

An Assessment of Recreational Value of *Udawattekele* Royal Forest Park

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ABSTRACT. A non-market environmental valuation technique, referred to as Individual Travel Cost Method was used to value the recreational benefits of the *Udawattekele* forest. The estimated total travel cost was regressed against the respective number of visits to determine the demand function for recreational value of *Udawattekele*. The study indicated that the increase of the travel cost has impact on the number of visits to the park. The estimated consumer surplus for the year of 2001 was Rs. 7,905,438 (Rs. 7.90 million). The total income collected at the park entrance during 2001 was Rs. 1,027 million. Estimated consumer surplus indicated that the users of the park gained considerable benefits. Therefore, the park entrance fee can be increased considerably from the present per capita entrance fee, which is Rs. 20.00. This clearly indicates that the present entrance fee is under valued. The optimum entrance fee that can be charged at the gate to get the maximum revenue is Rs. 70.15.

INTRODUCTION

Udawattekele is a unique natural resources to Sri Lanka in terms of its values as recreation, biodiversity, hydrology, environmental services and providing opportunity for educational and research activities. In 2001 more than 20,000 visitors enjoyed resources of the *Udawattekele* and according to the present trend the number is increasing considerably. It reviews that during the last five years i.e. from 1997 to 2001, the total number of local visitors has increased by 62%. Unique ecosystem and their elements will suffer from increased impacts of visitors overuse unless proper management measures are adopted. Even though government spends some amount of money to maintain and develop the park, no quantified information is available on the value of the benefits of this investment. Users of the *Udawattekele* pay an arbitrary fixed admission fee at present. No proper study was done to evaluate whether this is a reasonable figure. Therefore, it is worthwhile to assess from both the government as well as visitors point of view that, visitors pay a reasonable fee against the benefits that they are gaining from the park. Hence the general objective of the study was to assess the recreational value of *Udawattekele*. Specific objectives addressed were to determine the recreational demand of *Udawattekele* for the local visitors, the economic benefit to individual (consumer surplus) from the *Udawattekele* and to formulate necessary policy alternatives (recommendations) to maintain and develop the park.

METHODOLOGY

Study site and sampling

Udawattakele was selected as the study site for this exercise. It is located within the city limit of Kandy. The total extent of *Udawattakele* is about 105 ha. It is open for public from 9.00 am to 5.00 pm. A field survey was conducted to collect primary data. During the survey 180 visitors were interviewed. Out of the completed 180 questionnaires, 13 were discarded due to mistakes during the interview and outliers. Hence the actual sample taken for analysis was 167 visitors. Primary data collection was carried out during April to June in 2002. Secondary data were collected from the records, which were maintained by the park entrance.

Analytical procedure

The visitors of the park were first divided into two categories, namely local and overseas visitors. The overseas visitors have been omitted from the study to avoid the extremes that would come up due to their high purchasing power and other fees charged (visa, transportation, lodging *etc.*) compared to local visitors.

A questionnaire survey was taken amongst visitors to the site. Data was collected on places of origin of the trip, number of visitors, transportation cost, miscellaneous expenses, duration of journey, time spent at site and respondent's monthly income. Total visitors to the park for the year 2001 was obtained from the Divisional Forest Office as secondary data. Based on the survey data, the following steps undertaken to construct a demand curve for recreational value of *Udawattakelle*.

Travel cost estimation

Total Travel Cost = Travel cost + Opportunity cost of time.

- * Travel cost refers to the direct expenses incurred by visitors in getting to and from the site including fares, fuel, fees and other incidentals.
- * Opportunity cost of time is the value of time spent on the journey including time spent at the site (OECD, 1995).

The value of time is calculated by using the following formula

$$\text{Value of time Rs/hr} = \frac{MI}{30 \times 8}$$

MI	-	Average monthly income of visitor
30	-	Days per month
8	-	Working hours per day

Statistical regressions

This was done to test (to explain number of visits in terms of travel costs) the relationship between number of visits and respective travel cost through a linear regression using SAS package.

$$V_i = a + b \text{ TTC}_i + c \text{ INC}_i$$

V_i	-	Number of visits to the site
TTC_i	-	Total travel cost

- INC_i - Individual income
- i - Time respondent
- a, b, c, - Coefficients

Construction of the demand curve

This is to produce a demand curve for recreational value of *Udawattakele*. If the number of visits of the park users can be shown as a function of the "Price" paid, for which travel cost is a proxy, the relationship can be taken as a "demand curve" for the recreational value of *Udawattakele*.

Number of visits with respective total travel costs was used to estimate the demand equation for recreational value of *Udawattakele*. The area under this curve is calculated assuming that the demand is linear between any two points. In absence of an entrance fee, the entire area under the demand curve was considered as the consumers' surplus for recreational value of *Udawattakele*.

RESULTS AND DISCUSSION

Average visitors per month during last five years

During the months February and March there had been an increase of visitors to *Udawattekele* (Figure 1). On the other hand, there had been decrease in the number of visitors during the months October, November and December. This is may be due to that fact that these months are normally considered to be rainy months. During the remaining months of the year, there is almost even distribution of visitors.

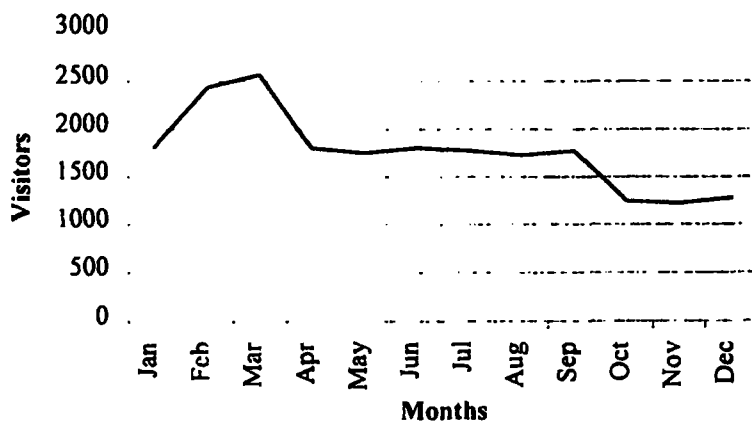


Fig. 1. Average number of visitors per month during last five years.

Demographic characteristics of visitors

Results indicated that visitors during survey period came mainly from seven districts, *Colombo, Gampaha, Kandy, Kegalle, Kurunegala, Matale* and *Nuwara-Eliya*. Most of the visitors were from Kandy (44%) and followed by Matale (23%), Kegalle (14%) and Kurunegala (12%), which were surrounding districts of Kandy.

Age distribution, Educational level and Gender of visitors

A greater number (73 %) of visitors were from the age group of 20-30 years. The balance 21% and 6 % were reported from age groups of less than 20 years and more than 30 years respectively. Results show that the *Udawattekele* has been popularized among the younger generation. Majority of the visitors were with the Advanced Level qualification (68%), while the balance 24% and 8% were with Ordinary Level qualifications or degree holders respectively. When comparing the sexes, the females (55 %) was higher than males.

Income distribution of visitors

Average income level of the visitors is between Rs. 5,000 - 10,000 per month (Figure 2). It shows that *Udawattekele* is more popular among middle income level people. It may be due to the low travel cost to visit *Udawattekele*.

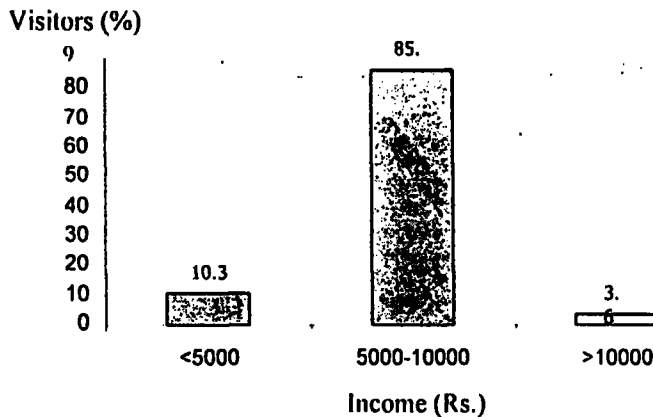


Fig. 2. Income distribution of visitors to *Udawattekele*.

Type of visits

When comparing the type of visits majority (90%) has come only to visit *Udawattekele*. This is because majority of the visitors has come to *Udawattekele* from the surrounding areas. People who have come from long distance have multiple visits (visited *Udawattekele* and *Maligawa*). Visitors from Colombo, Gampaha and Nuwara-Eliya districts indicated multiple visit trips, than single (Table 1). Income, time spend and distance travelled for the trip may be the main factors affecting single or multiple visits.

Demand for the recreational benefits of the *Udawattekele*

According to the analysis of variance, R-squared of the analysis was 0.7151 (71%) and Adj. R-squared was 0.7116 (71%). The modal was significant (Prob.>F=0.0001). There was a positive relationship between the number of visits and the individual income level (Figure 3).

There was negative relationship between the number of visits to the site and the total travel cost. It further showed that the increase of the total travel cost has significantly impact on the number of visits to the park.

Table 1. Type of visits with respect to the district.

District	Sample Size	Number of visits (%)	
		Single	Multiple
<i>Colombo</i>	5	40	60
<i>Gampaha</i>	3	34	66
<i>Kandy</i>	74	95	5
<i>Kegalle</i>	23	87	13
<i>Kurunegala</i>	21	86	14
<i>Matale</i>	38	100	0
<i>Nuwara-Eliya</i>	3	34	66

Individual demand function

$$\text{Visits} = 2.75 - 0.01104 \text{ TTC}$$

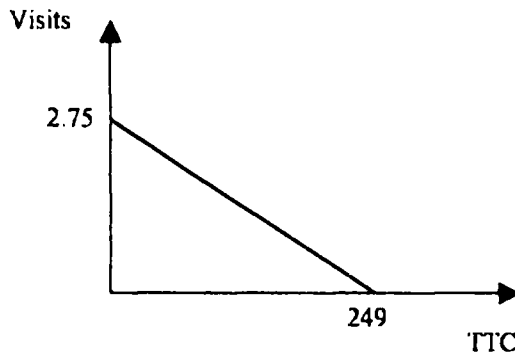


Fig. 3. Individual demand curve between Total Travel Cost and number of visits.

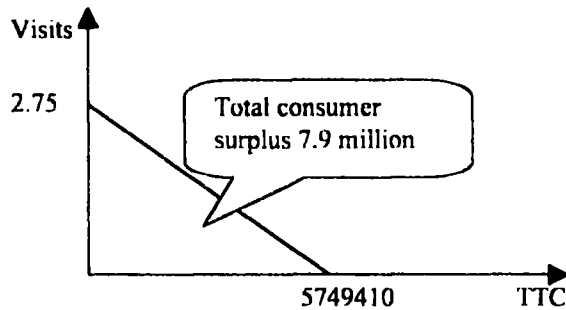


Fig. 4. Market demand curve between Total Travel Cost and number of visits.

The estimated consumer surplus in 2001 was Rs. 7.9 million (Figure 4). This was a relatively high value. It was because, the opportunity cost of time is higher as the visitors spend whole day for the trip. The total income collected at the entrance gate was 1.027 million. Visitors gain much more than their cost. However, this study indicated that the present entrance fee is under valued and there is a possibility of increasing the entrance fee of the park.

Determination of optimum entrance fee at maximum revenue

When the actual individual visits (V) were obtained, the total revenue from individual (TR) can be computed by multiplying V by respective fee (F). Appropriate regression was obtained by regressing visits (V) against the respective fee (F). Then TR was plotted against V to obtain the point which gives the maximum revenue as described by Silva, 1996). Analysis indicated that the optimum entrance fee is around Rs. 70.15 (Figure 5). This indicates that the present entrance fee is under valued and could be increased.

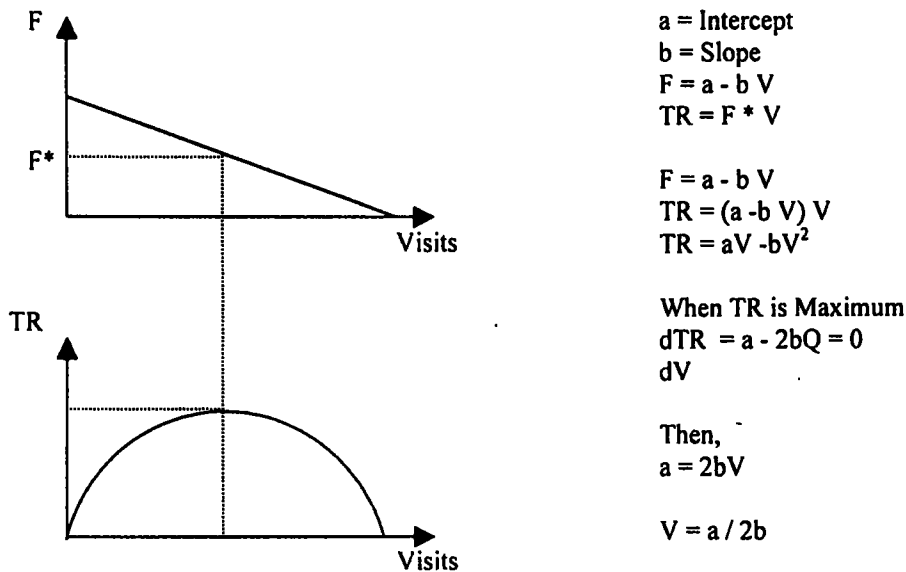


Fig. 5. Optimum entrance fee at maximum revenue.

$$F = 140.25 - 78.06V$$

$$a = 140.25, \quad b = 78.06$$

$$V = a / 2b$$

$$V = \frac{140.25}{2 * 78.06} = 0.898$$

$$F = \text{Rs. } 70.15$$

Rs. 70.15 was the entrance fee which maximise the total revenue.

CONCLUSIONS

The result shows that most of the people from the surrounding areas have visited *Udawattekele*. Majority of the visitors were middle-income group people. According to the age groups and sex, mostly the younger generation (21 - 30 years) particularly the female preferred to visit *Udawattekele*. One of the other significant fact was the visitors educational level. Fairly low percentages of degree holders have visited *Udawattekele*. Majority of the visitors came to enjoy the environment not for mainly educational purposes.

The Estimated consumer surplus in 2001 was Rs. 7.9 million. The total income collected at the park entrance during 2001 was Rs. 1.027 million. The users gain a much higher benefits than their cost. Therefore, Forest Department could extract more rents by increasing prices while providing a better service to the users. This would help to develop the park and to maintain it in an effective manner.

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