Estimating the Recreational Value of Hingol National Park Balochistan, Pakistan

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CERTIFICATE

This is to certify that this thesis entitled: **"Estimating the Recreational Value of Hingol National Park Balochistan, Pakistan?** submitted by Chakir Ali is accepted in its present form by the Department of Environmental Economics, Pakistan Institute of Development Economics (PIDE), Islamabad as satisfying the requirements for partial fulfillment of the degree in **Master of Philosophy in Environmental Economics**.

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List of Abbreviations

Following abbreviation are used in this study

CS	Consumer Surplus.
FGD	Focus Group Discussion
HNP	Hingol National Park.
ITCM	Individual Travel Cost Method.
IUCN	International Union for Conservation of Nature.
NP	National Park.
NWFP	North West Frontier Province.
TCM	Travel Cost Method.
WTP	Willingness to Pay.

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Dedication

I would like to dedicate my thesis to my beloved Father and my ideal brother Ahmed Ali

Abstract

This study is a case study of Hingol National Park HNP located in Balochistan province of Pakistan. This study is based on primary data collected from 210 respondents. Data was collected in the month of April, 2018 by a proper questionnaire. The main purpose of the study is to suggest a rise in entry fee for further improvements in the park. Results of this study reveal that recreational value of the park is 11900.92 PKR on average per visitor and total annual recreational vale is 500.35 million rupees. Current Consumer Surplus is PKR 88 per visitor and after the entry fee is raised to PKR 60 with certain improvements in the park, the Surplus increases to 112 PKR per visitor. Total annual Consumer Surplus was 30.96 million after the entry fee it is 50.7 million rupees. Results also reveal that various factors influence the annual visits to the park, such as income, distance, cost of the trip and quality of the park. This study suggests an entry fee Rs.60 per visitor for the park and this entry fee will generate 30 million rupees revenues for the park and can enhance employments in the park for the management and conserving the park.

Chapter 1

Introduction

1.1 Introduction

Protected areas are formed not only to conserve iconic landscape, seascape and offer protection to the endangered wildlife, but these areas also play vital role in the economic life of those communities who are living near by the national parks. These communities, all over the world, depend on the revenues generated through tourism and by fishing in the national parks. These activities are sensitive to changes in climate. Thus, the role of adaptation and mitigation to the climate change becomes critical. (M. Watson et al. 2014).

Like parks, the establishment and management of the protected areas also incur benefits and costs. The costs include operation and management cost of the parks to protect the biodiversity, and the opportunity cost for the local people who benefit from the area and extract resources. While introducing a protected area it must be kept in mind that the costs may not exceed the benefits (Brooks et al. 2004).

1.2 Background of the study area

Hingol National Park (HNP) is the largest national park of Pakistan covering an area of 6,190 km^2 (619,043 hectares). It is located in the Balochistan province and spread over three districts i.e, Gawadar, Awaran and Lasbela. The distribution of land is given as 56% in Awaran, 30% in Gawadar and 14% in Lasbela. The park was established in 1988 and declared as protected area. The name Hingol National Park was put by the name of Hingol River which passes through the centre of the park and falls into the Arabian Sea. Rocks, clay mountain ranges, sand dunes and

beaches are the main morphological characteristics of the land in the park area. These diverse landscape features provide a significant ecological environment to many species of flora and fauna (WWF-Pakistan, 2009).

The park is just 190 km away from the Karachi city. The beautiful view of the sea and the composition of lands like rocks, clay mountain ranges and the sand dunes give an outstanding recreational and educational opportunity to the people of Pakistan. It is the best place for the night camping, wildlife photography, surfing, cycling, hiking, bird watching, relaxation and for those who love mountain climbing. There are also natural architecture structures in the park. One of them is the most famous statue "Prince of Hope" it is a natural rock formation that looks like a prince standing. Another natural rock formation is shaped like a Sphinx. There are three major Mud volcanoes in the HNP. Makran coastal highway passes through the centre of the park which provides a beautiful view of the sea at the northern side and mountains at the south side to the travellers.

1.3 Problem statement

As mentioned above that Hingol National Park provides many services including wetlands, coastal eco-services and desert eco-services. The park is important for its biodiversity, archaeological sites and the recreational sites. Many threatened species of mammals, birds and reptiles are found in the park.

Important and rare animals in the park include Chinkara and Persian Jird. Their population is declining very rapidly. Asiatic Jackal, Pangolin or Scaly anteater**,** Wild Boar, Desert Wolf, Caracal or Bashoshah and common leopard are extinct now and their footprints have been found in different places of the park. The inflow of migratory birds also has been declining including

Houbara Bustard which is in the IUCN red list. One snake's species "Echis carinatus" has been observed which is vulnerable in the HNP (IUCN red list, 2015, Khan et al, 2010).

The desert wolf is found in Cholistan, Tharparkar and in Balochistan. Asiatic Jackal and desert wolf are among the rare species of wolves in Pakistan (Jhala, 2003). Common leopard is categorized in the red list of IUCN in Pakistan (Shehzad, et al. 2012). Ibex is one of the most hunted mammals in Sindh, Punjab and in Northern areas of Pakistan and its population has reached at the threshold level (Rais, et al. 2011, Maan and Chaudhry and Ali, 2008). Houbara Bustard is the most vulnerable in Sindh, Punjab and Balochistan (LEAD-Pakistan, 2014).

The evidence shows that many threatened animals and birds in Pakistan are also present at Hingol National Park as well as other animals and birds. The protection and conservation of these species of animals is very important to all of us to increase the environmental value, biodiversity conservation and scenic view of HNP. This study will be helpful for the conservation of wildlife and better management of the park beside this it will also be helpful for the revenue generating activities like tourism in the park.

1.4 Scope and significance of this study

The study was conducted as a case study of "Hingol National Park" which is located in Balochistan province of Pakistan. This study is based on primary data collected, through a well-designed questionnaire, from visitors to the sites. The specific sites which data was collected are Kund Malir, Princes of Hope, Sapat Beach, Golden Beach and Nani Mandir

The sites are selected because of their richness of biodiversity and variety of ecosystem services. Most of the people go there for the recreational reasons, visiting the historical places, for religious purposes and wildlife watching. This study provides a brief description about the beauty,

environmental importance and economic value of HNP to the environmental economic researchers Pakistan. Major benefit is valuation of the recreational site that will help to formulate the best policies for conservation of the recreational sites and biodiversity conservation. This is the reason that this study will be helpful for the inmprovement in the park, conservation of the eco-services that it provides and for promoting tourism in the park.

Currently, Government of Balochistan is working for the improvement of recreational services to promote tourism in the province. Results of this study will be useful for the Tourism Department of Balochistan for the management and improvement of the HN Park. The results of the study can serve as a guide for setting up revenue generation activities in HN Park.

1.5 Research Questions of this study

Following research questions are addressed in this study

Q. 1 What is the recreational value of Hingol National Park?

Q.2 What is the potential for annual revenues and visitor's attitude after suggesting an entry fee?

Q. 3 What will be the effect on the visits after the improvements?

Q. 4 How much the visitors are willing to pay for the conservation of the biodiversity of HN Park?

1.6 Objectives of the study

1. The basic and primary objective of this study is to calculate the recreational value of the Hingol National Park (HNP). For this purpose we need to estimate the demand function for the recreation services provided by the park and calculate the consumer surplus (CS).

2. To estimate optional entrance fee for the park.

3. Suggest measures to improve the quality of the services provided in HNP.

4. To examine whether the improvements can increase the demand for the services provided by HNP or not.

1.7 Organization of the thesis

The study is organized in six chapters. First chapter consists of introduction, problem statement, significance and scope of the study, research questions and objectives. In the second chapter there is thematic literature on national parks like national parks and conservation of biodiversity, national parks and livelihood of the people, national parks and tourism and the last theme is valuation of non-market good including national parks. In the third brief description about the demographic and biodiversity of the HNP is given. Fourth chapter of this study is the research methodology which includes theoretical background of the research methodology, econometric model and sample size and data collection. Descriptive statistics and results of the models are discussed in chapter Five. The final chapter includes conclusion and policy recommendation.

The questionnaire is in the appendix A. Appendix B reports tables of the frequency distributions and the pictures of the field survey are in Appendix C. Appendix D contains the econometric results of the models.

Chapter 2

Review of literature

2.1 National Parks and Conservation of Biodiversity

National parks and protected areas represent the only most valuable method of conserving biological diversity worldwide, protected areas conserve many of the world's natural habitats and species (Brandon and Wells 1992). Globally National Parks are known as the most wide-ranging type of protected areas. They are classified under the category II[1] of the IUCN categories of protected areas.

National Parks are created for the protection of the ecological honor of one or more ecosystems for present and future generations, to avoid exploitation or occupation damaging to the purposes of designation of the area and to provide a foundation for spiritual, scientific, educational, recreational, and visitor opportunities, all of which must be environmentally and culturally well-matched (Chap et al, 2003).

The area covered by National Parks and protected areas worldwide is 23 percent. There are two approaches for the conservation of biodiversity in National Parks; preservation approach is one approaches, which aims to exclude human activities from the National Parks except for tourism.

[1]Category II;"Large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area, which also provide a foundation for environmentally and culturally compatible spiritual, scientific, educational, recreational and visitor opportunities".

This approach prevents the people from the direct use of natural resources in the park for commercial or survival purposes. This type of approach is often known as the "protectionism approach". The main purpose of the preservation approach is to exclude such human activity which may go contrary to the objectives of conserving biodiversity in National Parks. Till 1980s the preservation approach was the most dominated approach (Muhamuza and Balkwill, 2013).

But now this approach is substituted by the second approach; called the community-based conservation approach, which permits the people (especially those in the vicinity of the National Parks) to benefit socially or economically from parks (Muhamuza and Balkwill, 2013). The community-based conservation approach was proposed to address the problems resulting from the exclusion of human activities from the park. The community-based conservation approach let the people living in the vicinity of the to benefit from the park and also involves initiatives aimed at conserving biodiversity in the park (Stolton et al, 2010).

There are many examples of the community-based conservation of the national parks. For instance, in Pakistan communities were involved in the management of wildlife conservation and given incentives (hunting fee) for the conservation of Markhor through the Trophy Hunting Program in NWFP, the program was successful for the conservation of Markhor, which converted the number of Markhor from extent to excess animals (Ali, 2008). Also in Uganda, there is an agreement with the nearby community of the Rwenzori Mountains National Park to access the specific resources from the Rwenzori Mountains National Park for subsistence (Mugisha, 2002).

Similarly, in Cameroon, the community living near the park were given money for infrastructural development, such as in development initiative and integrated conservation in Korup National Park (Malleson, 200). In Benin local community is given a percentage of revenues generated by the tourism of Pendjari National Park (Vodouhe et al, 2010).

Despite the application of these approaches, the results of Global Outlook 3, the Secretariat of the Convention on Biological Diversity published a latest report which show that biodiversity loss from protected areas still continues. The report shows that the targets agreed upon by the different countries of the world in 2002 have to reduce significant loss of biodiversity at national level but also on global, regional had not been met by 2010 (Vodouhe et al, 2010).

A major reason of the failure of protected areas is the human land expansion and intensifying of the land surrounded by the protected areas, which results in the change in biodiversity and ecological function within the protected areas (Hansen and Defries, 2007).

Although currently community with in the HNP is involved for the conservation of the wildlife but, they are doing it voluntarily. This study will provide a platform for the community to participate more for the conservation of wildlife.

2.2 National Parks and the Livelihood of the People

Although there is a contrast in the literature that national parks help the communities in the vicinity of the Park and parks have negative impacts on the livelihood of the communities. In majority of the cases, national parks affect the livelihood of the people and the objectives for the conservation of the biodiversity are not fulfilled (Walpole and Goodwin, 2001). That is because most people around the parks are below the poverty line and their livelihoods depend on natural resources in the parks (Mugisha, 2002).

Hence the local people living near the parks are the threat to the forest and wildlife. The main concern of the park authorities in developing countries have been a reduction of human interference in the parks. So, people have been displaced from their places and denied access to the park resources such as hunting, fuelwood and food products, which has, in turn, increased the economic insecurity for the several social groups and caused extreme hatred towards the official conservation measures (Ghimire, 1994).

For instance, in the case of Terrestrial Park and Nosy Antafana in Thailand, people were displaced from their places and prohibited in the parks which caused damages to the resources of the parks (Ghimire, 1994). A similar case is with the African National Parks. This problem can be sorted out, if the park authorities take the following measures (a) Creation of the Park in an Area with High Levels of Biodiversity and Not Degraded (b) Clear Communication Channels between Park Staff and Leaders of the communities (c) Must take into account the ecological factors in the area where the park is to be established (d) Park staff must be given good salaries (e) community in the surroundings must be given incentives (f) neighboring people must be engaged in other economic activities (g) education and awareness must be given to the people about the conservation of the biodiversity (Muhumuza and Balkwill, 2013).

2.3 National Parks and Tourism

Tourism is on of growing industry specially nature based in the developing countries, which is reliant on the characteristics of the natural based environment and particularly it is taking place in national parks (Eagles, 2002). National parks are the most important destination for the tourists, national parks and have been protecting the valued landscape and the biodiversity since 1800 (Timothy, 2000).

National parks are made for the preservation of biodiversity, cultural heritage and for the protection of valued landscape but there is also a cost for the preservation of the natural resources. The existence value of the resources must be compared with the economic cost of conservation and the opportunity cost of using the land for this purpose (Turner, 2002).

Not only the developing countries but also developed countries face the problem of managing the national parks on limited budgets (Lindberg, 2001). To overcome this issue national parks are the best option for tourism, funding and revenue generation (Hayes, 2006). In Netherlands, Saba Marin National Park generated 9% revenues through the tourism between 1993 and 1995 (Dharmaratne et al. 2000).

There are many examples of national parks and the revenue they generated from tourism and benefits to the local communities also (Buckley and Panell, 1990). If revenues generated by the national parks are used to hire local people as regular park staff or as contractors, such as for infrastructure development, then parks can benefit local communities and generate their support for the conservation of the biodiversity, this shows that tourism is not one benefit from the national parks, but it is also a source of revenue generation for them (Lindberg, 2001). Such initiative for the alternative land use shows an important role of tourism as the best choice for the revenue generation associated with the conservation of biodiversity (Eagles, 2014). Hingol National Park is a place for recreation and adventure. Proper management and tourism activities will generate employment for the people within the park and revenue generation for the better management of the park.

2.4 Valuation of the Non-Market goods

Travel cost was first introduced by Harold Hotelling in 1947, in his study he checked the relation between the trips of visitors to a park and the travel distance that they cover to reach the park. He concluded that higher distance causes decline in the number of trips to the recreational sites, which is the basis of economics of the demand for a good from this relation we can derive a demand curve for a recreational site and this demand curve would be helpful to estimate the total benefits provided to the visitors, these benefits will be equal to the entry fee and other recreational benefits or the consumer surplus for the visitors (Hotelling, 1947).

Further many improvements were done to the Travel Cost Method. Clawson and Knetsch (1966) introduced Zonal Travel Cost method. It describes that the demand for a recreational site can also be derived by the zonal travel cost method and these zones are divided according to the demography or by the socio-economic characters of the people to the site (Clawson and Knetsch 1966). Gum and Martin (1974) further introduced another method “Individual Travel

Cost Method (ITCM)" this method is based on the individual or a household that visits a site in a particular period of time and enjoy the benefits from the site.

There is an increasing trend in the literature body of valuing the non-market goods and services (Environmental Goods) to calculate their economic values which don't prevail in the goods market. Douglas and Taylor(1998), introduced an alternate Model for the Travel Cost Method that there should be a total expense model for calculating the cost which visitors bear for a trip. But they didn't mention the total cost that what type of costs should be introduced in the Travel Cost Model.

By violating the assumption of travel cost method that recreationalists visit one site and go back to their homes, John et al, (2000) calculated two consumer surplus one by primary trip and other by the multi-purpose trip his results show that multi-purpose trip givesas more accurate results than primary trip visit. Multi-purpose trips are more valuable due to joint consumption of the trip.

Instead of wage and leisure, the opportunity cost of time must be included in the Travel Cost Method. Higher values of consumer surplus encourage the Government for the conservation of the national parks (Christopher and Averil, 2007). Addressing these flaws in Travel Cost Method and some other issues like Opportunity cost of time, total expenditures during the journey, travel time, multi-purpose trips, site qualities and congestion, Ana and Luis(2000) calculated the economic value of the historic and cultural heritage of the Castile-Leon region in Spain. They divided the region into four zones and total consumer surplus calculated for four zones is €1163200.

Higher the travel distance lower will be visitation rates despite the good transportation system. Consumer visitation rate not only depends on travel cost but also substitute site will also affect it (Ana and Luis in 2000). In most of the literature only the expenditures which are in the basket

of goods of a consumer are taken into account but ecology and environment are not taken into account, Counting the ecology and environment M. Pirikiya calculated the consumer surplus US$ 12.53 and recreational value as US$ 52,558 for the forest park in Iran using the travel cost method (M. Pirikiya et al, 2016).

There are other methods e.g. Contingent Valuation Method (CVM) for calculating the economic values of the non-marked goods and services which do not prevail in the goods market. J. Walpole (2000), calculated discriminatory entry fee between the local communities and foreigner visitors to the Komodo National Park in Indonesia using the contingent valuation method he concluded that higher entry fee lessons the visitation rate (J.Walpole et al, 2000). There must be first-degree discriminatory fee in the parks high prices for the foreigners to cover the marginal damages like social costs and small spillover effects on the surrounding areas which are done by the local visitors (Alpizar, 2006). The contingent ranking method was used to calculate the recreational values of three recreational sites in North Thailand (Isangkura, 1998). Using contingent valuation method, total consumer surplus is 440,000 Rupees (US$ 88,000) for the Marin Park in Seychelles (Mathieu at, 2000).

Travel Cost Method is more accurate and gives more significant results than Contingent Valuation Method and another non-market valuation method, TCM is good for calculating the Consumer Surplus of the visitors and introducing entry for the recreational sites. Contingent Valuation method is based on the hypothetical senior while Travel Cost Method is based on market prices and on the cost and expenses of the visitors (Sukanya das, 2013, Amirnejad et al, 2014).

Bharali and Mazumder (2012) estimated the recreational value of the Kaziranga National Park as き 973.45 millions in India using Zonal travel Cost method. They concluded that higher distance lower will be the visits. Individuals who come from very far they spend more time at

the recreational site and group activity visitors are willing to pay higher than passive activity visitors (Iamtrakul et. al. 2005).

Improvements in the services of the park can increase the demand for visits and shifts the demand curve upward which can increase the revenues generated by the Ayubia National Park in Pakistan (Himmayatullah, 2003).

Limaheiet. et. al, (2014), calculated the recreational value for the Masouleh forest park in Iran through the Zonal Travel Cost Method (ZTCM). His results show that travel time to the site is negatively related to the number of visitors and higher the income higher will be the visitors. E Vicente, (2011), estimated the economic value for the cultural good of blockbuster art exhibition in Spain. He introduced 7.72€ entry fee for the promotion of tourism the blockbuster art exhibition and estimated consumer surplus between the range of 27.85€ to 93.23€ million.

Travel cost method and character transportation methods were used for the Keenjhar Lake in Pakistan for estimating the economic value of the wetland. The Consumer Surplus was estimated as $42.2 million assuming daily visit of 1000 as Consumer Surplus per visitor is $116 (A. Dehavi and H. Adil, 2011). Another study on Keenjhar Lake was done using travel cost method introducing an entry fees, Current revenue from the Lake is US$38,000 which is very low for the financing and cleaning the Keenjhar Lake, entry fee must be charged at PKR 25.00 which will be sufficient for the maintaining and cleaning the Keenjhar lake in Pakistan (Mangan, et. al 2003).

The efficient entrance fee which was calculated for individuals with zero opportunity cost for the 1st, 2nd day and 3rd day is6.20€, 0.36€ and 0.07€ respectively which shows different entrance fee for different individuals in different periods for peak seasons it must be high and zero in off seasons (Mendes, 2003). Fonsec and Rebelo (2010), calculated the recreational value of cultural heritage of museum located in Alto Douro Wine region-World heritage site by the

travel cost method. Himmayatullah, (2006) calculated the recreational value for the Margalla Hills National park in Pakistan and he calculated PKR 8.7 million annual Consumer surplus if a visitor has seven visits per year so the entry fee will be PKR 87 per visit.

This study is conducted for the valuation of the Hingol National Park by using Individual Travel Cost (ITC) method. We will suggest a feasible entry fee and calculate that how much revenues can be generated by the tourism for the park.

Chapter 3

Brief Description of the Study Area

Hingol National Park provides many benefits including wetlands, coastal eco-services and desert eco-services. The park is important for its rich biodiversity, archaeological sites, Ramsar Sites (RS) and the recreational sites. Currently, the department of Forest and Wildlife, Balochistan (FWB) is doing good efforts for the conservation of the wildlife and Reamsar Sites, further the local community is also involved in the wildlife conservation of the HNP, out of 32 game watchers ten are from the people from communities within the park.

For the conservation of the marine Turtles, people have been trained by the different projects that in the breeding seasons they hatch the eggs of the turtles and then they release the turtles into the ocean. Similarly, people were not only trained to protect the wildlife, but also were conscientized about the importance of wildlife in the Park. Unfortunately, the rules of protected areas are being violated as a Rest House is under-construction by the Tourism Department of Government of Balochistan within the premises of the HN Park.

3.1 Biodiversity of the Hingol National Park

The Park contains important biodiversity. Till now 65 species of reptiles, amphibians and 204 species of the bird and 35 species of the mammals, have been recorded in the Hingol National Park. Chinkara Gazelle, Ibex and Blandford Urial are the main animals of the Park. Other mammals in the park Sindh leopard, Indian fox, Jungle cat, Jackal, Sindh Wild Goat, Honey Badger, Indian Pangolin, Hedgehog, Porcupine, Indian Grey Mouse, Cairo Spiny mouse and Rock Mouse have also been recorded in the National Park (WWF, 2009).

From the 204 species of the birds Houbara Bustard, Tawny eagle, Dalmatian and Spot-billed Pelican, Bonnelli's eagle, Imperial eagle, Golden eagle, Eurasian griffon vulture, Lanner falcon, Egyptian vulture, Cinereous vulture, Red-headed Merlin, Kestrel, See-see partridge, Close-Barred sandgrouse, Indian sand grouse, Grey partridge, Stone Curlew, Striped buning, Coroneted sand grouse, Painted sand grouse, Eagle owl , Sind pied woodpecker, Hume's chat, Brown rock pipit, Finche larks, Hoopoe, Shrikes, Wheatears and other species of the birds have also been recorded from them 20 species of the birds are in the threatened (WWF, 2009 and Ghalib et at. 2008).

From the reptiles, Green Marin Turtles and Olive Ridley which are in the IUCN, Red List (2008), are also found in the Coastal areas of the Park. Marsh crocodile, Yellow Monitor Lizard, desert Monitor Lizard, and other species of lizards and chameleon have also have been recorded (WWF, 2009). In the centre of the Hingol National Park, there is a famous Hindu religious Mandir named as Hinglaj Mata Mandir, thousands of Hindus visit the Mandir from the different places of Pakistan. In the month of April More than 5000 people come for the religious gathering known as “Hinglaj Mata Teerak Yatra and Shri Hinlaj Seva Mandli” (WWF, 2009).

3.2 Ramsar Sites- the Hingol National Park (HNP)

There are also two Ramsar sites in the vicinity of the Park and one near to the park, which gives higher value to the park.

3.2.1 Jiwani Coastal Wetland

Jiwani was declared as a Ramsar site in 2001. Jiwani Coastal wetland is situated in the West of Hingol National Park. The area consists of five regions by the Cliffs: Daran Taak, Jangan Taak, Shaheed Taak, Deedlo Taak and Cahrlo. The site is an important nesting ground for the Green turtles and Olive Ridely which are in the Red List of IUCN and categorized as

endangered species (RSIS-Pakistan, 2011). Green turtles and Olive Ridely nest during Jul-Jan in the Daran Beaches of the Jiwani Coast which is 15km in the South East of Jiwani. These turtles come for breeding and nesting in the gently sloping sandy beaches at the foot of the cliff (Waqas et. al. 2011). Jiwani coast is a favourite place for the avifauna from all over the world. 109 species of the birds have been found at the Jiwani wetlands. 77 species of the birds were recorded as migratory while 32 as native (Ali, et. al. 2011).

3.2.2 Ormara Turtles Beach

In 2001Ormara Turtle Beach was declared as a Ramsar site. It is a beach located in the south-east of the Hingol National Park, along with the shore of the Arabian Sea. The Sandy beach is spread over about an area of 10km at Ormara Turtles Beach. The beach is a habitat of many considerable species of marine Turtles like endangered Olive Ridley and Green turtles. There are chances that Hawksbill turtle can be found at the beach, because the site covers the subduction zone of the Indian Ocean tectonic plate which is moving northward (RSIS-Pakistan, 2011). There are clusters of Mud Volcanoes at the shore. Migratory birds also visit the site but not in many numbers (Pandrani. et. al, 2005).

3.2.3 Miani Hor

Miani Hor was declared as a Ramsar site in May 2001 which is a lagoon which is situated in Sonmiani Tehsil District Lasbela. The lagoon is 60km long and 5km wide twisted and bent body of water leading to the Arabian Sea. This 7km wide lagoon is covered by the mangroves but it might be 10km at some places and is surrounded by the sand dunes (Saifullah and Rasool, 2002). It is the only place where three species namely Mangroves Avicennia marina, Rhizophora mucronata, and Ceriops tagal grow naturally and 100 species of fish have been recorded in the Lagoon (RSIS-Pakistan, 2011; Syed, et. al, 2014; and Khan, 2015).

Humpback Dolphin also exists in the lagoon (Siddiqui, et al., 2008). In the area, there is a diversity of the resident and migratory birds (Khan, 2015). The existence of the mangroves provides a conductive environment to the fauna.

Beside these all eco-system services, richness of biodiversity and tourism activities the structure of the park is very poor. One of the reasons behind the structure-backwardness of the HN Park is that there is no entry fee in the park for the revenue generation and maintenance of the park. Entry fee addresses the maintenance issues and for the improvements of the national parks that affects the visitor experience, like washrooms, cottages and roads (Mugisha, 2002).

Chapter 4

Research methodology

4.1 Theoretical Background of the Model

This portion of the study has been adopted from Himayatullah Khan (2014) and Fonseca (2010).

Like other goods, Non-market goods (environmental goods) also give utility by the consumption of these goods. The recreationists maximize their utility by visiting the recreational sites and doing other activities there (Brandao et al. 2014). In this study it is assumed that the utility of the individual is dependent on the number of trips to HNP, quality of park and expenses that he/she did for a visit to the Park. Let an individual y_{1k} choose to visit the HNP, for k = 1,….., n; k is the number of visits. The cost occurred during the travel to the site is c_{1k} and the individual also buy some bundle of goods E_i where i= 1,…., m, at the standard price of one. Individual maximizes his utility

$$Max: U(N, Q, E) \qquad (4.1)$$

Where N=number of trips to the Park.

Q= quality of the park,

E= is the quantity of market goods and it is assumed that its price is one,

Subject to the two constraints

1. First constraint: The cost occurred during the travel to the site is c_{1k} and the individual also buy some bundle of goods E_i where i= 1,…., m, at the standard price of one and individual cannot spend more than his constraint budget *I*.

$$I + (p_w * t_w) = E + (c * N) \quad (4.2)$$

Where

I= exogenous income,

p_w= wage of the visitor,

c= cost that a visitor bears for the trip.

2. The second constraint is the time constraint. The time must always be computed with the rest of the time limitation. Total time for all individuals is fixed.

$$T = t_w + (t_1 + t_2)N \quad (4.3)$$

T= total time available,

t_w= hours of work,

t_1 = travel time to the HN Park and

t_2= time spent at HN Park.

In this study, it is assumed that higher the quality (Q) of the park higher will be the number of trips (N) to the HN Park. Time constraint shows that travelling to the Park and time spent at the park keeps the visitors away from other activities. The visitor sacrifices his hours of work at the cost of leisure. Thus there is an opportunity cost of the time to the site. The opportunity cost of time is the wage rate. There is no entry fee to the HN Park so the cost of the entry fee will be zero.

Substituting equation 4.3 into 4.2 gives us

$$I + (p_w * T) = E + (p_E * N) \quad (4.4)$$

Where

$$p_E = (c_k * b) + (t_1 + t_2)p_w \quad (4.5)$$

p_E is the full price of the visit to the park which is the sum of time cost spent at the park and travel cost and c_k is the cost on per kilometer travel to the park and b is the distance to the Park and return from the park.

Equation 4.5 shows that the total price (p_E) for the park is the sum of monetary cost of the travel to the park, time spent in the park and the cost of travel to the park.

If a visitor maximizes his utility (equation 4.1) subject to the constraint (equation 4.4) the Lagrangian equation will be

$$£ = U(N, Q, E) + \lambda(I + p_w.T - p_E.E - N) \quad (4.6)$$

Solving the equation (4.6) by the optimization the derived Marshallian demand for the recreational site is

$$E = f(p_E, Q, I) \quad (4.7)$$

Equation (3.7) shows that the demand function for the recreational site is a function of quality of the park, income, monetary cost and time cost of the visit to the park.

4.3 Econometric model

Linear models are widely used in Travel Cost Method (Himmayatullah, 2003; Wallis and Garrod, 1991). There are many other examples that OLS model can be used in TCM like (Himmayatullah, 2006). Reason for incorporating the linear log model is, according to Tukey, J. W. (1977), when the residuals are positively distributed we can apply log to our independent variables. We had normality test on our data as well as on the residuals. The residuals were positively distributed so we used log on the independent variables. Basic lin-lin and lin-log econometric models were used in this study using the Ordinary Least Square (OLS) method. Hence the numbers of trips to Hingol National Park are the function of age, education, gender, opportunity cost, time spent in traveling, travel cost, household size, quality of the park,

income, substitute sites and the demand for recreational improvement, the econometric model can be specified as:

$$N_i = f(p_E, IN, TCS, age, EDU, HHS, Q, G, Dist, RI) \quad (4.8)$$

$$N_i = \alpha_0 + \alpha_1 p_E + \alpha_2 I + \alpha_3 TCS + \alpha_4 age + \alpha_7 age^2 + \alpha_6 EDU + \alpha_7 HHS + \alpha_8 Q + \alpha_9 G + \alpha_{10} RI + \alpha_{11} Dist + e_i \quad (4.9)$$

N_i number of visits to HNP in the last previous year,

p_E = travel cost to HNP including monetary, time spent in the park (opportunity cost) and time spent in traveling to the park,

I = income of the visitor,

TCS = travel cost of the substitute site,

age = age of the visitor,

age^2 = age square,

EDU = years of schooling.

HHS = household size,

Q = visitor's perception about quality of the park, if the visitor is satisfied with the services of the park then (Q=1, otherwise Q=0),

G = gender for male (G=1 otherwise G=0)

DIST = distance from the home town of visitor to the park and

RI = dummy for recreational improvement visitors who demanded for the wildlife watch it will be = 1, otherwise = 0. From the recreational improvements wildlife watching was the highly demanded improvement so this is the reason that dummy for wildlife watch was introduced.

$\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_8, \alpha_9 \alpha_{10} and\ \alpha_{11}$ are the slope coefficients of the above mentioned variables and e_i is the error term for the linear model.

$$N_i = f\{Ln(p_E, IN, TCS, age, EDU, HHS, Q, G, Dist, RI)\} \quad (4.10)$$

$$N_i = \alpha_0 + \alpha_1 lnp_E + \alpha_2 lnI + \alpha_3 lnTCS + \alpha_4 lnage + \alpha_5 lnage^2 + \alpha_6 lnEDU + \alpha_7 lnHHS + \alpha_8 Q + \alpha_9 G + \alpha_{10} RI + \alpha_{11} Dist + e_i \quad (4.11)$$

N_i = number of visits to HNP in the last previous years,

lnp_E = log of travel cost to HNP including monetary, time spent in the park (opportunity cost) and time spent in traveling to the park,

lnI = log of income of the visitor,

lnTCS = log of travel cost of the substitute site,

lnage = log of age of the visitor,

$lnage^2$ = log of age square,

lnEDU = log of years of schooling.

lnHHS = log of household size,

lnDIST = log of distance from the home town of visitor to the park and

$\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7, \alpha_8, \alpha_9 \alpha_{10} and\ \alpha_{11}$ are the slope coefficients of the above mentioned variables and e_i is the error term for lin-log model.

Other lin-lin and log-log models were used based on the willingness to pay for the improvements. An open end question was asked to the respondents, if they need improvements how much they are willing to pay? In these models the dependent variable is the Willingness To Pay (WTP) for the improvements and the independent variables are same as mentioned above.

Lin-lin model

$$WTP = f(p_E, IN, TCS, age, age^2, EDU, HHS, Q, G, Dist, RI) \quad (4.12)$$

Log-log model

$$lnWTP = f\{Ln(p_E, IN, TCS, age, lnage^2, EDU, HHS, Q, G, Dist, RI)\} \quad (4.13)$$

4.3.1 Logit Model (LM)

Logit Model was used to examine either a visitor is willing to pay an entry fee or not. This model was chosen because our dependent variable is a binary variable and the model has a well-established theoretical background (Akbar and Som, 2010).

We estimated this model for different entry fee. Our bids start from Rs.50. If a visitor is willing to pay R.50 or not so we will run this model for first bid. If he/she is willing to pay Rs.50 so the next bids will be Rs.60, 65 and Rs.70 respectively. Similarly If he/she is not willing to pay Rs.50 then the lower bids be Rs.40, 30 and Rs.25 respectively.

Thus the model can be specified as:

$$P_i = E(Y = 1/S_i) = [\frac{1}{\{1+e^{-(\alpha_0+\alpha_i \sum S_{i)}}\}}] \quad (4.14)$$

$P_i$is the probability of individual *'i'* that Y=1 and $S_i$is the set of all the independent variables that were explained above.

α_i (i=1,2,3…9) is slope coefficients of the independent variables to be estimated by the logistic distribution (Akbar and Som, 2010). By taking the natural log of equation (4.9) we get the following functional form of the logistic model:

$$L_i = \ln\{P_i/1 - P_i\} = \alpha_0 + \alpha_i \sum_{i=1}^{10} S_i + e_i \quad (4.15)$$

Where $L_i$is the logit and the model is linear in parameters and independent variables, the Maximum Likelihood Estimation will be used (Akbar and Som, 2010). In the above Logit Mode (LM) same independent variables will be used as explained in OLS model.

Where S_i= all explanatory variables,

$$S_i = \alpha_1 p_E + \alpha_2 I + \alpha_3 TCS + \alpha_4 age + \alpha_5 EDU + \alpha_6 HHS + \alpha_7 Q + \alpha_8 G + \alpha_9 Dist + \alpha_{10} RI$$

e_i= error term

4.4 Welfare Analysis

For the estimation of the Consumer Surplus (CS), we will estimate the demand function for the park. The idea of consumer surplus is the main principle of the travel cost method. The significance of the CS in the TCM tells us that actually how much a visitor values a visit to a recreational site. So the CS always tells us the recreational use value assigned to a recreational site (Hausman et al, 1995).

In the common economic terms, CS is the difference between the actual expense that you pay for a good and the maximum price that you are willing to pay for that good. According to Alfred Marshal "Consumer surplus is an economic measure of consumer benefit, which is calculated by analyzing the difference between what consumers are willing and able to pay for a good or service relative to its market price, or what they actually do spend on the good or service. A consumer surplus occurs when the consumer is willing to pay more for a given product than the current market price".

In the light of the above definitions, we can calculate the CS for the TCM that will be the difference between the total expenses incurred by a visitor to the HN Park and the maximum amount that the visitor is willing to pay for the recreational services of the park.

We will calculate the CS from the equation (4.7) which represents the demand function for the recreational site

$$E = f(p_E, Q, I) \tag{4.16}$$

The CS can be derived by taking the integral of the above demand function

$$CS = \int_{p_E}^{p_0} f\,(p_E, Q, I) dp_E \tag{4.17}$$

Where, p_E is the actual cost incurred by that visitor for the trip and

$p_0$is the cost where the number of trips go to zero also known as "Chock Price".

This method of estimating the CS is applied when OLS or any other technique is used for the estimation (Timah, 2011).

CS in this case will

$$\mathrm{CS} = \mathrm{TC} - \mathrm{WTP}$$

Where TC is the total price or total cost of the visit and

WTP is willingness to pay for the improvements

4.5 Data collection and Sample size

In our study, we use random sampling from the user groups of the Park. Those people who were there at that time and using the services of the park they are included in our data collection. Data collection was through the questionnaire which is designed for the user group of the Hingol National Park. Data was collected at different recreational sites of the HN Park, like Kund Malir, Golden Beach, Sapat Beach, Nani Madir and Princes of Hope.

The questionnaire contains 37 questions and divided into three sections. In the first portion of the questionnaire, we have asked the visitors about their socio-economic characteristics of the visitor. In the second portion there are questions regarding the recreational behaviour of the visitor and in the third portion there are questions regarding to the behaviour of the individuals about the entry fee and improvements in the HN Park and also related to the visitor's attitude towards the entry fee. The initial bid for the entry fee is Rs. 50 which is the entry fee in Hazar Ganji National Park in Balochistan. This bid is feasible according to low income of the people of Balochistan.

At first we was asked the visitors for Rs. 50. If the visitor is not willing to pay 50, we have asked him if he is willing to pay Rs. 40; if he is not willing to pay 40 then the lower bid was Rs. 30; if he was no willing to pay Rs. 30 we asked ask him for the lower bid Rs. 25. Similarly if the visitor is willing to pay Rs. 50 then we asked for higher bid Rs.60, if the visitor is willing to pay Rs. 60 we asked him for higher bid Rs.70, if he is not willing to pay Rs.70, then we asked him for R.65.

Questionnaires was be distributed among the visitors in the month of May, 2018 which is the peak season and many visitors come to the park in this season.

4.5.1 Sample size

The sample size is an important issue for determining an accurate sample size from the population. There is no data available regarding the population of the visitors and due to lack of resources and high cost for the pilot survey we were not able to go for counting the visitors in HN Park. So we asked about the population of the visitors to the Wildlife department of Balochistan in HNP. They gave us weekly data of the visitors in the month of April, 2018. Average visits on peaks seasons was 2500 per week. To determine the number of questionnaires we used the formula of (Cochran, 1997),

$$n = \frac{z^2 * s^2}{d^2} \tag{4.18}$$

Where

Z = 1.96, is the value of z-test at the 5% confidence level,

s^2 = 878, is the estimated variance for the population and

d = 4, is the margin of error which we took as 4.

Putting these values in equation (4.18) we get

$$n = \frac{(1.96)^2 * (878)}{4^2} \tag{4.19}$$

n =210. Which shows that the number of questionnaires to be distributed among the visitors is 210.

4.5.2 Focus Group Discussion

Primary data can also be collected by the Focus Group Discussion (FGD) in which we asked questions to the group of employees in wildlife conservation department and the communities living in the HNP. We ask them about the changes over time in the park. We also asked that either any change (positive or negative) have been occurred in the park or not. What improvements have been made in HN Park? We also went to the concerned departments and collected data about the measures they are taking for the conservation of the wildlife of the HN Park and Ramsar Sites in it.

Chapter 5

Data Analysis

5.1 Computation of Total Cost (TC)

Based on the information given by the visitors through questionnaires total cost p_E of a trip was calculated which is obtained by the sum of four components of the cost like Accommodation Cost (Ac), Time Cost (TC), Travel Cost ($T_{rvc}c$) and other expenses (Expc), mathematically Total Cost of a trip can be written as,

$$p_E = Ac + Tc + T_{rvc}c + Expc \tag{4.17}$$

Travel Cost ($T_{rvc}c$)

The $T_{rvc}c$ in this study denotes transport cost or fuel cost, if a visitor is using his own car for visiting the HNP. Most of the visitors used their own vehicles to come to NHP. If a visitor visits the park in group or with family so the fuel cost was divided by the group size to get the cost per person and the number was multiplied by two to get the of round trip cost. Some of the visitors who were living near by the park, their mode of transportation was motorcycles. Fuel cost was divided by the number of passengers to get the individual fuel cost. Visitors who used public transports only the cost of ticket and expenses during the journey are included.

There are evidences from the literature that taxes from the toll plaza must be included. These expenses were also incorporated. In Pakistan toll taxes to all the cars are almost same.

Accommodation Cost (AC)

Accommodation Cost is included for those visitors who came to NHP and booked a room in the hotel. In our study mostly families of the respondents stayed over night. To calculate the AC per person we divided the Total Accommodation Cost (TAC) by the size of the group (n).

$$AC = TAC/n \quad (4.18)$$

Time Cost (TC)

Like all the other activities tour to the recreational sites also needs time. The time is divided into two parts, first is the time consumed on traveling to the site and the other is the time spent at the recreational site (Douglas and Johnson, 2004). If a visitor gives his working hours for traveling and recreational purposes so he/she is trading his time between labor and leisure so the opportunity cost of time is the wage rate, the best way for the calculation of the time is the hourly wage rate (Englin and Shonkwiler, 1995).

For calculating the hourly wage rate of the respondents we divided the monthly income of the visitor by 30 to get the daily wage rate.

(Daily wage rate = Monthly Income/30

Where 30 is the number of days in a month. Further this daily wage rate was divided with 8 to get the Hourly Wage Rate (HWR)

HWR = Daily Wage rate/8

According to the Government of Pakistan labour policy 2010 the average working hours per day are 8-9.

For computation of the Travel Time Cost (TTC)

TTC = (HWR*TT),

TT is the travel time taken to the visitor to reach the NHP and TTC was multiplied with two (2) to get the round trip cost.

Round Trip Cost (RTC) = TTC*2,

Similarly for the calculation of the cost of time spent in the park or leisure time was obtained by multiplying the HWR with time spent on site (TS),

Leisure Time (LT) = HWR*TS

So Time Cost (TC) = RTC + LT

RTC is the round trip cost and LT is the cost of time spent on site.

Expenditures and entry fee

In this portion excluding the travel cost, time cost and accommodation cost, other expenditures like food, beverage and other expenditures were included that a visitor had done within the park or outside the park for the purpose of trip. The expenditures cost was obtained based on the questions that were asked to the visitors that how much he/she spent on food and for other expenditures.

In Hingol National Park there is no entry fee so the access cost or entrance fee is zero. Thus cost per person or expenditures on per round trip is equal to:

$$p_E = Ac + Tc + T_{rvc}c + Expc$$

Where the AC and cost of petrol was divided by the number of group size.

5.2 Descriptive Statistics

Table 4.1 Construction and units of the variables

Scales	Variables	Mean Value	S.Dev	min	max
Number of visits taken to NHP in last 12 months	N	1.35	1.22947	1	8
Total cost of the Trip to the NHP in Rupees	p_E	11066	4500.192	1562	25938
Monthly Income in Rupees	I	41425.1	16862.04	15000	120,000
Social Characteristics					
Gender, male=1, female=0	G	0.8904	0.3130	0	1
Age, in Years	Age	26.46919	4.962022	18	42
Years of schooling	Edu	14.36667	1.932803	10	18
Total Cost of the substitute site in Rupees	TCS	5919.282	6675.612	0	33166.67
Visitor's perception about the quality of the park (satisfied=1, unsatisfied=0)	Q	0.790476	0.4079412	0	1
Number of Household size/family members	HHS	5.747619	1.662453	2	9
Distance from the home to the NHP in km	Dist	302.381	167.3999	2	1500
Recreational improvements (If a visitor wants wildlife watch = 1, if Not = 0)	RI	0.8142857	0.3898051	0	1

Source: Field survey

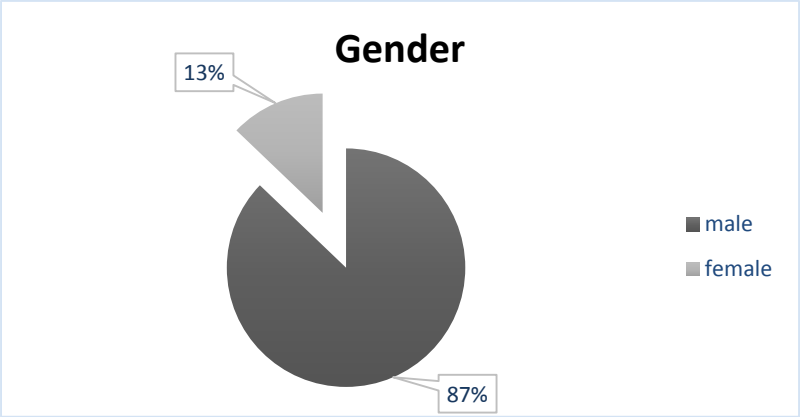
5.3 Variables and the expected signs

There are many factors which can affect the visit to the recreational site like the quality of the park and congestion, distance to the recreational site, cost of the trip, the age of the individual, income, household size, education, gender and cost of the substitute park. In this study the quality of the park is expected to be positively related to the numbers of trip N. Distance from the recreational site is expected to be negatively related to the demand for the recreational site. Cost of trip is expected to be negatively correlated with number of. Men, are expected to have higher demand for the outdoor recreational site than women. Education is positively correlated with demand for the recreational sites. Age is expected to be inversely related to the demand for the outdoor recreational, as people get old they demand less for the recreational site than the young ones. Higher the income higher will be demand for the visits to the recreational sites. Cost of substitute has positive effect on demand for a recreational site. These variables were adopted from (Himmaayatullah, 2004, Mangan, et al. 2003 and Douglas and Taylor, 1998).

Socio-Economic characteristics of respondents:

Gender: From the survey it was found the 89% of the respondents were male and almost 11% were female. As 52% of the respondents were married and 42 % were unmarried. Men were asked more questions because they were easily available and other reason is that mostly the women were not willing to answer the questions to a stranger and we have to follow the ethics of the field survey and the culture of the native local area.

Fig 5.1 Percent of the Male and female



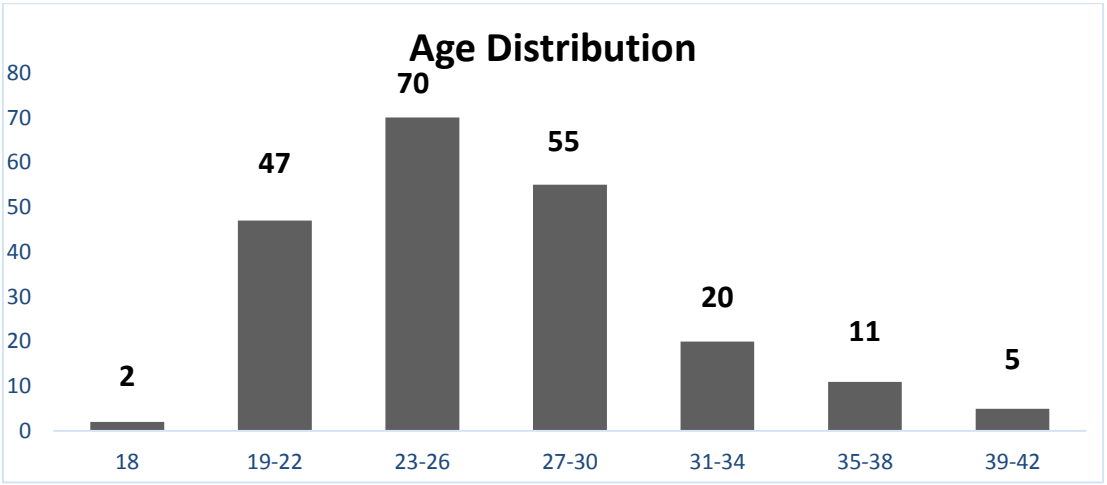
Residency:

We found out of 210 respondents, 57% percent were from Sindh province of Pakistan, 42% were from Balochistan and one visitor was from Kashmir. From the sample we find that out of 210 visitors 75% were from urban dwellings and 25% were from rural areas. Most of the visitor were from Karachi which is the 43% of the population.

Age:

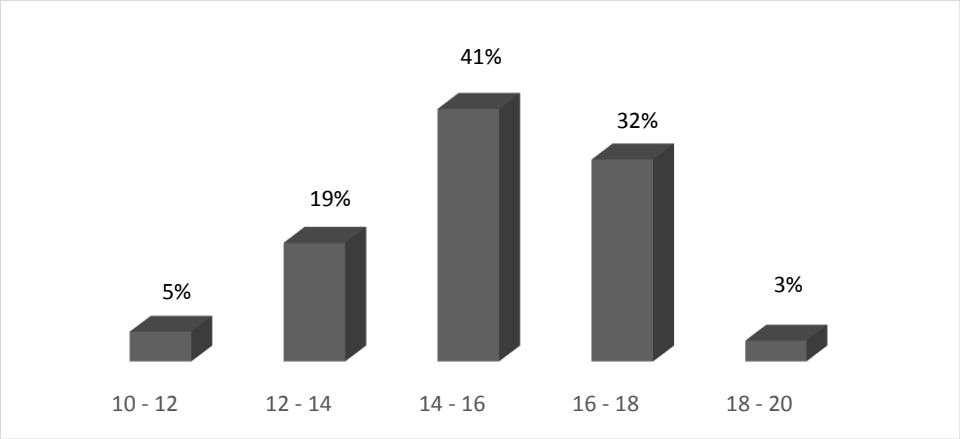
From the sample size of 210 average age of the respondents was 26.395. 45% age of the of the respondents were in between 24 to 28 minimum age was 18 years maximum age of the respondents was 42 years.

Figure 5.2 Age Distribution of the Respondents



Education: Figure 5.3 shows that 41% of the respondents have passed bachelor's degree 32% of the respondents have passed master's degree 19% of the respondents have 12-14 years of education and 5% were in between 10 to 12.

Fig 5.3 Years of education of the respondents



Income: Table 5.2 shows the income distribution of the sample size. 41% of the respondents' income lies between the range of 15001-30000. 32% of the respondents' monthly income is 30001-45000. Only 2% of the respondents earn 15000 per month.

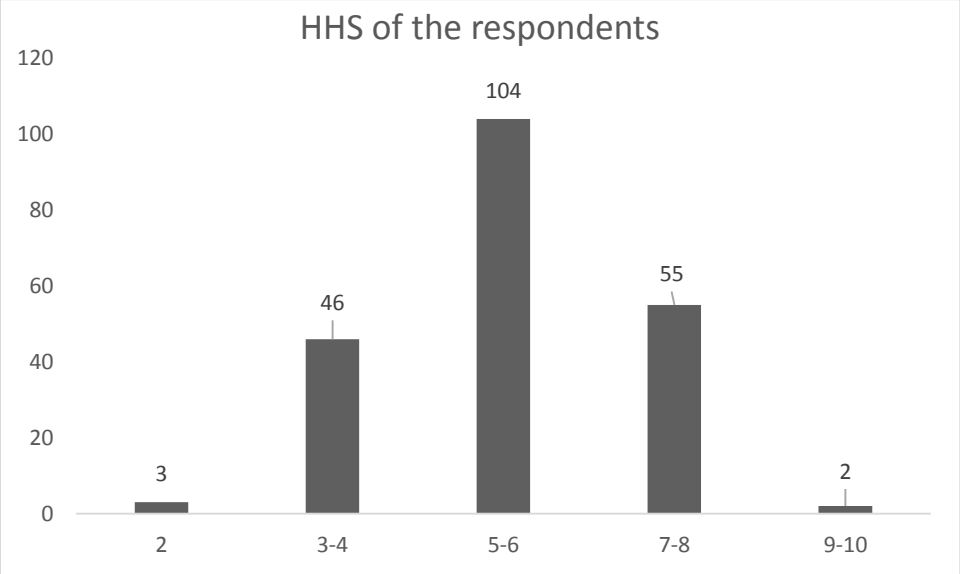
Table 5.2: income distribution of the respondents

Monthly Income in (Rs)		
Bin	*Frequency*	*Percent*
15000	2	2
15001-30000	86	41
30001-45000	68	32
45001-60000	25	12
60001-75000	14	7
75001-90000	11	5
90001-105000	3	1
105001-120000	1	1

Household Size HHS: Figure 5.4 tells us about the household size of the visitors and the frequency distribution table is given in the appendix B in table 5.3. From the survey we found

that 104 of the respondents have between 5-6 family members in their homes, 3 respondents have 2 members and only 2 respondents have 8-9 members in their family.

Figure 5.4 HH distribution of the respondents



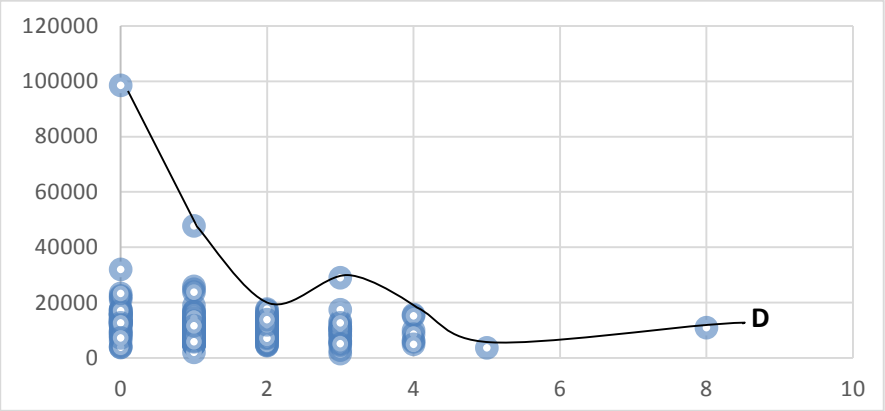
5.4 Visitor's Recreational Behavior

As from the information extracted by the questionnaire the average number of visits to national parks or natural tourism is 2.08. On average respondents spent Rs.10166.67 on natural based tourism in last 12 months.

Recreational demand for the HNP:

In Figure 5.5 "D" curve shows the recreational demand for the HNP. On X-axis there are number of trips to HNP and on Y-axis the travel cost of the visit, which shows that there is inverse relation between number of trips and cost of the trip.

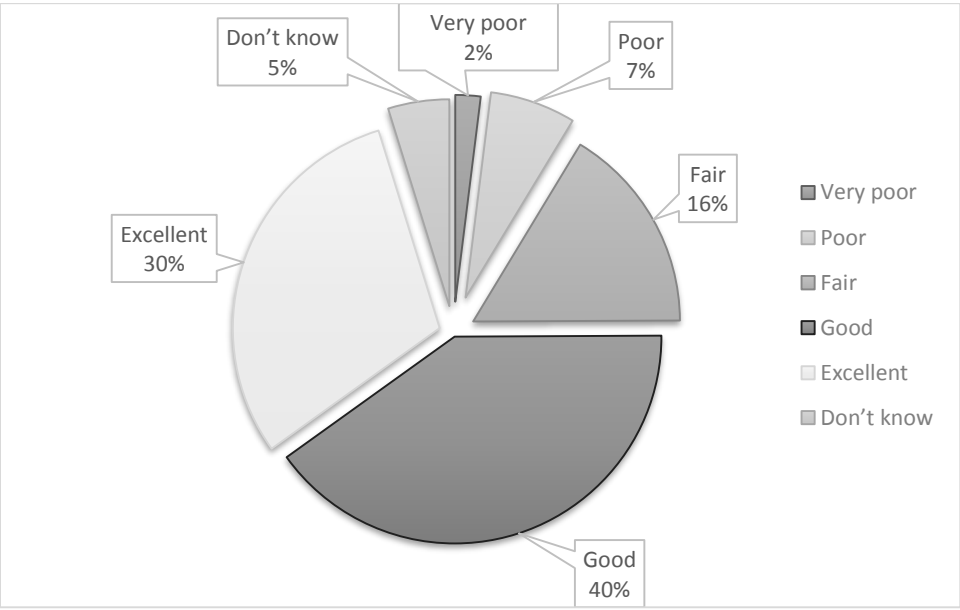
Fig 5.5: recreational demand for the HNP



The respondents who visited the NHP other than recreational purposes those questionnaires were excluded from the data analysis and also those visitors who visited other sites before coming to the park were also excluded to overcome on the problem of multi-purpose trips because their main purpose was not to visit the NHP.

Out of 210 respondents 2% of the respondents ranked the quality of the park very poor, 7% of the respondents see the quality of park as poor, 16% visitors ranked as fair quality, 40% ranked as good quality, 30% respondents ranked as excellent quality of the park and 5% respondents were unaware about the quality of the park. The frequency distribution table 5.4 is given in appendix B.

Figure 5.6: perception about the park facilities



Visitor's perception about the improvements of the park:

From the respondents 65% of the respondents wanted improvements in the park and 35% were satisfied with the current recreational benefits of the park further they were asked what type of recreational improvements they want the options were "Wildlife watching, Benches, Shades, Boats, and Other". 91% the respondents wanted wildlife watching, shades and boats.

Visitor's attitude towards the entry fee

After the improvements the visitors were asked, if the improvements take place will you be willing to pay an entry fee or not? Out of 210 sample 78% of the respondents were willing to pay for the improvements and 22% percent were not willing to pay. The justification of not willing to pay was " its government's responsibility".

Table 5.5 shows the frequency distribution of the respondents that how much respondents willing to pay voluntarily for the improvements. This was an open end question and the question was asked to respondent as "how much you are willing to pay for the improvements"?

Table 5.5 frequency Distribution of the WTP

WTP	Frequency	Percent
0	46	21.90
10	2	0.96
20	3	1.43
25	1	0.48
30	4	1.90
40	8	3.81
50	41	19.52
60	11	5.24
70	10	4.76
80	2	0.96
100	49	23.33
150	4	1.90
200	20	95.71
300	3	1.43
500	4	1.90
1000	2	0.95

5.4 Bids for the entry fee

5.4.1 Bid for Rs.50

After the voluntary willing to pay the visitors were given different bids for the entry fee. The initial bid for entry fee was Rs.50 those respondents who were willing to pay 50 rupees they were asked for higher bids but those who were not willing to pay an entry fee of Rs.50 with certain improvements those respondents were asked for lower bid Rs.40. The visitors were asked if the government imposes an entry fee with certain improvements will you be willing to pay an entry fee of Rs.50 or not? 81% of the respondents were willing to pay an entry fee and 19% were not willing.

5.4.2 Bid for Rs.60

After asking the bid for Rs.50 those who were willing to pay 50 they were asked for higher bid 60. For the bid 60 69% of the respondents were willing to pay Rs.60 as entry fee and 31% were not willing to pay.

5.4.3 Bid for Rs.70

Those who were willing to pay 60 as an entry fee they were asked for higher bid Rs.70. 62% of respondents were willing to pay entry fee Rs.70 and 38% were not willing to pay Rs.70 and those who were not willing to pay Rs.70 we asked them for lower bid Rs.65.

5.4.4 Bid for Rs.65

63% of the respondents were willing to pay Rs.65 and 37% were not willing to pay an entry fee Rs. 65 as entry fee.

5.4.5 Bid for Rs.40

19% of the respondents were not willing to pay Rs.40 as an entry fee and 81% of the respondents were willing to pay 40.

5.4.6 Bid for Rs.30

Those who were not willing to pay Rs.40 they were asked lower bids Rs.30. 16% of the respondents were not willing to pay Rs.30 and 84% of the respondents were willing to pay Rs.30.

5.4.7 Bid for Rs.25

Those who were willing to pay Rs.30 for them the bid was finished and those who were not willing to Rs.30 s an entry fee they were asked for the lowest bid Rs.25. 86% of the respondents were willing to pay Rs.25 and 14% were not.

5.5 Willingness to pay for the entry fee with improvements

The following figure 5.5 shows the negatively demand curve for the willingness to pay for entry.

Figure 5.5 willingness to pay for entry fee

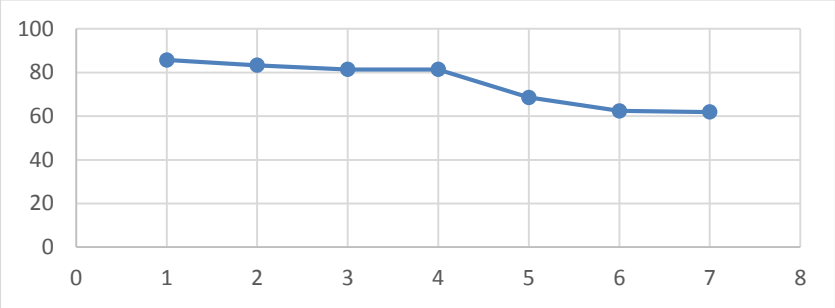


Table 5.5 shows that 85% of the respondents were willing to pay Rs.25, 83% were willing for the entry fee 30. For the entry fee Rs.40 81% were willing to pay 40 rupees similarly for bid 50 it is 81% with certain improvements. 68% were willing to pay Rs.60 and 62% were willing to pay Rs.65. the lowest portion of the sample was willing to pay Rs.70 which is 61%.

This shows that higher the entry fee lower the visitors will be willing to pay.

Table 5.6 frequencies and percent of respondents for the bids

Bids	Freq	Percent
25	180	85.71429
30	175	83.33333
40	171	81.42857
50	171	81.42857
60	144	68.57143
65	131	62.38095
70	130	61.90476

Demand for the improvements

Data reveals that for the recreational services most of the respondents demanded for the Wildlife watching, shades and benches. For the improvements in information section in the questionnaire about HNP most demanded improvements in ‘Signs’, Tourist Information

Centre and maps. For the miscellaneous mostly the demanded improvements are toilets, waste disposal and food and beverages. For the traffic the improvements in car parking and better roads were to be improvements.

5.6 Effect of improvements on recreational demand for the Park

The following figure 6.4 shows two demand curves for the NHP. D_1 Shows the actual recreational demand for the park which is represented in equation 1. D_2 Curve represents the hypothetical demand curve which depends of the certain improvements in the HNP. Details of the improvements are given in the table 5.8. Visitors were asked if these improvements take place how many times will you visit the HN Park annually. Equation 2 shows the hypothetical demand for the park with quality improvements.

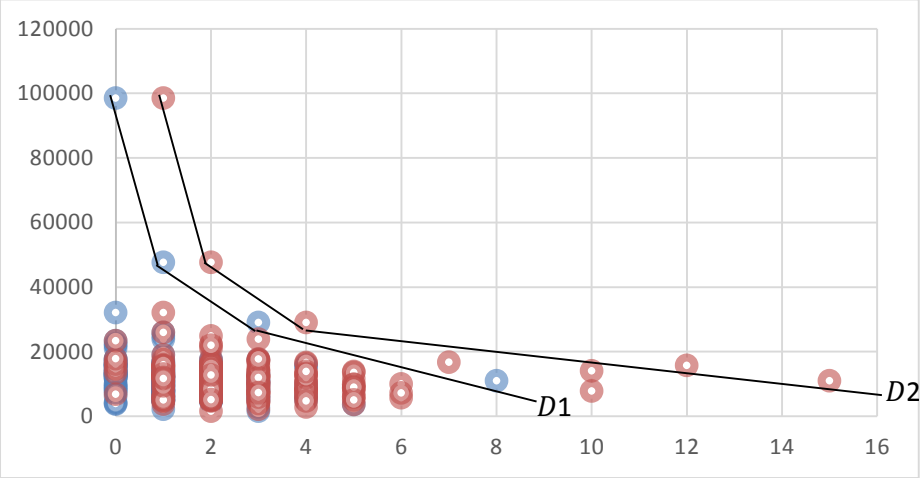
Table 5.7 quality improvements for the HN Park

Improvements in the following fields	**Details**
Recreational Site	**a.** Wildlife watching, **b.** Benches, **c.** Shades, **d.** Boats, other
Information about Hingol National Park	**a.** Maps, **b.** Information Sign, **c.** Precautionary Sign, **d.** Tourist Information Centre **e.** Other
Traffic	**a.** Better road, **b.** Car Parking, **c.** Other
Miscellaneous	**a.** Waste disposal, **b.** Toilet, **c.** Food and Beverage Services, **d.** Accommodation, **e.** Others

$$N_1 = 3.18539 - .0000753\,TC\ (R^2 = 0.0882) \quad 1$$

$$N_2 = 3.646253 - .0000872\,TC\ (R^2 = 0.0454) \quad 2$$

Fig 5.6 Demand for recreation before and after the improvements



5.7 Results of the Econometric Models

5.7.1 Results of the Linear OLS Model

Results of linear OLS model from the equation (4.9) are shown in the table 5.8 where the dependent variable is the number visits to the park from the last 12 months and independent variables are Income, Age, age^2, Total cost of the Visit (p_E), years of schooling (EDU), Total cost of the substitute site (TCS), Household size (HHS), Gender (G) and visitor perception about the quality of park (Q) as an dummy variables, (Dist) is the distance from the home to the park and Recreational Improvements (RI) is the recreational improvement which is the dummy for the highest demanded recreational improvements. Age square was taken because it is one of the important variables and it is nonlinear.

The results show that the number of visits have statically significant effect on income with positive sign, one unit increase in income causes 0.0000179 increase in the visit to the park keeping the other variables constant, one unit increase in Cost of the trip decreases the number of trips by -0.0000633 unit keeping the other variables constant, Age and

age^2 have statistically insignificant effect but age^2negative effect on the number of visits. People with high age are expected to visit less of recreational sites. They enjoy more to spend time at home with their relatives than visiting outside. Education level has positive impact on the number of visits, one unit increase in education increases the number of visits by 0.1066702 units keeping the other variables constant. Higher the years of schooling higher will be the number of visits because educated people have more knowledge about the recreation. Cost of the substitute site has statistically insignificant effect of the number of visits this might be due to the heteroscedasticity of due to the missing values in the data. 80 of the respondents reported that they do not know any other National Park so the cost of the substitute site was zero for those respondents. But still the positive sign follows the basic economic rule that higher cost of a good causes higher demand for the substitute good. Household has statistically positive but insignificant effect on the number of visits.

However dummy variables gender and quality of the have statistically significant and positive coefficients. Which show that males visit recreational sites 0.5458672 than females and visitors' perception about the quality of the park is positive, those visitors who thin that quality of the park is good they visit more. Dummy for recreational improvements have statistically insignificant but positive positive effects with the number of visits.

Table 5.8: Results of the Linear OLS Model

Variables	***Coefficient***	***Std. Err.***	***t***	***P>t***
Total Cost (p_E)	(-0.0000633)*	0.0000231	-2.74	0.007
Income	(0.0000179)*	4.96e-06	3.61	0.000
Total Cost of Substitute (TCS)	(6.83e-06)	.0000159	0.43	0.668
Age	(0.0281634)	0.1718104	0.16	0.870
age^2	(-0.0011609)	0.0029366	-0.40	0.693
Education (EDU)	(0.1066702)**	0.044448	2.40	0.018
Household Size (HHS)	(0.1855129)**	0.0705878	2.63	0.010
Q	(0.4417932)**	0.2100973	2.10	0.038
G	(0.5458672)***	0.2887011	1.89	0.061
Distance (Dist)	(-0.0014338)**	0.0006961	-2.06	0.042
Recreational Improvements (RI)	(0.2796333)	0.2270307	1.23	0.221

* Shows that the variable is statistically significant at 1% confidence interval, ** and *** shows it is significant at 5% and 10% respectively. Number of observation 210. $R^2 = 0.4131$.

Root MSE = 0.95219.

5.7.2 Results of the linear log OLS model

Results of linear log OLS model from the equation (4.11) are shown in the table 5.9. These results show that trip cost is negatively correlated with the number of visits., one percent increase in trip cost declines the number of visits by -0.7376583 units keeping the other variables constant, income has statistically significant effect with the number of visits, one percent increase in income causes 0.9077649 increase in the annual visits. One percent increase in

age^2 declines the number of visits by -0.2506721 units keeping the other variables constant. Years of schooling and household size have statistically positive and significant correlation with number of visits. One percent increase in years of schooling and household size increases the number of visits by 1.613355 and 0.7936273 respectively keeping other variables constant. One percent increase in distance declines the number of visits by -0.1083848 units.

Dummy variable recreational improvement has positive signs but insignificant effect with number of visits and visitors' perception about the quality of the park and gender variables have significant effect on the number of visits to HNP..

Table 5.9: Results of the linear log OLS Model

Variables	***Coefficient***	***Std. Err.***	***t***	***P>t***
Ln(Total Cost), (p_E)	(-0.7376583)*	0.2191072	-3.37	0.001
lnIncome	(0.9077649)*	0.2378555	3.82	0.000
Ln(Total Cost of Substitute), (TCS)	(0.1864807)	0.1674897	1.11	0.268
lnAge	(0.7901269)*	3.147591	2.10	0.038
$lnage^2$	(-0.2506721)**	0.490459	-2.33	0.027
lnEducation (EDU)	(1.613355)**	0.6426429	2.51	0.013
lnHousehold Size (HHS)	(0.7936273)**	0.369014	2.15	0.034
Q	(0.4864504)**	0.2177906	2.23	0.027
G	(0.5372573)***	0.2962219	1.81	0.072
lnDistance (Dist)	(-0.1083848)	0.1290406	-0.84	0.403
Recreational Improvements (RI)	(0.3292957)	0.2313021	1.42	0.157
Constant	-4.057072	3.434275	-1.18	0.240

* Shows that the variable is statistically significant at 1% confidence interval, ** and *** shows it is significant at 5% and 10% respectively. Number of observation 210. $R^2 = 3751$

Root MSE = 0.98253.

5.7.3 Linear OLS model for the Willingness To Pay (WTP)

Results of the linear model are shown in table 5.10 from the equation 4.12. in the model our dependent variable is the WTP for the improvements which is an open end question respondents were asked if the improvements take place how much will you be willing to pay?

The results show that one unit increase in years of schooling willingness to pay increases by 18.24758 units. Income has statistically significant effect with willingness to pay, one unit increase in income increases the WTP by 0.0027269 units keeping the variables constant. age^2 has negative effect on the WTP for the park. Household size HHS has statistically

significant effects on WTP. One unit increase in HHS increases the WTP by 22.9157 units keeping the effect of other variables constant.

Table 5.10: Results of the linear OLS Model with dependents variable WTP

Variables	***Coefficient***	***Std. Err.***	***t***	***P>t***
Distance	(-0.0749036)	0.1260334	-0.59	0.553
G	(64.60481)	52.21587	1.24	0.218
Q	(20.46467)	37.97465	0.54	0.591
Household size (HHS)	(22.9157)***	12.76271	1.80	0.075
Education (EDU)	(18.24758)**	8.03777	2.27	0.025
Age	(5.914814)	31.52057	0.19	0.851
age^2	(-84.41806)	443.0967	-0.25	0.849
Total Cost of Substitute Site (TCS)	(0.0021841)	0.00288	0.76	0.450
Income	(0.0027269)*	0.0008972	3.04	0.003
Total Cost (p_E)	(-0.00514)	.004188	-3.04	0.003
Recreational improvement	(58.56033)	41.09604	1.42	0.157
Constant	(32.30013)	451.7037	0.73	0469

* Shows that the variable is statistically significant at 1% confidence interval, ** and *** shows it is significant at 5% and 10% respectively. Number of observation 210. $R^2 = 2064$

Root MSE = 172.19

5.7.4 Results of the log model with WTP

Results of log OLS model from the equation (4.13) are shown in the table 5.11 where the dependent variable is WTP and independent variables are lndistance, gender, perception about the quality of the park lnHHS, lneducation, lnage,

$lnage^2$, lnincome, ln(cost of the substitute site), recreational improvement and total cost of the trip. One percent increase in HHS increase the WTP by 1.346698 percent, education and income are statistically significant in the logarithmic model with positive coefficients.. one percent increase in income increases the WTP by 1.197338 percent increase in WTP keeping

the other variables constant. One percent increase in years of schooling increases the willingness to pay for the improvements by 2.200528 percent.

Following table 5.11 shows the results of the log-log OLS model from equation 4.13

Variables	***Coefficient***	***Std. Err.***	***t***	***P>t***
lnDistance	(-0.3041786)	0.2321901	-1.31	0.193
G	(-0.1400329)	0.533009	-0.26	0.793
Q	(0.6561493)***	0.3918831	1.67	0.097
lnHHS	(1.346698)**	0.663988	2.03	0.045
lnEDU	(2.202639)***	1.156344	1.90	0.059
lnAge	(1.833605)	5.663641	0.32	0.747
$lnage^2$	(-1.064269)	2.681868	-0.40	0.692
lnTCS	(0.1482698)	0.3013739	0.49	0.624
lnIncome	(1.197338)*	0.4279871	2.80	0.006
Ln(Total Cost) (p_E)	(-0.5358103)	0.3942522	-1.36	0.177
Recreational improvement	(0.5694434)	0.4161951	1.37	0.174
Constant	(-13.71981)**	6.179489	-2.22	0.028

* Shows that the variable is statistically significant at 1% confidence interval, ** and *** shows it is significant at 5% and 10% respectively. Number of observation 210. $R^2 = 2232$

Root MSE = 1.7679

5.8 Results of the logistic model

Following tables show the results of the logistic model of entry fee for different bids. Respondents were asked for different bids, the dependent variable for this model is a binary variable if a visitor is willing to pay for the following bids 70, 65, 60, 50, 40, 30 and 25 the dependent variable is "1" otherwise "0". These bids for were considered as entry fee for the HN Park and the entry fee depend upon the certain improvements in the park. See improvements in the table 5.8.

5.8.1 Results of the Logit Model (LM) for entry fee Rs.70

Table 5.12 shows the margin effects of the logistic model for bid Rs.70. The results show that willingness to pay for entry fee Rs.70 has statistically significant and positive coefficient of income. Visitors who have high income are 0.008% more likely to be willing for the entry fee 70. Coefficient of trip cost (TC) is negatively correlated with the willingness to pay. Visitors who bear high cost of the trip to the park have a probability of 0.004357 to pay less for the bid 70. Age is statistically significant and positive coefficient. One unit increase in age visitors are 3% more likely to be willing to pay Rs.70 as an entry fee. Variable years of schooling (EDU) is statistically significant with the coefficient of positive sign. Educated visitors are 8% more likely to be willing for entry fee 70. Total Cost of the Substitute (TCS) has a positive and significant coefficient. Those visitors who bear high costs for visiting other sites are expected to be willing to pay more for the improvements in HN Park. Results show that visitors with additional household size are 13% more likely to pay Rs.70 for the entry fee. Coefficient of the variable distance (Dist) is negative, visitors who come from far away are 0.0069% less likely to be willing to pay.

The dummy variable gender is statistically insignificant and has a positive coefficient. Men have a higher probability of 0.25 than women for the willingness to pay. Visitors' perception about the quality of the park (Q) is positive and significant which shows that those who think that the quality of the park is good they are 34% more likely to be willing for bid 70. Visitors always want more improvements and better facilities at the recreational sites to enjoy the nature this is the reason that they need better recreational and other improvements in HN Park. Variable RI is statistically insignificant with positive sign.

Table 5.12 Results of the logistic model (for bid Rs.70)

Variables	Odd ratios	Std.err	z-Value	P-value	Coefficient
Income	(0.008524)**	0.00025	2.10	0.035	0.00139258
TC	(-0.004357)**	0.00002	-2.57	0.010	-0.0001839
Age	(0.0314367)***	0.01806	1.74	0.082	0.1277541
EDU	(0.0870306)**	0.03738	2.33	0.020	0.3536794
TCS	(0.0000168)	0.00001	1.61	0.107	0.0000684
HHS	(0.1316433)**	0.05126	2.57	0.010	0.5349788
Q	(0.3512419)**	0.15013	2.34	0.019	1.478872
G	0.2463244	0.21132	1.17	0.244	1.011735
Dist	(-0.0008571)***	0.00046	-1.86	0.063	-.0034831
Recreational improvement (RI)	0.0753962	0.17234	0.44	0.662	0.3039455

** and *** shows that the variable is significant at 5% and 10% confidence intervals respectively.

Number of observations 210. Pseudo $R^2 = 0.1087$

5.8.2 Results of the Logit Model (LM) for entry fee Rs.65

Following Table 5.13 shows the margin effects of the logistic model for bid Rs.65. Results of the logit Model LM for bid Rs.65 shows that income of the respondents' has a statistically significant and positive coefficient. One percent increase in income has a 0.0011873 probability of willingness to pay. Variable price of trip or Trip Cost (TC) is negatively correlated with the perception about the willingness to pay. Visitors who face high cost for a trip are 0.0027% less likely to be willing for the bid 65. Age is statistically significant and has a positive coefficient. Increase in one year of age has a .0335634 probability of willing to pay for entry fee Rs.65. Variable years of schooling (EDU) is statistically significant with the coefficient of positive sign. Those visitors who have higher years of schooling are expected to be willing to pay more for entry fee 65. Total Cost of the Substitute Site (TCS) has a positive and significant coefficient. Higher the cost of the substitute park of HN Park there is a higher probability of 0.00222 for the willingness to pay for HN Park. Higher household size (HHS) of the visitors are expected to be wiling more Rs.65 as an entry fee. Coefficient of the variable

distance (Dist) is negative. Visitors who cover a longer distance are 0.10758% less likely to pay Rs.65.

The dummy variable gender is statistically insignificant and has a positive coefficient which shows that male are expected to be willing more for the improvements. Visitors' perception about the quality of the park (Q) is positive and significant which shows that the quality of the park has a 0.3154 probability that visitors will pay Rs.65. recreational improvement for the wildlife watching has statistically insignificant effect on WTP for bid.

Table 5.13 Results of the logistic model (for bid Rs.65)

Variables	***Odd ratios***	***Std. Err.***	**z**	***P>z***	***Coefficient***
Distance	(-0.0010758)**	0.0018698	-2.47	0.013	-0.004624
Total Cost	(-0.000027)***	0.0000619	-1.94	0.053	-0.000119
Income	(0.0011873)***	0.0000158	1.66	0.097	0.0023262
TCS	(0.00222)**	0.0000437	2.18	0.029	0.0178955
Age	(0.0335634)**	0.0715297	2.02	0.044	0.1442657
EDU	(0.06004)***	0.1434397	1.80	0.072	0.2580705
HHS	(0.0836211)***	0.1907081	1.88	0.059	0.3594294
Q	(0.3154801)**	0.6468703	2.03	0.042	1.314116
G	(0.0035074)	0.7665813	0.02	0.984	0.0150523
Recreational improvements	(0.1966394)	0.6490876	1.25	0.211	0.8121353

** and *** shows that the variable is significant at 5% and 10% confidence intervals respectively.

Number of observations 210. Pseudo $R^2 = 0.1145$

5.8.3 Results of the Logit Model (LM) for entry fee Rs.60

Following table 5.14 reveals the margin effects of the LM for the bid Rs.60. In the following table Income, age, Education (EDU), visitors' perception about the quality of the park (Q), household size (HHS) and Total Cost of the Substitute site (TCS) have a positive and significant coefficients at the 10% confidence interval, while cost of trip is significant at 5% confidence interval with negative coefficient. Dummy variables Gender and recreational

improvements are statistically insignificant with positive sign. Distance has a negative coefficients but significant at 10% confidence interval.

Visitors with higher income are expected to be willing for the entry fee 60, with the increase in age there is 0.028249 probability in increase for the payment of entry fee, increase in one years of schooling visitors are 5% more likely to be willingness to pay, one unit in cost of visiting the substitute site there is 0.00013 probability of increase in payment for entry fee Rs.60.

Visitors who are satisfied with the quality of the park have a 1.265918 probability to be willing than other visitors. Visitors with higher HHS are 10% more likely to be willing for the entry fee 60.

Increase in one unit of distance from HN Park visitors are 0.087% less likely to be willing to pay 60 rupees, similarly for the cost of the trip there is 0.0077% less likely decline for the payment Rs.60.

Table 5.14 Results of the logistic model (for bid Rs.60)

Variables	***Odd ratios***	**Z**	***P>z***	***Coefficient***
Distance	(-0.0007772)***	-1.79	0.074	-0.0032632
Total Cost	(-0.0000416)*	-2.65	0.008	-0.0001746
Income	(0.073851)***	1.85	0.065	0.0940299
TCS	(0.000013)***	1.63	0.085	0.0000545
Age	(0.0282491)***	1.67	0.095	0.1186057
EDU	(0.0598661)***	1.72	0.085	0.2513518
HHS	(0.1048675)**	2.28	0.022	0.4402934
Q	(1.265918)***	1.90	0.057	1.265918
G	(0.3015548)	1.42	0.156	1.245874
Recreational improvements	(0.1402029)	0.88	0.380	0.5738107

** and *** shows that the variable is significant at 5% and 10% confidence intervals respectively.

Number of observations 210. Pseudo $R^2 = 0.1302$

5.8.4 Results of the Logit Model (LM) for entry fee Rs.50

Table 5.15 reveals the margin effects of the LM for bid Rs.50. Income has a positive and statistically significant effect on willingness to pay but one unit increase in income has a very low probability of increase in willingness to pay for bid 50. Visitors who bear high trip cost are 0.00215% less likely to be willing to pay for the entry fee Rs.50. Variable age is statistically insignificant for the bid 50. Education has a significant effect on willingness to pay. Increase in one year of schooling there is 0.08305 probability chance to increase in willingness to pay. Cost of the substitute site TCS is positive and significant with the willingness to pay for entry fee 50. Increase in one unit cost of the substitute site there are 0.00309% more likely increase in willingness to pay Rs.50. household size is significant with the willingness to pay. For each additional member there is 0.1295498 probability chance of willing to pay 50. Distance has a negative and significant coefficient at 5% confidence interval. Increase in one kilometer distance there is .009e95 probability of decline in willingness to pay Rs.50.

Dummy variables Gender visitors' perception about the quality of the park and recreational improvement for the wildlife watching are statistically insignificant for the bid Rs.50

Table 5.15 Results of the logistic model (for bid Rs.50)

Variables	**Odd Ratios**	**Std. Err.**	**z**	**P>z**	**Coefficient**
Distance	(-0.009395)**	0.0018475	-2.21	0.027	-0.0040917
Total Cost	(-0.0000215)	0.000063	-1.40	0.160	-0.0000884
Income	(0.0005371)**	0.0000158	1.96	0.049	0.0009431
TCS	(0.0000309)*	0.0000456	2.79	0.005	0.0001272
Age	(0.0200585)	0.0700235	1.18	0.239	0.0824885
EDU	(0.0830572)**	0.1475989	2.31	0.021	0.3415649
HHS	(0.1295498)*	0.1988919	2.68	0.007	0.5327609
Q	(0.2283428)	0.6319532	1.47	0.141	0.9306307
G	(0.03801280)	0.7855452	0.20	0.840	-0.1581941
Recreational improvements	(0.1321771)	0.6655493	0.80	0.421	0.5352443

** and *** shows that the variable is significant at 5% and 10% confidence intervals respectively.

Number of observations 210. Pseudo $R^2 = \ 0.1800$

5.8.5 Results of the Logit Model (LM) for entry fee Rs.40

From the margin effects of the Logistic Model (LM) results in the table 5.16 show that the variables gender (G), income and education (EDU) are statistically insignificant with positive coefficients while age, HHS and distance, recreational improvement and Perception about the quality of the park (Q), cost of the trip are significant at 10% confidence interval. and distance are significant at 5% confidence interval.

For the one unit increase in distance visitors are 0.10941% less likely to be willing for the bid 40, one unit increase in TCS have a 0.0000189 probability of WTP for bid, an additional unit of trip cost visitors are 0.00247% less likely to be willing to pay 40 rupees. visitors with high income are expected to be willing more, one unit increase in age visitors have a .0291629 probability of WTP for the bid, for the HHS visitors with additional family member have an expected probability of 0.0762327 to be willing for bid. Visitors with good perception of the quality of the park are 32% more likely to be willing to pay. Visitors who want wildlife watching are WTP for the entry fee Rs.40. Income has a very small effect of WTP.

Table 5.16 Results of the logistic model (for bid Rs.40)

Variables	***Odd Ratios***	***Std. Err.***	**z**	***P>z***	***Coefficients***
Distance	(-0.0010941)**	0.0018582	-2.51	0.012	-0.0046552
Total Cost	(-0.0000247)***	0.0000609	-1.73	0.084	-0.0001053
Income	(5.94e-06)	0.0000155	1.63	0.103	0.0000253
TCS	(0.0000189)***	0.0000421	1.91	0.056	0.0000804
Age	(0.0291629)***	0.0684314	1.81	0.070	0.1240788
EDU	(0.0380307)	0.1415818	1.14	0.253	0.1618085
HHS	(0.0762327)***	0.1851995	1.75	0.080	0.3243454
Q	(0.3322289)**	0.6169695	2.24	0.025	1.384314
G	(0.1330132)	0.7575472	0.72	0.471	0.5458023
Recreational improvements	(0.2657434)***	0.6371957	1.72	0.086	1.094766

** and *** shows that the variable is significant at 5% and 10% confidence intervals respectively.

Number of observations 210. Pseudo $R^2 = 0.1568$

5.8.6 Results of the Logit Model (LM) for entry fee Rs.30

For the bid Rs.30 table 5.17 shows the results of the logistic model. Results show that gender (D), Cost of the trip, Cost of the substitute site, household size HHS and gender variables are statistically insignificant.

This may be the reason that TCS is insignificant because visitors who visit other national parks or HN Park this bid is a very small proportion of the expenses that they do for the recreational purposes. This might not affect their willingness to pay. Cost of the trip is insignificant might be the reason that visitors come from very far and they spend thousands for per trip Rs.30 is a very small amount which cannot effect their willingness to pay for the entry fee.

Age is significant at 10% confidence interval, while education, recreational improvement, income, education and Q are significant at 5% confidence intervals and distance is significant at 1% confidence interval. Results of the marginal effects show that variables TCS, income and total have a very low effect on the WTP for entry fee 30.

One unit increase in age has a 0.0266391 probability chance that a visitor will be willing to pay Rs.30. visitors with good perception about the quality of the park are 30% more likely willing to pay 30 rupees for the improvements and one unit increase in distance have a probability chance of 0.00133 decline in the willingness to pay. Higher the years of schooling visitors are 6% more likely to pay entry fee. Visitors who want recreational improvement are willing more for entry fee.

Table 5.17 Results of the logistic model (for bid Rs.30)

Variables	***Odd Ratios***	***Std. Err.***	**z**	***P>z***	***Coefficients***
Distance	(-0.00133)*	0.0020188	-3.39	0.001	-0.006851
Total Cost	(-0.0000042)	0.0000598	-0.35	0.728	-0.0000208
Income	(6.92e-06)**	0.000017	2.10	0.036	0.0000356
TCS	(3.39e-06)	0.0000397	0.44	0.660	0.0000175
Age	(0.0266391)***	0.0721133	1.90	0.057	0.1372166
EDU	(0.0600891)**	0.1530471	2.02	0.043	0.3095157
HHS	(0.0326462)	0.1922063	0.87	0.382	0.1681586
Q	(0.3017759)**	0.6372288	2.15	0.032	1.367424
G	(0.0129903)	0.7297079	0.09	0.928	0.0660927
Recreational improvements	(0.3102514)**	0.6433239	2.16	0.031	1.389061

* Shows that the variable is statistically significant at 1% confidence interval, ** and *** shows it is significant at 5% and 10% respectively. Number of observations 210. Pseudo $R^2 = 0.1683$**.**

5.8.7 Results of the Logit Model (LM) for entry fee Rs.25

Table 5.18 shows the results of logistic model for bid Rs.25. Results show that variable distance is significant at 5% confidence interval and the variable years of schooling is significant at 5% confidence interval with positive sign. The variables income, gender and recreational improvement are significant at 10% confidence interval. While the other variables are insignificant in the logistic model for bid Rs.25.

These results show that in increase income or TCS there is a very little probability chance in willing to pay for bid 25. While one unit increase in years of schooling there is 0.057494 probability chance of WTP for bid 25. Visitors with good perception about the quality of the park are 20% more likely to be willing to pay.

Table 5.18 Results of the logistic model (for bid Rs.25)

Variables	***Odd Ratios***	***Std. Err.***	**z**	***P>z***	***Coefficients***
Total Cost	(-0.0000026)	0.0000611	-0.10	0.921	-0.0000052
Income	(5.09e-06)***	0.0000173	1.76	0.078	0.0000305
TCS	(2.09e-06)	0.0000413	0.30	0.761	0.0000125
Age	(0.011836)	0.0723757	0.98	0.327	0.0709427
EDU	(0.057494)**	0.1567523	2.20	0.028	0.3446083
HHS	(-0.0133823)	0.2002712	-0.40	0.689	-0.0802112
Q	(0.2073385)***	0.6316039	1.69	0.092	1.065502
G	(0.0092377)	0.7359902	0.07	0.941	0.0546797
Dist	(-0.0014893)*	0.0020988	-4.25	0.000	-0.0089266
Recreational improvements	(0.2429176)***	0.657731	1.84	0.066	1.210716

* Shows that the variable is statistically significant at 1% confidence interval, ** and *** shows it is significant at 5% and 10% respectively. Number of observations 210. Pseudo $R^2 = 0.1683$**.**

5.9 Entry fee

In this sub portion we suggest a feasible entry fee for the NHP for the revenue generation activities and for the maintenance of the park and for further conservation of the wildlife and Ramsar Sites. Suggesting a feasible entry fee is not so easy because we have to consider the number of visits that must not decline. Thus, for the different entry fee we have to see the recreational demand elasticity for different bids that were given to the visitors for the entry fee.

$$\boldsymbol{\eta}_i = \frac{\Delta Q}{Q} * \frac{P}{\Delta P}$$

Elasticity of demand shows the percentage change in quantity demand due to the percentage change in the prices. In our case for the study the elasticity of demand of NHP for recreational purposes will be

$$\eta_i = \frac{\Delta N}{N} * \frac{\Delta C}{C}$$

Where is N is the number of visits per year,

ΔN= $N_1 - N_2$, N_1 are the current number of visits and N_2 is the number of visits after the improvements.

And C is the total cost of the visit,

ΔC= $C_1 - C_2$, $C_1$is the current cost of the visit and $C_2 = C_1 + entry\ fee$.

Following table 5.6 shows the average elasticities of the recreational demand for different entry fee.

Table 5.19 elasticity of demand

Bids for entry fee	***Elasticity***	***Marginal effects of logit model***
70	-0.06372	-0.004357
65	-0.05842	-.0000279
60	-0.05027	-0.0000416
50	-0.06141	-0.0000215
40	-0.042351	-0.0000247
30	-0.034712	-0.0000042
25	-0.030263	-0.0000026

Table 5.19 reveals the elasticities for different bids for the entry fee and the marginal effects of the logistic models for different bids against the cost of the visit. The table shows that for entry fee Rs.70 elasticity for the number of visits is -0.06372 one percent change in cost of trip there is -0.06372 decline in the number of visits. The lowest elasticity for the bids is -0.030263, which is the elastic for bid Rs.25, this can be interpret as one percent increase in the cost of visit there is -0.030263 decline in the number of visits. These elasticities can be helpful for suggesting an entry fee but if we consider the results of logit models for different bids, the feasible entry fee for NHP is Rs.60, because this model gave more accurate results than other models. In this study the optimal entry fee is Rs.60 per visitor.

5.10 Recreational value of Hingol National Park (HNP)

Consumer surplus for the recreational demand of HNP can be calculated from the equation 4.17. Consumer surplus in simple economic term is the difference of what consumer is willing to pay and what actually he pays. The total recreational value is the sum of consumer surplus and the total cost of the trip (Himayatullah, 2004).

Table 5.20: Recreational value and CS for the park

	Consumer Surplus		
	Current	After the Entry Fee (60)	Recreational Value
Average per visitor, Rs	88	112	11900.92
Total annual (Millions)	30.96	50.7	500.35

Source: data collected on field survey, calculations were done on the basis of respondents cost and willingness to pay

Table 5.20 shows that the annual monetary recreational value of NHP is 500.35 million rupees. The monetary recreational value is a much high amount which yields to economy of Pakistan every year. This recreational value is the value of the recreational sites and historical places of HNP.

If the entry fee Rs.60 is imposed with certain improvements the annual revenue for the NHP will be 10 million. This much amount will be helpful to government of Balochistan for the conservation of wildlife and maintenance of the park and also for the conservation of the Ramsar Sites. After the improvements the number of visits will increase which also increased the consumer surplus for per visitor from 88 to 112 rupees.

5.11 Focus group discussion

During the field survey we also conducted Focus Group Discussions (FGD). Two FGD were conducted one with the officials of the Wildlife conservation department of Balochistan in district Uthal. The official told that over the time many changes have been occurred in the park. The biggest threat to the wildlife of the park is climatic variation. Due to the decline in the rain fall the number of trees are declining but also they are doing their best to protect them. The wildlife department has its own necessary for the plants in the spring season they grow plants and plant them in the park, but due to the large boundaries of the park it is very hard to visit those plants. The big threat to these plants is the grazing. Animals of the communities living in the parks their animals eat the plants.

The officials also reveal that tourism does not have any negative impact of the wildlife of the park. They also told that, "communities are involved in the protection of wildlife". Fifteen people have been trained and hired for the protection of wildlife and also for the marine life. Sometimes in the hatching seasons of the green marine turtle the eggs are not hatched properly so the people hatch them and release the in the sea.

Second FGD was with communities it was very hard to meet the people and to take their time for the group discussion. After two days with consecutive requests they were willing to give time. The source of income of the people of the HNP depends on fishing and livestock. During the fishing seasons (in summer seasons) they go for hunting in the sea while in off seasons they have small huts (in Kund Malir) give them on rent and charge Rs.500 per night.

Chapter 6

Conclusion and Policy Recommendation

Due to the increasing growth in nature based tourism, techniques for the valuation of the non-market goods are needed for the estimation of the economic benefits of the natural resources such as wetlands and national parks etc. In this study, we used individual travel cost method for the valuation of the largest national park of Pakistan, which is spread across the three districts, i.e., Awaran, Lasbela and Gawadar, covering an area of 6,190 km^2. HN Park is not only one of the most important and beautiful place for the nature base tourism but also it has great scenic views, wetlands, historical and religious places, variety of eco-system services, and many species of flora and fauna. The park also provides tourism, research and educational opportunities for the native as well as for the whole nation of Pakistan.

For the valuation of HNP ITM was used and to check the correlation between number of visits in last year with independent variables two OLS models were regressed. Our results show that results of the linear model are more accurate than the lin-log model.

This study was conducted by taking the sample size of 210 respondents via on site data collection through questioner. The survey reveals that visitors come from far flung areas for recreational purposes, the visitors who visit the park are mostly middle income people, almost all of the respondents were educated and had awareness about the environment and recreational services, and they go out for nature based tourism on annual basis. The quality of the park was ranked as good by 45% of the respondents, this is the reason that they visit the park frequently, they said. Visitors have high willingness to pay for the wildlife conservation and quality improvement of the park.

The estimated annually recreational value of HN Park is 500.35 million PKR. The revenue, 27 million PKR annually can be generated by imposing an entry fee of Rs. 60 per visitor for HN Park and assuming 2500 visitors per week in peak seasons, while excluding thousands of people from Hindu communities who come there for the "Tirak Yathra", a religious festival of the Hindus, in the month of April every year. Moreover, this revenue can be used for the improvements in quality and further developments in the park. High value of estimated CS encourages the government and other policy makers to invest more in the park for the quality improvements, for the protection of the marine life as well as for the wild life of the park. This study will be helpful for the tourism department of Balochistan to improve the quality of the park and to consider the willingness to pay of the visitors by imposing an entry fee of Rs.60 which is a feasible amount.

6.1 Policy Recommendation

Given the high recreational value of the Hingol National Park and consumer surplus, the provincial and federal governments has to allocate higher budget for the HN Park. From the field survey and results of this study, it is revealed that if the quality of the park is improved it would attract more and more visitors and can generate much more revenue for the government. Further, the Tourism department of Balochistan should focus for the quality improvements of the HN Park in order to promote tourism in Balochistan. People living within the park are mostly dependent on marine fishing if tourism is promoted in these areas it will generate employments for the native people in the form of tourist guide etc.

Budget allocated by government for maintaining National Parks and other natural resources are limited as compare to other development programs, the best alternative for the revenue generation activities is the imposition of entry fee in recreational sites. If entry fee of Rs.60 is imposed with certain improvements in the park that would generate some of its revenues by

tourism activities that would be helpful to extend for the management and maintenance of the park, revenues generated by tourism can further be used for the protection of wildlife and conservation of the Ramsar sites.

The recreational benefits and revenues from the entry fee for HN Park can provide a guidance or establish an example for parks management beyond the Hingol National Park in the country. As there are many National Parks (NP) in Pakistan that need more investment for the quality improvements. We hope, this study will attract the federal and provincial governments and policy makers to the demand for nature and the benefits that can accrue from the inventing in nature.

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Appendices

Appendix A

Questionnaire

This survey is being conducted for completing my M Phil thesis at the Department of Environmental Economics, PIDE, Islamabad. The thesis focuses on the evaluation of the Park. The following questions are thus purely for academic purposes and mainly concerned with household/individual perception about the socio-economic characteristics, expenditures on the trip and willingness to pay for the improvements in the services of the park. Your input is highly valued and I will be grateful if you could please take few minutes out to express your views in this regard. The information and identity of respondent will be kept confidential and will only be used for competing research and not for any other purpose. Your cooperation is highly appreciated.

Date: | | | |

Name of Interviewer_____.

Section A

General Information about the Visitor

1. Gender of the respondent: ____ Male ____ Female.

2. Where do you live?

Name of Place_____

3. Type of visitor: Individual ____ Family____Friends____ other (please specify)_____.

4. Age_____ (years).

5. Marital Status (please circle one): 1. Single 2. Married 3. Widowed/divorced.

6. Household Size: _____ (No. of Family Members).

7. Years of schooling _____.

8. Location: 1. Urban Dweller 2. Living in Rural Areas.

9. Income of the household (Rs./month): Rs._____.

Section B

Visitor's Recreational Behavior

10. How many times did you visit national parks or nature-based recreation in Pakistan within the last 12 months for recreation purpose?

No. of times: _____.

11. How much did you spend on eco-tourism during the last year? Rs. _____.

12. How many times did you visit the Hingol National Park within the last 12 months for recreation purposes?

No. of times: _____.

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

a. Working at job, **b**. Watching TV, **c**. Housework/Shopping,

d. Other (please Specify) _____.

14. How many hours were you at the Park today? _____ hours.

15. How did you come to this Park?

a. By Tour Bus, **b**. By mini bus, **c**. By rented car, **d**. By private car, **e**. By motorcycle,

f. By public bus, **g**. Other (please specify). _____.

16. How much did you spend on your trip from initial point to this national park:

Transportation _____ Rs. (in case of public transport)

Fuel_____Rs. (if private/own vehicle)

Food _____ Rs.

Accommodation_____Rs.

Other _____Rs.

Total _____ Rs.

17. Please estimate the time and distance it takes you to get to this national park from your home?

_____ hours_____ km.

18. If you are not from Balochistan, you came to Balochistan for:

a. Conference attendance, **b.** Business, **c.** Visiting friends or relatives, **d.** Travel, **e.** Recreational purpose, **e,** Other (please specify). _____.

19. If came for Recreational purpose how many other sites visited?

(a) Name of the site _____ (please specify).

(b) Name of the site _____ (please specify.

(c) Name of the site _____ (please specify).

20. How many visiting points have you visited within HN park?

a. Kund Malir, **b.** Agor, **c.** Golden Beach, **d.** Nani Mandir, **e.** Princes of Hope, **f.** sapat Beach

21. How would you describe the quality of recreational benefits at Hingol National Park?

a. Very poor, **b.** Poor, **c.** Fair, **e.** Good, **f.** Excellent, **g.** Don't know.

22. Are you satisfied with the existing recreational benefits of the park? Yes No.

23. Do you know any other National Park that you would like to visit instead of Hingol National Park? Yes No.

24. If Yes to **Q. 22**, Which other single site do you visit frequently?_____ and why?

Reason (Please Mention): _____.

25. If yes to **Q.23**, What would be your total cost to visit that park as compared to Hingol National Park? Rs._____.

26. What is the distance from your home to that park? _____km (please specify).

27. How much time would you spend at the next best alternative national park?_____ hours.

28. If No to **Q 22**, would you like to have improved recreational services provided by the Park?

Yes No.

29. If No to **Q 28**, why?

a. Satisfied with the existing recreational benefits/services of HN Park.
b. Don't have any money; cannot afford
c. Govt.'s responsibility
d. Not my responsibility
e. Others (please Specify)

30. If yes to **Q.28**, what types of improvements would you like to see at this park?

(i) Recreational Site:

What type of recreational improvement do you want in this Park?

(a) ____Wildlife watching, **(b)** ____ Benches, **(c)** ____ Shades, **(d)** ____ Boats, **(e)** ____Other (please Specify) _____.

(ii) Information about Hingol National Park:

a. Maps, **b.** Information Sign, **c.** Precautionary Sign, **d.** Tourist Information Centre **e.** other (please Specify) _____.

(iii) Traffic:

a. Better road, **b.** Car Parking, **c.** other (please Specify) _____.

(iv) Miscellaneous:

a. Waste disposal, **b.** Toilet, **c.** Food and Beverage Services, **d.** Accommodation, **e.** Others (please Specify) _____.

Section C

Visitor's Attitude towards Entrance Fees

31. If Hingol National Park needs more income to provide better services for visitors, such as more recreational sites, improved cleanliness, greater traffic safety, public safety and entertaining activities, how should these recreational services be financed?

a. By introduce entry fees, **b.** Rise Govt expenditures on Hingol Park

c. Other (please Specify) _____.

32. Suppose there were no other sources of improvement except imposing entry fees, would you be willing to pay entry fee? Yes No. If yes, how much _____Rs .

33. (a) Like Hazar Ganji National Park If the entry fee were **Rs. 50**, would you be willing to pay it to visit the Hingol National Park? Yes__ (go to **Q. b**), No__ (go to **Q. c**).

(b) Suppose that the engineers designing the project for improving environmental services of the park confronted some unexpected technical problems, and that instead of **Rs. 50** the entry fee was **Rs. 60**. In this case would you be willing to pay the entry fee or not? Yes _____ (Go to **Q. 34**) No.____ (go to **Q. c**)

(c) Suppose that instead of **Rs. 50** the entry fee was **Rs. 40.** In this case would you be willing to pay? Yes___ (finished; go to **Q. 35**) No____ (go to **Q. e**)

(d) Suppose that instead of **Rs. 40** the entry fee was **Rs. 30**. In this case would you be willing to pay? Yes___ (finished; go to **Q. 35**) No____ (go to **Q. e**)

(e) If instead of **Rs.30** the entry fee was **Rs. 25** will you be willing to pay? Yes___ (finished; go to **Q. 35**) No____ (go to **Q. f**)

(f) What is the minimum amount you would be willing to pay for the entry fee to this park? _____ Rs.

34. (a) If instead of **Rs. 60** the entry fee was **Rs.70** will you be willing to pay? Yes __ (finished; Go to **Q. 35**) No ___ (go to **Q. b**)

(b) Suppose that instead of **Rs. 70** the fee was **Rs. 65** will you be willing to pay? Yes No.

35. If you are willing to pay for improved quality of recreational services in the near future, perhaps you may wish to come to the park and spend more time for recreation. How many more times would visit this park? _____ visits per year.

36. Any suggestion for improvements in the park: _____

_____.

37. If these improvements taken place will your number of visits/year:

a. increase, **b.** decrease, **c.** remain constant?

Appendix B

Table 5.1: Gender of the respondents

Gender	Frequency	Percent
Male	187	89.05
Female	23	10.95
Total	210	100.00

Table 5.3 HHS frequency distribution

HHS	Frequency	Percent
2	3	1.43
3	49	23.33
4	45	21.43
5	18	8.57
6	26	12.38
7	35	16.67
8	24	11.43
9	9	4.29
Total	210	100.00

Table 5.4 Frequency distribution for quality of the park

Quality	***Frequency***	***Percentage***
Very poor	5	1.96
Poor	14	6.67
Fair	34	16.19
Good	84	40.00
Excellent	63	30.00
Don’t know	10	4.76
Total	210	100

Appendix C

Results of the econometric models

1.1 Results of the linear OLS model

```
Number of obs   =       210
F(11, 118)      =      7.55
Prob > F        =    0.0000
R-squared       =    0.4131
Adj R-squared   =    0.3583
Root MSE        =    .95219
```

NoofVisits	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
TotalCost	-.0000633	.0000231	-2.74	0.007	-.000109	-.0000176
Incom	.0000179	4.96e-06	3.61	0.000	8.07e-06	.0000277
TCS	6.85e-06	.0000159	0.43	0.668	-.0000247	.0000384
age	.0281634	.1718104	0.16	0.870	-.312068	.3683948
age_sqr	-.0011609	.0029366	-0.40	0.693	-.0069762	.0046543
EDU	.1066702	.044448	2.40	0.018	.0186512	.1946893
HHS	.1855129	.0705878	2.63	0.010	.0457298	.325296
Q	.4417932	.2100973	2.10	0.038	.0257433	.8578432
G	.5458672	.2887011	1.89	0.061	-.0258396	1.117574
Dist	-.0014338	.0006961	-2.06	0.042	-.0028123	-.0000554
recreational_improvents	.2796333	.2270307	1.23	0.221	-.1699492	.7292158

1.2 Results of the linear log model

```
Number of obs   =       210
F(11, 118)      =      6.44
Prob > F        =    0.0000
R-squared       =    0.3751
Adj R-squared   =    0.3168
Root MSE        =    .98253
```

NoofVisits	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lntc	-.7376583	.2191072	-3.37	0.001	-1.17155	-.3037663
lnincom	.9077649	.2378555	3.82	0.000	.4367462	1.378784
lntcs	.1864807	.1674897	1.11	0.268	-.1451945	.518156
lnage	.7901269	3.147591	2.10	0.038	-7.023214	5.44296
lnedu	1.613355	.6426429	2.51	0.013	.3407475	2.885963
lnhhs	.7936273	.369014	2.15	0.034	.0628792	1.524376
lndist	-.1083848	.1290406	-0.84	0.403	-.3639203	.1471507
recreational_improvents	.3292957	.2313021	1.42	0.157	-.1287455	.7873368
lnage_2	-.2506721	0.490459	-2.33	0.027	-3.202186	2.700842
G	.5372573	.2962219	1.81	0.072	-.0493426	1.123857
Q	.4864504	.2177906	2.23	0.027	.0551657	.917735
_cons	-4.057072	3.434275	-1.18	0.240	-10.85787	2.743729

1.3 Results of linear OLS model with dependent variable WTP

```
Number of obs   =       210
F(11, 118)      =      2.79
Prob > F        =    0.0029
R-squared       =    0.2064
Adj R-squared   =    0.1324
599   Root MSE   =    172.19
```

wtp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
TotalCost	-.0051435	.0041884	-3.04	0.003	-.0134959	.0030289
Incom	.0027269	.0008972	3.04	0.003	.000945	.0045005
TCS	.0021841	.0028804	0.76	0.450	-.0035214	.0078867
age	5.914814	31.52057	0.19	0.851	-63.71346	59.33914
age_sqr	-84.41806	443.0967	-0.19	0.849	-1.014825	1.088401
EDU	18.24758	8.037776	2.27	0.025	2.240339	34.07447
HHS	22.91572	12.76271	1.80	0.075	-2.387924	48.16787
Q	20.46467	37.97465	0.54	0.591	-55.02788	95.44625
G	64.60481	52.21587	1.24	0.218	-39.47231	167.2987
Dist	-.0732636	.1260334	-0.59	0.553	-.3225407	.1760135
recreational_improvents	58.56033	41.09604	1.42	0.157	-139.2448	23.35713
_cons	32.30013	451.7037	0.73	0.469	-1222.689	566.3031

1.4 Results of log model with dependent variable lnWTP

Number of obs = 210

F(11, 118) = 3.08

Prob > F = 0.0011

R-squared = 0.2232

Adj R-squared = 0.1508

Root MSE = 1.7679

lnwtp	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lntc	-.5358103	.3942522	-1.36	0.177	-1.316537	.2449164
lnincom	1.197338	.4279871	2.80	0.006	.3498068	2.044869
lntcs	.1482698	.3013739	0.49	0.624	-.4485325	.7450722
lnage	1.833605	5.663641	0.32	0.747	-13.04916	9.381946
lnedu	2.202639	1.156344	1.90	0.059	-.0872374	4.492515
lnhhs	1.346698	.663988	2.03	0.045	.0318204	2.661575
lndist	-.3041786	.2321901	-1.31	0.193	-.7639782	.155621
recreational_improvents	.5694434	.4161951	1.37	0.174	-.2547363	1.393623
lnage_2	-1.064269	2.681868	-0.40	0.692	-4.246559	6.375097
Q	.6561493	.3918831	1.67	0.097	-.1198859	1.432185
G	-.1400329	.533009	-0.26	0.793	-1.195536	.91547
_cons	-13.71981	6.179489	-2.22	0.028	-25.95688	-1.482735

Sphinx

Sapat Beach

Princess of Hope

City of Caves

Marsh Crocodile at Hingol River

Golden Beach

Worship Places of Hindus in HNP