EVALUATION OF NON-MARKET VALUE OF ROHTAS FORT

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Dedicated

To

My parents,

Brothers and Sisters

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ABSTRACT

This study aims to evaluate non-market value of Rohtas Fort. This study is based on primary data collected from 200 visitors, selected randomly. The data was obtained through structured questionnaire. For analysis Individual Travel Cost Method, descriptive statistics, priority and satisfaction indices were used. Findings revealed that the annual consumer surplus for an individual visitor was Rs. 7781 while the annual total consumer surplus was Rs. 855.92 million. Consumer surplus can be improved up to Rs. 883.32 million per annum if desired improvements are made. The total recreational (use) value of the Fort was Rs. 1150.45 million and this can be increased to Rs. 1177.85 million if desired services are provided. The major influencing factors of visitation frequency were observed as Travel Cost, Household Income, Age, Household Size, Education and sex dummy followed by their respective coefficients as -0.00134, 0.0000035, -0.039, -0.26, 0.087 and 0.63. The satisfaction index value of 1.1 showed that visitors were highly satisfied for museum as compared to other services. Sample visitors reported dissatisfaction for the waste disposal services, with index value of -1.21. Cleanliness is a major problem faced by visitors with highest priority index value of 0.88. Because on findings of the study, it is recommended that the authority should arrange proper waste disposal system. In addition, the authority should solve the problems of renovation and reconstruction, public parks, parking, maps and direction signs in the Fort, which will ultimately add to the value of the forte. After providing the desired services, the authority would have sufficient resources for renovation and maintenance. The authority can use this estimated consumer surplus to find the optimal entrance fee for the Fort.

Chapter 1: INTRODUCTION

1.1. Statement of the Problem

Historic places and buildings catch the attention of local and foreign visitors and play an important role in Tourism industry. Tourism is an important sector of the Pakistan economy (Khan, 2004). Pakistan due to its multiple cultures, customs and traditions of people and landscape has attracted 0.7 million tourists to the country, which counts for almost the double number of visitors to that who were visiting a decade ago (Wikipedia, 2012). Pakistan has a rich cultural and historic past with historic monuments stretching all over the country. These historic monuments and cultural heritage sites attract tourists from all over the world. The Travel & Tourism Competitiveness Report of the World Economic Forum suggests the ranking of Pakistan as one of the top 25% tourist destinations for its World Heritage sites in 2009 (Wikipedia, 2012). These are becoming a capital and a big source of foreign exchange earnings as well as the employment generation source for our economy indeed (Khan, 2004). With the increase in tourism and increasing interests of governments and NGOs in natural resource conservation, non-market evaluation is needed to estimate the value of the benefits of the services provided by environmental as well as cultural resources such historic sites (Khan, 2004). In recent years, the local governments have suggested tourism and recreation as the dominant activity of the region, so there has been a tendency for businessmen and management of the recreational places, to put more weight on the short term direct economic benefits of development over the longer term benefits which are related to recreational use (Iamtrakul *et al.* 2005).

Nature has various use and non-use values and economics cannot incorporate all but some of its values and work out some ways to save its existence. For many ecological and

recreational benefits, there exist no markets to measure its use or non-use values (Konda *et al.*, 2003). They are considered to be of having zero prices and can be used as a public good by many users without paying and most of these cultural and ecological assets have not been yet translated into any market prices so they are external to markets (Mourato and Mazzanti, 2002). The impact of this market failure can be severe. The lack of price to measure the values (or loss of values) of such recreational and ecological benefits brings difficulties for planners and policy makers to incorporate the economic benefits of such precious environmental amenities and cultural heritage. As a result, the value of these natural resources and recreational places is unnoticed and/or un-estimated by both the private and public sectors (Konda *et al.*, 2003).

Even when these environmental amenities and cultural heritage are being marketed in some places, the price (Fee) is not enough for their conservation, restoration, maintenance and development (Khan, 2004). Prices with the name of the entry fee, which are being practiced in some places, are not estimated properly. Usually the price being charged is without estimation or underestimated and does not show consumer preferences for such cultural destinations. Therefore, new methods to evaluate such cultural heritage's services based on users' benefit were introduced. To this end various approaches are used, however, the most popular is the Travel Cost Method (TCM).

Pakistan is blessed with many unique gifts of natural/man made assets, cultural/historical and friendly people (Tourism Development Corporation Pakistan, n.d). According to Tourism Development Corporation of Pakistan (TDCP), such gifts can be seen through the country and the Province of Punjab is also decorated with the same gifts of nature as like the other parts of the country. The geographical features, all the four seasons, historical places and current international and regional developments make Pakistan as well as Punjab the future tourist

destination of the world. Although the present contribution of the tourism sector to the economy is not satisfactory but the TDCP is committed to work for the development of tourism and further suggests that tourism can be developed and promoted multiple times to that of its present situation. Due to TDCP's continuous struggle to develop and promote tourism, a big change in local tourism can be observed and much admiration is received from home and abroad, especially for those developments and activities in which the TDCP is considered to be a pioneer and set trends. Increased tourism will increase the value of the cultural as well as historic sites in Pakistan. This study will also be helpful in promoting tourism through assessing the non-market value of the Fort followed by identifying problems and required improvements in the site.

1.2. The Significance of Study

Pakistan has numerous historical sites attracting local and non-local tourists. Rohtas Fort is the latest heritage site in Pakistan, also included in the World Heritage list, so it was inscribed on the list in 1997 (UNESCO, 1997). A small number of cultural resources are destroyed entirely; many are degrading gradually due to factors such as neglect, weather, pollution, congestion, traffic and encroachment inside these resources (Morey, 1994). According to the officials of the Department of Archeology (Punjab) about 1,10,000 people visit Rohtas Fort (RF) annually from all over Pakistan as well as a large number of people also come from abroad due to its international importance (Department of Archeology, Govt. of Punjab, 2011). Rohtas Fort is ruined mainly due to overuse, encroachment and lack of funds to maintain. No study has been conducted to evaluate the non-market value of the Forts in Pakistan. This study focuses the use value of the Rohtas Fort. Re-constructing the Fort according to the visitors' perceptions about problems, improvement, the use and non-use values of the Fort would get improved.

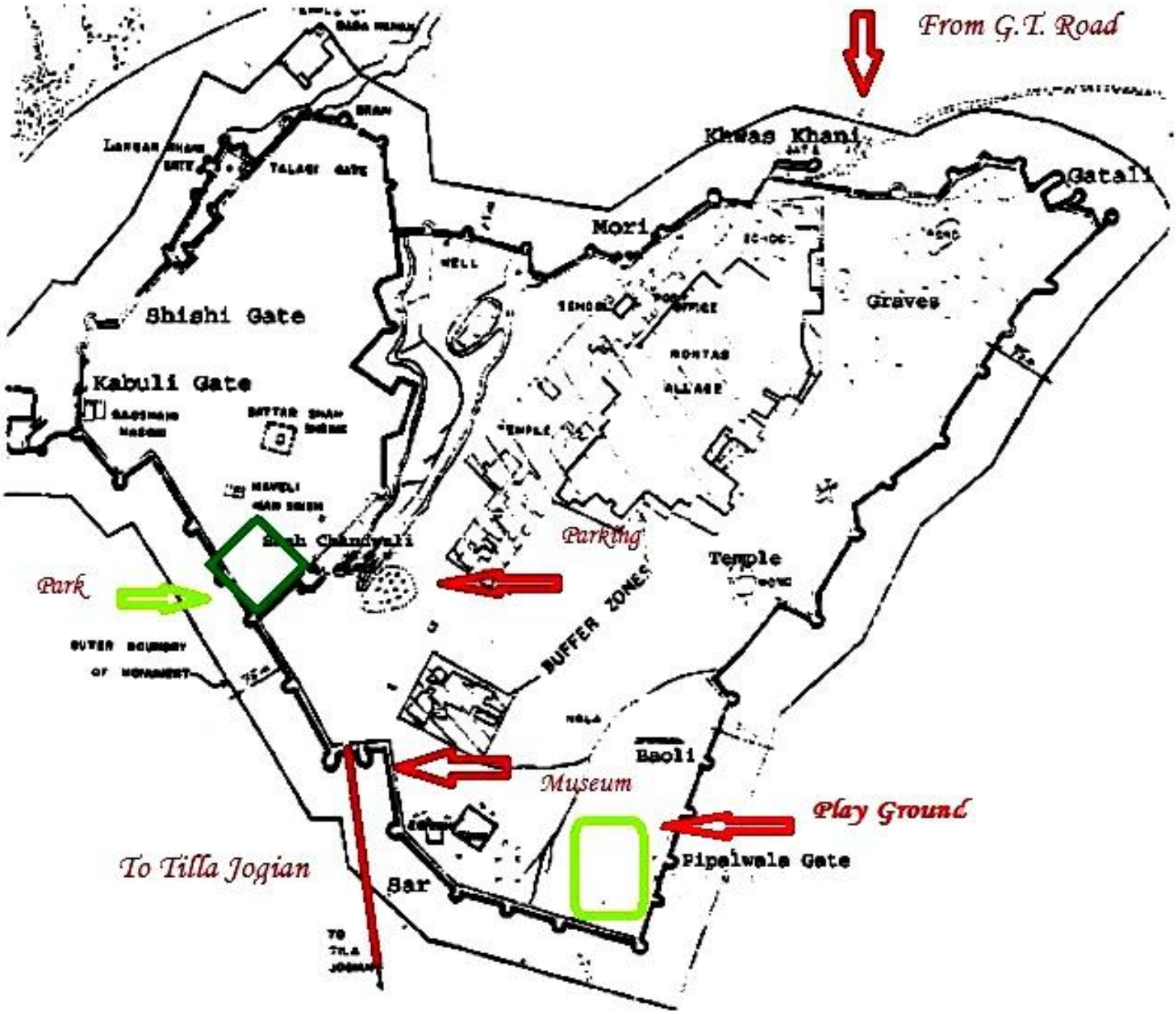
1.3. The description of the study site

The universe of this study is Rohtas Fort which is 100 km to the east of Rawalpindi/Islamabad near Dina (a town). The road to Rohtas Fort turns right from G.T. Road twelve kilometer past Dina. It is an inspiring historical/cultural monument and a recreational site in Pakistan. Afghan ruler Sher Shah Suri (1539-45 AD) ordered to build this Fort to serve as a China wall from those recently defeated Mughal armies and for the purpose of armed operations against Gakkhars (TDCP, nd). This Fort was the sign of velour and strategic importance for the ruler, Sher Shah Suri, who ruled over Sub-Continent only for six years during 1540 to 1545 A.D. Rohtas fort and the Great Grand Trunk Road (GT Road), linking Kabul with Calcutta were the big achievements for the builder as these not only served him but still are serving as a monument and a place to visit for recreation purpose. The castle was later used by Sikhs and Mughal emperor Akbar (Guides2Pakistan, n.d).

Sher Shah Suri was an Indian-born Pashtun, and his rule marked an interregnum in the Mughal control of India. He ordered the construction of both the Rohtas fort and the grand trunk road. The fort's site was strategic because it was situated at the northwestern frontier of the realm, and it was considered as an iron grip against the local tribesmen as well as against the armies of the recently defeated Mughal Emperor Humayun. Construction work on Rohtas Fort started around 1540 and continued for ten years. Rohtas Fort has the outer reaches of 5 kilometers; it consists of ten gates in the wall. The castle was built of ancient ashlars' masonry, and the peripheral wall is 10 to 13 meters wide and 10 to 16 meters high. The majestic Sohail Gate is the official main entrance. In addition, the fort has large and arcaded wells with chambers underneath the ground. The primary fort area, located on high ground in the northwest quadrant of the fortress, consists of a royally mosque as well as the residential fortress of the

Mughal governor, named as Raja Man Singh. In the Indian subcontinent, Rohtas Fort is a significant example of the sixteenth-century fortress building (Wikipedia, n.d).

1.1: Map of Rohtas Fort



Source: Wikipedia (2012)

1.4. Research Questions

The research questions for this study are:

What is the use value of the recreational benefits of Rohtas Fort?

What factors affecting visitation frequency for recreational services of the Fort?

What will be the change in the use value of the Fort if desired improvements are taking place?

What problems, visitors are facing during their stay at the Fort and are they satisfied from the available services of the Forte?

1.5. The universe and scope of the study

This study evaluates the use value of Rohtas Fort in province Punjab (Pakistan), a rich cultural heritage, situated 12 KM south of the Dina city. Issues relevant to the visitor's visitation, satisfaction from recreational services and problems faced by visitors are also assessed.

1.6. Objectives of the Study

The objectives of this study are:

- To estimate the use value of Rohtas Fort.
- To determine the factors influencing visitation frequency for recreational services of the Fort.
- To evaluate the state of satisfaction of the visitors from the recreational services, their visitation frequency and use value of the Fort, if desired improvements in Rohtas Fort are taking place.
- To assess the problem faced by the visitors and their perceptions about the ways to improve the recreation benefits of the Fort.

1.7. Hypotheses

1. The number of visits is inversely related to the visitor's age and it is positively related to households' income.
2. Travel cost and the number of visits to the site are inversely related.
3. Desired improvements in the fort and number of visits are positively related.

1.8. The Organization of study

This study consists of five chapters. First chapter focuses on the introduction of the study, which covers the statement of the problem, the significance of this study, the description of the study area, the universe, scope, objectives and hypotheses of the study.

A comprehensive review of the literature relevant to the issue under consideration is given in the second chapter. Data used and methodology developed for this study is explained in the third chapter. Results and discussions are given in the fourth chapter. The last chapter is based on conclusion and recommendations based on the results derived.

Chapter 2: LITERATURE REVIEW

2.1. Introduction

The chapter contains review of studies conducted on the valuation of recreational sites. The results and the methodology used in their respective studies are briefly mentioned in the review. The Last portion of this chapter includes the contribution of this study towards literature.

2.2. The review of previous studies conducted

Everitt (1983) found a minimum value for the recreational benefits of the Kauaeranga Valley, Coromandel State Forest Park using Zonal Travel Cost Method. The sampling method used in the survey was non-random. The minimum value derived for the recreational return was $100,000 /yr (1981, 3rd-quarter terms). Assuming this minimum return to remain constant for at least coming 20 years, the Valley's minimum value as a recreational resource is US $ 1 million at a discount rate of 10%. Value of travel time is assumed as zero in the benefit estimate of the study.

Durojaiye and Ipki (1988) studied three urban recreation centres in Nigeria – Agodi Gardens and the University of Ibadab Zoological Garden (U.I. Zoo), both located in Ibadan; and Luna Amusement Park, Lagos. Ibadan and Lagos are important cities in Nigeria. Ibadan was the hub of commercial activities in the Western Nigeria, and Lagos is the federal capital. Both cities have inadequate recreational facilities. TCM was used to find the recreational value as outlined by Clawson and Knestch (1966). Data was gathered between June and October 1983 as households left the park. The study estimated four forms of the equation: linear, quadratic, exponential, and log linear equation, presenting the results of the quadratic form only as it gave the most conservative, that is minimum value estimates. Thus, values were “at least as high as”

that provided by this functional form. The study made an attempt to include travel time and when included, the coefficients of average expenditure per trip for all centers except Agodi Gardens are smaller. The study found that the demand for recreational use of the three centers was price inelastic. The total consumer benefits for Agodi Gardens were US$ 352.12 and the consumer surplus per visitor was N 1.57 (US$ 0.01) and N 1.36 (US$ 0.01) for adults and children respectively. The non discriminating monopolist value estimated for the center in 1982 was US$ 81.42. That was the maximum amount that could have been collected as entry fees if fees of N 2.40 (US$ 0.01) per adult and N 1.20 (US$ 0.01) per child were charged. With these entry fees, however, only 3,113 adults and 4,814 children, or 20 % of the actual number of adults and children that visited the center that year, would have visited the center. The U.I. Zoo generated total consumer benefits of US$ 2949.28 and consumer surplus per visitor of N 2.18 (US$ 0.01) and N 1.49 (US$ 0.01) for adults and children, respectively. Luna Amusement Park generated total consumer benefits of US$ 7046.73 and consumer surplus per visitor of US$ 0.06 and US$ 0.02 for adults and children, respectively.

Maille and Mendelsohn (1993) used the travel cost method to estimate the value of preserving the remaining tropical forests that provide ecotourism in Madagascar by foreign tourists. The researchers conducted their survey in the Beza Mahafaly Special Reserve, a protected forest of about 640 ha in southwest Madagascar. The study measured the overall value of ecotourism in Madagascar. This was due to the fact that foreign tourists usually visit multiple sites upon reaching a distant country. The study used the ZTCM with both a linear and the inverse log models. The results from the inverse log model outperformed the linear model in the matter of higher R^2, and the fact that the coefficients were more significant. The consumer surplus was estimated by integrating the average airfare of each country and the airfare that

would drive visitation to zero. The airfare that would drive visitation to zero in the linear equation was US$ 2,241 and US$ 2,097 in the inverse log equation. The average consumer surplus per person per visit was $349 for the linear model and US$ 265 for the inverse log model. The resulting average value per visitor was between US$ 276 and US$ 360. They concluded that Madagascar could raise its fees substantially in light of foreign demand.

Navrud and Mungatana's (1994) valuation of flamingo viewing in Kenya was one of the milestones of non-market valuation in the developing world. The study consisted of a survey of a random sample of 185 visitors to Laku Nakuru National Park in Kenya, a protected area that serves as a bird sanctuary and supports 1.4 million flamingos. The researchers interviewed 58 Kenyan residents and 127 foreign visitors to the park. Their questionnaire queried them about their travel costs and asked them some contingent valuation questions. The mean observed value per visitor per day was between $68 and $85 for the Kenyan residents and between $75 and $79 for non-resident tourists. The contingent valuation exercise yielded a willingness to pay (WTP) for a higher entrance fee for park management of $53.25, a WTP for flamingo protection of $19.44, a WTP for the setup of a WWF flamingo fund of $21.88, and a willingness to accept (WTA) of $86.97 for visiting if there were no flamingos in the park. The statistically significant variables were travel cost, income, education, and age, as well as an additional household income variable for Kenyan residents only.

Othman (2000) used an open-ended C.V. questionnaire with face-to-face interviews to assess the conservation values, especially the total non-use or passive values, of the Matang Mangroves Forest located in Perak, Malaysia. Matang Mangroves Forest has been gazetted as a protected forest since pre-independence days. The forest consists of two forest types – production forest and "environmental" forest. The production forest comprises 80% of the total

forest area. Sustainable logging has been an ongoing activity in the production forest area. The timber is used mainly for the production of charcoal. The environmental forest constitutes some 20% of the forest. This forest is mainly for environmental protection and conservation functions. No amount of logging is permitted in this forest area. The hypothetical situation raised in this paper is that if the management of Matang Forest might increase the production forest area to allow for increased collection of royalties and premium from timber and charcoal production. An increase of 3% in the production forest area may decrease both the environmental forest area by 14% and the number of migratory bird species by 3% while increasing the number of jobs by 5%. The reduction in the environmental forest area can however be avoided if every household in Perak contributes annually to the Matang Mangroves Trust Fund. The mean and median of WTP were found to be US$ 5.21 and US$ 3.07 per year respectively. The study also found that after running an appropriate regression, the WTP was strongly influenced by income and relevant attitudinal variables such as environmental awareness and these variables have the expected signs. The coefficient of age was found to be insignificant. The coefficient for the Malay dummy was surprisingly negative and significant. That meant that the Malays are less likely to agree to pay for the conservation of the Matang Mangroves forest. Othman concluded that this might be because of the income for the Malays is substantially lower relative to their non-Malay counterparts. A profile check shows that the average monthly income for the Malays is US$ 303.99 while the non-Malays are at a higher figure, US$ 730.98.

Maharana and Sharma (2000) raised the issue of the importance of ecotourism in the Khangchendzonga National Park (KNP). The Yuksam-Dzongri-Goechha La trekking corridor is the most popular destination for adventure (trekking and mountaineering) and nature tourism in the eastern Himalayan region. The study also provided the useful estimation of the benefits of the

park besides fuel-wood, fodder and timber so as to protect the critical habitats in this park. They also demonstrated the practicality of developing the WTP functions for managers in estimating the benefits of other environmental values of forests, such as soil erosion and recreation. They adopted the CVM with a random survey of respondents consisting of domestic visitors, foreign visitors and local community members. The categories of respondents were international tourists, Indian tourists and the people living in the area as the local community. The study used a bidding game to elicit WTP, which generated mean WTP of US$ 8.84, US$ 1.91 and US$ 6.20 for foreign visitors, domestic visitors and the local community respectively. When OLS regressions were used to analyze WTP, age, education and income have a significant positive effect on the WTP. This study revealed that the visitors' WTP did not depend upon the benefits they personally would get in preserving the park, but most of them stated that their WTP was to keep the beautiful, unexploited landscape and rich biodiversity of this area intact. Annual WTP was US$ 8,777 for the maintenance and preservation of the KNP when extrapolated to total visitors and the community household, which is a significant sum.

Centeno and Prieto (2000) used Zonal Travel Cost Method (ZTCM) for finding the consumer surplus of four cultural heritage sites of Spain. Consumer Surplus (CS) for the Iberian Organ Festival, Walled ensemble of Uruena, Museum of Burgos and Cathedral of Palencia was estimated as US$ 325.11, US$ 355.73, US$ 1531.30 and US$ 930.56 respectively per year.

McKean and Taylor (2000) conducted surveys at the Lower Snake River reservoirs to measure willingness to pay for outdoor recreation trips and expenditures of recreationists by using Individual Travel Cost Method. The study estimated total willingness to pay of the recreationists at the reservoirs as US$ 31.58 million per year. Total expenses by recreationists were estimated as US$ 61,249,504 per annum. The consumer surplus was estimated as US$ 71

per person per visit. The total consumer surplus per recreationist per year was found to be US$ 596. The total annual consumer surplus for the reservoir's recreation was US$ 243,168.

Turpie and Joubert (2001) used ZTCM to find the consumer surplus and the recreational value of Krugar National Park (KNP), Komati Basin and Crocodile Catchment. The consumer surplus for KNP was US$ 32,588,936.40, US$ 19,879,251.20 for Komati Basin and US$ 7,136,977.07 for Crocodile Catchment per year. The recreational value of KNP was US$ 41,590,710.41, US$ 25,540,442.84 for Komati Basin and US$ 9,156,171.13 for Crocodile Catchment per year.

Khan (2004) found the use value as well as an optimal entry fee of Margla Hills National Park (MHNP) using Individual Travel Cost Method (ITCM). The opportunity cost of time for this study was equal to the full wage. The estimated economic benefits of recreation in the Park were about Rs. 23 million per annum. The consumer surplus was Rs. 32.01 million per year in case of an improved MHN Park. The study recommended charging Rs. 20 per person as the Park entrance fee. The annual monetary recreational value of the MHNP was about Rs. 200 million. The total recreational value was Rs. 209 million per year in the new scenario of improved recreational/environmental quality.

Poor and Smith (2004) used Zonal Travel Cost Method (ZTCM) to find out the consumer surplus and use value of Historic St. Mary's City. The opportunity cost of time for this study was 1/3 of the total wage. The average individual consumer surplus measured ranges from approximately US$ 8.00 to US$ 19.26 for three years, depending on the functional forms used in the study. The total value of recreational benefits was about US$ 75,492 to US$ 176,550 for three years.

Alberini and Longo (2005) estimated consumer surplus using Travel Cost Method (TCM) for four cultural heritage sites in Armenia, named as Haghardzin, Garni, Tatev and Khor Virap. The study did not include the opportunity cost of time. This study takes three scenarios, (i) the previous year's visitation frequency, (ii) the present year's visitation frequency with improved quality of the environment of the sites and (iii) the increased travel cost of 20% visitation frequency. The average consumer surplus was found as almost US$ 53.62 for Garni, US$ 46.30 for Haghardzin and US$ 33.75 for Tatev. The average welfare change related to implementation of the culture enhancing scenario at Garni was US$ 21.62 and US$ 15.74 for the infrastructure enhancement program, and US$ 25.21 for the service oriented program. These were expressed on a per year basis. The total consumer surplus was US$ 6 million per year.

Iamtrakul, Teknomo and Hokao (2005) estimated Willingness to Pay (WTP) and the consumer surplus of three parks named as Saga Castle Park, Kono Park and Shinrin Park using Travel Cost Method. The opportunity cost of time in this study was derived as US$ 9.35 per hour. Willingness to pay for Saga Castle Park was US$ 4.06, US$ 4.69 for Kono Park and US$ 3.72 for Shinrin Park. The value of the consumer surplus for the study was US$ 9.96 per hour.

Pak and Türker (2006) used Individual Travel Cost Method (ITCM) and Contingent Valuation Method (CVM) to find the consumer surplus and recreational value of the Kayabasi Forest recreation site. The study used CVM in three different scenarios. Situation 1: WTP for the current condition of the Kayabasi Forest recreation site US$ 9.888 billion per year, situation 2: WTP for the hypothetical improved present facilities US$ 17.264 billion per year and situation 3: WTP for the hypothetical new facilities US$ 20.232 billion per year. The use value of the Kayabasi Forest recreation site was estimated US$ 442.233 billion per year through ITCM.

Navarro, Paca and Rimas (2007) used Travel Cost Method to measure consumer surplus and the recreational value of Mt. Pulag National Park (MPNP), Philippine. In this study instead of the annual number of visits, the number of days stayed at the site, were added as dependent variable. The mean number of days to stay in the MPN Park was 2.86, and the on site expenses amounted to US$ 9.05 per day. Visitors' annual total recreational value of MPNP was estimated as US$ 1,365,518.37 and the annual consumer surplus was US$ 1140749.39.

Rafiq, Shafiqullah and Malik (2007) used Zonal Travel Cost Method to find the recreational value of the Chitral valley. They made four provincial zones of the whole country (Pakistan) as well as one zone for the entire world's visitors. The consumer surplus was estimated as Rs. 5225190 (US$ 50730) for the year 2007.

Fleming and cook (2007) found the consumer surplus for Lake McKenzie and Fraser Island using ZTCM. The total annual CS for Lake McKenzie was US$ 28,222,691.82 and US$ 218.23 consumer surplus per person per visit. The total annual consumer surplus per person for Fraser Island was US$ 350,862,042.48 and US$ 2,680.20 consumer surplus per visit.

Alvarez (2008) found the consumer surplus, WTP and the recreational value of Los Nevados National Park (LNNP) using Zonal Travel Cost Method (ZTCM) as well as Contingent Valuation Method (CVM). The total consumer surplus of the citizens of the 13 states ranges between a conservative COP 2.2 billion, the equivalent of US$ 1.1 million or about 3 cents per person, to a higher estimate of COP 9.2 billion or US$ 4.6 million or about 14 cents per person per annum using ZTCM. The consumer surplus through CVM was at COP 3.8 billion (US$ 1.9 million). Across all respondents, the average of the maximum reported WTP was amounted as US$ 3.32, which represents a 67% increase in the WTP. The average willingness to pay for

restoration was estimated as US$ 2 per person. The average WTP for restoration elicited was US$ 3.50.

Guha and Gosh (2009) used ZTCM to estimate Consumer Surplus (CS) and recreational value of Sundarban. Sundarban was recognized as the World Heritage site by UNESCO in 1987. Sundarban was selected Ramsar site in 1992. The recreational value of the Indian Sundarban was estimated as US$ 377,000 per annum.

Ahmad (2009) estimated the value of three marine parks in Malaysia; Payar, Redang and Tioman Marine Parks, using the double-bounded dichotomous choice method as well as Zonal Travel Cost Method (ZTCM) and Individual Travel Cost Method (ITCM). While using the ZTCM he estimated the annual recreational value as approximately US$ 17.8 million while the result from the ITCM was about US$ 8.6 million per year. According to the Zonal Travel Cost Method, the average consumer surplus was amounted as US$ 322.69 for each park. The willingness to pay per person to moderate the environmental impact of inland development was US$ 7.68 per visit, which was lower than the willingness to pay to reduce crowding, US$ 10.19. The willingness to pay of foreign visitors was US$ 12.62 which is much higher than the willingness to pay of locals at US$ 6.30. The mean willingness to pay from the Logit model was US$ 22.73 per respondent while the median was US$ 22.28. The elasticity of the three parks ranged between 1.07 and 1.36.

2.3. The contribution of the present study

The aforementioned literature explores that different studies have been conducted in different parts of the world relevant to the issue under consideration but no study has been conducted earlier to estimate the use value of recreation of heritage sites in Pakistan and particularly the Rohtas Fort, so, this study will bridge this gap.

Chapter 3: DATA AND METHODOLOGY

3.1. Introduction

The chapter includes analytical background, sampling design and analytical techniques used to achieve targeted objectives.

3.2. Analytical Background

The traditional quantity price based market demand models are useless to estimate the values of recreational benefits of Cultural heritage. Cultural heritage has public goods characteristics so none market valuation techniques can be used to estimate recreational benefits (Poor and Smith 2004). To find the use value of the cultural heritage site, economists have introduced some methods. Hotelling (1947) proposed the method of travel cost for the first time in 1947, to measure the benefits of any recreation site. After a decade Clawson (1959) and Wood and Trice (1958) used Hotelling's method and did research to find out the use of the travel cost method on different non-market valuation issues (Smith, 1996). Clawson (1959), Knetsch (1963), and later Clawson and Knetsch (1966) further developed the Travel Cost Method (TCM). Clawson and Knetsch (1966) derived a demand curve for a site by using Zonal Travel Cost Method (ZTCM). This demand curve estimated by them was acceptable as a theory. They found a negative relationship between the travel cost and number of visits in accordance with demand theory. Brown and Nawas (1973) and Gum and Martin (1975) introduced a new Travel Cost Model (TCM) based on observation of individual visitors, where the number of visits were taken per period by individuals or households (Khan, 2004), named as Individual Travel Cost Method (ITCM). It includes the expenses that an individual pays to travel to the site as an alternative for the price of such recreational benefits. We can find out three observations on which travel cost

method is based; first the cost of visiting a recreation site is not restricted to admission fee only, the monetary and time cost of traveling to the site is to be incorporated. Second, people from different places bear different costs of traveling to the site. Third, it is assumed that the value of any cultural site does not change with travel distance (Konda *et al.*, 2003). So the travel cost can be used as a proxy for the price so a demand curve can be derived from the recreation site (Lesser et. al, 1997).

This study follows Freeman (1993) for a single site Individual Travel Cost Method (ITCM) model. This study assumes that an individual's utility depends on the quantity of numeraire, total time spent at the site (Rohtas Fort) and the quality of the site. This study also assumes that the duration of the visit fix, so the time on the site can be represented by the Number of Visits (NV). An individual maximizes his/her utility:

Max: U(X, NV, q) Eq. 3.1

subject to the twin constraints, time and monetary:

$$M + P_w.t_w = X + c.NV \qquad \text{Eq. 3.2}$$

and total discretionary time available to the visitor is:

$$t^* = t_w + (t_1 + t_2)NV \qquad \text{Eq. 3.3}$$

Where

X = the quantity of numeraire whose price is one

NV = number of visits to the Fort (per annum)

q = environmental quality at the Fort

M = exogenous income (annual income)

P_w = wage rate (per hour)

c = the monetary cost of a trip to the Fort (Pak Rupee)

t^* = total discretionary time (annual)

t_w = hours worked

t_1 = round trip travel time (in hours)

t_2 = time spent on site (in hours)

The study assumes that NV and q are complementary in the utility function. It means that the number of trips is positively related to the environmental quality of the Fort. This study also assumes that the individual chooses the amount of time spent at work freely and that work does not provide utility (or dis-utility) directly so the opportunity cost of time is the full wage rate. The total travel costs include the opportunity costs of time and monetary cost well as the cost of fuel and maintenance if the visitor is visiting the Fort by his/her own conveyance. This study assumes that the monetary cost to visit Rohtas Fort consists of two types of costs: the entry fee ***f*** and the monetary cost of travel along with the (implicit cost) of time to visit the site $p_w(t_1+t_2)$, **Pw** is the opportunity cost of visit

$$pv = c + p_w(t_1+t_2)$$

$$= f + p_d d + p_w(t_1+t_2) \qquad \text{Eq. 3.4}$$

pv is the total round trip cost i.e. the total monetary cost and the opportunity cost of time. ***c*** is the full price of a visit, which is the sum of entry fee ***f***, ***pd*** is the per km cost of travel and ***d*** is the distance in km as shown in equation 3.4. The distance a person travels to a recreation site shows the implicit price, the visitor is willing to pay to utilize the site. The total cost of travel according to the equation 3.4 is **pv**.

Putting the time constraint (Eq. 3.3) into the monetary budget constraint (Eq. 3.2):

$$M + P_w.t^* = X + pv.NV \quad \text{Eq. 3.5}$$

Maximizing Eq. 3.1 subject to the constraint of Eq. 3.5, the individual's demand function for visits is:

$$NV = f(pv, M, q) \quad \text{Eq. 3.6}$$

3.3. Welfare measure

To find out the use value of the recreational benefits provided by RF, the first demand function of the Fort has been estimated. The value of the services from a recreation site is the sum of willingness to pay (WTP) for these services for all the people on the assumption that their WTP is for use value. The value of the flow of services from the Fort is the area under the compensated demand curve for these services or for access to the Fort, aggregated over all who visited the Fort. This value is divided into the consumer surplus of visitors and the total travel cost of the visitors to visit the site. The consumer surplus indicates the amount that a visitor is willing to pay to enjoy the sites' environmental as well as recreational value. The estimated consumer surplus for an individual making *NV* to the site in a linear form is $CS = \frac{-(NV)^2}{2\beta}$ proposed by Willis *et al.* (1991).

The consumer surplus is

$$CS(p_o, q_o) = \frac{-(NV_o)^2}{2\beta} \quad \text{Eq. 3.7}$$

Here NV for the initial level of quality where q=0

The change in consumer surplus (hypothetical) brought by quality improvement is:

$$\Delta CS = CS(p_o, q_1) - CS(p_o, q_o) = \frac{-(NV_1 - NV_o)^2}{2\beta} \quad \text{Eq. 3.8}$$

3.4. Sampling Design

As most of the visitors visit Rohtas Fort during the spring season so the survey was conducted during the months of February-March 2013. The respondents were selected randomly. Individuals were selected for getting information. However, if there was a family then only one member of the family was selected for filling the questionnaire and the people who were part of the group but from separate families, were selected to fill the individual questionnaire. There are mainly two entry points of the RF but the respondents were approached when they were at ease and also have experienced the whole recreation site, or at least have as much knowledge so that they could answer the questionnaire. The questionnaire (see Appendix-A) was based on the information mainly on travel cost, travel distance (from where respondent decides to visit Rohtas Fort), travel time, means of transportation, age, income of respondent and satisfaction and problems about visitation.

3.4.1 Sample Size

The study uses primary data, collected through the questionnaire. According to the officials of the Department of Archeology (Punjab province) about 110,000 people visit Rohtas Fort (RF) annually from all over Pakistan. The average number of visitors was 200 and 300 on weekdays and weekends respectively. Average per month number of visitors in Rohtas Fort is about 10,000, so this study uses a sample size 200 (1% of the population) for two months field survey i.e. February-March 2013. This sample size is enough and appropriate to use because for such type studies Ahmed (2009), Iamtrakul *et al.* (2005), McKean and Taylor (2000) used sample sizes ranging from 200-250.

3.5. Econometric Model

This study is based mainly on the work of Freeman (1993), Brown and Nawas (1973) and Gum and Martin (1975).

The proposed model is:

$$NV_i = \beta_0 + \beta_1 TC + \beta_2 HI + \beta_3 Ag + \beta_4 HS + \beta_5 Ed + \beta_6 D + u_i \quad \text{Eq. 3.9}$$

NV_i = Number of visits from the individual per year.

TC = Travel cost (in Pak Rs) which an individual bears from residence to the site per trip. This covers the opportunity cost of time spent as well as the monetary cast made for recreation purpose.

HI = household annual income (in Pak Rs)

Ag = the age of the visitor in years

HS = household size (the number of family members)

Ed = years of schooling

D = sex dummy, 1 for male and 0 for the female.

Economic theory suggests a negative relationship for Age (Ag) and Travel Cost (TC) with Number of Visits (NV) while a positive relationship for Household Income (HI) and Education (Ed) the with number of visits. The variables, namely Household Size (HS) and Sex Dummy (D) are expected to have the positive relationship dependent variable as estimated by various researchers (Khan, 2004).

In order to find the visitors' perceptions about improvements in Path ways, renovation/reconstruction and hotels/residences for visitors, respondents were asked what type of improvements they want to see and then a hypothetical demand curve is derived (Khan, 2004).

3.6. Determination of Satisfaction through Constructing Satisfaction Index

To determine the level of satisfaction from the existing facilities in the RF, the following formula was used:

$$I = \frac{2.0 f_{cs} + 1.0 f_{ps} + 0.0 f_0 - 1.0 f_{pd} - 2.0 f_{cd}}{N} \quad \text{Eq. 3.10}$$

I = satisfaction index such that $-2 \leq I \geq +2$,

f_{cs} = the frequency of responses indicating complete satisfaction

f_{ps} = the frequency of responses indicating partial satisfaction

f_0 = frequency of responses indicating the neutral

f_{pd} = frequency of responses indicating the partial dissatisfaction

f_{cd} = frequency of responses indicating complete dissatisfaction

N = Total number of observations = $f_{cs} + f_{ps} + f_0 + f_{pd} + f_{cd}$

In order to find the exact state of satisfaction from the available services provided by the Fort, five-point scale index was developed, which is mentioned below:

Completely Satisfied	Partially Satisfied	Neutral	Partially Dissatisfied	Completely Dissatisfied
+2	+1	0	-1	-2

Closer to +2 values of index shows that visitors are completely satisfied with the particular service and 0 value of the index means the visitor is neutral about it and on the other extreme side when there is a -2 index value then the visitor is showing complete dissatisfaction.

3.7. Construction of Priority Index for visitation problems

To assess the problems faced by the visitor from the existing facilities, the following index was used.

$$I = \frac{\Sigma s_i f_i}{N} \qquad \text{Eq. 3.11}$$

I = Priority Index such that $0 \leq I \geq 1$

s_i = scale value at i^{th} priority

f_i = frequency of i^{th} priority

N = Total number of observations

$N = \Sigma f_i$

Observing the major problems faced by visitors in the Fort were listed and then the priorities of the visitors about these problems were noted. The priorities of the respondents were taken on cleanliness, the availability of maps/directions, traffic/parking, parks/play ground, museum and renovation. Furthermore, the perceptions of the respondents were noted to add value to the Fort.

Chapter 4: RESULTS AND DISCUSSION

4.1. Introduction

The Chapter contains descriptive statistics about the respondents' characteristics the estimation of the TCM satisfaction and priority indices. Problems faced by visitors to the site (Rohtas Fort) are also given in subsequent sections.

4.2. Descriptive Statistics of Respondents' Visitation

According to the table 4.1, on average, the male respondent's visitation frequency was about 6 times per year and the female respondent's visitation frequency was about 2 times per year for cultural heritage sites for recreational purpose, while the minimum frequency of visitation for males was 1 and maximum was 20 and the minimum frequency of visitation for females was 1 and maximum was 5. The survey data of the study of Alvarez (2008) shows a mean number of annual trips per respondent of 1.05, while the study of Khan (2004) found 9 average visits to the Margla Hills National Park (MHNP). Ahmed (2009) observed 1.27 mean visits in his study.

The mean monthly household income for males is Rs. 41412.33 while the mean monthly household income for females is Rs. 22,450. This high monthly income could be due to the reason that during Feb-May frequency of high income people is comparatively more and also people from far destinations visit during this time period. Minimum household income for the male was recorded as Rs. 5000 and maximum was Rs. 150,000 while minimum household income for the female was recorded as Rs. 5000 and maximum was Rs. 45,000. The average distance of the respondents' place of origin (from where the respondent decides to visit Rohtas

Fort) to the Fort is 35 km. Although the frequency of those visitors is high, whose distance is not more than 15-25 km but this average of 35 km can be attributed to those who visit the site from far flung areas of Pakistan. The minimum distance is found to be 5 km and maximum was 300 km.

The average per trip travel cost is Rs. 2,300 for male and mean per trip travel cost for the female is Rs. 2,850, relatively high due to the fact that the cost of travel includes the monetary cost of travel along with the implicit cost of time to visit the site and in this study the opportunity cost of time is considered to be the full per hour wage of the visitor. The minimum travel cost was Rs. 360 and maximum of Rs. 7108, the travel cost was mentioned by male respondent.

Tables 4.1: Sample Respondents' Recreational Trips, Travel Cost, Distance and Income

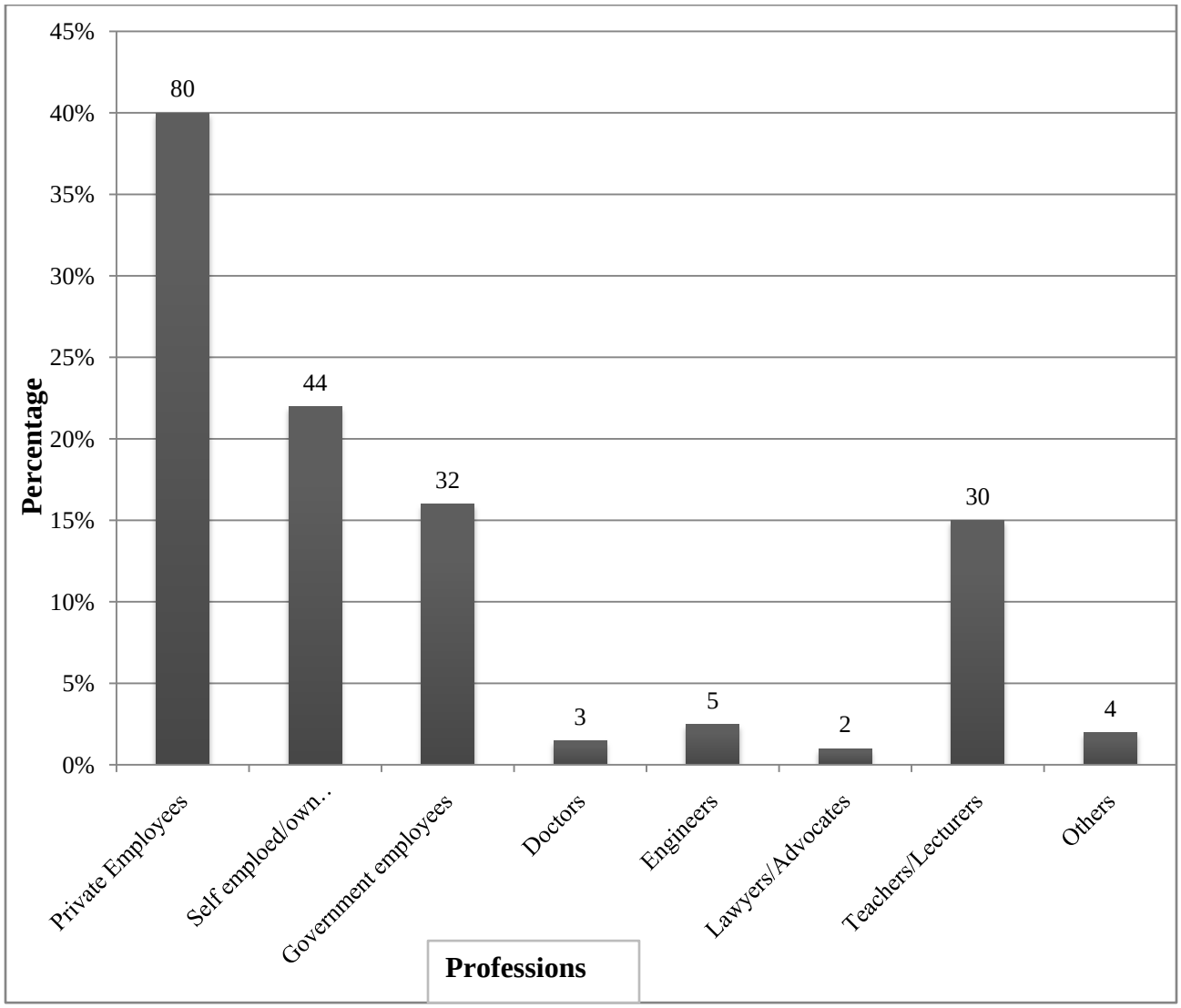
Variables		Mean	Minimum	Maximum
Number of Recreational Trips to Fort	Male	6	1	20
	Female	2	1	5
Per Trip Travel Cost to Fort (Rs)	Male	2300	360	7108
	Female	2850	1000	7108
Distance (KM)		35	5	300
Monthly Household Income (Rs)	Male	41412.33	5,000	150,000
	Female	22,450	5,000	45,000

Source: Field Survey

The figure 4.1 shows that 40% of the respondents were employed in the private sector. The 2nd largest category of sample respondents belongs to those people who were either self-employed or doing personnel business. Government employees, Doctors, Engineers and Lawyers/Advocates accounted for just 21%. As much as 15% respondents asserted to be

teachers/lecturers. This is due to the fact that during the spring season, the frequency of the study tours/visits becomes high.

Figure 4.1: Occupational status of the sample respondents



Source: Field Survey

Table 4.2 defines the descriptive statistics of the sample visitors. During the survey the mean age of the male visitors was found 35.34 years and the mean age of the female visitors was found 29 years, the mean household size was about 5. About 72% of the respondents were male and remaining 28% were female. Out of these 55% were married and 45% were single, 18% were illiterate, 45% of the respondents had primary level education and 20% were matriculate.

Remaining 17% had inter or above qualification. When the sample respondents were asked, "Do you want improvements in quality of Fort?" 78% replied 'Yes' and remaining said 'No'. Again when they were asked how should the funds for improvement be raised? 70% thought that it's the responsibility of the Government to provide funds for improvement in the recreational benefits of the Fort and 30% recommended increase in entry fee as they think that this is the asset of all the stakeholders.

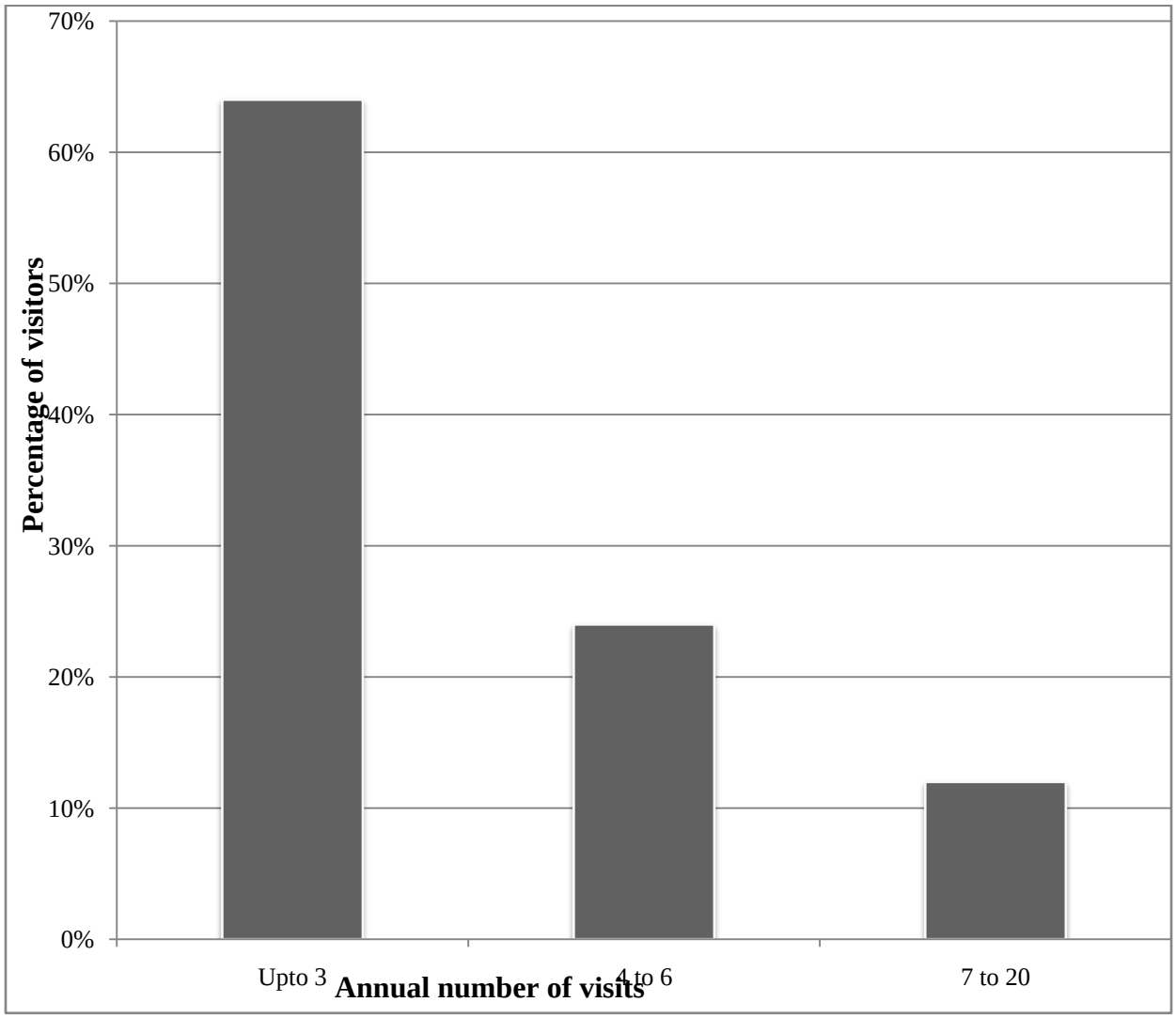
Table 4.2: Descriptive statistics of sample respondents

Indicator description		Statistic
Mean Age (Years)	Male	35.34
	Female	29
Mean Household Size		4.97
Gender: Male Female		72% 28%
Marital Status: Married Single		55% 45%
Education: Illiterate Primary Matriculate Intermediate Graduate Masters and above		 18% 45% 20% 11% 5% 1%

Source: Field Survey

Figure 4.2 shows that 64% of the sample respondents visited the fort up to 3 times annually. 24% of the visitors visited 4-6 times annually and remaining 12% were those who visited Fort 7_20 times including 1 respondent who reported that he has visited the fort 20 times in the last 12 months. The average number of visits was 3 per year which is due to the high frequency of those visitors who visited the Fort less than 3 times a year. The frequency of the visitors who visited 1 time per year is 46 (about 23% of total sample respondents) and those who visited Fort 2 times per year were for 39 (about 20% of total sample respondents).

Figure 4.2: **Sample respondents' annual visitation frequency**



Source: Field Survey

Table 4.3 shows sample respondent's different income groups. 39 % of total sample respondents fall in the income group of less than or equal to Rs. 25000. About 38% sample respondents reported their income in the range Rs. 25000-50000 per month. About 23% respondents reported their income in the range of Rs. 50000 above income.

Table 4.3: The classification of sample respondents according to their monthly income

Income Group (Monthly in Rs)	Number of household	Percent
Upto 10,000	30	15
10,000 to 25,000	48	24
25,000 to 50,000	76	38
50,000 to 75,000	18	9
75,000 to 100,000	12	6
100,000 above	16	8
Total	200	100

Source: Field Survey

4.3. Factors influencing visitation frequency in the Rohtas Fort

First the explanatory variables were tested for multicollinearity (see Appendix-B) and the results shown no multicollinearity issue in the regression analysis. According to the Khan (2004) an absolute value of 0.8 shows possibility of multicollinearity. Again Khan (2004) had 0.47correlations in the data and Ahmed (2009) also had less than 0.39 in his data. The co-efficient of travel cost shows that it has inverse relationship with visitation frequency. In other words as the travel cost paid by visitors to visit Rohtas Fort increases, their frequency of visits will decrease. Thus, we may infer that those visitors who live far from the Fort have less demand

to visit the Fort as compared to those who live closer. The coefficient value of TC is -0.00134 in this study while the coefficient value of TC was -0.13 for Khan (2004), the coefficient value of TC was -0.0000362 for Pak and Türker (2006), the coefficient value of TC was -0.0005 for Turpie (2001) and the coefficient value of TC was -1.287 for Iamtrakul *et al.* (2005). The high income group visited more frequently than those who have the low income which is evident from the positive sign of the coefficient of HI, with the coefficient value 0.0000035 for this study, while the coefficient value 0.034 for Khan (2004) and the coefficient value -0.072 for McKean and Taylor (2000). Household size (HS) and age (Ag) of the respondents have shown the negative relation with the number of visits (NV) while education (Ed) and gender dummy (D) is positively related with NV. The coefficient value of HS for this study is -0.26 while the coefficient value of 0.034 for Khan (2004). The coefficient value of Ag is -0.039 for this study, while the coefficient value of -0.020 for Khan (2004). The value of coefficient for Ed is 0.087 for this study, while the value of coefficient of Khan (2004) was 0.067. The value of coefficient for D is 0.63 for this study, while the value of coefficient of Khan (2004) was 0.21. All of these explanatory variables are statistically significant. The regression analysis with results is shown in the table 4.4.

The value of R^2 shows that about 49% variation in the dependent variable is explained by regression and this is a reasonable R^2 for cross-sectional data (Khan, 2004). In order to find out the best fitting model, models with different functional forms, i.e. linear, log-linear, linear-log and log-log were estimated. The linear functional form was found to be the best fit for this study. Therefore, only linear regression results are given.

Table 4.4: Regression results of the determinants of visitation frequency

Variables	Coefficients	Std. Error	t-stats	P value
Intercept	6.63	0.92	7.13	0.0000
Travel Cost (TC)	-0.00134	0.000162	-8.27	0.0000
Household Income (HI)	0.0000035	0.00000052	6.62	0.0000
Age (Ag)	-0.039	0.015327	-2.55	0.0115
Household Size (HS)	-0.26	0.079396	-3.24	0.0014
Education (Ed)	0.087	0.042248	2.06	0.0406
Dummy (Sex) (D)	0.63	0.358325	1.758021	0.0803
R^2	0.49	Adj. R^2	0.48	
F-statistic	31.14	Prob(F-statistic)	0.0000	

Source: Author's calculation

4.4. Recreational Value of Rohtas Fort

Table 4.5 shows Consumer Surplus and total Recreational Value of the Fort for the year 2013. According to this study the annual monetary value of the recreation for the Fort is Rs. 1150.45 million (approximately US$ 11.70 million). This is the value that the Fort yields every year for the economy. However, this is not the revenue of the Fort. This value is divided into the consumer surplus of visitors and total travel cost[1] of the visitors to visit the Fort. Khan (2004) found the recreational value of MHNP as Rs. 200.1 million and Ahmed (2009), while using the Zonal Travel Cost Method (ZTCM), he estimated the annual recreational value as approximately

[1]The total travel costs include the opportunity costs of time as well as payments by visitors to transportation companies and service providers and fuel and maintenance cost etc. To find out the opportunity cost of the visit, Individual's monthly income was divided by 25 (average working days) and then the answer was again divided by the individual's daily working hours. The answer is the per hour wage of the respondent. This per hour wage was multiplied by the number of hours, the visitor sacrificed for the visit to the Fort to find out the opportunity cost.

Rs. 1751.61 million (US$ 17.8 million) while the result from the Individual Travel Cost Method (ITCM) was about Rs. 846.28 million (US$ 8.6 million) per year. Navarro *et al.,* (2007) estimated visitors' annual total recreational value as Rs. 169.26 million (US$ 1.72 million). Another study by Guha and Gosh (2009) estimated the annual recreational value of the Indian Sundarban as Rs. 37098685 (US$ 377,000). The recreational value is Rs. 1177.85 million (US$ 11.97 million) in the new scenario of improved services of the Fort for an entire year.

This study estimated the total consumer surplus of all visitors for a year as Rs 855.92 million (US$ 8.71 million) for an entire year. Khan (2004) found consumer surplus value for MHNP as Rs. 23.2 million per year and Alvarez (2008) found total annual consumer surplus US$1.9 million for his study. Ahmed (2009) claimed the value of consumer surplus as US$ 322.69 per year for his study. Navarro *et al.* (2007) found US$ 1.13 million consumer surplus for Mt Pulag Park. This is the value of the benefit that visitors gain by visiting the Fort. However, this recreational value does not include non-use value. The total consumer surplus in the new scenario of improved services is Rs. 883.32 million (US$ 8.98 million) per year. The total Travel Cost is Rs. 294.53 million (US$ 2.99 million).

Table 4.5: Consumer surplus, Recreational value and Travel cost

	Travel Cost	Consumer Surplus (in Pak Rupee)		Recreational Value (in Pak Rupee)	
		Actual	After improvement	Actual	After improvement
Mean Per Visitor (Rs.)	2677.54	7781.09	8030.2227	10458.63	10707.76
Total (Rs. in Millions)	294.53	855.92	883.32	1150.45	1177.85

Source: Field Survey

4.5. Respondents' Satisfaction for available Services of the Fort

Table 4.6 shows the satisfaction index of respondents on the five-point scale, regarding available services of the Fort. The sample respondents showed satisfaction for the prevailing services in Rohtas Fort. The highest rank was observed for the museum. The lowest satisfaction was observed for waste disposal as its index value is negative i.e. -1.21.

Table 4.6: Satisfaction index with the ranking for existing services at Fort

Services	Index Value	Ranking in order of Satisfaction
Museum	1.1	I
Information about Rohtas Fort	0.2	II
Parking	0	III
Traffic	-0.4	IV
Food and Beverages	-1.2	V
Waste disposal	-1.21	VI

Source: Field Survey

4.6. Respondents' Perceptions about Improvements in the Fort

In this study the sample respondents were asked to mention their priorities (up to sixth priority) about improvements in the Fort (Table 4.7). The respondents attached the highest priority[2] to Environment/cleanliness as they think that the Forts administration is not providing proper waste disposal services. The sample respondents also showed keen interest in renovation/reconstruction of the Fort as the index value is 0.68, the 2nd largest value. Museum is on the least priority, as it is considered to be satisfactory, indexed as 0.2.

[2] Closer to 1, the index shows the issue is on top priority and closer to 0.00 means the issue is of less priority.

Table 4.7: Priority index with the ranking (about the problems which the visitors may face)

Issues/Improvement head	Index	Ranking in order of priority
Environment/cleanliness	0.88	I
Renovation/reconstruction	0.68	II
Parks	0.67	III
Parking	0.53	IV
Info about RF	0.5	V
Museum	0.2	VI

Source: Field Survey

4.7. The impact of quality improvements on recreational demand

Equation 4.1 and Figure 4.3 presents the linear demand curve for visitation in Rohtas Fort by sample respondent. Negative slope of the curve shows the negative relationship between the number of visits (NV) and travel cost (TC) as hypothesized. Coefficient value of TC shows that with about Rs. 676 change in Travel Cost, there will be 1 decrease in Number of Visit.

NV_o = 7.62 - 0.00148*TC Eq. 4.1

S.E = (0.5285) (0.00014)

t-value = (14.41) (-7.93)

R^2 = 0.24 F-stat = 62.85 Prob(F-stats) = 0.0000

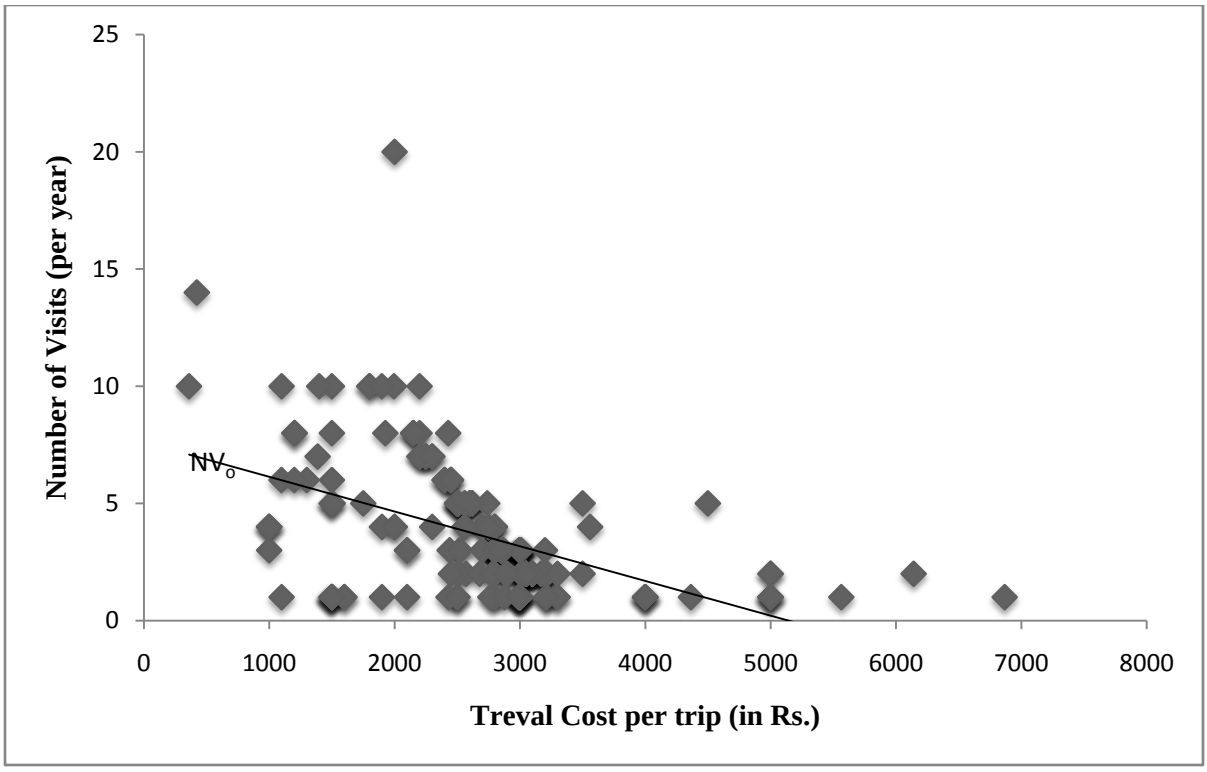


Figure 4.3: Fort Visitation Demand Curve

Figure 4.4 shows two linear demand curves about visitation in Rohtas Fort. The NV_o demand curve of the Fort is the lower curve in figure 4.4. A hypothetical demand curve of the Fort, which is based on improvements in the recreational quality of Fort services, is given by equation 4.2 and is represented by the NV_1 in figure 4.4. To find out visitors' perceptions about quality improvements in the Fort, respondents were asked what type of improvements they want to see in the Fort. Table 4.7 presents details on the type of improvements which were identified and prioritized by the sample respondents. Sample respondents were asked about the number of visits that they would make if Fort facilities improve. This number is used as the dependant variable to estimate the hypothetical demand curve of the Fort. Improvements in the quality of Fort services shifted the demand curve upward to the right. The coefficient value of TC shows that with about Rs. 532 change in Travel Cost, there will be 1 decrease in Number of Visit.

NV_1 = 9.32 - 0.00188*TC Eq. 4.2

S.E = (0.5328) (0.00018)

t-value = (18.21) (-10.01)

R^2 = 0.34 F-stat = 100.2 Prob (F-stats) = 0.0000

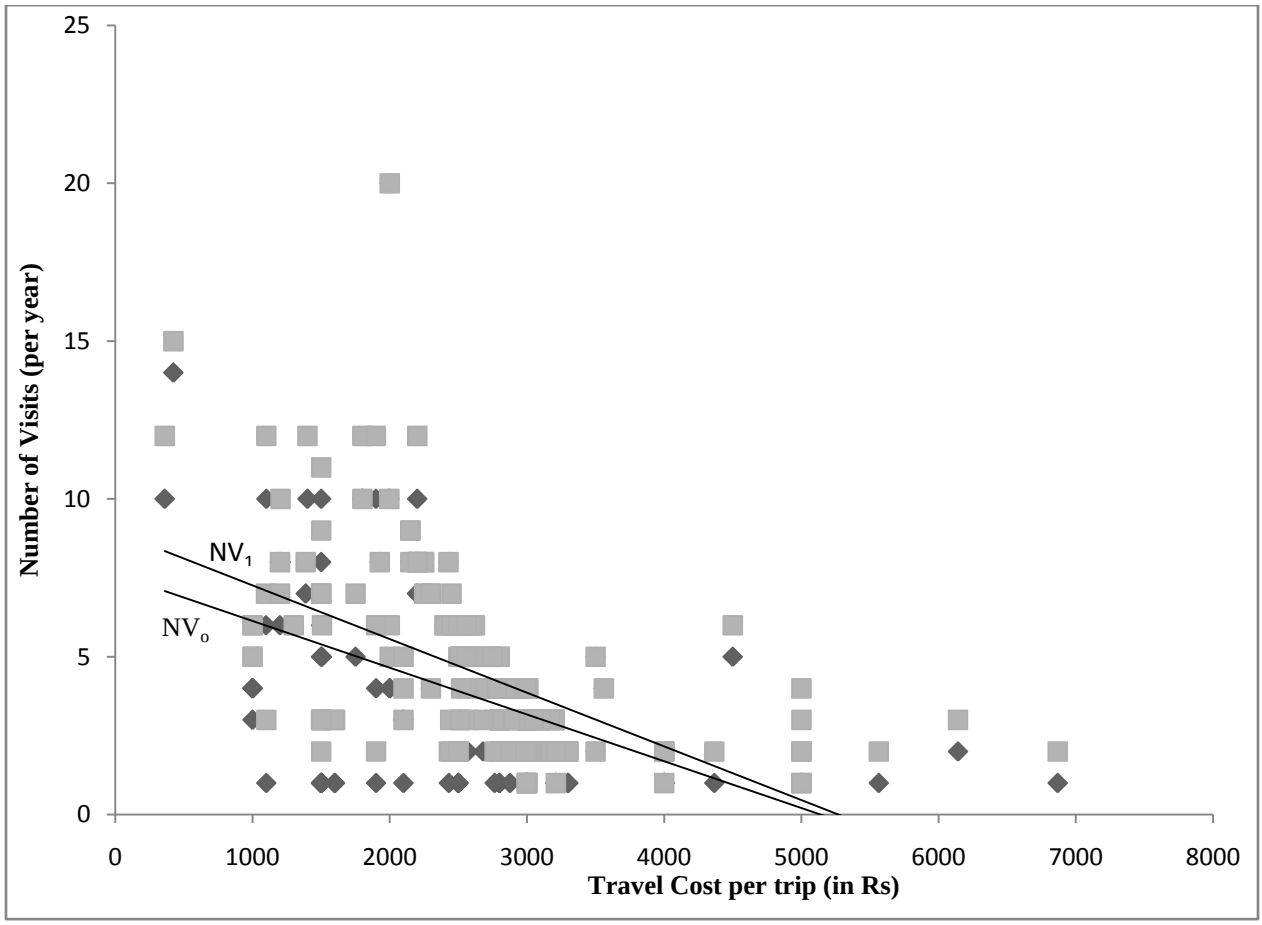


Figure 4.4: Actual and Hypothetical Fort Visitation Demand Curve

The NV_1 demand curve (the demand curve after improvement) is not parallel to the actual demand curve which is due to the reason that the people from far off places (with high Travel Cost) don't respond to improved services as compared to those who are native (with low Travel Cost).

Chapter 5: CONCLUSION AND RECOMMENDATION

5.1. Introduction

The chapter summarizes major findings followed by conclusion and recommendations based on findings of the study. The limitations of the study are also given at the end.

5.2. Major findings of the study

1. The mean annual number of visits to the Fort by sample respondents was 4 while the mean distance of the respondents' place of origin to the Fort, was 35 km.
2. The average per trip travel cost to visit the Fort was Rs. 2677 (it included the monetary as well as the opportunity cost of the visit) by the sample respondents.
3. About 40% of the sample respondents were employed in the private sector and 22% were self-employed. The other 38% respondents belonged to some other professional categories.
4. The mean age of the sample respondents was 35 years in which 72% were male and 28% were female. About 55% of the sample visitors were married and 45% were single.
5. Eighteen percent respondents were found illiterate and remaining were literate.
6. During survey seventy eight percent were in favor of improvements in quality of the Fort and remaining 22% were not. Out of these 78% (who were in favor of improvement), 30% were in favor of increase in entry fee for maintenance and management. Maximum willingness to pay for the Fort's services was Rs. 100 per visit.
7. Approximately 64% of the sample visitors visited the Fort upto 3 times annually and their average number of visits is estimated as 3 visits per annum. 24% of the sample visitors visited the For 4 to 6 times annually.

8. Seventy-eight percent sample respondents had monthly income Rs. 50,000 or less while their mean income was Rs. 41412 per month.
9. The major determinants of the visitation frequency were Travel Cost, Household Income, Age, Household Size, Education and sex dummy followed by their estimated coefficients as -0.00134, 0.0000035, -0.039, -0.26, 0.087 and 0.63 respectively.
10. The annual monetary value of the recreation for the Fort was estimated as Rs. 1150.45 million (approximately US$ 11.70 million) while the total consumer surplus of all visitors was estimated as Rs 855.92 million (US$ 8.71 million) for an entire year.
11. The expected recreational value and total consumer surplus was estimated as Rs. 1177.85 million (US$ 11.97 million) and Rs. 883.32 million (US$ 8.98 million) if the desired improvements taking place in the Fort.
12. The satisfaction index of sample respondents on the five-point scale for the available services at the Fort showed that they were completely dissatisfied from the waste disposal with the index value of -1.21.
13. The priority index about the problems showed that waste was the most severe problem at the Fort with 0.88 index value.

5.3. Conclusion

Employing the Individual Travel Cost Method, the study estimated the total annual consumer surplus as Rs. 855.92 million (US$ 8.71 million) and the total recreational value as Rs. 1150.45 million (US$ 11.70 million), which can be further increased if desired improvements are made. The desired improvements included renovation and reconstruction, waste disposal, food and beverages, public parks, parking, maps and direction signs in the Fort. Furthermore, improved the quality of services can attract more visitors. There existed negative relationship

between the number of visits to the Fort and Travel Cost which implies that with the increase in travel costs people visit the site less frequently and the people with less Travel Cost visit the site more frequently. Household Income, Education, Households Size and gender have shown positive relationship with Number of Visits. The age was found negatively related with the NV. The major problem faced by visitors was waste disposal.

5.4. Recommendations

1. The available facilities are inappropriate and the authority should provide the desired improvements (for example, any public park or children's play land) which will ultimately add to the value of the Fort.
2. Keeping in view the high willingness to pay for the entrance fee, the authority can increase the entrance fee which will add to the revenue generation for the Fort.
3. The authority should arrange the appropriate waste disposal system for the Fort.
4. Keeping in view large amounts of recreational value and consumer surplus the authority should implement renovation/maintenance projects.
5. Visitors from far off places visit the Fort annually so the residence facility like tourist resort should be provided by Fort management or Fort management should allow private sector investment in this regard within or out of the Fort.

5.5. Limitations

1. Due to time and monetary constraints, only peak months (as people from far of destinations visit the Fort during spring and one can obviously consider them a high income group because they spend more than native to the Fort) of the visitation to the Fort, that are February to March, were selected for the survey which may over estimate some of the values.

2. Measuring the opportunity cost of time was difficult. Because the time spent traveling could have been used in different ways, for example, if people enjoy the travel itself, then travel time provides the utility, not a cost, and the value of the site will be improperly estimated. There is no strong consensus on the appropriate measure, the person's wage rate, or some fraction of the wage rate and the value chosen may have a large effect on benefit estimates of the Fort. However, the opportunity cost of time in this study has taken full wage per hour as Freeman (1993) used in his study.
3. Cost-Benefit analysis has not been made due to non-availability of appropriate data. The study also recommends having research over determining the appropriate entrance fee.

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Appendix-A

Questionnaire on Evaluation of Non-market Value of Rohtas Fort

Date:_____/_____/2013 Name:_____

A: General Information about the Visitor

A: 1. Gender of the respondent: (i) Male (ii) Female.

A: 2. Age_____

A: 3. Marital Status: (i) Single (ii) Married (iii) Widowed/Divorced

A: 4. Household Size: _____ (No. of Family Members).

A: 5. Years of schooling: _____Years

A: 6. Income of the household (Rs. /month):

1. Less than Rs. 10000
2. Less than Rs. 20,000
3. Less than Rs. 30,000
4. Less than Rs. 50,000
5. Less than Rs. 1, 00,000
6. More than Rs. 1, 00,000

A: 7. What is your profession? _____.

A: 8. What is your monthly Income (Rs) _____.

B: Visitor's Recreational Behavior

B: 8. How many times did you visit the Rohtas Fort within last 12 months for recreation purposes? _____.

B: 9. How much did you spend on visiting Rohtas Fort today? Rs_____

B: 10. Where do you live?

Name of Place_____

B: 11. If you were not on this trip today, what would you most likely be doing?

(i) Working at job (ii) Shopping/Housework

(iii) Watching TV (iv) Other _____

B: 12. How many hours did you spent at the Rohtas Fort today? _____ hours.

B: 13. How did you come to this Fort? by_____

(i) Tour Bus (ii) Mini bus (iii) Taxi (iv) Personal car

(v) Motorcycle (vi) Public bus (vii) Bicycle

(viii) Other_____

B: 14. How much did you spend on your trip from your home to this site?

Transportation Rs._____ (in case of public transport)

Fuel Rs._____ (if private/own vehicle)

Food Rs._____,

Other Rs._____,

Total Rs. _____

B: 15. Please estimate the time and distance it took you to get to the Fort from your home?

_____hours,_____ km.

B: 16. If you are not from Jhelum, you came to Jhelum for:

(i) Conference attendance (ii) Business (iii) Visiting friends/relatives

(iv) Recreational purpose (v) Travel (vi) Other_____.

B: 17. Would you like to have improved recreational services provided by this site?

(i) Yes. (ii) No.

B: 18. What type of improvements would you like to see? _____.

B: 19. Please specify your satisfaction about the facilities and recreational services of the fort below.

(i) Information about Rohtas Fort:

(a) completely satisfied (b) partially satisfied (c) Neutral

(d) partially dissatisfied (e) completely dissatisfied

(ii) Parking:

(a) Completely satisfied (b) partially satisfied (c) Neutral

(d) partially dissatisfied (e) completely dissatisfied

(iii) Traffic:

(a) Completely satisfied (b) partially satisfied (c) Neutral

(d) partially dissatisfied (e) completely dissatisfied

(iv) Waste disposal:

(a) Completely satisfied (b) partially satisfied (c) Neutral

(d) partially dissatisfied (e) completely dissatisfied

(v) Food and Beverages:

(a) Completely satisfied (b) partially satisfied (c) Neutral

(d) partially dissatisfied (e) completely dissatisfied

(vi) Museum:

(a) Completely satisfied (b) partially satisfied (c) Neutral

(d) partially dissatisfied (e) completely dissatisfied

B: 20. Please prioritize the issues mentioned below for upgrading the recreational services of the fort.

Issues	Prioritize
Info about RF	
Environment/cleanliness	
Renovation/reconstruction	
Parks	
Museum	
Parking	
Others (please specify and prioritize) _____	

C: Visitor's Attitude towards Entrance Fees

C: 21. If Rohtas Fort needs more income to provide better services for visitors, such as improved cleanliness, greater traffic safety and public safety, how should these recreational services is financed?

(i) Raise the entry fees (ii) Donation to Fort fund

(ii) Raise government budge (iv) Other_____.

C: 22. Suppose there were no other sources of improvement except imposing/raising entry fees, would you be willing to pay higher entry fee?

(i) Yes (ii) No

C: 23. (a) If the entry fee were Rs. 20, would you be willing to pay it to visit the Rohtas Fort? (i) Yes. (ii) No. (Go to f).

(b) Suppose that instead of Rs. 20 the entry fee was Rs. 30. In this case would you

be willing to pay the entry fee or not?

(i) Yes (ii) No. (Go to e)

(c) Suppose that instead of Rs. 30 the entry fee was Rs. 40. In this case would you be willing to pay the entry fee or not?

(i) Yes. (Go to f) (ii) No. (Go to d).

(d) Suppose that instead of Rs. 40 the entry fee was Rs. 35. In this case would you be willing to pay the entry fee or not?

(i) Yes (Finished; go to C: 24) (ii) No (Go to f)

(e) Suppose that instead of Rs. 30 the entry fee was Rs. 25. In this case would you be willing to pay?

(i) Yes (finished; go to C: 24) (ii) No.

(f) What is the Maximum amount, you would be willing to pay for the entry fee to this fort? Rs_____

C: 24. If you are willing to pay for improved quality of recreational services in the near future, perhaps you may wish to come to the fort and spend more time for recreation. How many more times would you then be here? _____ visits/year.

Appendix-B

Correlation Matrix

Variable	AG	D1	ED	HI	HS	NV	TC
AG	1.000000						
D1	0.390850	1.000000					
ED	-0.080826	-0.004509	1.000000				
HI	0.037115	0.277163	0.257365	1.000000			
HS	0.157146	0.020324	-0.124376	-0.014515	1.000000		
NV	-0.238460	0.122980	0.316990	0.417722	-0.208788	1.000000	
TC	0.240804	0.044154	-0.172589	0.012139	-0.003970	-0.490867	1.000000

Source: Author's calculations