Valuing Ecotourism in Palutungan Resort, Gunung Ciremai National Park, Indonesia

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Abstract
In this paper, we conducted an empirical study on the economic value of Palutungan Resort, Gunung Ciremai National Park (Indonesia), using an individual travel cost method. Gunung Ciremai is the highest mountain in West Java Province which has high biodiversity and constitutes the home range of the endangered species, Nisaetus bartelsi and leopards. Using the individual travel cost method, we estimated the annual consumer surplus of ecotourism for Palutungan Resort to be approximately $19, while its total economic value was $0.23 million. However, Palutungan Resort does not benefit exclusively, because the total economic value is divided diversely among the central government (non-tax revenue), local government (taxes), and local communities, while the transportation agencies, retailers, and gas station companies also reap some valuable benefits. In regard to the benefit allocation, all of the associated parties should participate in the conservation and preservation of natural resources in Palutungan Resort to improve the ecotourism services.

Key Words: ecotourism, individual travel cost method, consumer surplus, importance performance analysis, Gunung Ciremai National Park

Introduction
Over the last fifty years, tourism has been recorded as the fastest growing industry, accounting for some 9% of the world's GDP (over 235 million jobs) and providing one out of 12 jobs in the world (UNWTO 2015). International tourist arrivals reached 1.138 billion in 2014, a 4.7% increase over the previous year, further contributing to the global economic recovery around the world (UNWTO 2015). Ecotourism has become a global issue and has attracted much attention (Stone and Wall 2004; Gurung and Seeland 2011; Gilbert 2003), especially in developing countries, which represent 46% of the total international tourist arrivals in 2011 (UNWTO 2015). Ecotourism is defined specifically as “responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education” (TIES 2015). Most of the tourists come from developed countries and involve people seeking more leisure and showing concern to improve the quality of the environment (Veenhoven 1999; Rinzin et al. 2007).

Hetzer (1965) identified four “pillars” of responsible tourism: minimizing the environmental impact, respecting the host culture, maximizing the benefits to local people, and maximizing tourist satisfaction. The tourism context was shifted toward “ecological tourism” by Miller’s (1978) work on eco-development in Latin America in the 1970s-1980s. The concept of ecotourism comprises both supply and demand in the balance of natural resources and the economic welfare and well-being of the local people (Batta...
The International Ecotourism Society revised the definition of ecotourism created by the founding members in 1990 to be: “responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education (TIES 2015)”. By definition, ecotourism can be viewed as a product associated with natural resources (Bastian et al. 2015; Arnegger et al. 2010), travel as a potential market (Chase et al. 1998) and sustainable development (Gilbert 2003; Rinzin et al. 2007; Wang et al. 2012).

Ecotourism activities in particular involve multi-stakeholders (Gurung and Seeland 2011; He et al. 2008; Rinzin et al. 2007) and benefit both conservation programs (Bednar et al. 2012; Lee et al. 1997) and local people (Yacob et al. 2008). The World Ecotourism Summit 2002 in Quebec, Canada, mentioned that tourism can bring both benefits and costs to the environment and local communities. The benefit and adverse impact caused by tourist behaviour can be considered as a possible threat to the ecosystem (Kenan 2006) and have the potential to disengage local people (Vanderheiden and Sisson 2010). Uncontrolled tourism activities would overburden the limited facilities and threaten the traditional cultures, values and the environment (Rinzin 2007). In fact, ecotourism is far more complex, having both ecological and social aspects. The components related to ecotourism activities include the experience itself, education, appreciation of nature, interaction between humans and nature, environmental services, carrying capacity, increased revenue and, in some cases it may even encourage travellers to have a positive impact on their new surroundings (Resulaj 2012).

Thus, the economic valuation of ecotourism sites requires the negative impact to be considered, while looking into the responsible travel that is trying to be achieved. Among the techniques widely used in valuing ecotourism benefits are the Contingent Valuation Method (CVM) and Travel Cost Method (TCM), which were both pioneered in the USA (Twerefou et al. 2012). The two variants of the travel cost method are the Zonal TCM and Individual TCM. Gains in efficiency of estimation of several hundred percent could often be obtained by using individual observation, rather than the traditional zone averages (Brown and Nawas 1973).

Beginning in the 2000s, many studies were conducted to value forest services including ecotourism. Pham and Tran (2001) conducted a study to measure and analyse the ecotourism impact on the recreational value of the natural resources in the Hon Mun Islands. The Hon Mun Islands have contributed significantly to the economy, but have been polluted and over-exploited by various activities (Tran 1998). They explored the recreational value of the coral surrounding the Hon Mun Islands, which was the richest coral biodiversity in Vietnam, to provide scientific information for the fight against the sea port expansion proposal, and both variants of the TCM were engaged here. Zonal TCM estimates the annual recreational value to be around $17.9 million, while Individual TCM estimates it at $8.7 million. Raharjo and The Individual Travel Cost Method was used by Twerefou (2012) to value the environmental resources and other public infrastructures such as recreational sites in Kakum National Park in Ghana. Kakum is a protected area designed to preserve the vast rainforest, including its bio-diversity, habitat and natural processes, and house of canopy walkaway as an ecotourism attraction in Africa. Twerefou (2012) suggested that the travel costs, gender, and knowledge of composite sites are significant factors that influence the visitation rate to the park. Recently, Emiriya (2013) suggested that the substitute sites, travel costs and individual income have a negative influence on an individual’s visit. The resulting recommendation was a policy input to take great care of the NNP, since the sustainable management of wildlife resources could provide the country with very significant and much needed revenue.

In this study, the objective is to conduct an empirical study on the economic value of Palutungan Resort, Gunung Ciremai National Park, Indonesia, using an individual travel cost method. Gunung Ciremai is the highest mountain in West Java Province which has high biodiversity and constitutes the home range of the endangered species, Nisaetus bartelsi, and leopards. Also, we investigate the performance of ecotourism services through importance-performance analysis in order to improve its vulnerable points and attract more visitors who want to enjoy ecotourism services in the Palutungan Resort of Gunung Ciremai National Park, Indonesia.
Materials and Methods

The survey

According to Raharjo (2002), TCM questionnaires could be constructed by: 1) the visitor profile regarding the socio-economic characteristics of the respondent, 2) the visitor’s motivation and preference focusing on their purposes, optional activities provided, and visitation rate, 3) the visitor’s perception and opinion on the ecotourism site related to visitor satisfaction. Satisfaction has played an important role in planning marketable tourism products and services (Yoon and Uysal 2005). Tourist satisfaction is important for successful destination marketing, because it influences the choice of destination, the consumption of products and services, and the decision to return (Kozak and Rimmington 2000). The respondent choses the importance and performance rate for each attribute item in five Likert scale points from 1=strongly disagree, to 5=strongly agree, and the travel cost incurred by visitors as basic economic concepts of demand and supply is employed to estimate the willingness to pay (Emiriya et al. 2013). Willig (1995) defines the economic value as a measure of the maximum amount an individual is willing to forgo in other goods and services in order to obtain some good.

Individual travel cost method

Since its original inception by Hotelling (1947), the travel cost method has evolved into the most widely applied ‘revealed preference’ approach for valuing recreational sites. ITCM is one of the basic approaches to TCM which was developed by Brown and Nawas (1973) and Martin and Gum (1974). This study places the emphasis on the individual expenditures during a certain period, for instance 1 year, and adopts the method of Brown and Nawas (1973) where the number of visits is a function of the cost as follows:

\[ V = f(C) \] \hspace{1cm} \text{Equation (1)}

ITCM estimates the consumer surplus by analysing the individual visitors’ behaviour and their recreational activity. TCM falls into the general category of neo-classical welfare economics, which assumes that individuals maximize their utility subject to certain constraints (Emiriya 2013). The consumer surplus is the area above the market size, which is a monetary measure of the net benefit that the consumer gained from the transaction (Navarro et al. 2007). The consumer surplus is derived from a demand function that measures the cost and quantity of goods or services. The demand function is an empirical relationship between the price and quantity/service (Maille 1993), where the annual number of visits is assumed to have a positive, non-zero value (Arbel and Bargur 1976). The author assumes that the demand curve is a linear model:

\[ y = a + bx \] \hspace{1cm} \text{Equation (2)}

where: \( y \) (annual visitation), \( a \) (intercept), \( b \) (coefficient travel cost), and \( x \) (total travel cost)

Graphically, the individual consumer surplus (ICS) is located underneath the demand curve (Camm 1983) and above the price/cost level (Navarro et al. 2007).

In Fig. 1, \( C^* \) represents the individual travel cost level to visit as many as \( Q \) times a year and the area bounded by \( 0C^*RQ^* \) is the gross willingness to pay, which can be considered as the market size. The market size is truncated by the entrance fee as a compulsory payment. The triangle \( RC^*maxC^* \) is translated as the satisfaction derived from paying to a visit to Palutungan Resort or consumer surplus.

Importance Performance Analysis (IPA)

IPA is a two-dimensional grid based on the customer-perceived importance of the quality attributes and attribute performance (Matzler et al. 2004). It has been adapted from the perception-performance analysis of Johnston and
Heineke (1998) and the importance performance analysis of Martilla and James (1977). In this study, the importance value (y axes) represents the visitor expectation from the ecotourism site and the performance (x axes) value is related to the manager quality service.

The means of the performance and importance divide the matrix into four quadrants and each quadrant can be summarized into a specific suggestion for the management (Fig. 2). The IPA provides the managers with highly valuable information for both satisfaction measurement on the visitor side and efficient allocation of resources on the manager side. The interpretation of the expectation-performance grid is illustrated by quadrants where:

1. Quadrant I (good work area) means excellent performance on high expectation features, implying opportunities to gain or maintain the competitive benefit;
2. Quadrant II (focus area) means poor performance on extreme expectation dimensions, indicating a high priority for immediate action;
3. Quadrant III (low priority area) means low expectation and low performance, suggesting that it may not be necessary to focus additional effort on these attributes; and
4. Quadrant IV (surplus area) means low expectation of high performance, implying that resources would be better off being allocated elsewhere.

Results and Discussion

Descriptive statistic

Most of the respondents visited Palutungan Resort 2-3 times a year, with the majority of them being young and male (Table 1). The average visitation rate was 2.78 times per year, with most of the visitors coming from the surrounding districts of Gunung Ciremai National Park. The age classification was widely distributed from 15 to 55, with 24 being the average age of the respondents. Regarding the income level, those respondents who have an income level below $100 were more inclined to visit.

The visitors' behaviour was analysed in terms of their needs regarding the trips they made. High visitation (3 times a year) demonstrates increased attentiveness and concern about the environment, while at the same time supporting ecotourism as a sustainable development approach. For this reason, good education about and interpretation of ecotourism as a top priority is important for both visitors and staff.

Students were a particular target and concern of the

| Variables                  | %  | Mean | Std.dev. |
|----------------------------|----|------|----------|
| Number of visits (times a year) |    |      |          |
| #1                         | 16 | 2.78 | 1.23     |
| #2                         | 28 |      |          |
| #3                         | 28 |      |          |
| #4                         | 20 |      |          |
| #5                         | 6  |      |          |
| #6                         | 2  |      |          |
| Age (years)                |    |      |          |
| 15-25                      | 48 | 23.92| 8.88     |
| 26-35                      | 34 |      |          |
| 36-45                      | 12 |      |          |
| 46-55                      | 6  |      |          |
| 56 up                      | -  |      |          |
| Income ($)                 |    |      |          |
| 0-100                      | 50 | 84.8 | 98.82    |
| 100-150                    | 26 |      |          |
| 150-200                    | 2  |      |          |
| 200-250                    | 14 |      |          |
| 250 up                     | 8  |      |          |
| Gender                     |    |      |          |
| Men                        | 64 |      |          |
| Women                      | 36 |      |          |
| Total                      | 100|      |          |
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**Table 2.** Previous study of socioeconomic issues

| Site                | Country  | Mean # of visit | Age  | Income          | Gender      |
|---------------------|----------|-----------------|------|-----------------|-------------|
| Palutungan resort   | Indonesia| 2.78            | 23.9 | $100-150        | Male 64%    |
| Hon Mun Islands     | Vietnam  | 1.7             | 32.3 | VND 1,325,536   | Male dominant|
| Curug Sewu          | Indonesia| 3.58            | 24.33| IDR 561,847     | -           |
| Margalla Hills      | Pakistan | 7               | 38.9 | Rs 10,000-20,000| Male 67%    |
| Mt. Pulag           | Philippines| 1.22         | 26.88| PHP 27,086      | Male dominant|

**Table 3.** Regression Estimates

| Variable | Coefficient | t-value | Sig. |
|----------|-------------|---------|------|
| Constant | 4.062       | 15.878  | 0.000|
| Travel cost | -3.524E-5   | -5.889  | 0.000|

management. The strategy of segmentation provides a wide-range of information which can help consumers in the identification of attractive ecotourism activities. The suitability variables used for carrying out segmentation included: 1) the specific segmentation, 2) home of origin and distance, 3) visitors' motivation and 4) appropriate ecotourism activities.

From the point of view of its proponents, ecotourism is a potential market to increase income and local community empowerment, including gender issues. In fact, ecotourism has not necessarily shifted the gender stereotypes in the modern-community. The findings show that the participation of women is still marginalized, as they count for only 36% of the respondents in ecotourism activities, although women have begun to take an active role in lodgings, restaurants, and retail and other small businesses (Horton 2009). That is, unless special attention is focused on labour issues based on gender perspectives, inter-gender relations, and differential access to and control over environmental, livelihood and cultural resources, ecotourism may unwittingly exacerbate the existing gender inequalities in local communities (Walter 2011).

The visitation rate of Palutungan resort is higher than that of Hon Mun Islands in Vietnam at 1.7 times a year (Table 2), where over 50% of the respondents visited Hon Mun Islands for the first time. This can have two implications: (1) the Vietnamese are not in the habit of taking annual holidays and/or (2) the Hon Mun Islands are not that attractive to the Vietnamese (Pham and Tran 2001).

From these findings, it can be inferred that Palutungan Resort has become an attractive ecotourism destination and that the average age of the visitors is 24 years old.

The visitation rate at Palutungan Resort is even higher than that of Mt Pulag National Park in the Philippines at 1.22 times per year, but the average length of stay in Mt. Pulag of 2.86 was higher than that of Palutungan. Most people who came to Mt Pulag National Park did so during the trekking reason (Navarro 2007), while Palutungan was a common leisure site. The Margalla Hills National Park (MHNP) has the highest visitation rate of 7 times a year. The advantage of MHNP is that it is the closest to the national capital and its combination of 3 land-use types offers outstanding recreational and educational opportunities for the people of Pakistan (Khan 2004).

Most travellers in Indonesia and Southeast Asia were below 30 years old, preferring ecotourism activities as weekend experiences or an annual holiday where the ecotourism activities based on their interpretation, nature issues and related natural phenomena. Furthermore, there is evident potential for growth of ecotourism industries, underlining the importance of identifying the market target and its implications with regard to the future development of this sector (Galley and Clifton 2003).

This is the case in Pakistan, where the mean visitor age was 39 years old with a high annual visitation rate of 7 times per year. The number of visitation rate to MHNP because of various ecotourism activities provided by management of MHNP. At least 8 alternative ecotourism activities are provided by MHNP, including sight-seeing, walking, bird watching, relaxation, exercising, eating seafood, swimming, boating and combinations of these activities. The second reason is that the number of national parks in Pakistan is small compared to other countries, because the forest cover is as little as 5% on the national level (Hyde et al. 1996).
Therefore, in the past few years, Pakistan has shown great interest in the expansion and proper management of its national park system. The last reason is that MHNP is located at the strategic crossroads close to the national capital.

**Consumer surplus**

As the result of regression in Table 3, the Y intercept and travel cost coefficient were estimated as the following equation:

\[ y = 4.062 - 3.524 \times 10^{-5} x \]  

Equation (8)

The coefficient of determination \( (R^2) \) is 0.648, indicating a good fit of the regression relatively, with the travel cost variable explaining about 64.8% of the variation in the number of visits. The result implies that the travel cost has a statistically significant influence on the number of visits. The F-stat value of 34.677 is higher than the F-table value of 4.04, indicating that the traveling cost simultaneously influenced the number of visits.

It can be inferred that the travel cost variable has a negative correlation with the dependent variable, number of visits. The findings follow a general theory of economics, where the variable costs will have a negative correlation to demand. Therefore, if the travel cost increases to a certain level, the number of visits will decrease along the curve. On the other hand, if there is no cost incurred by visitors to Palutungan Resort or it is assumed that the cost variable is constant, the number of visits has a value of 4.062.

The potential benefits for charging a consumer fee are significant in that it provides the ecotourism site with economic value. From the demand function, this study calculated the individual consumer surplus to be IDR 263,760 per year or IDR 94,878 per visit. The total economic value of Palutungan Resort is about IDR 3,212,601,672 or $232,041. Palutungan Resort contributes this value to the improvement of the local economy. However, Palutungan Resort does not benefit entirely from this value. The total economic value is allocated to the central government (non-tax revenue) and local government (tax revenue), with the remainder of the benefit going to the local communities. The transportation agencies, retailers and fuel station companies also benefit from Palutungan Resort. Regarding the allocation of the benefit, all of the parties should participate in the conservation and preservation of natural resources in Palutungan Resort.

At the implementation level, conflicts of interest invariably exist adjacent to the respective country and local area issues. A seaport expansion proposal to improve the national economy was made in the Hon Mun Islands, Vietnam (Pham and Tran 2001). They estimated the economic value of the Hon Mun Islands in relation to the seaport expansion proposal. Their study inferred an economic value of $8.7 million (Table 4), suggesting that the port expansion proposal needs to be reconsidered. The socio-economic characteristics are indicators to measure the benefit and benefit-sharing within the community (Cusack and Dixon 2006). The benefit of ecotourism sites in developing countries was found to be lower than that in developed countries, because of their different socio-economic characteristics (Raharjo 2002). Raharjo calculated the benefit of Tawangmangu Forest Park to be $7.51 million (Table 4), which was comparable to that in previous studies, and found that it contributed to the local as well as national economy.

Improving the quality of ecotourism sites is believed to increase recreational benefit (Khan 2004), which would in turn increase their contribution to the national economy.

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**Table 4. Previous studies on ecotourism valuation**

| Author       | Year | Method       | Value ($) | Site                          | Country     |
|--------------|------|--------------|-----------|-------------------------------|-------------|
| Pham and tran| 2001 | ITCM, ZTCM   | $8.7 million | Hon Mun Islands | Vietnam    |
| Raharjo      | 2002 | ITCM         | $7.51 million | Tawangmangu Forest park | Indonesia  |
| Khan         | 2004 | ITCM         | $0.4 million  | Margalla National Park | Pakistan   |
| Navvaro      | 2007 | ITCM         | $1.25 million | Mt. Pulag National Park | Philippines|
| Tweredou     | 2012 | ITCM         | $5.8 million  | Kakum National Park | Ghana      |
| Emiriya      | 2013 | ITCM, CS=$94,260,576 |   | Nyanga National Park | Zimbabwe   |
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(He 2008), and such improvements are necessary if the goal of being a superior site at the local, regional and international levels is to be attained (Emiriya 2013). Khan estimated the benefit of establishing and managing MHNP and found its total economic benefit to be $0.4 million based on the various reasons for visiting it. The level of satisfaction is related to the numerous ecotourism activities that are provided within the ecotourism site and its associated segmentation market.

Palutungan Resort was established in 2004, while MHNP was established in 1980 and this difference in the establishment period leads to the latter having a superior consumer surplus to Palutungan Resort. Thus, improving the quality of the site and providing numerous activities would tend to prevent any deterioration in the number of visitors (Emiriya 2013).

The uniqueness of the ecotourism site also plays an important role in attracting visitors. The beautiful scenery of Mt. Pulag in the Philippines incites people to come and generated benefits of $1.25 million. Kakum National Park in Ghana offers its visitors the opportunity to explore a vast tropical rainforest canopy from a suspension bridge and houses the only Canopy Walkaway in Africa (Twerefou 2012). This was the first study to quantify the monetary valuation of Kakum National Park since its official opening in 1994 and its aggregate monetary value was found to be $5.8 million.

Importance performance analysis

Fig. 3 illustrates the importance-performance index for Palutungan Resort based on the visitors’ real experiences (n=50). The IPA analysis reveals that, among the 7 variables that the visitors were asked to evaluate, there are no variables located in Quadrant I, “keep up the good work”. Since the visitors were dominated by students, their evaluation perception tends to be quite outspoken and critical.

The historical, entrance gate and scenery were located in Quadrant II. Visitors felt that the historical and cultural value of the site was not managed well by the operator. The IPA score on the historical value is an expression of the satisfaction level of the visitors, who did not seem to feel that Palutungan Resort has good historical and cultural value.

Cleanliness and service were found to be areas that the management did not include as part of their priorities, since the visitors did not view these items as being particularly important to them and, consequently, relatively fewer resources from the company should be expended in this effort (Liang and JiaYing 2014). Meanwhile, there are two variables included in quadrant IV (surplus area) which are facilities and accessibility. Here, the visitors felt that the facilities and accessibility were good (Safari et al. 2013) in Palutungan Resort.

![Fig. 3. Cartesian Diagram of IPA analysis of Palutungan Resort.](image-url)
Conclusion

There is a growing interest in Indonesia to develop ecotourism as a source of employment and a means to increase people’s welfare and it is seen as a tool to achieve these goals. The central objective of this study was to provide an economic valuation by applying the Individual Travel Cost Method to Palutungan Resort, Gunung Ciremai National Park, for use as a policy input to develop an ecotourism site based on a market approach.

From the socio-economic point of view, the visitors who visit Palutungan Resort were found to be dominated by male students aged 15-25 years old. This finding shows that Palutungan Resort attracts students who desire to experience nature on weekends or during the holiday period and this seems to be common behaviour in Southeast-Asia, where similar ecotourism activities are observed in conservation or protected areas.

The individual consumer surplus was estimated to be IDR263,770 per year or IDR94,878 per visit with a visitation rate of 2.78. The total monetary value of Palutungan Resort was found to be IDR 3,212,601,672 or $232,041. This is a reliable value, since the data survey reveals that the individual cost of travel to Palutungan Resort is IDR 8,000-129,500. The author also provides a comparison with similar studies which found that Palutungan Resort has a smaller monetary value compared to other resorts and that this condition may be explained by its level of attraction and services. Since Palutungan Resort offers scenery, waterfalls, camping grounds and trekking only, which are common in National Park areas, the visitors were dominated by students. From this finding, it is suggested that the ecotourism operator or National Park management should develop alternative attractions in order to incite more visitors to come.

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