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Economic Assessment on Recreational Demand for Sanjay Gandhi National Park, Borivali, Mumbai Using Travel Cost Approach

Nimisha S Narkar, Vinod M Mhaiske *, Vinayak K Patil, Satish S Narkhede and Dipak B Malave[1]

College of Forestry, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth,
Dapoli, Dist Ratnagiri (MS) 415712
[1]College of Agriculture, DBSKKV, Dapoli, Dist Ratnagiri (MS) 415712
E-mail: vinod.mhaiske@gmail.com

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ABSTRACT

The recreational value of tourist sites and attractions is commonly measured using methods used for assessing non-market goods. One of these methods is the Travel Cost Method (TCM). This method is commonly used for assessing the demand for recreational sites. The conducted research studied the recreational value and the demand for recreation in the Sanjay Gandhi National Park, Borivali, Maharashtra State by applying the individual travel cost method. Data gathered in the respondent's survey served from 150 visitors during the month August 2014 to April 2015to determine the visitors demand as a measure of recreational value. The dependent variable in the conducted method is the number of visits in the area and among the independent variables, studied monthly income, age, gender, education level, employment status, travel cost and park value. Findings of the study showed that the number of visits of visitors decreases with increase in travel cost. The estimated coefficients of age and park value were found to be positive whereas the coefficients of education level, employment status, gender, and monthly income of visitors turned out to be negative.

INTRODUCTION

Now a day, the use of national parks for recreational purposes in many countries has increased many fold. National Parks (NP) have an opportunity when we use for ecotourism. The opportunity is to generate money by offering the attractive view of national park resources for the visitors of ecotourism that will provide visitors satisfaction (Ali Yibrie 2011). Most Protected Areas (PAs) are open for tourism and recreation, providing the public with a space to relax and interact with nature (Carey et al. 2000). During the year 2011, the number of Foreign Tourist Arrivals (FTAs) in India reached the level of 6.29 million, registering a growth of 8.9% over the FTAs of 5.78 million in 2010 (MTDC 2013).

There are about 103 National Parks, spread all over the country (MoEF 2015). Maharashtra

contributes about 6 National Parks. Among these, Sanjay Gandhi National Park (SGNP) established in 1983 at Thane District has a spread of over 103.68 sq. km area. This Park is also known as Borivali National Park. It is one of Asia's most visited National Parks with two million annual visitors (www. sgnp.maharashtra.gov.in). The park also holds claims to be largest park in the world located within city limits. It is known for dense forest, vast bird life, butterflies, reptiles, and small population of tigers.

The non-market valuation techniques are increasingly gaining grounds in the forefront of most research work in economics. This is so because some goods and services which readily have some kind of value either do not command a market price or that the market prices of such goods and services do not correctly match the values of the goods or services. Examples of such goods and services include environmental goods and services such as recreation sites (public parks, beaches, zoos, *etc*). Non-market valuation is therefore all about seeking ways to ascribe values to such goods and services which are either not traded in the market or whose prices are not fair reflections of their values (Boardman et al. 2006).

The economics of outdoor recreation deals with the supply and demand for natural resources for recreational purposes (McConnell 1985).Some methods were developed for estimating the economic value of non market environmental goods such as parks and recreation areas in the last 40 years (Veli Ortacesme et al. 2002). These methods may be divided into two groups: direct and indirect methods. The indirect methods rely on the behavior of consumers in related markets to reveal their valuations of the non-market goods, while direct methods use surveys to ask individuals valuations for these goods in a hypothetical market (Smith et al. 1986). Economic assessment of Protected Areas is, therefore, an important source of information both for park managers and for society in general.

The Travel Cost Method (TCM) is the most common indirect method used to estimate the recreational use value of natural areas. This method was initially suggested by Harold Hotelling in the 1930s as a potential means of valuing national parks. Clawson and Knetsch developed Hotelling's approach and used the name Travel Cost Method (Tisdell 1991).

The main focus of this study is an economic assessment on recreational demand for Sanjay Gandhi National Park, Borivali, Mumbai, using travel cost approach.

METHODOLOGY

For study of assessing recreational demand, questionnaire was divided into two separate section.. The first section aims to capture the general information of respondents on the nationality, sex, age, education level attained, annual household income, occupation, number of visit, group size, etc. The second section of the questionnaire included the information on travel cost, travel time, origin of journey, distance, expenses on entrance, accommodation, food, etc. The questionnaire was constructed to be as easily comprehensible as possible and respondents were guided (answers are given in terms of options and they just have to tick boxes).

Total time taken for conducting this exercise was maximum 30 minutes each. Primary data for this investigation was gathered from a sample of on-site visitors at Sanjay Gandhi National Park, Borivali by means of a questionnaire during the month August 2014 to April 2015. Secondary data was a source of information and has been collected through various sources of published literatures and web sites. Availability of limited time, objectives of study and bearing in mind the need to minimize exposure to small sample bias, the proposed work targeted to obtain at least 150 responses for this present investigation.

Travel Cost Method (TCM)

Several methods of valuing environmental goods and services have evolved in recent years. One of them, the travel cost method (TCM) has been used extensively around the world to value public recreation sites with minimal or no admission charges. For assessment of recreational benefit of the SGNP the Individual Travel Cost method (ITCM) is used. Travel cost approach was originated by Harold Hotelling and the

methodology was subsequently developed in the late 1950s and 1960s mainly by Trice and Wood (1958), Clawson (1959) and Clawson and Knetsch (1966). Since then, TCM has been applied for valuing recreation in a variety of circumstances.

The Travel cost method, which used the amount of money and time people spend to reach the site, enabled him to derive the demand for the site. This in turn was used to calculate recreational benefits associated with the site. The regression results of the TCM indicate that travel costs, income, and education are important determinants of the recreational demand of the site. The basic underlying assumption of TCM is that the cost an individual incurs in visiting a site reflects a lower limit of the person's valuation of the site (Dixon et al. 2014).The recreational value of a park is indicated by how many people travel how far to visit it, because the cost of travel is effectively the cost of a visit. The information requested in a TCM survey includes travel costs (petrol, food and other travel-related expenses, time spent travelling to the site and time spent on site), entrance fee, personal motivation and socio-economic characteristics (Ward and Beal 2000).

The data gathered from the survey were adjusted, especially the independent variable of travel costs. The travel cost variable as determined in the model comprised the real travel cost to (and from) the destination and the travel time needed to get to (and from) the destination. For calculating actual travel cost, hourly income is determined on the basis of monthly income data of the respondents. Standard working time hours were taken into consideration, which are 8 hours per 24 hours.

Semi log regression model

In the application of travel cost method different functional forms and specifications of the model have been used by the researchers. In the present study semi log linear specification model have been used with the motive to check sensitivity of the results. The data was analyzed for pattern based on proportions. Statistical tools of Mstat software was used for standard deviation and semi log regression.

RESULTS AND DISCUSSIONS

Demand function for recreational benefits of SGNP

Dependent Variable

The focus of this study was to estimate the demand function for recreational benefits of Sanjay Gandhi National Park of the visitors of the park. The travel cost method treats rate of visitation as the quantity demanded of the demand function. Thus, visitation rate (VR), *i.e.*, number of visits to SGNP in last five years was taken as the dependent variable.

Travel cost

In the travel cost (TC) method total expenditure incurred to make visits to the recreational site is taken as a proxy for the price of the recreational benefits paid by the visitors. Hence, the principal independent variable of concern is the travel cost (TC) incurred by the visitors. The travel cost has been computed as the sum the travel expenses to and from SGNP; the expenses on food and beverages and lodging, entry fee of the park and any other expenses. The number of visits to the site and travel cost are expected to be inversely related. It is clear from figure 1 that the number of visits of visitors decreases with increase in travel cost.

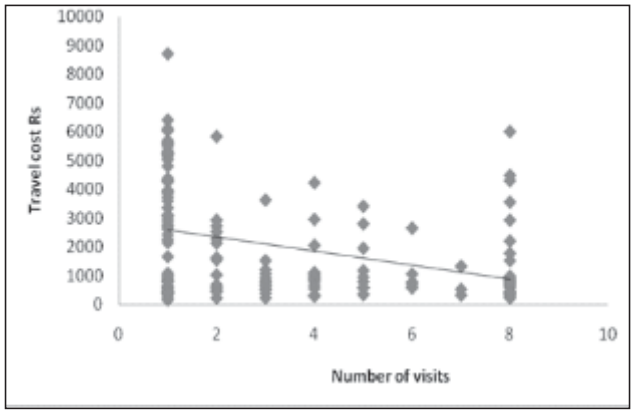

Fig. 1. Scatter of travel cost against number of visits to SGNP

Control Variables

The demand for any good or service depends not only on its price but also on some other factors. Likewise apart from travel cost the number of visits by individuals to a recreational site also depends on some other factors such as their economic characteristics; age, monthly income,

sex, educational attainment of the visitors, size of their households and quality of the site concerned. Hence they are used as control variables which may affect the visitation rate to the park.

Monthly income of visitors

Economic status of the consumers is a crucial determinant of demand for any good or service. The most widely recommended measure of economic status of an individual is his monthly income (MI). Generally higher the per capita income of a household better is its access to such assets. Because large sized households are supposed to possess less of the consumer durables as they have to support more people with the same income. It is reasonable to assume that the monthly income has strong positive correlation with the household economic status or more specifically household per capita income. It was observed from that the economic status of the visitors and number of visits to the park are negatively related (Figure 2).

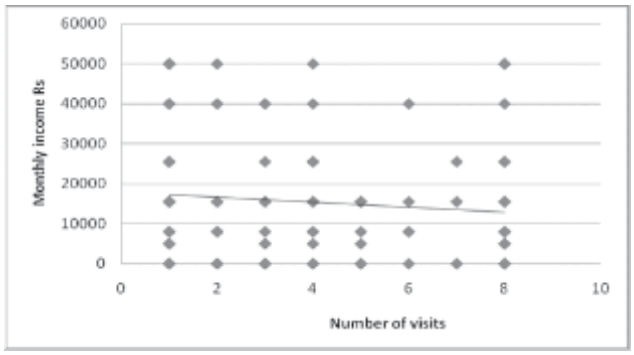

Fig. 2 Scatter of monthly income against number of visits to SGNP

Age of visitors

Age (AG) is an important factor that may affect the rate of visitation by individuals to a recreation site. Hence, age in years of the visitors is also taken into account in this study as an explanatory variable. Age of the visitors may affect the visitation rate both positively and negatively, depending on the nature of the site concerned. It is concluded that there is a positive relationship between the age of the visitors and the number of visit to the SGNP (Figure 3). Number of visits increases with increase in age of visitors.

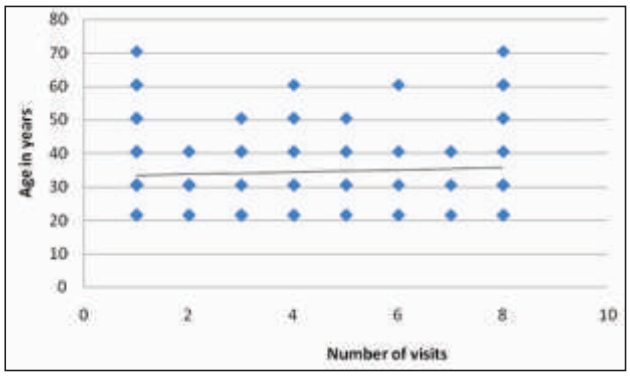

Fig. 3 Scatter of age against number of visits to SGNP

Gender of visitors

Gender (GE) of the visitors is taken as another explanatory variable which may influence the demand for visits to the SGNP. It is clear from figure 4 that there is negative relationship between gender and visitation rate.

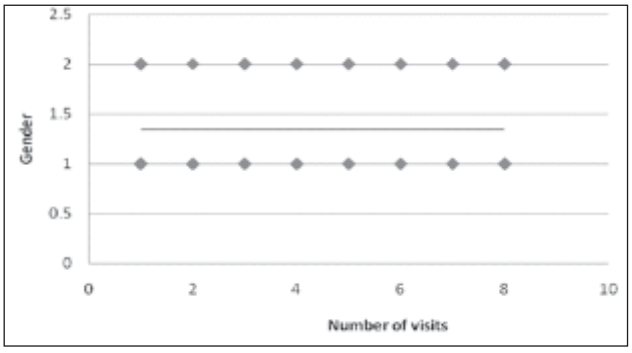

Fig. 4 Scatter of gender against number of visits to SGNP

Education level of visitors

Education makes an individual aware of the existence of environmental amenities and their importance as a source of recreation and other uses. Hence to find out the impact of Education Level (EL) on the demand for environmental amenities of SGNP level of educational attainment (in years) of the visitors has been taken as another explanatory variable. Code was given to Education levels; primary 1, high school 2, college 3, graduate 4, post graduate 5 and illiterate 6. It is concluded that education level has a negative impact on visitation rate (Figure 5).

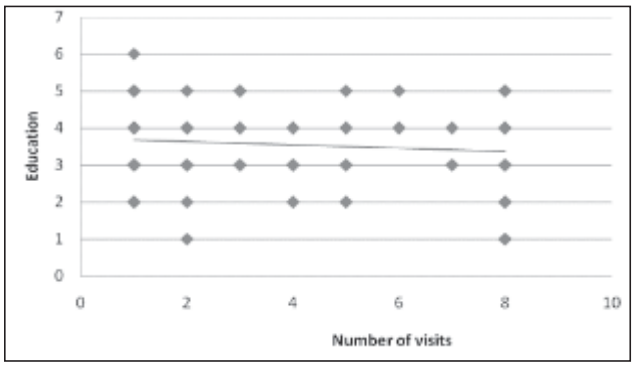

Fig. 5 Scatter of education level against number of visits to SGNP

Employment status of visitors

Employment status (ES) of the individual is aimportant determinant of demand for any good or service. The most widely recommended measure of economic status of an individual is his employment status. Generally employed person have always higher purchasing power than unemployed to such assets. Employment status code was allotted to student 1, employed 2, unemployed 3, pensioner 4, business 5 and any other 6. It was observed from figure 6 that the employment status of the visitors and number of visits to the park are negatively related.

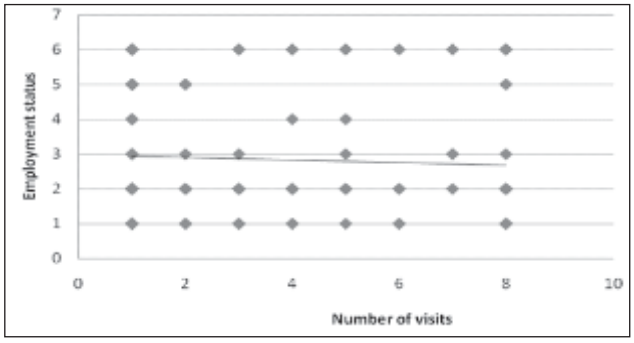

Fig. 6: Scatter of employment status against number of visits to SGNP

Park value

The park value (PV) as perceived by visitors may also affect visitation rate. It is observed that the visitors have some knowledge about the quality of the park. They were asked to report about their perception about the quality of SGNP. This perception about the quality of the park is taken as another explanatory variable and it was grouped into nine aspects. These aspects interviewed to respondents are view in the park, historical significance of park, services/facilities in park, cleanliness and maintenance in park, transport/access to the park, support from forest department staff, sighting of wildlife, visitors guide facility and safety and security of visitors. The opinions were classified as excellent, very good, good average, poor, very poor. The score was given 6 for excellent, 5 for very good, 4 for good 3 for average, 2 for poor and 1 very poor. Based on the total score of the individual visitors on park value, the average of total score was calculated. It is seen from figure 7 that the sign of this variable is positive that is if the visitors know that the quality of the park is good than they will visit more to the park than others who have an opposite perception about quality of the park.

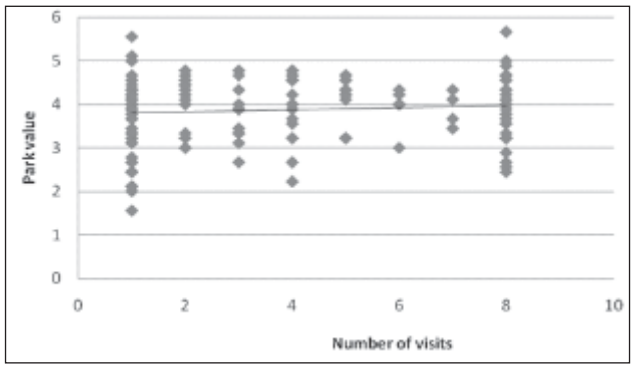

Fig. 7 Scatter of park value against number of visits to SGNP

The Model

Keeping in view of the dependence of visitation rate on the factors mentioned above the recreational demand function for amenities of SGNP can be written as –

$$Vi=f(TCi+MIi+AGi+GEi+ELi+ESi+PVi) \text{ ---- } (1)$$

Where, *Vi* represents visitation rate for the ith individual. Definitions of the explanatory variables are mentioned in Table 1. As mentioned earlier, to estimate the demand for recreational amenities of SGNP semi log specifications of the demand function and methods of estimation have been attempted in the present study. The estimable equation for the semi log linear specification model can be specified as-

$$y = c0 + c1*X1 + c2*X2 + c3*X3 + c4*X4 + c5*X5 + c6*X6 + c7*X7 \text{ ---------- } (2)$$

Table 1. Definition of explanatory variables and their likely impact on visitation rate to SGNP

Sl. No	Variables	Definition	Sign of co - efficients
1.	Travel Cost (TC)	Travel cost + time cost + exp on food + exp on entry fee + other exp	-
2.	Monthly Income (MI)	1-5000, 2 -8000, 3 -15500, 4 -25500, 5 - 40000, 6-50000 (Rs)	-
3.	Age (AG)	Age in years	+
4.	Gender (GE)	1 for male and 2 for female	-
5.	Education Level (EL)	1-Primary, 2 - High school, 3 -College, 4 - Graduate, 5- Post graduate, 6- Illiterate	-
6.	Employment Status (ES)	1-Student, 2 -Employed, 3 -Unemployed, 4 - Pensioner, 5-Business , 6- Any other	-
7.	Park Value (PV)	6-Excellent, 5 - Very good, 4 - Good 3 - Average, 2 -Poor 1-Very poor	+

-Negative, + Positive

The variable of prime concern for estimation of the demand function is Travel Cost, which is used as proxy for price of recreational benefits of SGNP. As seen from table the co-efficient of TC turned out to negative. It implies that higher the amount of travel cost less is the visitation rate or recreational demand for SGNP. This conforms to the usual theory of consumers behaviour as far as the demand for any good or service is concerned.

The regression results of recreational demand for the amenities of SGNP are shown in Table 2.The coefficient of age (AG) of visitors was found to be positive. This implies that old aged people tend to visit more to enjoy recreational amenity of SGNP. Coefficient of the perception about value of the park (PV) has positive impacts on visitation rate. This implies that if the visitors know that the quality of the park is good, then they will visit more than those who think that the quality of the park is not good.

The coefficient of level of education (EL) was found to be negative. This reflects that higher the level of educational attainments less is the desire to enjoy amenity of SGNP and hence lower will be visitation rate. On the other hand, employment status of visitors (ES) has a negative impact on the visitation rate. This is because employed have to feed more people and hence have less capacity to visits SGNP.For Gender (GE) of visitors the coefficient of the variable was found to have negative impact on the visitation rate to SGNP. This implies that males tend to visit more to the park than females. The estimated results also suggest that the monthly income (MI) have negative impact on the visitation rate to SGNP. Higher the monthly income of a household lower will be the access to such assets. The negative coefficient of MI implies that higher the value of the MI, lower will be the visitation rate to the SGNP.

Table 2. Regression result of demand for recreational benefits of SGNP

Sl. No	Variables/Particulars	Coefficient	Parameter	Standard Deviation
1.	Intercept	C0	1.049	0.3075
2.	Age	C1	0.01419	0.003209
3.	Education	C2	-0.09923	0.03646
4.	Employment status	C3	-0.04191	0.02156
5.	Gender	C4	-0.0282	0.07356
6.	Monthly income	C5	-8.8e-7	2.416e-6
7.	Park value	C6	0.08127	0.04828
8.	Travel cost	C7	-0.0002009	1.978e-5

CONCLUSION

The study sought to provide an economic assessment of the current recreational demand for SGNP and to estimate the major determinants of visit to the park using a simple formulation of the TCM with a sample of 150 visitors to the park. Regression analysis established that travel costs, gender, age, education, employment status, monthly income and park value are the most important factors that influence visitation to the SGNP.Present investigation shows that the variable of prime concern for estimation of the demand function is travel cost, which is turned to negative. Explanatory variables were also found expected signs of their coefficients. The estimated coefficients of age and park value were found to be positive whereas the coefficients of education level, employment status, gender, and monthly income showed negative relationship.

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