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Enhancing the Recreational Benefits of Trang An Landscape Complex for Vietnamese Visitors

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Abstract

Trang An Landscape Complex is Vietnam's latest and sole mixed natural and cultural world heritage site, inscribed by UNESCO's World Heritage Committee in July 2014. The complex is famously known as an "outdoor geological museum". It currently receives 3.5 million visitors annually compared with the targeted 7.2 million in 2020. Records for 2014 showed that almost 90% of the total visitors were Vietnamese. Most of visitors came to the complex in February and March. The uneven tourist distribution results in the underemployment of more than one-third of the local population. Meanwhile, the province's tourism sector plan targeted a two-fold increase in Vietnamese visitors from 2015 to 2020 at an 8.5% average annual growth rate. This study estimated the recreational demand of Vietnamese visitors to Trang An Complex and measured the changes in recreational benefits.

Keywords: Recreational Benefits, World Heritage, Trang An Complex

1. Introduction

Nowadays, World Heritage Tourism has been developing rapidly and is regarded as a very important component of the tourism industry in many countries including Vietnam. Among the eight world heritage sites, Trang An Complex is the latest and solely mixed natural and cultural property in Vietnam. The site was inscribed by the World Heritage Committee of UNESCO in July 2014 (UNESCO, 200, 2014). The complex is situated in Ninh Binh province, the northern region of Vietnam, 96 km south of Hanoi. Trang An Complex covers an area of nearly 12,440 ha surrounded by limestone, hills, and river valleys which is famously known as an “outdoor geological museum” (Vietnam Institute of Geology and Mineral, 2014).

Being Vietnam’s first site to be acknowledged as a mixed natural and cultural heritage, the Trang An Complex includes three major areas: the Trang An–Bai Dinh scenic area, the Tam Coc – Bich Dong Landscape, and the Hoa Lu Ancient Citadel – historical area. The Complex attracts approximately 3.5 million visitors per year and generated tourism revenue of about USD 40 million in 2014 (Trang An Complex Management, 2015).

According to the Vietnam Tourism Master Plan to 2020, World Heritage Sites are major tourism attractions to generate income in the service sector (Ministry of Culture, Sport, and Tourism Vietnam, 2014 and Vietnam Prime Minister–Decision No 201/QĐ-TTg, 2013). In 2014, the total visitations to Trang An Complex were about 3.51 million, with 87.96% of Vietnamese and 12.04% of foreign visitors (Ministry of Culture, Sport, and Tourism Vietnam, 2014). Under the planning and development of Ninh Binh tourism industry to 2020, tourism development in Trang An Complex has been targeted to increase Vietnamese visitors to be double from 2015, with average annual growth rate of 8.5% (Department of Culture, Sport, and Tourism of Ninh Binh, 2015). However, 60.18% of Vietnamese visitors came here during February–March (28.04% in February and 32.14% in March). There was only 0.12 million Vietnamese visitors per month for the rest of the year (April to January) in 2014 (Trang An Complex Management, 2015). The uneven distribution of tourist number is main cause of under-employment of more than 40% local people, who involved in tourism business from April of last year to January of next year (Chairman of Ninh Binh People’s Committee–Decision No 796/QĐ-UBND, 2012).

Currently, the visitors only stay in Trang An Complex less than 3 days, while the visitors normally stay 3 to 5 days in Ha Long Bay, which is one of Natural World Heritages in Vietnam. In addition, there were 16.05% of Vietnamese tourists to 3 sites (culture and nature) and 83.95% visitors only 1-2 sites of Trang An Complex in 2014 (Trang An Complex Management, 2015). It is noted that Vietnamese tourist tends to make more trips and spend more time to natural sites than to cultural sites. The purpose of this research is to explore potential recreational activities to enhance recreational benefits for Vietnamese visitors to Trang An Complex. In terms of the research problems, the study tries to respond the research questions such as: how to increase number of visits during the unpopular period (April of last year to January of next year) of the year? and how to increase number of visits to the total number of sites in Trang An Complex.

2. Literature review

2.1 World heritage sites in Vietnam

Vietnam is home to eight World Heritage Sites, including five cultural, two natural, and one mixed heritage sites (the detail information of World cultural and natural heritage sites in appear in the appendix 2). In 2014, of the 47.5 million tourists in Vietnam, 17.3 million (36.4%) visited these eight World Heritage Sites (Ministry of Culture, Sport, and Tourism, 2014). According to the Vietnamese Prime Minister, through Decision No 201/QĐ-TTg (2013) the total number of tourists in Vietnam to be targeted in 2020 is 50 million, with Vietnamese tourists accounting for 82% of these.

2.2 Recreational studies for world heritage sites

Very few economic valuation studies on World Cultural Heritage Sites are currently found in literature. A study of World Heritage Sites in Spain by Bedate et al. (2004) surveyed 915 respondents about their previous heritage tourism trips to Iberian Organ Festival, Museum of Burgos, Cathedral of Palencia and Walled Ensemble of Urueña. General knowledge of the heritage and expenditure in recreational activities were presented at the sites they visited. Zonal travel cost method was employed to estimate the demand curve and consumer surplus value of four different cultural sites in Castilla y León region of Spain.

Susana and Rebelo (2010) analyzed the economic valuation of cultural heritage to a museum located in the Alto Douro Wine Region-World Heritage Site in Portugal. A Poisson travel cost model was used to investigate variables that explain the probability of visiting the museum. Results confirmed that the probability of visiting the museum is positively influenced by the educational level and gender and negatively by travel.

Tuan and Navrud (2008) applied Contingent Valuation Method for My Son Sanctuary in Vietnam. Visitor data were collected from 967 respondents, where they have been classified into visitor and non-visitor groups to estimate the aggregate WTP for preservation investment in the World Cultural Heritage Site. Results of this study provided ideas on deriving benefits from non-visitors to increase preservation investment in the site.

2.3 Recreational studies using Travel Cost Method

Fleming and Cook (2007) collected data from 1,360 respondents in Australia in April and August 2006 using Zonal Travel Cost Method (ZTCM) to estimate the recreational value of Lake McKenzie. Results showed that the recreational values of Lake McKenzie varies from USD 13.7 to USD 31.8 million per annum, and USD 104.3 to USD 242.8 per person per visit. Meanwhile, Hynes and Greene (2012) collected a group of 256 observations from Silverstrand Beach, Ireland in 2009 and applied the Random Parameters Negative Binomial model and a Latent Class Negative Binomial model to investigate the change in consumer surplus from the change of site quality. Consumer surplus per trip was computed at €30.54. In both studies, TCM was used to estimate the recreational benefits from changes in site quality and recreational activities. Site quality was also found to be an important determinant of visitors' behavior and frequency of recreational trips.

Similarly, Navrud and Mungatana (1994) used TCM to estimate the value of preserving the current flamingo population in Lake Nakuru National Park in Kenya. Respondents were asked what percentage of their time in the park was spent viewing and photographing flamingos. The annual recreational value of wildlife viewing in the Park was found to be USD 1.5 to 7.5 million, with the flamingos accounting for more than one-third of this value. The study showed that in 1991, Kenya Wildlife Service's total revenue from entrance

fees, royalties from hotels and lodges and camping fees was 5-10% of its observed recreational value, i.e., the Park had a much larger economic potential than was actually realized. Finally, they concluded that protecting the flamingos contributes both to nature conservation and, financially, to the social welfare of the country.

3. Study Method

3.1 Data collection

Individual Vietnamese visitors to Trang An Complex were chosen as interview respondents. Samples were taken using two approaches: respondents were interviewed in the Trang An Complex following a skipping pattern and respondents who visited the Trang An Complex as part of a package tour from the tourism companies in Hanoi were directly interviewed. Data from a total of 292 on-site and off-site respondents were collected from July to August 2015. Censored data method was also used to get the number of trips per Vietnamese visitor in Trang An Complex. To overcome the multi-destination trip problems, the visitor's geographical origin was considered as the place he/she was when he/she decided to the Trang An Complex.

In the survey, visitors were queried regarding their travel costs of the visit, reasons for choosing the Trang An Complex as a travel destination, and aspects of their demographic information. Interviewers were instructed to interview only individuals, avoiding participation of others from the same group, although several members of a group could be interviewed individually. Only adults were interviewed, and interviewers were instructed to interview the head-of-household if family groups were encountered.

Travel cost and contingent behavior questions are utilized for this study. The visitors are asked to give the number of trips taken in 2014. In order to enhance recreational benefits, a scenario of increasing recreational activities for Vietnamese visitors to Trang An Complex during the unpopular period was described to capture the willingness to pay for the intention of return in the near future. Finally, the survey is ended by asking respondents to give their socio-demographic information.

3.2 Analysis

Descriptive statistics were used to analyze the data collected. The recreation demand function traces out Vietnamese visitors' characteristics based on their travel cost for number of trips to Trang An Complex in present and future. In the Travel Cost Method framework, travel cost is the proxy for the price, and its definition typically involves some subjectivity. The measure used in our estimation Travel Costs includes out-of-pocket expenses and the opportunity cost of time. Individual's travel cost was computed based on (i) the round-trip distance in kilometers from home to Trang An Complex; (ii) the reimbursement rate per kilometer depended on mean of transportation; (iii) the entrance fee; (iv) the group size (number of people travelling together); and (v) the opportunity cost of travel time. Besides, regression techniques were employed to examine the influence of the factors on Vietnamese visitors' behavior and perception to Trang An Complex. The Tobit censored regression model was employed in this study to censor outcome.

The hypothetical scenario of proposed activities in different periods of year is constructed, then respondents were asked to state how many trips they would make under this hypothetical situation. In fact, there were 90.41% of total respondents have intention to return to Trang An Complex in the condition of the hypothetical scenario. Besides, some visitors are attracted by recreational activities in Trang An Complex, but they are unwilling to pay for hypothetical trip to Trang An Complex because they assume their benefits will not be improved. The main advantage of the model extension is to evaluate a hypothetical situation. Moreover, empirical research of this research is based on testing the following research hypotheses (i) individual visitor makes more trips to natural site than to cultural site of Trang An Complex; (ii) increasing recreational activities leads to increasing benefits of a Vietnamese visitor to Trang An Complex.

3.3 Individual Travel Cost

3.3.1 *Why Tobit model?*

The theoretical basis for using Tobit data models is very important in the interpretation of estimation results. The problem with using the standard

microeconomic approach is that if trips are non-negative integers, differential calculus cannot be used to obtain the optimal consumption bundle. Hellerstein and Mendelsohn (1999) addressed the problem by setting the additional constraint that the number of trips must be a non-negative integer. Their solution requires that each individual has a set of unobserved factors, that is, given a price and determinants of the number of trips that are taken. The goal in this kind of analysis is to estimate demand functions and the willingness to pay of individuals drawn from the population of interest, conditional on arguments in the demand functions (Haab and McConnell, 2002).

It is important to note that the dependent variable, or the number of trips per year per visitor, is not fully observed and the dependent variable assumes zero values for a part of the samples. Because an OLS (ordinary least squares) estimator cannot be applied, it is common to use a Tobit model for the observed value. Let the dependent variable of the open-ended part of the ITCM method be the number of trips in actual and hypothetical trips, which are latent variables that are not observed if equal to zero but observed if greater than zero.

3.3.2 Individual travel cost model

TCM studies have consistently shown that as the price of access (cost of travel) increases, the visit rate to the site falls. TCM is usually estimated as a trip generating function such as the following:

$$V = f(P, Ts) \quad (1)$$

Where V is the visit rate and/or number of trips per year for individual travel cost method, respectively; P is the cost of travel to the site; and Ts is a vector of travel costs to substitute sites.

Following Haab and McConnell (2002), the individual demand function is given by estimating Tobit Models of Recreational Demand:

$$X_i = \begin{cases} \beta Z_i + \varepsilon_i & \text{if } \beta Z_i + \varepsilon_i \geq 0 \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

Where X_i is the i^{th} individual's demand, β is a vector of coefficients, Z_i is a vector of explanatory variables which includes price, and ε_i is normally distributed with mean zero and variance σ^2 . We use the general form of the likelihood function equation (2) to construct the Tobit likelihood function.

Letting $\Phi\left(\frac{z_i\beta}{\sigma}\right) = \int_{-\infty}^{\frac{z_i\beta}{\sigma}} \phi(t) dt$ $\phi(t)$ being the density function for an $N(0, 1)$ variate we write:

$$L(\beta, \sigma | x, z) = \prod_{i=1}^T \left[1 - \Phi\left(\frac{z_i\beta}{\sigma}\right) \right]^{1-I_i} \times \left[\frac{1}{\sigma} \phi\left(\frac{x_i - z_i\beta}{\sigma}\right) \right]^{I_i} \tag{3}$$

$$\begin{aligned} \text{Since: } Pr(X_i + \varepsilon_i \leq 0) &= Pr(z_i\beta + \varepsilon_i \leq 0) \\ &= Pr(\varepsilon_i \leq -z_i\beta) \\ &= 1 - Pr\left(\frac{\varepsilon_i}{\sigma} \leq \frac{z_i\beta}{\sigma}\right) = 1 - \Phi\left(\frac{z_i\beta}{\sigma}\right) \end{aligned}$$

The log-likelihood function for the Tobit model is:

$$Ln(L(\beta, \sigma | x, z)) = \sum_{i=1}^T (1 - I_i) \ln[1 - \Phi\left(\frac{z_i\beta}{\sigma}\right)] + I_i \left\{ \ln\left[\phi\left(\frac{x_i - z_i\beta}{\sigma}\right)\right] - \ln(\sigma) \right\}$$

The Tobit model can be estimated with standard iterative methods for maximum likelihood methods. The estimation process usually converges quickly, unless there are many regressors and much collinearity.

In a statistical sense, the censoring means that the complete distribution of the dependent variable may not be observable and the unobservable portion of the distribution is massed at zero. The number of trips per year is specified as a dependent variable in the TCM demand function. For simplicity, Haab and McConnell (2002) presented the latent demand function as: $x_i^+ = \beta_{0i}^+ + \beta_1 C_i^0$, where C_0 is the current own-site travel cost and β_{0i}^+ is either a constant or a linear in parameters function of covariate other than own-site travel cost, plus the error term. Let $0 = \beta_{0i}^+ + \beta_1 C^*$ determines the choke price that sets quantity equal to zero such that $C^* = -\beta_{0i}^+ / \beta_1$. The individual subscript i has been dropped for convenience. Integrating under the demand curve from the current price C_0 to the choke price C^* yields consumer surplus:

$$CS = \int_{C^0}^{C^*} (\beta_0^+ + \beta_1 C) dC = \left(\beta_0^+ C^* + \frac{\beta_1 C^{*2}}{2} \right) - \left(\beta_0^+ C^0 + \frac{\beta_1 (C^0)^2}{2} \right)$$

The following simplification holds for any C:

$$\left(\beta_0^+ C + \frac{\beta_1 C^2}{2} \right) = \left(\frac{2\beta_0^+ \beta_1 C^2 + \beta_1^2 C^2}{2\beta_1} \right) = \frac{(\beta_0^+ + \beta_1 C)^2}{2\beta_1} - \frac{(\beta_0^+)^2}{2\beta_1}$$

By definition: $\beta_0^+ + \beta_1 C^* = 0$ and $\beta_0^+ + \beta_1 C^0 = x^+$. Upon evaluation and rearranging, the Consumer surplus becomes: $CS = \frac{(x^+)^2}{2\beta_1}$ (4)

4. Results

Descriptive statistics are first reported for the Vietnamese visitors to Trang An Complex. Regression estimates of a base travel cost model are presented and a variety of regression diagnostics reported. The last section provides estimates of the individual consumer surplus values for Vietnamese visitors and recreational benefits of Trang An Complex. The benefits of Vietnamese visitors in hypothetical trip are valued on the condition of increasing potential recreational activities in Trang An Complex.

4.1 Demographics of Vietnamese visitors

Vietnamese visitors' characteristics are presented in table 1. The average visitor visited the Trang An Complex 1.84 times over one year and average length of trip is 1.08 days (1 day = 12 hours) in actual trip and increase to 2.29 days in hypothetical trip. The total cost per trip to Trang An Complex around USD 73.61, which is lower than average personal income per month of Vietnamese with USD 383.99, and higher than the national average level. This is understandable sense since travel is a luxury good and only the middle and higher-income brackets can afford their recreational preferences. Furthermore, 90% of sample visitors spent time for 1 to 2 sites in Trang An Complex. In addition, 63.01% of total respondents indicated that the most visited place is a natural or semi natural landscape in Trang An Complex.

Table 1. Definition and description of variables

Variable	Definition	Mean	Min	Max
Actual tourist				
Trip	Actual trip per year	1.84	1.00	5.00
Travel cost	Travel cost per trip in actual trip (USD*)	73.61	12.26	367.77
Gender	Gender (1 = female, 0 = male)	0.52	0.00	1.00
Age	Age (years)	36.87	15.00	83.00
Marital	Marital status (1 = married, 0 = single)	0.62	0.00	1.00
Education	Years of formal education (years)	13.58	9.00	18.00
Personal income	Personal income per month (USD/month)	183.99	44.45	2,488.89
Distance	Distance from home (km)	07.88	16.00	1,916.00
Package tour	Trip by tour (1 = package tour, 0 = non-package tour)	0.58	0.00	1.00
Important trip ⁽¹⁾	Important trip (1 = important, 0 = not important)	0.70	0.00	1.00
Nature travel trip	Nature travel trip (1 = if the most visited site is a natural space, 0 = other)	0.63	0.00	1.00
Working in government sector	Government sector = 1, other = 0	0.33	0.00	1.00
Hypothetical trip on the condition of increased recreational activities over different periods of the year				
Hypothetical trip	Hypothetical trip per year	2.01	1.00	3.00
Hypothetical travel cost	Travel cost per hypothetical trip (USD)	138.22	20.93	722.29
Hypothetical nature travel trip	Natural trip (1 = if the most visited site is a natural space, 0 = other)	0.45	0.00	1.00
Hypothetical natural activities ⁽²⁾	Natural activities (1 = if preference is for nature-based activities, 0 = other)	0.62	0.00	1.00
Hypothetical cultural activities ⁽³⁾	Cultural activities (1 = if preference is for culture-based activities, 0 = other)	0.33	0.00	1.00
Hypothetical mixed activities ⁽⁴⁾	Mixed activities (1 = if preference is for mixed-based activities, 0 = other)	0.52	0.00	1.00

Note: * Exchange rate in Dec/2015: 1 USD = 22,500 VND (Vietnamese currency)

⁽¹⁾ Important trip refers to sample visitor's opinion whether Trang An Complex is the main site in the trip.

⁽²⁾ Nature-based activities indicate whether visitor's favorite recreational activities involve contact with nature such as mountaineering, biking, hiking, fishing, traveling over caves by boat, and so on.

⁽³⁾ Culture-based activities indicate whether visitor's favorite recreational activities involve contact with culture such as traditional festival in pagodas, temples, spiritual activities, and so on.

⁽⁴⁾ Mixed-based activities indicate whether visitor's favorite recreational activities include both natural and cultural activities.

4.2 Recreational Demand for Vietnamese visitors of Trang An Complex

The following regression specifications serve as base model for the estimates of the demand functions. The recreational demand models and recreational benefits of Vietnamese visitors to Trang An Complex were estimated using Tobit model.

4.2.1 Recreational Demand for Vietnamese visitors to Trang An Complex in Actual Trip

In order to perform all estimation procedures, the database file was imported to the statistical analysis package. The number of round trips taken by the respondent in 2014 was considered the dependent variable in the ITCM model. Table 2 shows the results from the Tobit model for Vietnamese visitors demand functions. Most variables in the model are statistically significant, except for the "working in private sector" variable. Travel cost variable is significant at the 0.01 level and has a negative coefficient, thus recreational demand is downward sloping, as expected. The distance variable is also negatively related to the number of trips to Trang An Complex. It is therefore reasonable to infer that there is less demand for people who live far from the Trang An Complex.

Table 2. Demand analysis of Vietnamese visitors in actual trip to Trang An Complex

Variable	Coef. Estimates	Marginal effect
Travel cost	-0.000263***	-0.0000032
Gender	-0.222049**	-0.0026769
Education	0.028775*	0.0003469
Personal income	0.000029***	0.0000003
Distance	-0.000280*	-0.0000034
Package tour	-0.472209***	-0.0056926
Important trip	0.337980***	0.0040744
Nature- travel trip	0.205757**	0.0024804
Working in government sector	0.288050**	0.0034725
Working in private sector	0.113762	0.0013714
Constant	1.593558	
Log likelihood	-319.633	
Pseudo R2	0.1816	
Number of Observation	292	

Note: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Source: Estimated from the survey data (2015)

Furthermore, people who preferred natural and seminatural spaces and stated that contact with nature is a very important motive for them are those who visit Trang An Complex most often. The nature-travel trip dummy is positively correlated with the number of trips and is significant at 5% level. Moreover, 31.85% of respondents stated having natural trip as their purpose for the visit, compared with 20.21% who stated cultural trip. Both the regression result and statistical analysis are compatible with the theoretical hypothesis that the individual Vietnamese visitor makes more trips to the natural site than to cultural site of Trang An Complex.

4.2.2 Recreational Demand for Vietnamese visitors to Trang An Complex in Hypothetical Trip

The hypothetical trip demand function measures the number of trips to Trang An Complex, given that recreational activities are increased. As presented in Table 3, Vietnamese visitors have a positive attitude toward nature-based, culture-based, and mixed recreational activities, which are all significant at 1% level. Thus, the Trang An Complex has a great potential to increase recreational activities that shall lead to an increased number of trips during unpopular periods.

Table 3. Demand analysis of Vietnamese visitors in hypothetical trip to Trang An Complex

Variable	Coef. estimates	Marginal effect
Hypothetical travel cost	-0.00026***	-0.0000389
Gender	-0.07438	-0.0112993
Education	0.017508	0.0026599
Personal income	0.000129**	0.0000020
Distance	-0.00065***	-0.0000982
Package tour	-0.14789*	-0.0224679
Hypothetical nature travel trip	0.412896***	0.0627278
Hypothetical nature-based activities	0.675639***	0.1026442
Hypothetical culture-based activities	0.603014***	0.0916109
Hypothetical mixed-based activities	0.585739***	0.0889864
Constant	0.708858	
Log likelihood	-320.789	
Pseudo R2	0.1952	
Number of Observation	264	

Note: *** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

Source: Calculated from the survey data (2015)

Consistent with the hypothesis, the nature-travel trip variable significantly and positively affected the number trips to the Trang An Complex at 1% confidence level. Moreover, nature-based, culture-based, and mixed activities are positively correlated with the number trips and is significant at 1% level of confidence for domestic respondents. If the number of trips changes by 10%, nature-based activities changes by 1.02%, culture-based activities by 0.92%, and mixed-based activities by 0.89% in the same direction.

4.3 Recreational benefits of Trang An Complex

Table 4 compares the benefits between actual trip and hypothetical trip in the condition of increasing recreational activities in Trang An Complex by measuring the consumer surplus of Vietnamese visitors. The benefits of tourists in hypothetical trip are about twice higher than that in actual trip. The consumer surplus per visitor of Trang An Complex is USD 702.19 million, while its approximate achieved USD 1,227.94 million in hypothetical. Hence, increasing the recreational activities will enhance recreational benefits for Vietnamese visitors to Trang An Complex.

Table 4. Recreational benefits of Trang An Complex

Item	Unit	Actual	Hypothetical
Consumer surplus per visitor	USD	522.61	702.19
Consumer surplus per trip	USD	284.71	350.84
Number of visits	Million people	3.09	3.50(*)
Recreational Benefits	Million USD	880.11	1,227.94

Note: (*) The number refers from Trang An's Tourism Report 2015 (Trang An Complex Management, 2015)

Source: Calculated from the survey data (2015)

5. Conclusion

With the growing focus on eco-tourism development and conservation, the Trang An Complex has been subjected to remarkable developments, as it occupies a prime position as an indispensable component of Vietnam's tourism industry. This World Heritage Site contributed significantly to the creation of employment and income source for the local people. This study analyzed and estimated the recreational benefits of Trang An Complex using the ITCM method. Demand models and value of this world cultural and natural heritage site were illustrated in actual and hypothetical trips.

The nature-travel trip variable was found to be significant and positively affects the number of trips made by the visitor to the Trang An Complex. Out of all respondents, 63.01% embarked on nature-travel trips while 90.07% visited 1 or 2 sites out of the total 3 sites found in the Trang An Complex in 2014. On the average, Vietnamese visitors make 1.84 trips per year to the said heritage site.

From the most appropriate model, mean consumer surplus per trip per Vietnamese visitor was found to be USD 284.71 while recreational benefits of the Trang An Complex from domestic visitors were computed as USD 879.75 million in 2014.

More importantly, this study found that increasing recreational activities such as nature-based, culture-based and mixed activities during unpopular months will consequently increase the recreational benefits for Vietnamese visitors to the Trang An Complex. Specifically, consumer surplus per trip of Vietnamese visitors amounted to USD 350.84 while recreational benefits of Trang An Complex was estimated to be USD 1,227.94 million in the hypothetical trip.

Clearly, the Trang An Complex represents a valuable environmental resource for Vietnam's economic vitality. There is a large consumer surplus of welfare to be gained from existing World Heritage Sites. In the future, as the number of visits to the site and travel time increases for the rest of year due to improved recreational activities, Trang An Complex will become more valuable, while providing enhanced benefits to Vietnamese visitors. Consequently,

the local people would receive increased benefits, since tourism serves as a significant income source.

Further research is needed to assess visitor perception, behaviour and experience of foreign and domestic visitors to Trang An Complex; this would allow meaningful comparisons to be made. The TCM approach to the World Heritage Sites management issue and exploration of recreational benefits will always be necessary.

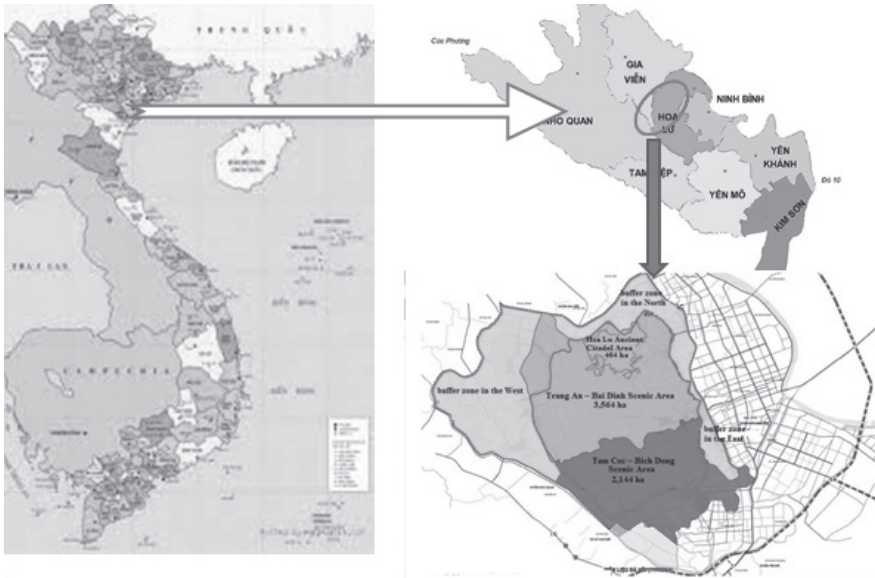
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Appendices

Appendix 1: Map of Trang An Landscape Complex



1. Karst mountain ecosystems



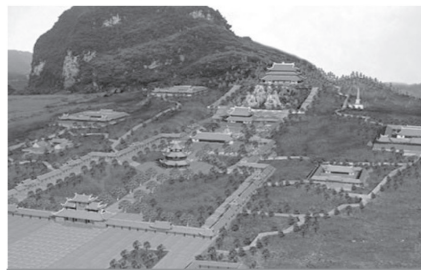
2. River systems
4 main river systems
and 31 lakes.



3. Cultivated system: Rice
fields



4. Cave systems
More than 50 caves.



5. Historical and cultural areas: Temples and
pagodas
More than 30 temples and pagodas.

Appendix 2: World cultural and natural heritages in Vietnam

	Items	Hue Complex of Monuments	Hoi An Ancient Town	My Son Sanctuary	Thang Long Imperial Citadel	Ho Dynasty Citadel
1.	Year established	1993	1999	1999	2010	2011
2.	Total area (ha)	500	310	1,158	18.39	5,235
3.	Distance from Hanoi Capital (km)	660	775	850	0	180
4.	Sources of income to local people	<ul style="list-style-type: none"> - Tourist activities, - Local business, - Agriculture. 	<ul style="list-style-type: none"> - Tourist activities, - Local business. 	<ul style="list-style-type: none"> - Tourist activities, - Agriculture, 	<ul style="list-style-type: none"> - Tourist activities, - Local business. 	<ul style="list-style-type: none"> - Tourist activities, - Local business, - Agriculture.
5.	Number of visitors (million people/year)	n.a.	1.5-2.0	0.3-0.7	0.08-0.12	0.06-0.1
6.	Popular months of visits	February-May	February-August	March-July	No certain period	No certain period
7.	Important information	<ul style="list-style-type: none"> - Hue complex was the capital of Viet Nam in 1802. - It is an exceptional specimen of late feudal urban planning in East Asia. - It has historical and cultural value. 	<ul style="list-style-type: none"> - The Town was built and preserved from 15th to 19th century. - It has historical and traditional urban value. - The town complex has 1,107 timber frame buildings. 	<ul style="list-style-type: none"> - Its spiritual origins goes back to Indian Hinduism in the 4th to 13th century. - The tower temples were constructed over 10 centuries. - The monuments are unique in Southeast Asia. - It has archeological and historical value. 	<ul style="list-style-type: none"> - The site was built in the 11th century. - It has archeological and historical value. - The site has longevity and continuity, as evidenced by different archeological levels and monuments. 	<ul style="list-style-type: none"> - The site is a testament to the flowering of neo-Confucianism in the late 14th century Viet Nam, and it spread to other parts of East Asia. - It bears exceptional testimony to a critical period in Vietnamese and Southeast Asian history and Buddhist values. - has archeological and historical value.

Source: UNESCO (2014) and General Statistics Office of Vietnam (2014)

	Items	Halong Bay	Phong Nha- Ke Bang Park
1.	Year established	1994	2003
2.	Total area (ha)	155,300	85,754
3.	Distance from Hanoi Capital (km)	180	500
4.	Important information	<ul style="list-style-type: none"> - Ha Long Bay has 1,600 islands and islets. - The property is centered on drowned limestone karst landforms, arches, and caves. - This landscape has the liveliest tourist activities in Vietnam. 	<ul style="list-style-type: none"> - The National Park includes: <ul style="list-style-type: none"> + Terrestrial and aquatic habitats + Primary and secondary forest + Sites of natural regeneration + Tropical dense forests and savanna + Cave system - It has a cave system over 44.5 km, tour boats are able to penetrate inside to a distance of 1.5 km. - There is a large number of faunal and floral species.
5.	Sources of income to local people	<ul style="list-style-type: none"> - Tourist activities - Marine transport - Fisheries - Local business 	<ul style="list-style-type: none"> - Forest and non-timber products - Tourist activities - Local business - Agriculture
6.	Number of visitors (million people/year)	8-10	1.2-1.5
7.	Popular months of visits	March-August	No certain period

Source: UNESCO (2014) and General Statistics Office of Vietnam (2014)

Appendix 3: Questionnaire

Trang An is the newest world heritage of Ninh Binh province and Vietnam. It plays an important role in socio-economic development of Ninh Binh province in general and local residents in particular as well. When it comes to the point of how much significant of resource in terms of amenity, it has been difficult to assess the recreational values of this Landscape. How people devote their time and money to visit Trang An Complex. The purpose of this survey is to get an idea of visitation patterns and how the tourists spend time and money visiting the Trang An Complex.

Please tick the appropriate boxes to indicate your choice. Your answers to these questions will be used to help plan and manage the landscape. Keep in mind there are no right or wrong answers to these questions. Your best opinions are fine. Therefore, your honest response is essential for the success of this research. Thank you for your cooperation.

A. General Questions

A1. What province/ address are you from?

Commune _____ District (Town) _____ Province _____

or Company/office address _____

Approximate distance to Trang An Complex (if known) _____ km

(if you can pls detail: From your home to station, bus stop,... and to Trang An Complex)

A2. If you were not on this trip today, what would you most likely be doing?

0. Working 2. Shopping or watching movie

1. Staying home 3. Other (specify) _____

A3. What is the total number of days you will be in Trang An Complex?
[If respondent is uncertain, say just your best guess.]

0. Hoa Lu Ancient Citadel Cultural–Historical Area _____ days or _____ hours

1. Trang An-Bai Dinh Complex Area _____ days or _____ hours

2. Tam Coc–Bich Dong Scenic Area _____ days or _____ hours

Other (specify)

A4. What is your purpose in your trip?

1. Cultural 2. Natural 3. Mixed

A5. How many sites did you visit?

Nuber sites	Site
<input type="checkbox"/> 1. 1 site	<input type="checkbox"/> 1. Hoa Lu
	<input type="checkbox"/> 2. Trang An – Bai Dinh
	<input type="checkbox"/> 3. Tam Coc–Bich Dong
<input type="checkbox"/> 2. 2 sites	<input type="checkbox"/> 1. Hoa Lu + Trang An – Bai Dinh
	<input type="checkbox"/> 2. Trang An – Bai Dinh + Tam Coc–Bich Dong
	<input type="checkbox"/> 3. Tam Coc–Bich Dong + Hoa Lu
<input type="checkbox"/> 3. 3 sites	<input type="checkbox"/>

A6. How many times have you visited Trang An Complex in 2014? ____ times

A7. Which month did you visit Trang An Complex in last year? (off-site)

Site	Month
The first time	
<input type="checkbox"/> 1. Hoa Lu Ancient Citadel Cultural–Historical Area	
<input type="checkbox"/> 2. Trang An – Bai Dinh Scenic Area	
<input type="checkbox"/> 3. Tam Coc–Bich Dong Scenic Area	
The second time	
<input type="checkbox"/> 1. Hoa Lu Ancient Citadel Cultural–Historical Area	
<input type="checkbox"/> 2. Trang An – Bai Dinh Scenic Area	
<input type="checkbox"/> 3. Tam Coc–Bich Dong Scenic Area	
The third time	
<input type="checkbox"/> 1. Hoa Lu Ancient Citadel Cultural–Historical Area	
<input type="checkbox"/> 2. Trang An – Bai Dinh Scenic Area	
<input type="checkbox"/> 3. Tam Coc–Bich Dong Scenic Area	

A8. You are travelling to Trang An Complex?

- 0. Alone
- 1. With friends. Number of people in your group: _____ persons.
- 2. With family. Number of people in your group: _____ persons.
- 3. With a tour group. Number of people in your group: _____ persons.
- 4. Other (specify) _____

A9. Why are you visiting Trang An Complex? *(Please tick)*

- 0. Vacation or holiday
- 1. Conference/seminar
- 2. Business
- 3. Study and research
- 4. Other reason _____

A10. How did you get to Trang An Complex from your home? *(Please tick one or more)*

Mean of transportation	How many km? or What it costs for mean of transportation?
<input type="checkbox"/> 0. Moto bike	_____ km
<input type="checkbox"/> 1. Private car	_____ km
<input type="checkbox"/> 2. Bus	_____ km or _____ VND
<input type="checkbox"/> 3. Train and bus combined	_____ VND/Train's ticket _____ VND/Bus ticket
<input type="checkbox"/> 4. Airplane and bus combined	_____ VND/Airplane's ticket _____ VND/Bus ticket
<input type="checkbox"/> 5. Other (specify) _____	_____

A11. What is your main reason for visiting the Trang An Complex? *(please check all that apply, and specify in order)*

0. Easy access
 1. Education/research
 2. Special interest, please specify _____
 3. Friends ask to come along
 4. Other (specify) _____

A12. Your estimated round trip travel expenses to Trang An Complex: VND _____

A13. What activities have you participated in at TrangAn Complex? *(Please tick all that apply)*

Trang An– Bai Dinh	Tam Coc-Bich Dong	Hoa Lu
<input type="checkbox"/> 1. Cultural festivals <input type="checkbox"/> 2. Natural activities <input type="checkbox"/> 3. Mixed activities	<input type="checkbox"/> 1. Cultural festivals <input type="checkbox"/> 2. Natural activities <input type="checkbox"/> 3. Mixed activities	<input type="checkbox"/> 1. Cultural festivals <input type="checkbox"/> 2. Natural activities <input type="checkbox"/> 3. Mixed activities

A14. Are you visit Trang An Complex this time as part of a group tour, or on a prepaid package trip, or did you make your own local hotel and other travel arrangements yourself?

1. Group tour
 2. Prepaid package tour
 3. Made own travel arrangements
 4. Other including don't know, unsure

A15. Please estimate what it costs you during your stay at TrangAn Complex (only).

A15.1. Travel with non-package tour: VNĐ

Item	Trang An – Bai Dinh	Tam Coc-Bich Dong	Hoa Lu	Total
1). Local transportation (bus, taxi, boat, etc)				
2). Lodging/hotel				
3). Food and beverages				
4). Recreation (boating, biking, ...)				
5). Photographs				
6). Souvenir				
7). Entertainment				
8). Other expenses _____				
Total expenses				

Which covers for: 0. yourself only 1. your group _____ persons

A15.2. Travel with the package tour:

Item	Trang An– Bai Dinh	Tam Coc-Bich Dong	Hoa Lu	Total
1). Total cost/trip				
2). Souvenir				
3). Other expenses _____				
Total expenses				

Which covers for: 0. yourself only 1. your group _____ persons

A16. Listed below are reasons why some people think Trang An complex in Vietnam is important to explore for recreational activities.

Circle one number for each reason:

	Not at all Important	2	3	Very important	4	<i>Don't know</i>
1. It is important to have these sites so that I can visit them now.	1 5	2	3	4	9	
2. It is important to have these sites so that other people can visit them now.	1 5	2	3	4	9	
3. It is important to have these sites so that future generations can visit them.	1 5	2	3	4	9	
4. It is important to have these sites because they inspire pride in Vietnamese heritage.	1 5	2	3	4	9	
5. It is important to have these sites because they are part of local people of life.	1 5	2	3	4	9	
6. It is important to have these sites because their names appear in the Vietnamese history.	1 5	2	3	4	9	
7. It is important to have these sites to remember events in culture and nature.	1 5	2	3	4	9	
8. It is important to explore recreational activities for these sites because they could be irreversible loss	1 5	2	3	4	9	

Experts and people in this area believe that increasing recreational activities in the rest of the year lead to increasing benefits of a Vietnamese visitor to Trang An Complex. Following the scenario was described in the table below, please answer question **A17**.

Month	Date (#days)	Recreational activities	Site
April	Vietnam holiday and International Labor Day: 30th April and 1st May (2 days)	- Mountaineering	- Trang An-Bai Dinh,
May		- Biking - Camping - Fishing - Boat trips - Temple ceremony	- Tam Coc-Bich Dong, - Hoa Lu.
June	Harvest festival: 15th to after 25th June (>10 days)	- Homestay tourism - Agriculture tourism - Visiting traditional villages - Boat trips	- Hoa Lu, - Tam Coc-Bich Dong.
July	Exhibition of products: 15th to 20th July (5 days)	- Visiting traditional villages - Boat trips	- Trang An-Bai Dinh, - Tam Coc-Bich Dong, - Hoa Lu.
August	Mid- Autumn festival: 15th to 16th August (2 days)	- Visiting traditional villages, temples, pagodas - Camping - Traditional boat racing festival	- Hoa Lu, - Trang An-Bai Dinh
September	National Day: (1st and 2nd September) (2 days)	- Boat racing on the river - Visiting traditional villages - Camping	- Trang An-Bai Dinh, - Tam Coc-Bich Dong, - Hoa Lu.
October	The food festival: 17th to 20th October (3 days)	- The food festival - Visiting traditional villages - Specialties of the regions - Boat trips	- Trang An-Bai Dinh, - Tam Coc-Bich Dong, - Hoa Lu.
November	Cultural festival (second weekend of November) (2 days)	- Cheo theatre festival on the river - Boat racing on the river	- Trang An-Bai Dinh, - Tam Coc-Bich Dong, - Hoa Lu.
December	New year holiday: 30th December to 1st January (2 days)	- Temple ceremony - Boat trips - Visiting traditional villages	- Trang An-Bai Dinh, - Tam Coc-Bich Dong, - Hoa Lu.
January	Forest festival opening: 15th to 18th January (3 days)	- Mountaineering - Biking - Camping - Boat trips	- Trang An-Bai Dinh, - Tam Coc-Bich Dong, - Hoa Lu.

A17. After reading the information on the above Table, does it increase your probability to come to Trang An Complex in the future?

- 1. Yes } → go to question A18
- 2. Maybe }
- 3. No } → go to part B
- 4. Don't know }

A18. Places that you visit at Trang An in the near future? *(Please tick all that apply)*

- 1. Hoa Lu Ancient Citadel Cultural–Historical Area
- 2. Trang An – Bai Dinh Scenic Area
- 3. Tam Coc–Bich Dong Scenic Area

A19. Which activities do you plan to do in Trang An Complex? *(more than one choice)*

Site	Activities	Month
<input type="checkbox"/> 1. Hoa Lu	<input type="checkbox"/> 1. Cultural festival <input type="checkbox"/> 2. Natural activities <input type="checkbox"/> 3. Other (specify) _____	
<input type="checkbox"/> 2. Trang An – Bai Dinh	<input type="checkbox"/> 1. Cultural festival <input type="checkbox"/> 2. Natural activities <input type="checkbox"/> 3. Other (specify) _____	
<input type="checkbox"/> 3. Tam Coc–Bich Dong	<input type="checkbox"/> 1. Cultural festival <input type="checkbox"/> 2. Natural activities <input type="checkbox"/> 3. Other (specify) _____	

A20. How many time do you have to visit Trang An again in the near future?

1. 1 time 2. 2 times 3. 3 times 4. more than 3 times

A21. How many days do you stay in Trang An again in the near future or for the next trip?

1. 1 day 2. 2 days 3. 3 days 4. more than 3 days

And,

0. Hoa Lu Ancient _____ days or _____ hours

1. Trang An– Bai Dinh _____ days or _____ hours

2. Tam Coc–Bich Dong _____ days or _____ hours

Other (specify)

B. Questions About personal information

B1. Your gender?

0. Male 1. Female

B2. How old are you? _____ years

B3. Marital status?

0. Single 1. Married 2. Other _____

B4. What is the highest grade you completed in school?

0. None 4. College/University
 1. Primary school 5. Masters or another graduate degree
 2. Secondary school 6. Other (specify) _____
 3. High school

B5. What is your present occupation/nature of your employment?

0. Unemployed* 5. Student**
 1. Civil servant 6. Retired
 2. Own business 7. Non-working spouse
 3. Private employee 8. Other (specify) _____
 4. Wages labourer

B6. What is your approximate net MONTHLY income?VND

*If not working, record spouse's monthly income:VND

**If student record parents' monthly income:VND

B7. Your household's monthly incomeVND

B8. How many members of your family? _____ persons.

B9. Your trip to Trang An Complex is?

0. No important

1. Important

B10. Are you working for /or have membership of any environmental organisation?

0. Yes, specify _____ 1. No.

“End interview, thank respondent”