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CAPTURING THE BENEFITS OF PRESERVING WORLD CULTURAL HERITAGE SITES

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Capturing the Benefits of Preserving World Cultural Heritage Sites¹

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Abstract

There is an increasing body of contingent valuation (CV) studies applied to cultural heritage sites. These CV studies assess the social benefits of cultural resources, but few provide advice on the policy use of the results and the ways these benefits could be captured and used to improve the condition of the sites. This study attempts to do exactly this by conducting a CV survey of a preservation program for a World Heritage site (WHS), My Son in Vietnam, and then use the estimated benefits for visitors to develop a optimal entrance fee scheme that maximize revenues for the site. The adoption of this optimal price regime would both increase revenues and reduce congestion at the site. We also perform a cost-benefit analysis of the preservation project, and show how the outcome can be used to justify investments in preservation of. this WHS

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1. Introduction

The economic benefits accruing from the preservation of a world cultural heritage are primarily received by visitors and non-visitors. Visitors are willing to pay to access the site. They could hold both use and non-use values, and the contingent valuation (CV) survey can take place on the site. Non-visitors do not visit the site (at the time of the survey) but presumably benefit from knowing that the cultural heritage is being preserved. Some of these non-visitors may have no intention or desire to visit the site, but others may have previously visited or plan to visit it in the future. This means that off-site respondents do not hold existence values alone, see [2].

CV has been widely used to estimate the economic benefits of cultural heritage. CV is a direct stated preference (SP) method where respondents are asked their willingness to pay (WTP) for the benefits received, or their willingness to accept (WTA) compensation for their loss. Theoretically, the CV is based on welfare economics and assumes that stated WTP amounts are related to respondents' underlying preferences. Furthermore, CV (and its derivatives like choice modeling (CM)) is the only valuation technique that can capture non-use values. Application of the CV method to cultural heritage goods is well suited because respondents accept the idea of public provision of these goods (Navrud and Ready 2002). This makes it an obvious choice for valuing cultural heritage goods. The use of CV is given some endorsement by the findings of the NOAA panel of experts (i.e. Arrow et al. 1993), and is widely used in both developed and developing countries (Whittington 1998; FAO 2000; Mourato and Mazzanti 2002; Tuan and Navrud 2007).

This study uses the CV method to estimate the economic benefits of preservation of the My Son World Heritage site (WHS) in Vietnam, and to show how these benefits can be captured and used to justify further investments in preservation of this site.

The study focuses on measuring the economic benefits accruing to (i) foreign visitors to My Son; (ii) Vietnamese visitors to My Son; (iii) Vietnamese visitors that visit the area but do not visit My Son during their current trip; and (iv) local residents. By estimating the benefits to all these groups, we are better able to construct policies that can capture all benefits to cultural heritage sites. In addition, we assess optimal entrance fees for visitors that maximize revenues to the site. We also test whether the preservation project for My Son pass a benefit-cost test, by comparing the aggregated benefits with the social costs over time of the project.

This study is of obvious interest as the estimation of the economic value of cultural heritage conservation has increasingly been recognized as a useful tool for policy-making (Mourato and Mazzanti 2002; Navrud and Ready 2002; Eftec 2005). There is also an increasing demand from the national Ministries of Finance to document the social benefits of conservation in order to justify the budgeted costs of the projects. Using the CV method, we can estimate the economic benefits derived from both use and non-use value values accrued to My Son. Estimating and expressing in monetary terms the economic benefits of the My Son preservation project is important because these benefits will be used in cost benefit analysis (CBA) of preservation efforts, and shed light on the magnitude of these benefits in terms of households' WTP to preserve and restore the site. The study can also be very useful in informing decisions of designing pricing strategies (i.e. entrance fee) for the cultural destination of the My Son. Working out the demand for cultural assets, and particularly the price elasticities of the demand for this site with different visitor groups can help policy-makers to design a pricing policy that would regulate visitor flows and maximize visitor revenue for this cultural heritage site.

The rest of this paper is structured as follows. Section 2 describes literature review, theoretical framework, study site, survey and the design of the CV questionnaire. Section 3 presents socio-economic characteristics of respondents, respondents' knowledge and attitudes, WTP estimates, the WTP's determinants and aggregate WTP estimates of the benefits. Section 4 assesses optimal entrance fees that maximize revenues from visitors, and performs cost-benefit analysis of the preservation project. Section 5 concludes the study with a discussion of opportunities for future research in this area.

2. Methodology

2.1 CV in cultural heritage valuation

Non-market valuation methods such as CV, CM, Travel Cost Method (TCM), and the Hedonic Pricing Method (HPM) have been used in valuation studies of cultural resources. SP methods known as CV and CM are considered to be the best techniques to estimate the total economic value of cultural resources that are not traded in the market (Mourato and Mazzanti 2002), and which have large non-use values. CV and CM are to some extent complements. CV is used to estimate people's WTP for a certain scenario or project, while the CM method is used to estimate people's marginal WTP for certain attributes of the same scenario or project. The CM method is believed to have an advantage in terms of minimizing strategic behaviour since it encourages the respondents to concentrate on the trade-offs between characteristics of a good or program, as opposed to simply stating whether they are 'for' or 'against' a program in a CV survey (Adamowicz et al. 1998). Possible difficulties associated with CM include respondent fatigue, annoyance (if the respondent dislikes all of the possible alternatives), and the decision to ignore one of the attributes if the levels of the attribute lacks credibility (FAO 2000). The most common method used for valuing cultural goods has been CV (see Navrud and Ready 2002; Noonan 2003; Eftec 2005), but in recent years the number

of CM studies applied to cultural resources has increased (e.g. Morey et al. 2002; Edward and Kathleen Greer 2003; Mazzanti 2003; Apostolakis and Jaffry 2005; Tuan and Navrud 2007²).

Compared to SP methods such as CV or CM, Revealed Preference (RP) methods like TCM and HPM have not been widely used in valuation of cultural resources. Some studies used TCM to value cultural goods can be found in the literature (e.g. David 1994; Forrest et al. 2000; Bedate et al. 2004; Poor and Jamie 2004; Alberini and Longo 2006). The only application of HPM to estimate economic benefits of cultural heritages is Ruijgrok (2006).

In the literature of CV studies on cultural heritage valuation, there are some studies measuring benefits of cultural heritage derived from visitors, e.g. [21, 23, 25, 38, 37, 5, 18, 20, 1]. Other studies value the benefits of cultural heritage derived from non-visitors, see [13, 29, 21, 24, 19, 36, 28, Seenprachawong 2006]. These studies show that substantial benefits of cultural heritage accrue to both visitors and non-visitors.

While there are some studies measuring the benefits held by visitors and other studies estimating the benefits held by non-visitors, very few attempts have been made to value cultural heritage benefits to both visitors and non-visitors to the same site. Beltran and Rojas [4] performed a CV survey to estimate individuals' WTP among Mexican citizens, both visitors and non-visitors, for use and preservation of the archaeological sites. The study found that the WTP of the visitors for preservation of the archeological sites was significantly higher than that of non-visitors. In their report to the World Bank on the Fes rehabilitation project, Carson et al. [7] report a CV study of restoring the old city of Fes in order to measure economic benefits that accrue to foreigners visiting Morocco, both those that visit Fes and those that don't .. They found that visitors and non-visitors to Fes would be willing to pay US\$70 and US\$30, respectively. Sanz et al. [30] estimated the WTP of both visitors

² Tuan and Navrud (2007) apply both CV and CM to estimate the benefits of preserving My Son cultural heritage site (i.e. the same 'good' as in this study), and compare results from these two independent SP methods. The study finds that results of the two methods are very similar which can be interpreted as a test of convergence validity.

and Spanish residents for the national museum of Sculpture in Valladolid, Spain. They found that the mean WTP of both visitors and Spanish citizens was €27 under a conservative scenario with parametric estimation. Ruijgrok [27] estimated recreational and bequest values of the heritage in the Tieler and Culemborgerwaard, the Netherlands. He found that visitors would be willing to pay €1.22 per visit, and non-visitors would be willing to pay €11.88 per year per household.

This study estimates the benefits of preserving My Son cultural heritage that accrue to both visitors and non-visitors. Our study differs from Beltran and Rojas [4], Carson et al. [7], Sanz et al. [30], and Ruijgrok [27] in the way that Beltran and Rojas [4], Sanz et al. [30], and Ruijgrok [27] measure benefits to national residents (Mexican, Spanish, and Dutch), and Carson et al. [7] value benefits to foreign visitors. This study measures benefits to both national residents (Vietnamese) and foreign visitors. Specifically, the study measures the economic benefits accruing to the following affected groups: (i) foreign visitors to My Son; (ii) Vietnamese visitors to My Son; (iii) Vietnamese visitors that visit the area but do not visit My Son during their current trip; and (iv) local residents.

2.2 Theoretical framework

The CV method [18] was used to elicit the economic benefits of the preservation and improvement of the My Son cultural heritage. The individual's compensating variation for the proposed improvement is given by:

$$U(Y, Q_0) = U(Y - WTP, Q_1) \quad (1)$$

where U represents the indirect utility function of an individual, Y is the income level, Q_0 is the current condition of the site, Q_1 is the improved condition, and WTP is interpreted as the maximum amount that the individual would be willing to pay to secure the improvement.

For empirical estimation, it is common to specify the WTP welfare measure as:

$$WTP_i = X_i \beta' + \varepsilon_i \quad (2)$$

where X_i represents a vector of explanatory variables, β is a vector of parameters, and ε_i is the error term reflecting unobserved taste components. The parameters of this equation can be estimated by the maximum likelihood method [6].

The total aggregate WTP estimates depend on both the benefits per person or household and the number of beneficiaries. The populations that accrue benefits from the preservation of My Son are four groups of respondents as mentioned above. The aggregate benefits can be estimated as:

$$B_{total} = \sum_{j=1}^4 (n_j \times B_j) \quad (3)$$

where $j = 1 \dots 4$ are the four benefiting groups, n_j is the number of persons or households in group j , and B_j is the mean WTP of group j .

For foreign visitors and Vietnamese visitors to My Son, we aggregate using the sample mean WTP of each group multiplied by the corresponding number of visitors in each group. The sample of each group is randomly selected and is assumed to be representative of all visitors of that group to My Son in the year of study.

For Vietnamese visitors visiting the area but not My Son at the time of survey, we aggregate multiplying the sample mean WTP by the number of Vietnamese visitors to major tourist destinations in the vicinity of My Son. We assume that the study sample is representative of all Vietnamese visitors to the area in that year.

The population of local residents is defined as those households living in Quangnam province where My Son is located. We aggregate multiplying the sample mean WTP by the number of households in this province.

The total aggregate WTP is then the sum of the aggregate WTP of the four groups, see equation 3. Note, however, that since a WHS in theory is a global public good, non-visiting households in other parts of Vietnam and other countries worldwide could in theory have a positive WTP for My Son.

However, since the number of substitute sites they could pay for increase with increased distance from My Son, we expect the mean WTP for My Son for this group to be very small or zero.

2.3 Study site and survey

My Son is located in the Quangnam province in the central Vietnam. This is a large complex of religious temples, which was originally comprised of more than 70 temples. The vestiges of 25 of these temples remain today. In December 1999, UNESCO recognized My Son as a World Cultural Heritage Site. In the period of 1997-2005, the average rate of growth of visitors to My Son is 24.3% per year for foreign visitors and 41.5% per year for Vietnamese visitors; and in 2005 about 117,000 visitors visited My Son [31]. This cultural tourism is important to Vietnam as it helps to improve cultural exchanges and raise the living standards for the local people [35]. In spite of its benefits to society, this cultural heritage site is severely threatened by degradation and loss. There are some natural environmental causes that damage the site such as soil erosion, landslides, floods, and tropical climate. However, human activities including wars; plain neglect and tourism pressures are arguably the main causes of the degradation and destruction [14, 34]. This unique site is now in a state of significant disrepair, and urgently requires conservation efforts.

The surveys were conducted in the summer 2005 with a total of 967 face-to-face interviews. The sample size and location of interviewing for each group of respondents are presented in Table 1.

[Insert Table 1]

For the Vietnamese tourists to the area, but non-visitors to My Son, interviews were performed in Hue (i.e. the city located 170 km north of My Son) and Hoian (i.e. the town located 35 km east of My Son) as they are two of the largest tourist destinations in the Central of Vietnam (Figure 1). Thus, we used a convenience sample, as it is very costly and difficult to conduct a survey representative of all Vietnamese visitors who do *not* visit My Son at the time of survey. For local residents, we used stratified sampling to get a representative sample of households in Quangnam province [32]. In order

to avoid double counting, the Vietnamese visitors sample omitted respondents who lived in Quangnam.

[Insert Figure 1]

2.4 The CV questionnaire

Four versions of the CV questionnaire were used in the surveys of the four groups of respondents. All versions of the questionnaire were identical apart from the valuation section. Each questionnaire began with a series of questions designed to obtain information about respondents' perception and attitudes towards My Son. Other questions examined how frequently respondents visited My Son, and how interesting they found the My Son visit to be. Respondents were also asked whether they want to visit My Son some time in the future.

All respondents were presented the My Son preservation scenario which consists of a clear description of My Son through text, maps, and photos. The purpose of this text is to provide each respondent with the same set of information about the characteristics and the current condition of My Son. First the *status quo* scenario is presented, in which the deterioration of the site continues due to insufficient resources for preservation. Then, the proposed preservation plan is presented. The plan will improve the condition of My Son from its current state, and preserve the site for the future. Thus, the impact of the preservation plan on My Son is "the good" the respondents are asked to value.

Two payment vehicles were used. For visitors to My Son (foreign and Vietnamese visitors to My Son), a special fee in terms of an increase in the entrance fee was used. For non-visitors (Vietnamese visitors to the area and local residents), a tax was used. Both these payment vehicles are mandatory, and give respondents the incentive to truthfully state their preferences for preserving My Son (as opposed to voluntary contributions). Since the standard referendum type question would not be a meaningful elicitation method to foreign visitors as they are non-residents, they were asked whether they would still visit My Son if the entrance fee would increase by the stated amount. This way of

asking reminds foreign visitors that they have substitute sites they might go to, and forces them to think whether My Son would still be worth visiting if the entrance fee was increased by such amount. The bid amounts were stated in US\$ with four bid levels of \$1, \$5, \$10, and \$15. For the three Vietnamese groups, the bid amounts were stated in Vietnamese currency, equivalent to \$0.31; \$1.26; \$3.14; and \$6.29.

After the valuation section, debriefing questions were asked in order to identify the motivation underlying respondents' positive WTP or refusal to pay. Socio-economic data such as sex; age; education; employment status; and income were also collected, and subsequently used in the econometric analysis.

3. Results and discussions

3.1 Socio-demographic characteristics, knowledge and attitudes of respondents

Table 2 describes some socio-demographic characteristics of respondents. It can be noted that fewer females were interviewed in the three visitor groups. This could be explained by the fact that during field interviews, there were some couples where the task of answering questions was delegated to their husbands. Further, the rate of non-participation and incomplete interviews for females is higher than for male respondents.

[Insert Table 2]

Table 2 shows that the respondents in the three visitor surveys are relatively young, mean annual household income of foreign visitors is much higher than for Vietnamese respondents and the lowest group is local residents. The education level of local residents is also much lower than that of visitors. Across three groups of visitors, about 40% of visitors traveled alone. Because trip costs can be influenced by the number of family members and the payment vehicle was per adult entrance fee, the variable *Alone* was introduced. Since there is no data on these socio-demographic variables in the visitor statistics, we cannot test the representativeness of the visitor samples. For the local residents

we find that variables of the sample such as gender, attending school, unemployment and percentage of surveyed households living in urban areas are not significantly different from the Quangnam province, see Table 3. However, respondents' age is higher, and respondents' income is lower than the average population.

[Insert Table 3]

Table 4 shows the mean values and standard deviations of respondents' knowledge and attitudes.

[Insert Table 4]

Several variables related to the respondents' knowledge and attitudes were assessed. The first variable was respondents' knowledge of My Son *before* they visited the site (*Know*). Overall, previous knowledge of My Son was very low. For foreign visitors, most respondents knew 'nothing' or 'only a little' about My Son before they visited it. For Vietnamese respondents, most of them knew 'only a little' or a 'fair amount' about My Son.

The second variable was the respondent's views of the importance of preserving WHSs in Vietnam (*Importance*). Across the four groups of respondents, about 60-70% thought that preserving the WHSs in Vietnam was important. It is interesting to observe that local residents consider the preservation of WHSs in Vietnam less important than foreign visitors, i.e. 60% and 67%, respectively. One possible explanation is that this is a very selective group of foreign visitors, i.e. it is quite likely that people that visit the site are already those interested in cultural heritage issues.

The third variable was the respondent's stated reasons for their visit to Vietnam, i.e. if visitors wanted to visit historical cities, as opposed to visiting beaches; the countryside; modern cities; and other locations. This variable, *Hcity*, was used for foreign visitors only. 41% of foreign visitors selected historical cities as the first reason to visit Vietnam.

Hue and *Hoian* were two other variables used to assess whether respondents had visited either of these two 'competitor' destinations. Hue is quite far away from My Son, while Hoian is fairly close

by. The percentage of respondents who had previously visited Hue (*Hue*) vary a lot. The Vietnamese visitors to the area had the highest percentage (90%) because the survey of this group had been conducted mainly in Hue. Only 27% of local residents had visited Hue before. 90% of foreign visitors to My Son had previously visited Hoian (*Hoian*), while 50% of Vietnamese visitors to the area had visited Hoian.

Some other variables were also assessed, including *Visit*, *Satisfied*, *Ftrip* and *Before*. *Visit* was defined as if a respondent had visited My Son before (this variable was only used for Vietnamese respondents, since most foreign visitors in the survey were visiting My Son for the first time). Across the three Vietnamese groups, about 15% of the respondents had visited My Son before.

Satisfied assessed a respondent's satisfaction with their visit to My Son. This variable was used for visitors to My Son only (foreigners and Vietnamese). For visitors to My Son, 68% and 81% of the foreign visitors and Vietnamese visitors, respectively, were satisfied with their visit.

Ftrip assessed whether visitors to My Son (i.e. foreign and Vietnamese visitors to My Son) were considering visiting My Son again sometimes in the future. 29% and 65% of foreign visitors and Vietnamese visitors, respectively, wished to visit My Son again. For non-visitors to My Son (Vietnamese visitors to the area and local residents), *Ftrip* was used to assess respondents' desire to visit My Son sometimes in the future. 74% and 56% of local residents and Vietnamese visitors to the area, respectively, planned to visit My Son sometimes in the future. This result seems to us reasonable, since local residents are rather close to My Son, thus a visit to the site may be the first priority in their choice for a future visit. Other Vietnamese respondents have more substitute sites they could visit than the local residents.

The last variable (*Before*) was defined as a respondent being interviewed before they had visited My Son (this variable was used for visitors to My Son only). 36% and 26% of respondents were interviewed before they visited My Son for foreign and Vietnamese visitors, respectively.

3.2 Determinants of the WTP

To examine the construct validity of the CV results, valuation functions are estimated. The dependent variable is the discrete yes/no-response to the WTP question. The explanatory variables are the bid amount the respondent was asked, the respondent's socioeconomic characteristics, knowledge and attitude variables. Four binary logit models, one for each group of respondents, are estimated and reported in Table 5.

[Insert Table 5]

All valuation functions achieve relatively good fits. The coefficients of *bids* are statistically significant and negative implying that the probability of a yes-response decreases as the bid increases, which is consistent with economic theory.

For foreign visitors, most of the variables in the model have expected signs and are significant. The probability of a yes-response increases for a respondent that has higher income (*Income*), has attended college (*Ugo*), wants to visit historical cities (*Hcity*), is *satisfied* with his or her visit, and wants to return to My Son (*Ftrip*). The probability of a yes-response decreases if the respondent is being asked about the preservation plan *before* visiting My Son. Thus, having experienced the site increases the probability of paying.

For Vietnamese visitors to My Son, the importance they attach to preserving WHSs in Vietnam (*Importance*); how satisfied they are with experience of visiting My Son (*Satisfied*); and if they consider returning to My Son in the future (*Ftrip*) all have an expected positive and significant effect on the probability of a yes-response. Having attended college (*Ugo*) has a positive and significant (at 10% level) effect on the probability of accepting a yes-response.

Among the Vietnamese visitors that did not visit My Son at the time of the survey, having attended college (*Ugo*), visited My Son before (*Visit*), and planning to visit My Son in the future (*Ftrip*) all have a significant, positive effect on the probability of a yes-response, as expected. Visiting Hue

(Hue) is positively and significantly related to the probability of paying, while visiting Hoian (*Hoian*) has a significantly negative effect. This suggests that a Hue visit appears to be a complement to a My Son visit, while a Hoian visit seems to be a substitute. *Alone* has a significant negative effect on the probability of saying yes. In other words, traveling with family members increases the probability of selecting yes.

For local residents, having high income (*Income*); attended college (*Ugo*); visited My Son before (*Visit*); and regarded preserving the WHSs in Vietnam as important (*Importance*) all have expected signs and significantly increase the probability of accepting a yes-response. Having visited Hoian (*Hoian*) has a significant positive effect on the probability of saying yes to pay.

3.3 WTP estimates

Overall, the percentages of yes-response to the WTP question are 51.0%; 42.4%; 49.2%; and 45.2% for foreign visitors; Vietnamese visitors to My Son; Vietnamese visitors to the area; and local residents, respectively. Respondents with no-response to the WTP question were also asked to state their reasons for doing so. Table 6 documents the motives for respondents' refusal to pay.

[Insert Table 6]

A no-response could be consistent with economic behavior, indicating that the respondent derived no benefits from preserving My Son or faced income constraints. Alternatively, a no-response could be due to a respondent's rejection of some aspects of the CV scenario or engaging in free rider behavior. Motivations for not being willing to pay are classified as valid reasons and scenario rejecters (SR).

The next section presents mean WTP estimates for both including SR and excluding SR for each group of respondents. Table 7 presents the parametric estimates of the mean WTP for each group of respondents. The mean WTPs are computed using the sample means of all variables in the logit models. The confidence intervals (C.I) for the parametric estimates are obtained by using the Delta method [11].

[Insert Table 7]

Mean WTP estimates vary among four groups of respondents. For visitors to My Son, foreign visitors would be willing to pay much more than Vietnamese visitors, i.e. \$8.78 and \$2.27 for foreign visitors and Vietnamese visitors with SR included, respectively. This result is consistent with a general pattern found in the literature, e.g. [20, 23] and economic theory as well (i.e. foreign visitors earn higher income and spend more for the visit to My Son than Vietnamese visitors do).

It is interesting to observe that Vietnamese visitors to My Son (visitors) are willing to pay less than Vietnamese visitors to the area (non-visitors), i.e. \$2.27 and \$2.70 for visitors and non-visitors with SR included, respectively. However, this difference is not significant at 95% C.I.

Including SR in the WTP analysis, which means treating no-response as zero instead of non-zero (and removed from the analysis as in the case of SR excluded), the WTP estimates are lower for all groups of respondents (Table 7). On average, the WTP estimates with SR are 16% lower than without SR. In the following sections we will use the results from the sample where SRs are included. This will provide a conservative estimate of the benefits.

3.5 Aggregation of WTP estimates

Table 8 describes the aggregate WTP estimates for each group of respondents. For foreign visitors to My Son, the CV question asked a one-time payment rather than annual payments. The issue is mainly to emphasize the idea that the preservation plan is a one-time project, i.e. the temples could not be restored repeatedly over time. Therefore, in order to calculate the annual benefits over a period of time, the issue of repeat visits should be noted. Nevertheless, results of the survey of foreign visitors show that most of foreigners visited My Son just once (241 out of 243 foreigners visited My Son for the first time). Thus, in this particular case, an aggregate estimate of the annual benefits can be obtained by multiplying the mean WTP by the number of foreign visitors to My Son (assuming that all foreigners visited My Son just once in their lifetime). According to the Management Board of My

Son Relics, the number of adult foreign visitors to My Son in 2005 is 86,461. This yields an estimate of \$759,128.

[Insert Table 8]

Vietnamese visitors to My Son were also asked for a one-time payment, and here also we need to take into consideration the issue of repeat visits when calculating annual benefits. Results of the survey with Vietnamese visitors to My Son show that 15% of them have visited My Son before, thus we could assume that 85% of these visitors should be used in calculation of the annual benefits. This ad hoc adjustment provides a conservative estimate of the annual benefits for preserving My Son.

There are 30,527 adult Vietnamese visitors to My Son in 2005. With the above assumption, the adjusted number of Vietnamese visitors to My Son is 25,948, as seen in Table 9. This gives an estimate of \$58,930.

[Insert Table 9]

With Vietnamese visitors to the area, the study attempts to measure the potential benefits to Vietnamese visitors to the area that did not visit My Son during their current trips. Three major tourist destinations in the area close to My Son are Hue, Danang, and Hoian. According to departments of tourism in these provinces, the number of domestic visits to Hue; Danang; and Hoian in 2005 is 703,050; 510,702 and 649,567, respectively. There is currently no available data showing the percentage of Vietnamese visitors who make multiple visits among Hue; Danang and Hoian. As in the survey of 238 individuals taking place in Hue and Hoian (mostly in Hue), 50% of the visitors to Hue also visited Hoian. Assuming that 50% of the visitors to Danang neither visited Hue nor Hoian and 50% of visitors to Hoian neither visited Hue nor Danang, this adds up a total of 1,283,200 visitors (i.e. 703,050 visitors to Hue, 255,351 visitors to Danang, and 324,799 visitors to Hoian) to the area in 2005.

In addition, because the WTP of Vietnamese visitors to the area but not My Son (i.e. non-visitors with mean WTP of \$2.70) is higher than that of Vietnamese visitors to My Son (i.e. visitors with mean WTP of \$2.27), but not significantly different, we conservatively assume that these non-visitors would pay the same as visitors (i.e. the mean WTP of Vietnamese visitors to the area is also \$2.27). The aggregate WTP of Vietnamese visitors to the area is then \$2,914,236.

For Vietnamese visitors to the area who did not visit My Son, there are two more possibilities to be considered. The first one is the total number of Vietnamese visitors to the Central of Vietnam, which is about 3 millions. The second possibility is the total number of Vietnamese visitors travel within Vietnam that not visit My Son during their current trip, which amounts to 16 millions in 2005 [34]. These visitors would likely hold some non-zero WTP for preserving My Son. Since the sample of Vietnamese visitors to the area did not include those visitors, our estimate provides a conservative estimate for non-visitors benefits.

For local residents, an aggregate estimate of the benefits can be obtained by multiplying the mean WTP by the number of households in Quangnam province. According to the Statistical Yearbook of Quangnam province, the number of households in Quangnam in 2005 is 330,534. This yields an estimate of \$715,949.

Since the sample of local residents did not extend to households beyond the Quangnam province, we have omitted other households living in Vietnam (i.e. about 20 million households). In theory, the preservation benefits of My Son could accrue to any household in Vietnam. The fact that My Son is a well-known attraction in Vietnam, implying that other households in Vietnam would likely to have a positive WTP for preserving My Son. Excluding these households from the aggregation should give a lower estimate for non-visitors benefits.

For non-visitors, it is important to determine the number of years over which individual WTP should be aggregated. The aggregate WTP over more than one year would likely overestimate the benefits.

Thus, this study uses only the first year's aggregate for these two groups. The conservative aggregate WTP for all groups in the first year (i.e. 2005), with ad hoc adjustments, is then about \$4.5 million (see Table 9). Note that if the rest of the Vietnamese households (20 million) were willing to pay only \$0.22 per household as a one-time amount, we would double this estimate. We cannot exclude this possibility, but since we have no empirical evidence to support it we will conservatively assume they have zero WTP.

4. Policy implications

4.1 Revenues from visitors

With the current entrance fee of \$4 for foreign visitors and \$1.89 for Vietnamese visitors, the number of visitors to My Son in 2005 is 86,461 foreigners and 30,527 Vietnamese. This yields revenue of \$403,540 (\$345,844 for foreign visitors and \$57,696 for Vietnamese visitors). This figure would increase if the numbers of visitors to My Son increased³.

For foreign visitors, the expected visitation rate and revenues at different entrance fees are reported in Table 10. With an existing entrance fee of \$4, 86,461 foreigners visited My Son in 2005. As the entrance fee increases, the percentage of those willing to visit decreases, as expected. However, the percentage decrease in visitation is less than the percentage increase in the entrance fee, thus the expected revenue increases and maximizes at about \$14. In other words, within this range, the demand for visiting My Son is inelastic. As the entrance fee exceeds \$14, the demand is elastic and the expected revenue begins to decrease.

Note that this increase in entrance fees to maximize revenue would create side effects. This study shows that if entrance fees exceed \$14, the number of visitors would drop 54% compared to current

³ The average rate of growth of visitors to My Son in the period of 1997-2005 is 24.32% per year for foreign visitors and 41.50% per year for Vietnamese visitors, see [32].

numbers (for those their WTP is less than the entrance charges). This would have an impact on the economy as the whole, dependent on whether these people would visit other sites instead.

[Insert Table 10]

Table 10 also shows the expected visitation rate and revenue at different entrance fees for Vietnamese visitors to My Son. As the entrance fee increases, both the visitation rate and revenue decrease. The expected revenue is maximized at the current entrance fee of \$1.89. In other words, within the bid ranges, the demand of foreign visitors for visiting My Son is inelastic, while for domestic visitors the demand is elastic. This is consistent with results from similar type studies of national parks and eco-tourism, see e.g. [22, 8].

It is interesting to see that the expected revenue for foreign visitors is maximized at \$14, which is 1.61 times higher than the current entrance fee, while the expected revenue of Vietnamese visitors is maximized at the current fee (\$1.89). This suggests that in designing the pricing policy, more emphasis should be placed on foreign visitors rather than on Vietnamese visitors.

According to Table 10, if optimal entrance fees that maximize revenues were imposed, substantial annual revenues could be captured to finance the required preservation investments. For example, if the optimal entrance fees of \$14 for foreign visitors and \$1.89 for Vietnamese visitors were imposed, the generated revenues would be \$613,216 (\$555,618 for foreign and \$57,598 for Vietnamese visitors). This would be 52% higher than the current fee revenues. This policy recommendation would also reduce congestion⁴ at My Son by reducing the number of foreign visitors by 54%. For Vietnamese visitors, however, there is no decline in the visitation rate at the optimal entrance fee. Thus, overall, imposing the optimal charge for the Vietnamese visitors would not reduce the problem of congestion.

⁴ During the peak hour (from 11 a.m to 1 p.m), there is occasional congestion at My Son. Especially, in the summer - the high season of Vietnamese visitors, the congestion problem is occurred more often. With the current growth of visitors, this will be a big problem in the near future, unless there is a great improvement in infrastructure and services at the site.

In order to deal with the congestion problem at My Son due to Vietnamese visitors, we discuss some possible solutions in the following section. In the long term one solution might be to enhance infrastructures and services at the site. Another solution is to limit the number of visitors to the site. However, this might exclude individuals with high values for visiting the site while including those attaching low values to these public goods. Other option is to use price to limit access. As discussed above, the increase in price reduces both the visitation rate and revenue. Thus, this is an inefficient solution to Vietnamese visitors. There is room for a pricing structure that has higher price at specific times in the high season and lower price during the low season to avoid all domestic tourism taking place e.g. in the summer, and spreading the visits more evenly across the year.

The current fee policies relating to cultural heritage sites in Vietnam is not properly based on the individual preferences of tourists (i.e. demand) or on supply in tourism market; nor is it properly designed to maximize revenues or restrict tourism demand to meet the environmental carrying capacity of endangered sites. There is also a tendency to apply a more uniform pricing policy for foreign and Vietnamese visitors to sites in Vietnam. For example, the entrance fee for visiting My Son before 2004 was VND50,000 and VND10,000 for foreign and Vietnamese visitors, respectively, which have now increased to VND60,000 (US\$4) and VND30,000 (US\$2). Thus, from entrance fees being 5 times higher for foreigners, this has now been reduced to twice as high. This pricing policy is generally imposed on an uninformed basis. Based on the calculated consumer surplus (and total WTP), our results suggest that an even larger price differentiation would increase both revenues and facilitate preservation, due to more money for preservation and reduced damage to the site from reduced congestion. This could possibly also secure social equity, see [15] and [16] for details.

4.2 Cost-benefit analysis

For non-visitors, mean WTP estimates are \$2.27 and \$2.17 for Vietnamese visitors to the area and local residents, respectively. The payment vehicle used for these two groups is a one-time tax. Thus,

the WTP aggregated over the number of Vietnamese visitors to the area and the local residents is also the present value of the benefits to these groups. The one-year aggregate WTP estimate of non-visitors is \$3,630,185. These benefits are 4.44 times higher than those received by visitors to My Son. The total costs of the My Son preservation⁵ amount to \$12.89 million. The annual revenue from visitors to My Son under the current entrance fee regime is \$403,442. According to the Management Board of My Son Relics, 50% of this revenue is spent on annual operating costs. If the remaining 50% of this revenue (\$201,721) was used for preserving My Son, it would take 64 years⁶ to collect revenues from visitors to cover the costs of preservation. If the optimal entrance fee regime was imposed, it would take 42 years to collect the preservation costs. The aggregate WTP of benefits for all groups of respondents in 2005 was \$4,448,242. This constitutes 35% of the total preservation costs. If all of these benefits were collected in the first year, and then revenues collected annually from visitors to My Son, it would take 20 years⁷ to cover the preservation costs. This suggests that if funding for My Son were to be based on benefits generated from entrance fees alone, this would lead to a level of preservation for My Son that would not be optimal for the site or best for society. Since non-visitors to My Son have shown that they place significant value on the preservation, the results from this study can be used to justify current costs of the preservation and also to argue for increased preservation investment.

The calculations above are based on simply comparing the social costs of preservation to the potential social benefits for My Son over time with no discounting. In the next section, we conduct a cost-

⁵ This is a conservation plan proposed by the Vietnamese government in collaboration with international agencies. The total cost of this preservation plan is VND196 billion over a period of time from 2004 to 2015. The exchange rate in 2004 was US\$1=VND15,208, which is equivalent to US\$12.89 million [9].

⁶ Assume that the increase in the annual operating costs over time is equal to revenue increase from the increase of visitors to My Son.

⁷ In addition to the assumption that the increase of visitors (the growth rate) generates revenues to cover the increase in the annual operating costs; the growth rate of visitors also compensates for the rate of repeat visits to My Son.

benefit analysis (CBA), and show how the outcome can be influenced by different time frames and social discount rates⁸.

As we assume that the My Son heritage is preserved for future generations, we assume that the time horizon of the preservation project is infinity, ∞ . The net present value (NPV)⁹ is calculated as

$$NPV = -C_0 + B_{locals} + B_{non-mysonvisitors} + \frac{B_{domesticvisitors}}{r} + \frac{B_{foreignvisitors}}{r} + \frac{NR}{r} \quad (4),$$

where C_0 is the total costs of the conservation project which equals to \$12.89 million. Since we have no details of how the costs would be spent, we assume that this is an initial investment cost¹⁰ and occur immediately ($t = 0$).

B_{locals} refers to the one-time amount ($t = 0$) or the present value of the benefits accrued from local resident households in Quangnam province, is \$715,949 as calculated above.

$B_{non-mysonvisitors}$ represents the one-time amount ($t = 0$) or the present value of the benefits derived from the Vietnamese visitors visiting the area who do not visit My Son during their current trip, which is equal to \$2,914,236.

$\frac{B_{domesticvisitors}}{r}$ is interpreted as the present value over an infinite time horizon ($t \rightarrow \infty$) of the Vietnamese visitors to My Son. $B_{domesticvisitor}$ is an annual benefit that continues infinitely, r is the social discount rate. The annual benefit of the Vietnamese visitors to My Son is \$58,930.

$\frac{B_{foreignvisitors}}{r}$ is the present value of benefits to the foreign visitors to My Son over infinity ($t \rightarrow \infty$).

$B_{foreignvisitors}$ is the annual benefit to the foreign visitors to My Son and equals to \$759,128.

⁸ Discounting implies putting more weight on consumption today than consumption in the future. The choice of discount rate reflects the weight put on the future compared to today. The higher the discount rate is the more weight is put on today compared to the future (Boardman et al. 2006).

⁹ NPV is the value today of a stream of benefits and/or costs that occur in the future.

¹⁰ This assumption will overestimate the costs.

$\frac{NR}{r}$ refers to the present value of a perpetuity ($t = \infty$) of net revenue. Net revenue (NR) is an annual benefit, which is generated from the current entrance fees after 50% is spent on annual operating costs (\$201,721).

We use a 6% social discount rate in the CBA of this project, but also carry out sensitivity analyses with 4%¹¹ and 10%¹². The benefit-cost ratio (BC ratio) and internal rate of return (IRR) will also be calculated.

[Insert Table 11]

Table 11 presents $NPVs$, BC ratios and $IRRs$ for the My Son preservation project. The $NPVs$ under different discount rates range from \$0.9 million to \$16.2 million, the BC ratios from 1.07 to 2.26 and the IRR is 11%. This suggests that the preservation project is economically viable.

[Insert Table 12]

We then assume that the preservation project will last 20 years¹³ ($t = 20$), the same social discount rates are used. Table 12 presents results of the CBA¹⁴. The CBA results show that the $NPVs$ under different discount rates are always positive; the BC ratios range from 1.02 to 1.40 and the IRR is

¹¹ This is a relatively low discount rate, since it is likely that future generations will put more weight on the preservation of cultural heritages such as My Son more than the current generation. For example, there is some evidence of a positive relationship between income, education and cultural benefit (Mourato and Mazzanti 2002), and as income and education is expected to increase, future generations are assumed to be willing to pay more for preserving of cultural heritages. In addition, as time goes by, many cultural heritages will deteriorate or be lost. Cultural heritages are already scarce, but they will be scarcer, and thus the value of the heritages will increase.

¹² The World Bank sometimes uses a 10% discount rate for their investments. Thus we will check for this option.

¹³ This means that we are now assuming that the current preservation investment lasts only 20 years (before a new preservation investment project will be implemented).

¹⁴ In calculating we apply the equation (4) with keeping C_0 ; B_{locals} ; $B_{non-mysonvisitors}$ the same as before, and modifying the last three components by the following formula $\sum_{t=0}^{19} \frac{B_t}{(1+r)^t}$.

10.5%. This analysis suggests that the preservation for My Son is also feasible even with a shorter time horizon of the preservation project.

5. Conclusions

This study estimates the economic benefits that would be created by a proposed preservation program to preserve and restore the My Son world cultural heritage site in Vietnam. The study then discusses policy implications for revenue collection and CBA.

Results shows that the adoption of the optimal price regime would both increase revenues and reduce congestion at the site. However, this pricing regime would not reduce the congestion problem due to Vietnamese visitors. The idea of imposing a pricing structure with seasonal differentiations to reduce the number of Vietnamese visitors in the high season is feasible. Results also show that if the justification of investments were only based on entrance fees, then this would lead to a level of preservation for My Son that would not be optimal for the site nor for the society. The inclusion of benefits derived from non-visitors are needed to argue for increased preservation investment. The CBA results show that the preservation project for the My Son world cultural heritage seems to be an economically viable proposition.

There is limited empirical evidence in Vietnam on the income elasticity of WTP in terms of increased fees and taxes. This indicates that additional studies need to be conducted to ensure an informed basis for the development of an optimal fee policy in pricing cultural heritages.

The lack of data on the tourist carrying capacity of My Son shows the need for future research to fill this information gap. More need to be known about the impact of additional visitors on this cultural resource if a truly sustainable pricing policy is to be developed.

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Figures

Figure 1. Map of the Central area of Vietnam



Source: Adopted from <http://www.vnnavi.com/mientrung.html>

Tables

Table 1. Sampling scheme

| Group of respondents | | Location of interview | Number of respondents |
|----------------------|---------------------------------------|-----------------------|-----------------------|
| Visitors | (i) Foreign visitors to My Son | My Son | 243 |
| | (ii) Vietnamese visitors to My Son | My Son | 245 |
| Non-visitors | (iii) Vietnamese visitors to the area | Hue and Hoian | 238 |
| | (iv) Local residents | Quangnam province | 241 |
| Total number | | | 967 |

Table 2. Socio-demographic characteristics

| | Foreign visitors to My Son | Vietnamese visitors to My Son | Vietnamese visitors to the area | Local residents |
|-----------------------|-------------------------------|-------------------------------------|---------------------------------------|--------------------|
| | <i>Mean (Std.)</i> | <i>Mean (Std.)</i> | <i>Mean (Std.)</i> | <i>Mean (Std.)</i> |
| Sex ^a | 0.46 (0.50) | 0.37 (0.48) | 0.38 (0.49) | 0.51 (0.50) |
| Age | 33.41 (10.91) | 37.26 (12.13) | 38.63 (12.39) | 43.18 (11.09) |
| Income (US\$) | 57,075 (40,834) | - | - | - |
| Income (VND million) | - | 1.77 (0.70) | 1.52 (0.65) | 0.81 (0.65) |
| Education | 3.63 (0.87) | 3.64 (0.84) | 3.41 (0.76) | 2.07 (0.88) |
| Alone | 0.44 (0.50) | 0.42 (0.49) | 0.40 (0.49) | - |
| Child | - | - | - | 0.34 (0.48) |
| Number of respondents | 243 | 245 | 238 | 241 |

Note: ^a Sex = 1 for female, 0 for male. Age = age of respondents (years). Income (US\$): household yearly income of foreigners. Income (VND million): household monthly income of Vietnamese respondents. Education: 1 = primary; 2 = secondary; 3 = high school; 4 = college; and 5 = graduate. Alone = 1 if the visitor is traveling alone, 0 otherwise. Child = 1 if the household has a child, 0 otherwise.

Table 3. Socio-demographic characteristics of local resident sample and Quangnam province

| Variables | Local residents | Quangnam average |
|--|-----------------|------------------|
| Gender (% female) | 0.51 | 0.52 |
| Age group (≥ 18 years, %) | | |
| 18-39 | 0.38 | 0.58 |
| 40-59 | 0.50 | 0.33 |
| 60 or over | 0.11 | 0.10 |
| Attending school (%) | 0.08 | 0.07 |
| Unemployment (%) | 0.02 | 0.03 |
| Income (household monthly income, VND million) | 0.81 | 1.11 |
| Urban (% of household living in urban areas) | 0.17 | 0.16 |

Source: The Statistical Yearbook of Quangnam province 2004 and own calculations

Table 4. Respondents' knowledge and attitudes

| Variable | Foreign visitors to My Son | Vietnamese visitors to My Son | Vietnamese visitors to the area | Local residents |
|-----------------------|-------------------------------|-------------------------------------|---------------------------------------|--------------------|
| | <i>Mean (Std)</i> | <i>Mean (Std)</i> | <i>Mean (Std)</i> | <i>Mean (Std)</i> |
| Know ^a | 1.82 (0.65) | 2.78 (1.04) | 2.14 (1.12) | 2.36 (0.97) |
| Importance | 0.67 (0.47) | 0.73 (0.45) | 0.69 (0.46) | 0.60 (0.49) |
| Hcity | 0.41 (0.49) | - | - | - |
| Hue | 0.60 (0.49) | 0.79 (0.41) | 0.90 (0.30) | 0.27 (0.44) |
| Hoian | 0.90 (0.30) | 0.83 (0.38) | 0.50 (0.50) | 0.58 (0.50) |
| Visit | - | 0.15 (0.36) | 0.15 (0.36) | 0.16 (0.37) |
| Satisfied | 0.68 (0.47) | 0.81 (0.39) | - | - |
| Ftrip | 0.29 (0.45) | 0.65 (0.49) | 0.56 (0.50) | 0.74 (0.44) |
| Before | 0.36 (0.48) | 0.26 (0.44) | - | - |
| Number of respondents | 243 | 245 | 238 | 241 |

Note: ^a Know is respondent's knowledge of My Son before visited the site, scale from 1 to 5, where 1 = nothing and 5 = very much. Importance = 1 if respondents regard the importance for preserving WHSs in Vietnam, 0 otherwise. Hcity = 1 if respondents select historical cities as the first reason for the visit to Vietnam, 0 otherwise. Hue = 1 if respondents had visited Hue before, 0 otherwise. Hoian = 1 if respondents had visited Hoian before, 0 otherwise. Visit = 1 if respondents had visited My Son before and 0 otherwise. Satisfied = 1 if respondents satisfied with their experience of visiting My Son, 0 otherwise. Ftrip = 1 if respondents consider visiting My Son again sometime in the future, 0 otherwise. Before = 1 if respondents were interviewed before visiting My Son and 0 otherwise.

Table 5. Estimated parameters of the logit models

| Variables | Foreign visitors to My Son (p-value) | Vietnamese visitors to My Son (p-value) | Vietnamese visitors to the area (p-value) | Local residents (p-value) |
|------------|--|---|---|---------------------------------|
| Constant | -1.23 (.112) | -3.75 (.020) | 0.47 (.627) | -12.27 (.000) |
| Bids | -0.41 (.000) | -0.02 (.000) | -0.05 (.000) | -0.07 (.000) |
| Sex | 0.0004 (.654) | 0.0001 (.955) | 0.03 (.062) | -0.01 (.717) |
| Age | -0.003 (.856) | -0.002 (.501) | -0.0004 (.653) | -0.08 (.813) |
| Income | 0.002 (.002) | 0.001 (.582) | -0.001 (.661) | 4.99 (.000) |
| Ugo | 1.47 (.002) | 0.63 (.076) | 2.76 (.000) | 3.42 (.012) |
| Alone | -0.13 (.759) | 0.18 (.608) | -2.73 (.000) | - |
| Child | - | - | - | -0.29 (.697) |
| Hcity | 1.56 (.001) | - | - | - |
| Hue | -0.61D-4 (.935) | -0.003 (.114) | 2.21 (.011) | -1.12 (.158) |
| Hoian | 0.001 (.582) | -0.005 (.831) | -2.15 (.000) | 1.48 (.046) |
| Visit | - | -0.41 (.383) | 2.15 (.000) | 1.98 (.037) |
| Importance | 0.74 (.118) | 0.03 (.000) | -0.83 (.016) | 1.73 (.025) |
| Know | 0.004 (.938) | 0.68 (.148) | 0.0004 (.583) | 0.12 (.866) |
| Satisfied | 2.21 (.000) | 2.31 (.000) | - | - |
| Ftrip | 2.27 (.000) | 2.30 (.001) | 0.83 (.016) | 0.44 (.595) |

| | | | | |
|---------------------------|--------------|-------------|--------|--------|
| Before | -1.97 (.000) | 0.59 (.181) | - | - |
| <i>Summary statistics</i> | | | | |
| Log-likelihood | -77.46 | -111.99 | -65.27 | -53.81 |
| Pseudo-R ² | 0.54 | 0.33 | 0.60 | 0.67 |
| Chi-squared | 181.85 | 110.04 | 199.33 | 264.27 |
| Number of obs. | 243 | 245 | 238 | 241 |

Table 6. Reason for not willing to pay

| Respondent's reasons for non-willing to pay | Foreign visitors to My Son | Vietnamese visitors to My Son | Vietnamese visitors to the area | Local residents |
|--|----------------------------------|-------------------------------------|---------------------------------------|--------------------|
| 1. I have no spare income | 8 (6.7) | 34 (24.1) | 25 (20.7) | 41 (31.1) |
| 2. I think the cost is too high | 67 (56.3) | 34 (24.1) | 41 (33.9) | 20 (15.2) |
| 3. If an acceptable method of paying is found* | 6 (5.0) | 19 (13.5) | 11 (9.1) | 4 (3.0) |
| 4. I would pay if other people agree to pay* | 2 (1.7) | 13 (9.2) | 4 (3.3) | 25 (18.9) |
| 5. I would pay if payment period is extended* | 0 | 3 (2.1) | 2 (1.7) | 8 (6.1) |
| 6. There are other sites that I prefer to visit* | 2 (1.7) | 3 (2.1) | 1 (0.8) | 0 |
| 7. The preservation of My Son is unimportant* | 0 | 2 (1.4) | 1 (0.8) | 1 (0.8) |
| 8. Not believe paying will solve the problem* | 3 (2.5) | 3 (2.1) | 0 | 1 (0.8) |
| 9. It is the government's responsibility* | 20 (16.8) | 10 (7.1) | 14 (11.6) | 16 (12.1) |
| 10. I do not trust the institutions that will handle the money for preservation work* | 3 (2.5) | 5 (3.5) | 1 (0.8) | 2 (1.5) |
| 11. I oppose the plan regardless of costs* | 0 | 1 (0.7) | 0 | 0 |
| 12. Other reasons* | 6 (5.0) | 9 (6.4) | 19 (15.7) | 6 (4.5) |
| 13. Don't know/ Not sure* | 2 (1.7) | 5 (3.5) | 2 (1.7) | 8 (6.1) |
| Total respondents not WTP | 119 | 141 | 121 | 132 |

Note: Categories with * are classified as scenario rejecters (SR). Numbers in brackets are percentage.

Table 7. Mean WTP estimates (US\$)

| | Foreign visitors to My Son | Vietnamese visitors to My Son | Vietnamese visitors to the area | Local residents |
|--------------------|-------------------------------|----------------------------------|------------------------------------|---------------------|
| SR included | 8.78 [7.53-10.02] | 2.27 [1.47-3.08] | 2.70 [2.00-3.39] | 2.17 [0.74-3.59] |
| SR excluded | 9.80 [8.56-11.05] | 2.72 [1.91-3.52] | 2.94 [2.25-3.63] | 2.70 [1.28-4.13] |

Note: Numbers in [] are 95% confidence intervals.

Table 8. Unadjusted aggregate WTP estimates

| Groups of respondent | Foreign visitors to My Son | Vietnamese Visitors to My Son | Vietnamese visitors to the area | Local residents |
|----------------------|----------------------------------|-------------------------------------|--|------------------------------------|
| Mean (US\$) | 8.78 [7.53-10.02] | 2.27 [1.47-3.08] | 2.70 [2.00-3.39] | 2.17 [0.74-3.59] |
| Number of visitors | 86,461 | 30,527 | 1,283,200 | - |
| Number of households | - | - | - | 330,534 |
| Aggregate WTP (US\$) | 759,128 [651,051- 866,339] | 69,329 [44,754- 93,923] | 3,458,991 [2,568,821- 4,348,353] | 715,949 [244,055- 1,187,363] |
| Total | 5,003,396 [3,508,681-6,496,251] | | | |

Note: Numbers in [] are 95% confidence intervals.

Table 9: Ad hoc adjustments of aggregate WTP estimates (adjustments in bold)

| Groups of respondent | Foreign visitors to My Son | Vietnamese Visitors to My Son | Vietnamese visitors to the area | Local residents |
|--------------------------|----------------------------------|-------------------------------------|--|------------------------------------|
| Adjusted mean (US\$) | 8.78 | 2.27 | 2.27 | 2.17 |
| Adjusted no. of visitors | 86,461 | 25,948 | 1,283,200 | - |
| Number of households | - | - | - | 330,534 |
| Aggregate WTP (US\$) | 759,128 [651,051- 866,339] | 58,930 [38,041- 79,835] | 2,914,236 [1,881,220- 3,948,059] | 715,949 [244,055- 1,187,363] |
| Total | 4,448,242 [2,814,366-6,081,869] | | | |

Note: Numbers in [] are 95% confidence intervals.

Table 10. Expected revenue at different entrance fees (optimal in bold)

| Foreign visitors | | | Vietnamese visitors | | |
|------------------------|------------|----------------------------|------------------------|------------|----------------------------|
| Entrance fee (US\$) | % visitors | Expected revenue (US\$) | Entrance fee (US\$) | % visitors | Expected revenue (US\$) |
| 4 | 100 | 345,844 | 1.89 | 100 | 57,598 |
| 5 | 78 | 338,639 | 2.20 | 69 | 46,605 |
| 9 | 69 | 535,775 | 3.14 | 51 | 48,785 |
| 14 | 46 | 555,618 | 5.03 | 30 | 45,323 |
| 19 | 11 | 188,513 | 8.18 | 20 | 49,100 |

Table 11. Results of the cost-benefit analysis with an infinite time horizon

| Time horizon | Infinity | | |
|--|------------|-----------|---------|
| Discount rates (%) | 4 | 6 | 10 |
| Net Present Value (<i>NPV</i> , US\$) | 16,236,687 | 7,738,535 | 940,014 |
| Benefit Cost ratio (<i>BC ratio</i>) | 2.26 | 1.60 | 1.07 |
| IRR (%) | 11 | | |

Table 12. Results of the cost-benefit analysis with the time horizon of 20 years

| Time horizon | 20 years | | |
|--|-----------|-----------|---------|
| Discount rates (%) | 4 | 6 | 10 |
| Net Present Value (<i>NPV</i> , US\$) | 5,155,715 | 3,140,814 | 292,373 |
| Benefit Cost ratio (<i>BC ratio</i>) | 1.40 | 1.24 | 1.02 |
| IRR (%) | 10.5 | | |