demand curve with the integrated method between the average ITC and individual TCmax, The TCmax, or choke price that obstructed the tourists from visiting the site was 4,800 Thai Baht/person/trip, which represented such value in the equation where the variables were static to calculate the consumer surplus (CS).

Equation represented

$$\begin{aligned} CS_i &= \int_{TC_i(\text{mean})}^{TC_i(\text{max})} (a_0 - \beta_1 TC) dT \\ &= \int_{1170.1}^{4800} 2.14705 dTC - \int_{1170.1}^{4800} 0.000355928 dTC \\ &= 7793.57679 - 3856.63399 \\ &= 3,936.94 \text{ Thai Baht/person/year} \end{aligned} \quad 2.9$$

Thereby, the consumer surplus was 3,936.94 Thai Baht/person/year.

Then, the Average Consumer Surplus (ACS) was calculated from the ACS of the tourists who visited the Ayutthaya Historical Park divided by the average number of times of travel (Q_i), as follows:

$$ACS = \frac{CS_i}{Q_i} = 3,936.94/2.61$$

$$\text{Consumer surplus} = 1,508.40 \text{ Thai Baht/person/time} \quad 2.10$$

The last step was to calculate the sum of the CS by multiplying the ACS with the number of tourists visiting the Ayutthaya Historical Park, which was 1,325,572 persons in 2019.

$$CS = ACS \times N = 1,508.40 \times 1,325,572 = 1,999,500,930.91 \text{ Thai Baht/year} \quad 2.11$$

The space under the demand curve showed that the economic valuation of the Ayutthaya Historical Park in 2019 was 1,999,500,930.91 Thai Baht. That being said, it was the economic benefits of the Ayutthaya Historical Park evaluated from the number of tourists visiting the site and spending for the travel.

Discussion

Most tourists who visited the Ayutthaya Historical Park were female aged 18-30, single, and had free time during the weekend to travel with friends to relax. Women loved visiting the historical site with their group of friends to appreciate the arts and culture and make merit. Simultaneously, male tourists preferred adventurous activities.

The average travel costs of the majority of the tourists who visited the Ayutthaya Historical Park was 215.3 Thai Baht/person, which included the cost of petrol, car rent, and transport fee. Moreover, most tourists traveled a short distance of approximately 100 km. from their accommodation to the Park.

The average rate of traveling to the Ayutthaya Historical Park was 2.61 trips/year. When compared to the regional data, most tourists, 237 persons (59.25%), were from Region 1, which was the area that was located closest to the Park.

Furthermore, the study results on the socio-economic factors affecting the travel to the Ayutthaya Historical Park showed that only the travel costs had the impact on the travel with a statistical significance of 0.05.

- From the research, it was found that the travel costs (TC) had a negative or reversed impact on the travel to the Ayutthaya Historical Park. That was to say, when the TC increased, the number of times of travel decreased; the coefficient was -0.000355928. It explained that if the cost increased one Thai Baht and the other factors were static, the travel to the Park decreased by 0.000355928 trips. Conversely, if the TC decreased, the travel would increase.

- Distance (L) exhibited that the number of times of travel to the Ayutthaya Historical Park had a negative impact on the distance; the coefficient was -0.00210562. That was to say, when the distance was longer, the number of times of travel decreased. On the contrary, if the distance was shorter, the number of times of travel increased.

The economic valuation of the Ayutthaya Historical Park using the ITCM in 2019 indicated that the consumer surplus was 1,508.40 Thai Baht/year while the total economic valuation was 1,999,500,930.91 Thai Baht/year.

Policy Recommendations

1. In terms of the travel cost of the tourists, it could be seen that when the travel costs increased, the number of the times of travel decreased accordingly. Therefore, regular products and services control should be

performed; such as, the accommodation price, bus fee, car rental fee, etc. Moreover, promotions should be considered to interest the local people and tourists who travel from the other regions to make a decision to visit.

2. In terms of the behavior of the tourists who visited the Ayutthaya Historical Park, the main activities were making merit, seeing the arts and culture, and taking photos with the ancient remains. For this reason, the relevant authorities should have a plan to maintain the ancient remains to be clean, as well as to provide sufficient and safe facilities and public utilities. The screening area and alcohol gel should be provided for safety during the COVID-19 pandemic to ensure tourists about the safety, health, and sanitation.

3. In terms of tourism marketing, the entrepreneurs should maintain the cleaning standard of the products and venue. The products should have good quality and be sold at the same appropriate price for Thai and international tourists. Food should be monitored for the cleanliness, taste, and fresh ingredients. In addition, car rental and accommodation entrepreneurs must prioritize the safety and cleanliness, and not increase the price during the seasonal festivals. This would give confidence to the tourists to visit the Park. Moreover, the local products representing the identity of the region should be promoted and distributed.

4. For facilities, more rest areas should be arranged for the tourists who come with the family that has an elderly person who needs the space and seat to take a rest. Sufficient lighting on the streets should also be considered for the safety of tourists at night.

5. All relevant sections should set the plan and strategies by having a meeting to discuss about the problems and guidelines for solutions to deal with the COVID-19 pandemic in order to enhance the safety and confidence to the tourists.

Acknowledgements

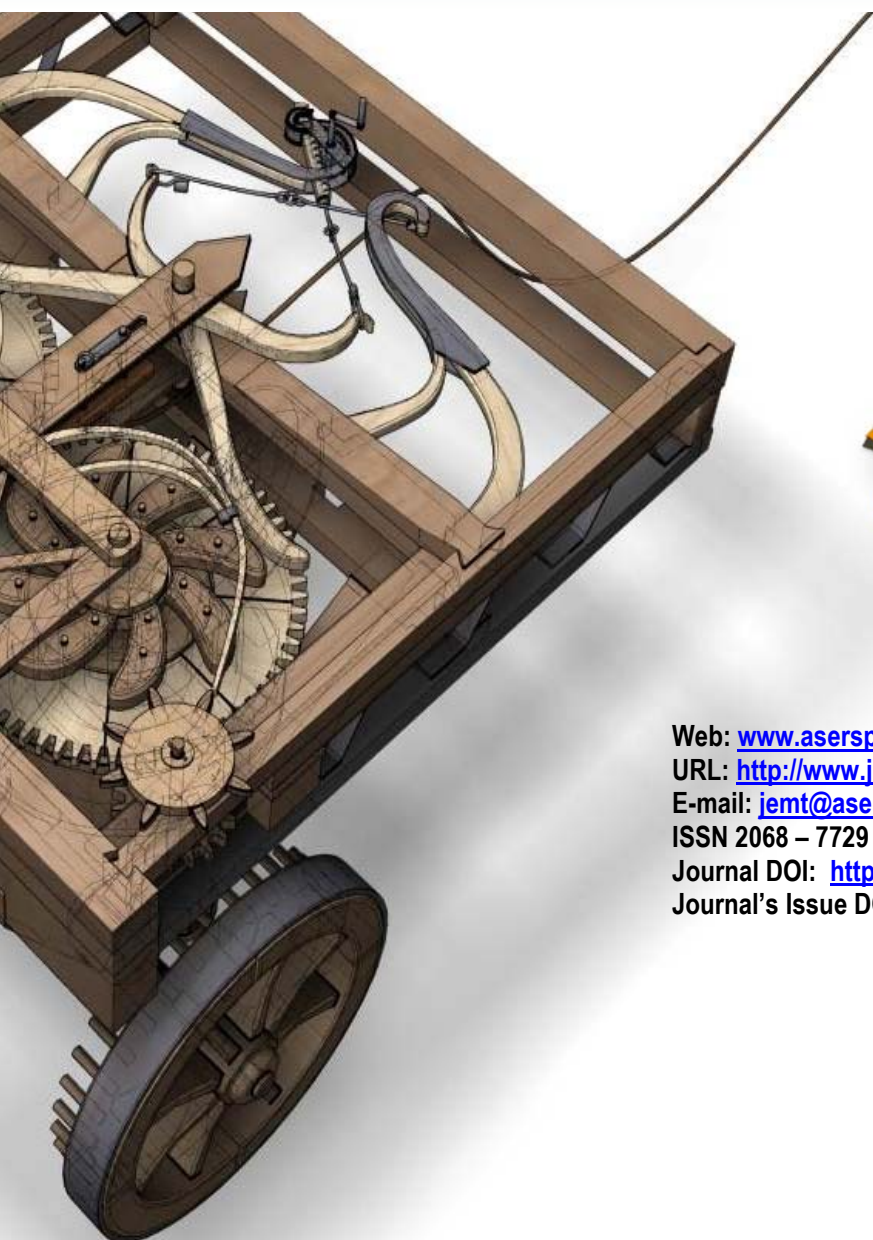
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