The goal of IGCP is to ensure the conservation of the regional afromontane forest habitats of the mountain gorillas in Rwanda, Uganda and the Democratic Republic of Congo

INTERNATIONAL GORILLA CONSERVATION PROGRAMME (IGCP)

FINAL DRAFT

Analysis of the Economic Significance of Gorilla Tourism in Uganda

Dr. Yakobo Moyini
Berina Uwimbabazi, Msc.

Environmental Monitoring Associates (EMA) Ltd
Plot 49 Kanjokya Street
Kampala-Uganda
Tel: (256)-41-540351 email: eeau@swiftuganda.com

www.mountaingorillas.org

Acknowledgements

We, would like to thank Ms. Helga Rainer, Programme Officer, IGCP for the support during the course of the economic analysis of gorilla tourism and her encouragement when things looked bleak. Stephen Asuma of IGCP had to accommodate us within his busy schedule. We are truly grateful to him. We would also like to thank the African Wildlife Foundation for the financial support that made this study possible.

Our thanks also go to the staff of both Bwindi and Mgahinga national parks who accommodated some of our unreasonable requests very well. The staff helped us with the distribution and collection of the visitor questionnaires. We also would like to thank the numerous individuals with whom we held very fruitful and insightful discussions including community groups and tour operators.

However, we must absolve any of the above individuals and institutions from responsibility for any omissions or errors contained in this report.

Acronyms and Abbreviations

AWF	African Wildlife Foundation
BINP	Bwindi Impenetrable National Park
CBD	Convention on Biological Diversity
CV	Contingent Valuation
DRC	Democratic Republic of Congo
GD	Game Department
GoU	Government of Uganda
GPT	Graduated Poll Tax
IGCP	International Gorilla Conservation Pogramme
MGNP	Mgahinga Gorilla National Park
MTTI	Ministry of Tourism, Trade and Industry (successor to MTWA)
MTWA	Ministry of Tourism, Wildlife and Antiquities
PAYE	Pay As You Earn
RUM	Random Utility Model
TCM	Travel Cost Method
ToR	Terms of Reference
TWP	Total Willingness to Pay
UBOS	Uganda Bureau of Statistics
UCOTA	Uganda Community Tourism Association
UNP	Uganda National Parks
UTB	Uganda Tourist Board
UWA	Uganda Wildlife Authority
VAT	Value Added Tax
VIP	Very Important Person

Executive Summary

Gorilla tourism, is the single most important asset over which Uganda has an absolute comparative advantage when compared to Kenya and Tanzania. However, considering the regional distribution, Uganda needs to have closer collaboration with Rwanda and the Democratic Republic of the Congo to harmonise and coordinate gorilla tourism in the region, particularly in relation to tariffs, standards and animal health issues.

The analysis presented in this report focuses on the economic significance of tourism based on the mountain gorilla (*Gorilla gorilla berengei*) in Mgahinga Gorilla National Park and Bwindi Impenetrable National Park.

Gorilla tourism provides significant economic benefits to the tourists, Uganda as a whole, the various levels of governments, the local communities, and the Uganda Wildlife Authority. Being the main attraction for tourists visiting Uganda, gorilla tourism also plays a catalytic role in the sense that some of the people who primarily come to see the mountain gorilla end up visiting other wildlife areas and tourist attractions as well.

Both the travel cost method (TCM) and the contingent valuation method (CVM) were used to value the mountain gorilla as a tourism resource. Depending on which social rate of discount is used, the resource, as a tourist attraction at full capacity was valued at $ 7-33 million. Due to the characteristic of the tourists surveyed, mainly lower income foreigners, the value arrived at should be regarded rather conservative.

The spending of tourists who come to view the gorillas also generates regional economic impacts. Again at full capacity utilisation, the national annual economic impacts were estimated to be: $ 4.4 million foreign exchange earnings; $ 8.8 million sales effects; $ 3.9 million of income; $ 2.7 million government revenue; and 946 person years of employment opportunities.

The study also estimated annual benefits flowing to UWA and the local communities at full capacity as $ 2.1 million and $ 678,000, respectively. Tourist responses also revealed some

willingness to pay higher tariffs which if realised could be better shared between UWA and the local communities. Also promoting greater interaction between tourists and local communities should, on balance, result in greater benefits accruing to these communities.

The analysis revealed that opportunities exist for improving tourist experience while in Uganda, including the advance provision of information and educational material. The tourists surveyed indicated a significant willingness to make additional voluntary contributions towards gorilla conservation, law enforcement, and community development, if done right.

Finally, during the analysis of the economic significance of gorilla tourism, difficulties were encountered with respect to the following: the sample size represented better the lower income spectrum of tourists; and the absence of solid multipliers for estimating some of the regional economic impacts.

A number of recommendations have, therefore, been made as follows:

- Review the gorilla tourism tariff structure, with a view to increasing benefits accruing to UWA and the local communities;
- Revisit the standby arrangement that existed before;
- Promote more interaction with local communities while avoiding any adverse social impacts, so as to encourage tourists to stay longer and spend more in the communities;
- Promote the availability of information and educational materials at tourists' point of departure;
- Design, pre-test, and annually administer tourist survey questionnaires in all wildlife protected areas and other areas of tourism interest so as to allow for calculations of net economic benefits (resource values), and economic impacts; and
- Improve upon estimates of regional multipliers through collaboration with institutions such as UBOS.

Table of Contents

List of Figures

List of Tables

List of Boxes

1.0 INTRODUCTION

1.1 Background

Globally, tourism is one of the fastest growing segments of the world economy, representing close to 7% of total world trade including trade in merchandise, **(Box 1)**. In Uganda, tourism is seen as an important source of foreign exchange earnings. In the 1960s and up to 1970, tourism was Uganda's third largest foreign exchange earner, after coffee and cotton. Other attributes are that tourism: is a job creator; is a generator of tax revenues for the different levels of government; impacts on regional (national) economic activity; fosters an enterprise economy in the way it attracts small and medium-sized enterprises; has strong linkages to other sectors of the economy like agriculture, transport, communications, and to some extent manufacturing industry; brings benefits to local communities; and has considerable potential for expansion and value-added, especially since the potential of the industry is only now being consciously tapped.

In recognition of the importance of the tourism industry in Uganda, Government developed and put in place a ten-year Tourism Master Plan. The Government of Uganda (GoU) also rationalised the institutional structures necessary for the effective development and promotion of tourisn products. This rationalisation resulted in the merger of Uganda National Parks (UNP) and the Game Department (GD) to form the Uganda Wildlife Authority (UWA). While UWA is primarily concerned with wildlife- related tourism products development, the Uganda Tourist Board (UTB) is the primary institution for the promotion of the tourism products developed. In addition to reforms of institutional structures, GoU also introduced a new Wildlife Policy and a Wildlife Statute in 1996. These institutional instruments are both pro-tourism.

Before the reforms in institutional structures and instruments, Uganda's national parks expanded from the original four savanna grassland ecosystems (Queen Elizabeth, Lake Mburo, Murchison Falls and Kidepo Valley national parks) to include six forest ecosystems (Mount Elgon, Bwindi Impenetrable, Mgahinga Gorilla, Rwenzori Mountains, Semuliki and Kibale national parks) which were originally central forest reserves. And in 1996, the

Uganda Wildlife Authority inherited twelve game reserves, animal sanctuaries and controlled hunting areas (Pian-Upe, Bokora, Matheniko, Otze-Dufile, Ajai, Katonga, Kyambura, Kigezi, Karuma, Bugungu, Semuliki and Kaiso Tonya). The wide range of habitats, and fauna and flora in the different ecosystems has provided the Uganda Wildlife Authority with substantial opportunities for tourism product development.

1.2 Conservation and Tourism

While opportunities for tourism product development in wildlife protected areas are there, the question of the extent to which tourism should be encouraged at the expense of conservation arises. Ultra conservationists would like to see as little level of tourism as possible in the wildlife protected areas. Meanwhile those in support of tourism are for higher levels of tourist activities. As a matter of policy, the Government of Uganda favours ecotourism, a position closer to the conservationists. This policy distinguishes Uganda from its other East African neighbours, Kenya and Tanzania, who practice mass tourism.

This study concerns the economic significance of gorilla tourism, one of the most highly regulated ecotourism activities in Uganda. The mountain gorilla is regarded as the most endangered of the great apes. In a report by Vedder and Weber (1990) on mountain gorillas in Rwanda, it is indicated that their population declined from 450 in 1960 to 274 in the 1970's. The main reason for this decline was the reduction in the size of their natural habitat for agricultural purposes, which in turn exposed them more to unscrupulous poachers.

The known population of mountain gorillas today is approximately 650 with about half of them located in Bwindi Impenetrable National Park (BINP) and a critical part of the remaining half in Mgahinga Gorilla National Park (MGNP), both in Uganda **(Figure 1)**. These parks offer the animals a natural habitat and relative protection. Gorilla viewing

Box 1

TOURISM AT A GLANCE

Global

- Excluding international transport, world-wide tourism receipts grew from about US$ 2.1 billion in 1950 to US$ 425.0 billion in 1996.

- In total, over the same period, the value of world-wide tourism represented 6.6% and 6.7% of total world trade, including trade in merchandise.

- World-wide international tourist arrivals increased from 25.3 million in 1950 to 594.6 million in 1996 (same-day visitors excluded).

Africa

- Over the same period, excluding international transport, Africa's tourism receipts grew from US$ 88 million in 1950 to US$ 8.0 billion in 1996.

- Arrivals in Africa increased from 524,000 in 1950 to 7.3 million in 1980 and, further, to 20.6 million in 1996.

- The continent's share of world arrivals increased from 2.6% in 1980 to 3.41% in 1995.

East Africa

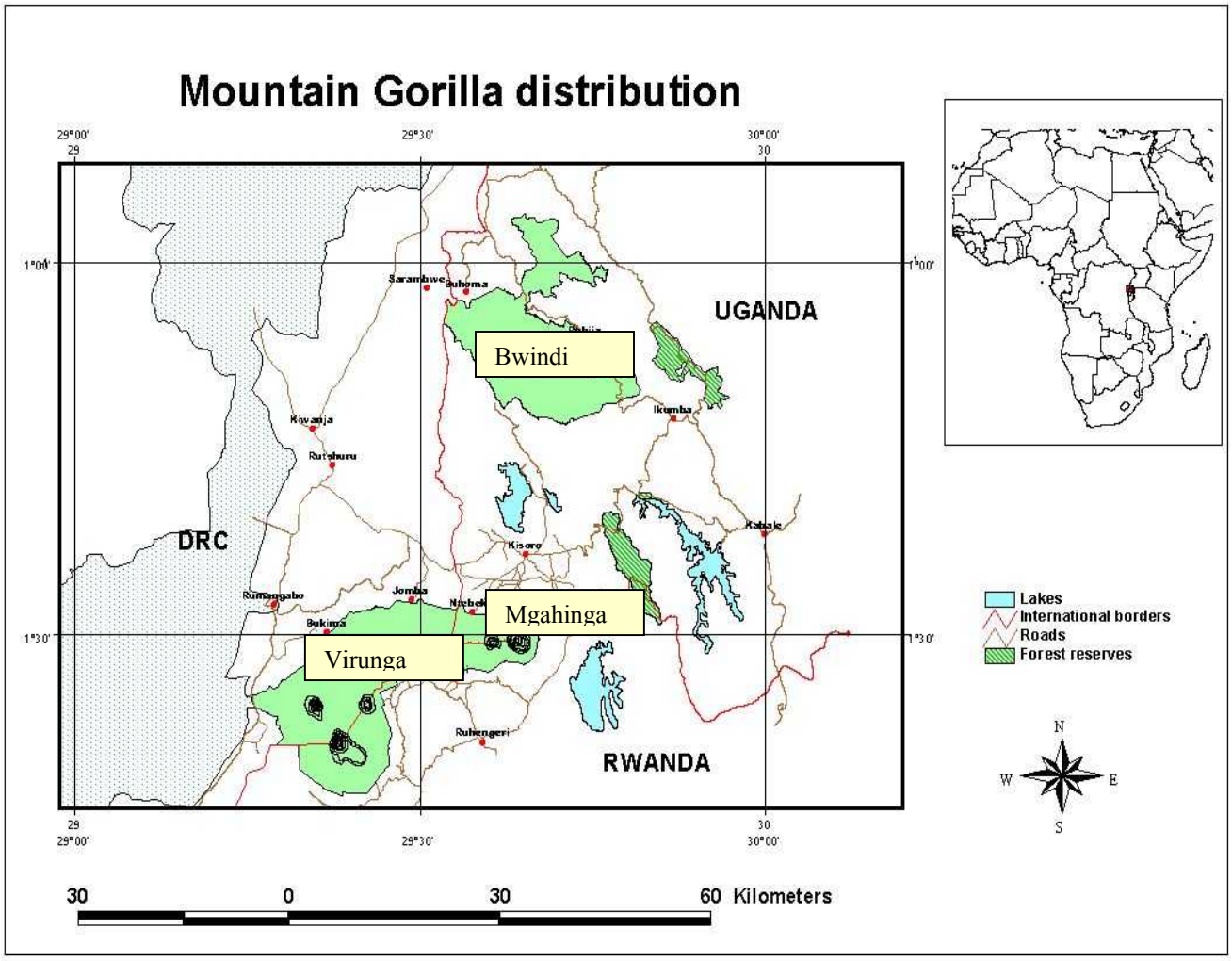
- Excluding international transport, East Africa's tourism receipts grew from US$ 452 million in 1980 to US$ 1.64 billion in 1995.

- Between 1980 and 1995, Eastern Africa was the fastest growing destination in terms of arrivals on the African continent. Arrivals increased from 1.3 million in 1980 to 4.2 million in 1995, representing an average annual growth rate of 8.25%.

- Kenya, Tanzania and Uganda had their combined arrivals increased from 1.1 million to 1.2 million between 1991 and 1995.

Figure 1

Location of Mgahinga Gorilla National Park (MGNP) and Bwindi Impenetrable National Park (BINP)



began in April 1991, and is presently limited to not more than twelve visitors per day in BINP and six in MGNP (representing six visitors per habituated gorilla group per day).

BINP covers an area of approximately 320km^2 on the steep Virunga slopes and stretches across a 65km boundary between Uganda and Congo, while MGNP which is separated from BINP by a distance of about 25km, covers an area of approximately 29km^2. MGNP forms the Uganda cornerstone of the Virunga range and borders national parks in both Rwanda (Parc de Volcans) and Congo (Parc de Virunga).

Efforts to implement nature conservation and protect wildlife species in Africa, may appear to be so low or non - existent. The reasons for this are diverse, but generally incline towards poverty, political instability, rigid land tenure systems, and absence of environmental protection policies. Yet, for many African countries, it is precisely their gifts from nature that hold the promise for their economic survival and sustenance for future generations. Apart from the pastoralists and subsistence farmers who must, of necessity, eke out an existence from the bounties of natural resources or lack of them, eco-tourism offers an opportunity for the state (government) to generate incomes that could warrant sustainable growth in many African countries. Gorilla tourism, is a specialised form of eco-tourism with great potential for this.

Currently, gorilla tourism is the primary focus for the development of the tourism industry in Uganda. As such, gorilla tourism has the potential to bring in considerable funds to the national economy, with the associated multiplier effects on local and regional economies.

This particular form of tourism is however very fragile due to the nature of gorilla tourism. There is great pressure on the habitat as well as the resource, through a number of potentially conflicting land uses. It is, therefore, necessary to have a solid economic basis for the development of the industry, which takes into consideration local, national and regional interests.

1.3 Study Objectives

As stated in the Terms of Reference (ToR), the overall objective of this study, therefore, was to assess the economic value of the mountain gorilla as a tourism resource in Uganda, through consultation with stakeholders and application of the relevant environmental economics analytical techniques. This report is intended to influence policy related to gorilla tourism and the protection of their habitat regionally and nationally.

1.4 Approach

The approach used in this study is based on the fact that wildlife resources are precious assets to be conserved for the benefit of all humanity. This recognition is the central tenet underlying sustainable development; namely, deriving socioeconomic benefits from Uganda's biological resources today while providing for the population of these resources for future generations. The implicit policy, therefore, is to maintain and enhance wildlife populations, and the ecosystems on which they depend for the benefit of present and future generations.

There is a global concern that some of the fundamental causes underlying the loss or unsustainable use of biological resources throughout the world resides in the fact that societies have failed to value the environment and the goods and services it sustains. This certainly is the perception in Uganda too. There is, therefore, need to know: how much value (direct benefits) on wildlife and wildlife-related activities; and the economic activity

(indirect benefits) generated by the sustainable use of wildlife resources as shown in **Box 2**. Information on economic benefits is a powerful tool that can be employed to help achieve sustainable development policies and programmes.

In analysing the economics of tourism, two fundamentally different types of assessments are used that involve quite distinct approaches, as follows.

- **Economic Impact of Tourist Expenditures**

  = (Direct + Indirect + Induced) impacts

  Sound analysis of the economic impacts of visitor spending requires reliable estimates of:

  - **visits** (the number and types of visitors);
  - **spending** (how much a typical visitor spends in the area and on what kinds of products and services); and
  - **multipliers** (which capture the secondary, indirect and induced, impacts, of the visitor expenditures on the area's economy).

- **Net Economic Benefits to Tourists**

  = Consumer Surplus

Consumer surplus is the difference between the maximum amount an individual is willing to pay to obtain tourism experience and the amount the individual actually pays.

- **Total Value of a Tourist's Experience** is the sum of direct expenditures plus consumer surplus as shown in **Figure 2.**

Box 2

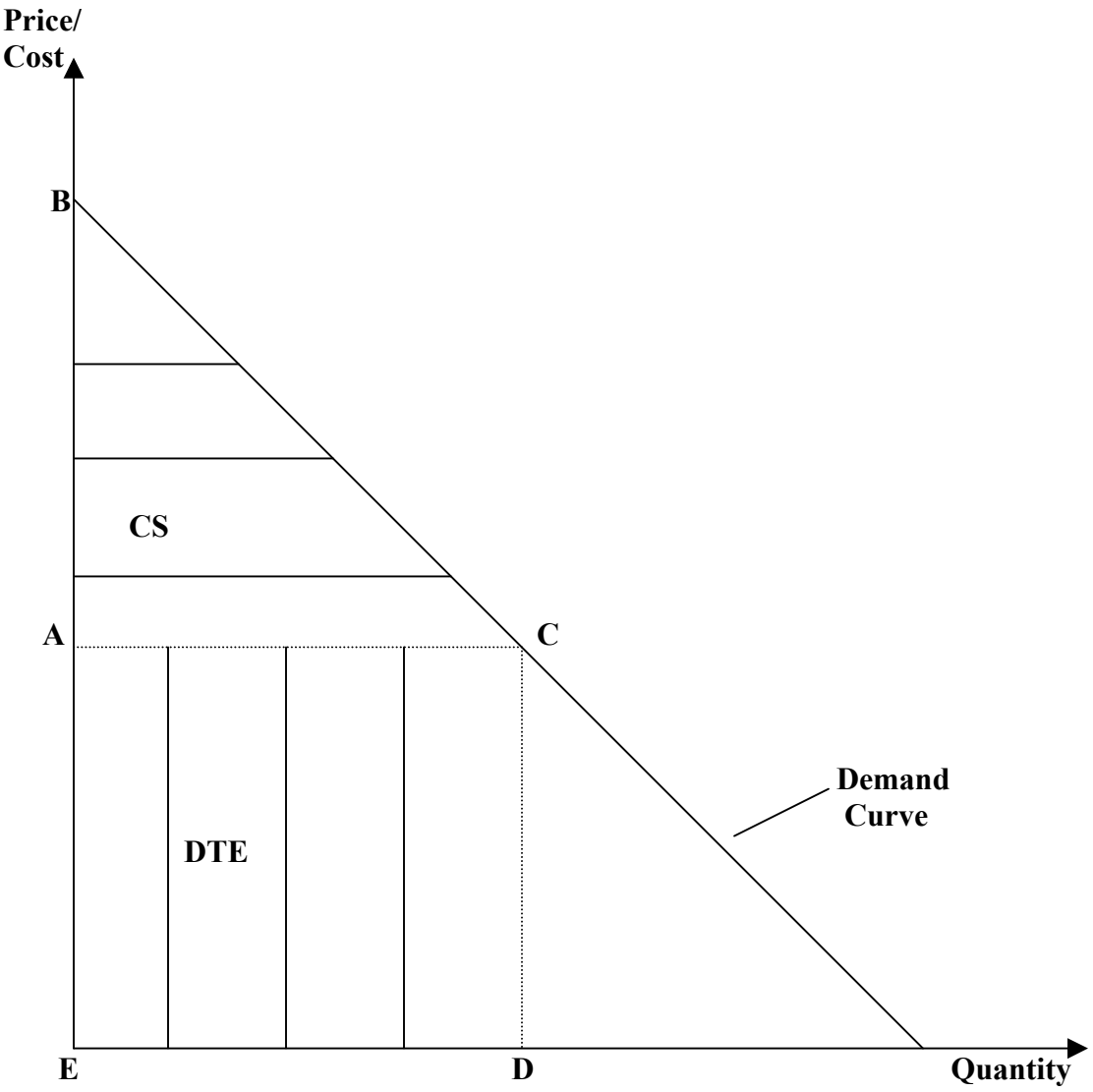
Economic Significance of Tourism

Direct Benefits – are economic values that people place on the utilization of a resource; that is, what people are willing to pay for the enjoyment of a tourist attraction and related activities. **Total Willingness to Pay (TWP)** is the sum of the actual expenditure incurred in a tourism activity and related activities; and an additional amount, a net economic value, for the value of the enjoyment received but not paid for. That is, TWP

= Actual Expenditures + Net Economic Value (Consumer Surplus).

Indirect Benefits – measure the impacts on local and national components of Uganda's economy. These impacts are expressed in terms of: contributions to Gross Domestic Product (GDP); personal income; number of jobs; and revenues accruing to various levels of government from taxes. Often **induced** benefits are included among the indirect benefits.

Figure 2 Value of Tourist Experience



CS – Consumer Surplus = ABC
DTE – Direct Tourist Expenditure = ACDE
Total Value of Tourist Experience = Consumer Surplus + Direct Tourist Expenditure = EABCD

2.0 ECONOMIC THEORY

2.1 Introduction

A pertinent question to ask in estimating the economic significance of tourism is: what is it that we are attempting to measure? Clearly, the answer is two fold. The first is the net economic benefits of tourism. The second, is the economic impact of tourist expenditures.

The net economic benefit of wildlife-related tourism is a measure of the value people attach to a tourist attraction. According to Environment Canada (1998), since wildlife is a renewable resource that can be expected to provide benefits year after year, there is an important related question on the present value of the future benefits that will result from well-managed wildlife populations today. When estimated thus, the net economic benefit can be used to provide an estimate of the value of the wildlife-related tourism.

A third question that arises from the valuation of wildlife related tourism is whether such value is synonymous with that of an entire protected area. If the only value the protected area has is as a tourist attraction, then the answer is yes. However, in practice, most wildlife protected areas provide other goods and services in addition to tourism. Environment Canada (1998) observed that while most valuation studies examine a specific resource or use of a resource, such as the tourism value of a species, a few studies are now beginning to look at an integrated approach to analysis. These integrated approaches often consider a forest system or park as a natural area. In some cases this leads to identifying a number of resource uses, followed by individual valuations for each use. While these valuations may

rely on the same techniques as single resource valuations, the resulting quantified values are pulled back together into an integrated framework for comparison.

According to Stynes and Propst (1996), there appears to be some confusion between the notion of economic value or benefit and economic impact. The former involves economic

efficiency, while impacts usually involve the distribution of costs and benefits associated with economic activity across designated regions.

Stynes and Propst (1996) further elaborated on economic impact as follows. That economic impacts are the changes in economic activity resulting from an action. These changes have traditionally been expressed in terms of sales, industrial output, income, value added, employment, and government revenues and costs. Multiplier, economic base models, and input-output analysis are principal tools for conducting economic impact analyses. According to Stynes and Propst (1996), conventional theories stress the importance of export activities as the basis for regional economic growth. Tourism is an export activity in that it brings income and foreign currency into a region in exchange for products and services produced within that region. An important use of economic impact assessment tools is to measure or predict the regional economic effects of changes in tourism development and activity.

2.2 Resource Valuation

2.2.1 Overview

According to HIID (1997), the Convention on Biological Diversity (CBD) calls for the integration of biological diversity concerns into decisions taken in social and economic sectors, including tourism. HIID (1997) observed that this new vision of protected areas and sustainable use requires an awareness and identification of the goods and services

provided by natural areas, often at no or low costs to the beneficiaries. The author further observed that for communities and public policy decision makers, economic valuation techniques offer insight into the value of a given ecosystem and the services it provides, be it provision of resources such as water or food for direct consumption, services such as watershed catchment protection and climate regulation, or cultural values and tourism uses.

Although wildlife protected areas are gazetted for one or more significant floral and/or faunal attributes, they quite regularly provide a wide range of benefits other than tourism. The total economic value (TEV) of a national park, therefore, is the sum of its direct values, indirect values and option values (which are all use values), plus its existence values (a non-use value) as illustrated in **Figure 3**.

Pearce and Turner (1990) defined both existence and option values as thus.

Option Value = Value in use (by the individual) + Value in use by future individuals (descendants and future generations) + Value in use by others (vicarious value to the individuals).

Existence value, on the other hand, is value placed on the national park and which is unrelated to any actual or potential use of the park. Existence value is thought to provide one of the building bridges between economists and environmentalists since it is not readily explained by the conventional motives. Existence values may accrue based on altruistic motives of bequest, gift or sympathy for the park. Gaian motivations can also generate existence values based on stewardship motives.

From the foregoing, therefore, **the tourism value of a park is an insufficient basis for attaching an economic value to a whole wildlife protected area.** It only refers to that portion of the value of the park attributable to tourism services and products.

Not withstanding the above classification, the process of valuation provides information about the value of nature's products. It identifies the value various stakeholders place on goods and services, the beneficiaries currently served, and those groups which would derive additional benefits through alternative uses of protected areas (HIID, 1997). In this way, noted the author, valuation serves to raise awareness for the concerns of natural resource protection and may provide useful information for management decisions regarding natural resources. Finally, that in addition, valuation can help to identify alternative methods to finance conservation by revealing costs and benefits that exist but may not be recognised by potential stakeholders.

According to Environment Canada (1998), information on economic benefits is a powerful tool that can be employed to help various levels of government and other decision makers to achieve sustainable development policies and programmes by: (a) demonstrating how the loss of biological resources results in a loss of benefits to the people and hence constitutes economic and social costs to communities; and (b) developing economic incentives for those who maintain or enhance biological resources and disincentives for those who degrade important ecosystems, among others.

2.2.2 Approaches to the Valuation of Natural Resources

The process of valuation provides information about the value of nature's products. It identifies the value various stakeholders place on goods and services, the beneficiaries currently being served and those groups, which would derive additional benefits through alternative uses of protected areas.

It is generally recognized that there are essentially two different bases of assigning value for wildlife: anthropocentric approaches; and biocentric approaches. These two approaches are not mutually exclusive, but do assign different values to the same resource under similar circumstances.

Anthropocentric approaches

Anthropocentric approaches can be characterised as utilitarian as they assign value to the wildlife insofar as they provide satisfaction to humans, either individually or as a society. These (anthropocentric) values can be grouped into use values, the value of wildlife derived from direct or indirect use and existence values; the value of wildlife to people beyond their use value (**Figure 3**).

Use values are the least controversial of wildlife values or in general natural resource values, as they are the easiest to identify and measure as consistent with existing markets. Use value is not limited to consumptive uses, such as hunting but also non-consumptive uses such as bird watching and indirect use values.

Anthropocentric values that are not use values are considered existence values; the values are to individuals and society in simply knowing the wildlife exists. Existence values can be characterised as vicarious values; the value to a particular individual in the knowledge that the wildlife exists, or as inter-temporal values; the value of conserving the resource for future generations. In addition, the existence value contains an element of value related to the option that conservation of the wildlife provides for future use. For example, an endangered animal species may have undiscovered medical uses for which the preservation of the species provides an option value.

Biocentric Valuation Approaches

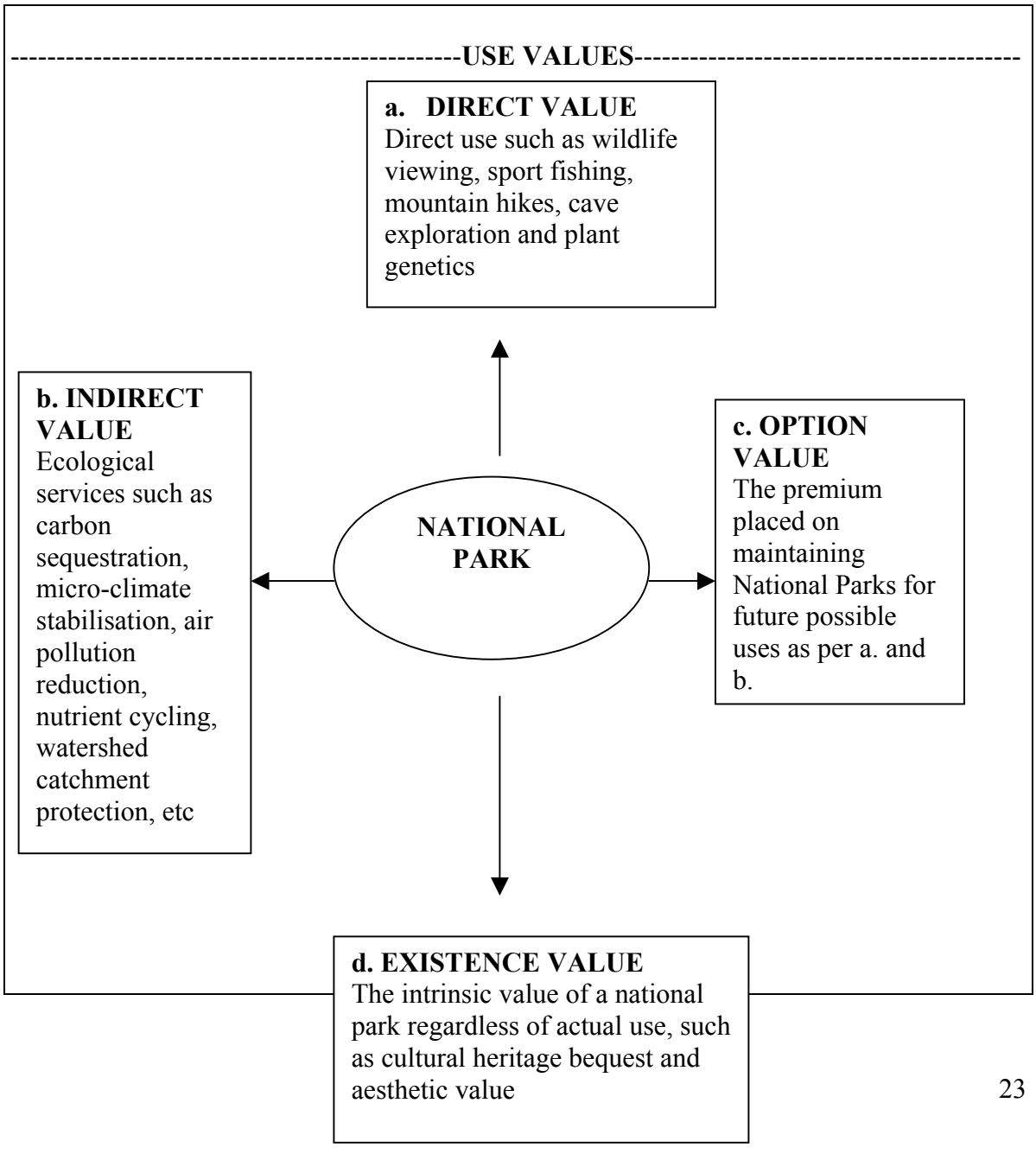
Biocentric approaches can generally be characterised as rights-based approaches, that recognise the intrinsic value of wildlife existence independent of human satisfactions. Intrinsic values however, are not readily measurable in monetary worth, as they are a matter of right.

Therefore, from an economic perspective, the preferred method of valuing wildlife and natural resources in general is to quantify anthropocentric values of use and existence through some form of utilitarian cost – benefit analysis. Anthropocentric values are favoured because they are theoretically measurable, while intrinsic values are not recognised universally and the process of monetising them is speculative. In addition, the use of valuation approach is consistent with current law, which does not recognise legal

rights for natural resources such as wildlife apart from the interests that people have in the resources.

The value of a natural resource such as wildlife is, therefore, the sum of the legally recognised elements of value in so far as they can be separated and independently measured. It is, however, important to note that use existence and intrinsic values are not necessarily exclusive and, therefore, elements of intrinsic values may be included in measurements of use and existence values.

The process of valuation provides information about the value of nature's products. It identifies the value various stakeholders place on goods and services, the beneficiaries currently being served and those groups which would derive additional benefits from their alternative uses of protected areas.


----------USE VALUES----------
a. DIRECT VALUE
Direct use such as wildlife viewing, sport fishing, mountain hikes, cave exploration and plant genetics
b. INDIRECT VALUE
Ecological services such as carbon sequestration, micro-climate stabilisation, air pollution reduction, nutrient cycling, watershed catchment protection, etc
NATIONAL PARK
c. OPTION VALUE
The premium placed on maintaining National Parks for future possible uses as per a. and b.
d. EXISTENCE VALUE
The intrinsic value of a national park regardless of actual use, such as cultural heritage bequest and aesthetic value

----------**NON-USE VALUES**----------

Figure 3 Components of Total Economic Value of a National Park (adapted from Emerton, 1996).

2.3 Economic Impacts of Tourism

According to Frechtling (1994), an economic impact analysis traces the flows of spending associated with tourism activity in a region to identify changes in sales, tax revenues, income, and jobs due to tourism activity. The most direct effects occur within the primary tourism sectors: lodging, restaurants, transportation, amusements, and retail trade. Through secondary effects, tourism affects most sectors of the economy. According to Stynes (1999), the economic impact of visitor spending is typically estimated by some variation of the following simple equation:

Economic Impacts of Tourist Spending = Number of Tourists * Average Spending per Tourist* Multiplier.

Stynes (1999) further observed that the foregoing equation suggests three distinct steps and corresponding measurements or models, as follows: (a) estimate the change in the number and types of tourists to the region; (b) estimate average levels of spending (often within specific market segments of tourists in the area; and (c) apply the change in spending to a regional economic model or set of multipliers to determine the secondary effects. These methods and corresponding information typically involve distinct methods, models and information sources. Each component of the equation may be estimated via expert judgement, from secondary sources, through primary data collection, by means of a model,

or through some combination of these approaches. Stynes (1999) observed that as one moves from judgement to secondary data to primary data and formal models, the methods become more complex and the time and expense of the study increases.

Formally, according to Stynes (1997), regional economists distinguished direct, indirect, and induced economic effects. Indirect and induced effects are sometimes collectively called secondary effects. The total economic impact of tourism is the sum of direct, indirect and induced effects within a region as defined in **Box 3.**

Box 3

Definitions of Economic Impacts

- **Direct effects** – are the changes in economic activity during the first round of spending. For tourism this involves the impacts on the tourism industries (businesses selling directly to tourists) themselves.
- Re-spending of tourism dollars. There are two types of **secondary effects**.
    - **Indirect effects** – are the changes in sales, income or employment within the region in background-linked industries supplying goods and services to tourism businesses. The increased sales in linen supply firms, resulting from more hotel sales is an indirect effect of visitor spending.
    - **Induced effects** – are the increased sales within the region from household spending of the income earned in tourism and supporting industries. Employees in tourism and supporting industries spend the money they earn from tourism on housing, utilities, groceries, and other consumer goods and services. This generates sales, income, and employment throughout the region's economy.
- **Total effects** are the sum of direct, indirect and induced effects.

- **Multipliers** capture the size of the secondary effects in a given region, generally as a ratio of the total change in economic activity in the region relative to the direct change. Multipliers may be expressed as ratios of sales, income or employment, or as ratios of total income or employment changes relative to direct sales.

Source: Stynes (1997)

According to Stynes and Propst (1996), the value of economic impact assessment rests in its usefulness to natural resource policy and decision makers. The economic impact assessments are useful, the authors and Liestritz and Murdock (1981) say, to the extent that they: (a) estimate economic impacts for political jurisdictions; (b) make annual projections required for effective planning; (c) derive impacts for both "with" and "without" project conditions so that the consequences of a proposed action can be anticipated; (d) project business output by sector as an aid to fiscal impact analysis; (e) show the consequences of alternative development scenarios; (f) accept new information as it becomes available; and (g) produce relevant impact estimates in a reasonable amount of time.

3.0 PAST ECONOMIC SIGNIFICANCE OF TOURISM IN UGANDA, 1992-1999

3.1 Uganda's Tourism

3.1.1 Overall

There is general consensus that properly developed and managed, tourism can bring many benefits to a country by way of foreign exchange earnings and contributions to the balance of payments, income and employment generation, as well as government revenues. Since many tourist attractions are in rural areas, tourism can also help with regional dispersal of development and stimulate overall economic growth by creating a higher level of demand for intermediate goods and services, the so-called multiplier effects.

In the Ten-Year Tourism Master Plan, the following multipliers were estimated to prevail by the year 2000 (MTWA, 1993).

- Foreign exchange earnings – leakage factor of about 35%
- National income – income multiplier of 0.45
- Employment – 108 person years of jobs per $1 million of tourist expenditure.
- Government revenue – revenue multiplier of 0.26.

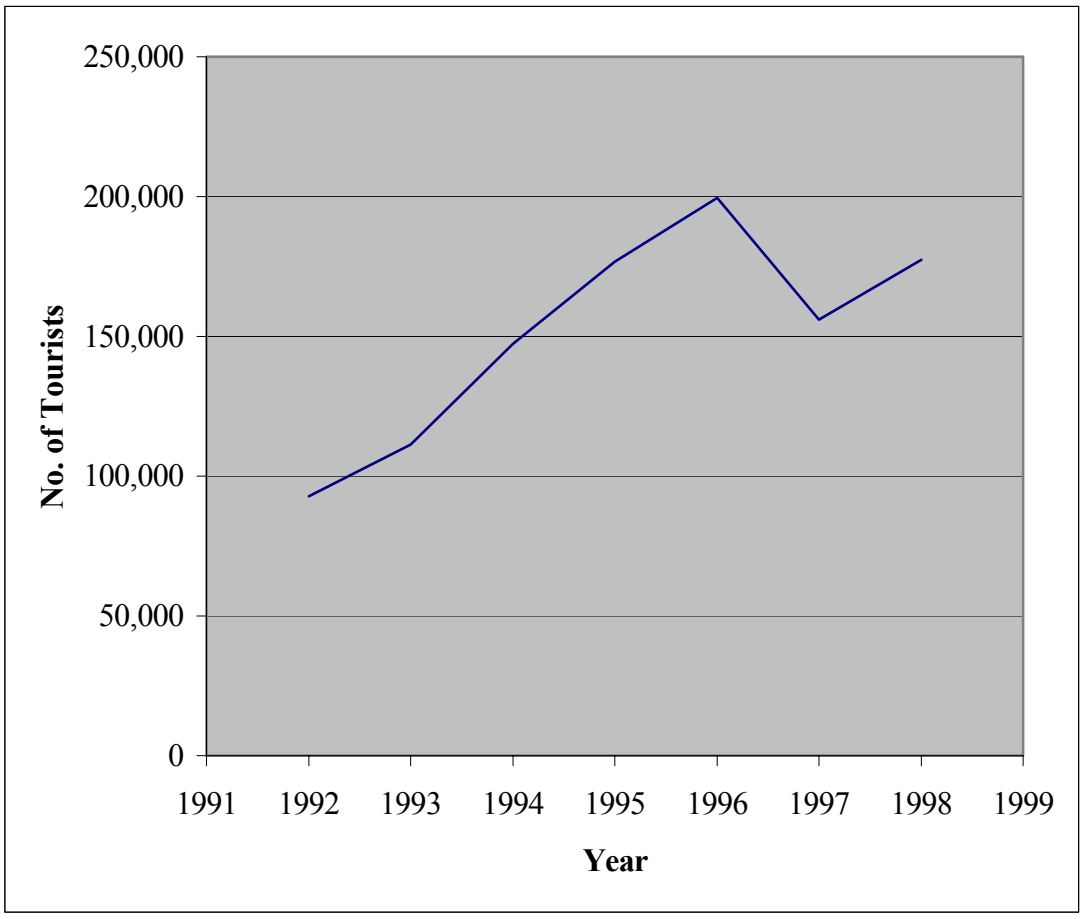
Based on the foregoing multipliers, it is possible to estimate the economic impact of tourism in Uganda for a given period of time.

Figure 4 shows the trend in tourist arrivals into Uganda for the period 1992 to 1998. Overall, during the period 1992-1997 for which there is expenditure data, 883,531 tourists visited Uganda and spent close to US$ 500 million. Using the multipliers presented above, and coefficients derived from other government sources and expert judgement, the revenue of US$ 500 million had significant economic impacts as shown in **Annex 1** and summarised below.

Tourist expenditures in Uganda over the period 1992-1997 generated net foreign exchange earnings of $ 325 million; direct, indirect and induced sales of $650.00 million; national income of $ 292.50 million; government revenue of $ 201.50 million; and 70,200 person years of jobs.

Economic Measure	Direct Effect	Indirect + Induced	Total Effect
Foreign Exchange Surplus ($millions)	325.00	-	325.00
Sales effects ($ millions)	500.00	150.00	650.00
Income ($millions)	225.00	67.50	292.50
Jobs (Number)	54,000	16,200	70,200
Government Taxes ($millions)	155.00	46.50	201.50

Figure 4 Trend in Tourist Arrivals into Uganda for the Period 1992 to 1998.



3.1.2 Gorilla Tourism

Gorilla tourism is a specialized form of tourism which began in Uganda in 1991 in two national parks, Mgahinga and Bwindi. Over the period 1994 and 1999, an estimated 17,546 visitors consisting of non-resident foreigners, resident foreigners, citizens, and VIPs visited the parks.

Based on recorded and research data, the following assumptions can be made.

- 88% of the tourists were from outside Uganda.
- during the period, average weighted tourist expenditure related specifically to gorilla tourism was about $ 768 / visitor (Andersson and Rundquist, 1997).
- 65% of tourist expenditure was used to purchase Ugandan goods and services (capture rate) based on MTWA (1993).
- a multiplier of 2.0 to account for the additional sales (indirect and induced) effects generated by direct tourist expenditure.
- effective tax rate (VAT and other local government taxes and licences) of about 26%.
- a sales to income ratio (labour cost as percent of sales) of 20%.
- effective income tax rate (weighted average of P.A.Y.E) of about 25%.
- a job to sales ratio of 108 person years per million dollars of sales.
- an income multiplier of 0.45 (MTWA, 1993).

Based on the foregoing, the economic impact of gorilla tourism for the period 1994-1999 was estimated and is presented in **Annex 2**. Results indicate that from 1994 up to 1999, gorilla tourism attracted net foreign exchange earnings of about $ 7.70 million. Gorilla tourism is also estimated to: have generated $ 15.40 million of sales in the Ugandan economy; contributed $ 4.77 million in government tax revenues; supported close to 1,700 person years of jobs; and contributed to national income of $ 6.93 million.

Economic Measure	Direct Effects	Indirect + Induced Effects	Total Effects
Net Foreign	7.70	-	7.70

Exchange Surplus ($millions)			
Sales ($ millions)	11.86	3.54	15.40
Income ($millions)	5.33	1.60	6.93
Jobs (Number)	1,564	469	1,663
Government Taxes ($ millions)	3.67	1.10	4.77

4.0 FORECAST OF THE FUTURE ECONOMIC SIGNIFICANCE OF GORILLA TOURISM

4.1 Introduction

Gorilla tourism in Uganda started in 1991 in Bwindi Impenetrable Forest and 1993 in Mgahinga Forest in a bid to promote eco-tourism. These gorilla habitats have certainly shrunk over the years, as they are surrounded by some of the highest rural population density in Uganda, and one of the highest in Africa.

Although gorilla tourism officially started in 1991, it already had a history in Uganda where visitors were occasionally taken up to Mgahinga Forest Reserve to try and see gorillas since the 1970s and some gorilla tourism even occurred at Mgahinga in the 1950s. Also, tourists tried to see the gorillas in Bwindi Impenetrable Forest, although these attempts were often fruitless or resulted in attacks.

The Ugandan Government then got concerned over the haphazard approach to gorilla viewing and in May 1989 executed a complete ban on gorilla viewing in Uganda, pending the introduction of a controllable framework of tourism management policies based on the experience of gorilla tourism in Rwanda and the Democratic Republic of Congo (DRC) where organised gorilla tourism had begun 20 years earlier focusing on the eastern lowland

gorillas in the Parc National de Kahuzi-Biega. Mountain gorilla tourism is more recent and began in 1979 in Rwanda and then in 1984 in the DRC.

It is generally accepted that the demand for nature or "eco"- tourism is growing worldwide at a faster rate than tourism in general. As a result of the rare nature of the mountain gorilla, there is a high world demand for gorilla tourism. This strong demand was further highlighted by the experience of Rwanda and the DRC. For instance, in 1989 more than 8000 tourists saw the gorillas in Rwanda and receipts from the park and associated extraneous monetary benefits make gorilla tourism the third most important foreign exchange earner in Rwanda.

Although there is a clear high demand for gorilla tourism, it should be noted that, gorilla viewing is a particularly specialised form of nature tourism which could easily become uncoordinated and potentially harmful, in the absence of detailed guidelines. Experience from gorilla tourism in Rwanda and the DRC illustrated that, there were clear benefits to conservation. Based on this, and the realisation of the high demand for these animals, the Government of Uganda decided to elevate both forests (Bwindi Impenetrable and Mgahinga) to national parks, so as to start controlled tourism.

MGNP was originally planned to be the primary focus of gorilla tourism in Uganda, being contiguous with the area of the Virunga Volanoes in Rwanda and the DR Congo, where some gorilla groups are habituated. However, the conflict on the Rwanda border at that time made the area too dangerous and attention was then shifted to Bwindi Impenetrable Forest.

Uganda Wildlife Authority (UWA), the Uganda Tourist Board (UTB), and other stakeholders have continued to develop gorilla tourism in the country. The International Gorilla Conservation Programme (IGCP) has assisted UWA with the habituation of gorilla groups. Other things being equal, therefore, it is hoped there will be at least three gorilla groups in Bwindi Impenetrable National Park and one in Mgahinga Gorilla National Park for visitor viewing. Due to ecological considerations each gorilla group will receive only

six visitors per day. At full potential, therefore, on any given day, the two parks should be able to accommodate 24 tourists. At full capacity, a total of 8,760 tourists are expected to visit the two parks every year. All visitors are expected to participate once – single entrance, single exist.

4.2 Net Economic Benefit and the Value of the Mountain Gorilla

4.2.1 Techniques

Various techniques exist for resource valuation. These techniques range from market-based methods (market price approach, appraisal method, and resource replacement cost) to non-market or indirect valuation techniques (travel cost method, contingent valuation method, random utility models, hedonic price method, factor income method) to cross-cutting methods (benefit transfer, unit-day valuation method, etc) as detailed in **Annex 2**.

4.2.2 Value of the Mountain Gorilla

The methodology used in estimating the net economic benefit of gorilla tourism and the detailed results obtained are presented in **Annex 3**. Both the travel cost method and the contingent valuation method were used to arrive at an average consumer surplus of $ 196 / tourist.

Based on full capacity of 8,760 tourists per year, the annual net economic benefit of gorilla tourism in the two parks is:

Net Economic Benefit/ year = $ (8,760 * 196)

= $ 1,716,960

Based on the theory of annuity, it is possible to quantify the magnitude of this sustained yield of direct benefits in perpetuity by capitalizing the $ 1,716,960 of annual net benefits (consumer surplus).

To determine the value of the mountain gorillas as a tourist attraction one needs to estimate the present value of the net economic benefits accruing to the tourists. Therefore, there is need to identify an appropriate social time preference (discount) rate. However, determining the appropriate rate is quite controversial, and ranges from 0% per annum for ultra-conservationists to 22% per annum representing present average commercial bank loan rates. Government uses a social discount rate that is lower than the one for commercial loans but higher than the zero rate. Current Government of Uganda social discount rate used in project analysis is 12% per annum. In determining the value of gorilla tourism, three rates were used: 5% (greater emphasis on conservation); 12% (Government's official social discount rate); and 22% (reflecting private time preference).

If it is assumed that the mountain-gorilla-related tourism benefits resulting from adequate conservation measures today will continue to accrue in perpetuity, then it is appropriate to ask "What is the present value of expected direct benefits for generations to come?" It is possible to quantify the magnitude of this sustained yield of direct benefits in perpetuity by capitalising the $ 1,716,960 of annual net benefits (consumer surplus).

According to Environment Canada (1998), in order to explain what is meant by capitalised value, one could compare wildlife resources with an interest-earning assest such as an annuity. The capitalised value, or present value of the annuity, is the total amount of money that would have to be invested today at a fixed interest rate to earn an annual return equal to the value of the benefits from this asset. When applied to wildlife resources, this means that the capitalised or present value of these renewable assets is the total amount of money that would have to be invested today to earn, in future years, an annual return equal to the net economic value of wildlife-related activities as measured today.

Therefore, the values attached to the tourism-generating mountain gorilla groups of the two parks at different time preference levels are as follows:

- At 5% discount rate (conservation focused)

  $ 1,716,960 /annum ÷ 5% = **$ 34,339,000**

- At 12% discount rate (GoU social discount rate)

$ 1,716,960 /annum ÷ 12% = **$ 14,308,000**

- At 22% discount rate (private time preference rate)

  $ 1,716,960 /annum ÷ 22% = **$ 7,804,000**

Tourists do not go out of their way looking for a single mountain gorilla for a viewing experience. A group consisting of a number of gorillas – sort of a family – is what tourists go to see. Therefore, it is not reasonable to attempt to estimate the value of a single mountain gorilla. Furthermore, Mgahinga and certainly Bwindi have more mountain gorillas than the proposed three groups tourists are expected to view. Hence, the foregoing estimates of value refer only to the three groups. The others do not earn any tourism revenue and in that context have no value.

Depending on one's time preference, therefore, the value of any of the three groups of mountain gorillas available for viewing in the two parks is infinity (for the very ultra-conservationists or preservationists) at 0% discount rate; $11.4 million /group at 5% discount rate; $ 4.8 million /group at 12% discount rate; and $ 2.6 million /group at 22% discount rate. The least divisor must remain the group. Dividing the group value by the number of its members is not consistent with the tourism significance of the mountain gorillas.

4.3 Annual Economic Impacts

4.3.1 Annual National Level Impacts

At full capacity, representing 8,760 tourists per year and average expenditure per tourist of $874, the annual economic impact of gorilla tourism was estimated, presented in **Annex 4** and summarised below. Total sales effect of tourist expenditure was estimated at about $ 8.8 million / year; net annual foreign exchange earnings of $ 4.4 million; annual government revenue in form of taxes at about $ 2.7 million; national income of $ 3.9 million / year; and total employment effects of about 946 person years of jobs per annum.

Economic Measure	Direct Effects	Indirect + Induced Effects	Total Effects
Net Foreign Exchange Earnings	4,379,369	-	4,379,369
Sales Effects	6,737,491	2,021,248	8,758,739
Income	3,031,871	909,562	3,941,433
Government Revenue	2,088,623	626,586	2,715,209
Employment (person year)	728	218	946

4.3.2 Annual Community Level Impacts

The assumption for estimating annual community level economic impacts of gorilla tourism are the same as for the national one, except for the following:

- local communities in Buhoma and Mgahinga receive on average 5% of tourist expenditures on food, some accommodation, drinks and crafts.
- effective aggregate tax rate (VAT, etc.) is virtually nil.
- effective average income tax rate much lower than the national one, and estimated at 2%.
- Average expenditure at community level includes direct tourist expenditures plus revenue sharing (20% of entrance fees) at $ 42 / tourist.

Based on the foregoing and at full capacity, the annual economic impact of gorilla tourism at community level was estimated and presented in **Annex 4** and summarized below. Total sales effect of tourist expenditure at community level was estimated at $ 678,374 / year; net annual foreign exchange earnings at $ 339,187; annual government revenue in form of taxes at about $ 2,713; national income of $ 305,268; and total employment effects of about 73 person years per annum.

Economic Measure	Direct Effects	Indirect + Induced Effects	Total Effects
Net Foreign Exchange	339,187	-	339,187
Sales Effects	339,187	339,187	678,374
Income	152,634	152,634	305,268
Government Revenue	1,357	1,356	2,713
Employment (person year)	37	36	73

4.4 Revenue to Uganda Wildlife Authority (UWA)

The following assumptions were used to estimate annual revenues that could accrue to UWA, the management authority of the two parks.

Bwindi Impenetrable National Park

- 6570 tourists per year.
- Weighted (non-resident foreign, resident foreign, citizen and VIP) average permit fee of $ 238 per tourist.
- Permit fee accounts for about 89.0% of all park revenues.
- Subsequently the effective weighted average park revenue per visitor is $ 267.

Mgahinga Gorilla National Park

- 2,190 tourists per year.
- Weighted (non-resident foreign, resident foreign, citizen and VIP) average permit fee of $ 157 per tourist.
- Permit fee accounts for about 83.2% of all park revenues.
- Subsequently, the effective weighted average park revenue per tourist is $ 189.

Calculation

Using the foregoing assumptions, the annual revenue accruing to UWA was estimated as follows:

Bwindi: 6,570 tourists/ year x $267 per tourist = **$ 1,754,190**

Mgahinga: 2,190 tourists per year x $ 189 per tourist = **$ 413,910**

Total: $ (1,754,190 + 413,910) = **$ 2,168,100**

At the prevailing tariffs, and assuming full capacity utilisation, Uganda Wildlife Authority has the potential to earn $ 2,168,100 / year as gorilla tourism revenue from both Bwindi and Mgahinga national parks.

5.0 POLICY IMPLICATIONS

5.1 UWA Tariffs

One of the issues that has been debated for a long time is what Uganda Wildlife Authority should charge for gorilla viewing. As presently structured, out of the average $874 of travel cost per tourist, the Uganda Wildlife Authority receives a weighted average of $ 238 / tourist in Bwindi and $ 157 / tourist in Mgahinga. This results in a combined weighted average of about $ 210 / tourist which is equivalent to 24% of the average travel cost of the tourist. Close to 43% of those interviewed felt the costs of gorilla permits were high; while 55% thought the rates were reasonable. The remaining 2% felt they were either low or did not express an opinion. Non-resident foreigners who favoured higher rates were willing to pay as much as $ 500 per permit. Resident foreigners suggested $300 while Ugandan citizens thought they could pay $ 175 per permit.

The regression analysis in **Annex 3** shows that at prevailing conditions, each tourist on average realises a net benefit of $ 196 per visit. At full capacity of 8,760 tourists per year,

this surplus translates into about $ 1.7 million. There is, therefore, scope to further increase tariffs.

5.2 Net Foreign Exchange Earnings

The MTWA (1973) study indicated that by 1993, the capture rate of foreign exchange expenditures by tourists was quite low since most of the goods and services required by tourists had to be imported. However, the study noted that as the Ugandan economy improves, the foreign exchange capture rate should improve to at least 65% by the year 2002. This was the capture rate that was used in the analysis of annual economic impacts. But how realistic is this estimate? Probably not. Discussions with industry experts seem to suggest that many tourists originating from outside Uganda (88% of total visiting both parks), pay for their experience outside the country. If this is true then the effective foreign exchange received is much less than the analysis presented in Chapter 4.0 would suggest. The same goes for the sales, income, government revenue, and employment impacts. It would be useful to try and ascertain the true capture rate for gorilla tourism.

5.3 Revenue Sharing

The share of revenue which UWA collects that goes to the local communities was fixed by an Act of Parliament and provided for in the **Wildlife Statute 1996**. The Statute mandates UWA to allocate 20% of entrance fees to the communities adjacent to the parks. Considering UWA's own requirement for recurrent and developmental finance, it is unlikely that the institution would welcome any increases in the community's share of its revenues. However, should UWA increase its tariffs, it may be possible for the organisation to give a part of the increase for additional community support, up and above the statutory requirement.

5.4 Standby Arrangements

Standby arrangements refer to situations whereby tourists can go to the parks and await their turn to purchase gorilla permits from the park authorities, an approach favoured by overlanders and backpackers. When standby arrangements were in place it was possible for tourists, particularly groups, to wait for a week or longer to purchase permits. This allowed

the tourists to spend a lot more in the communities, lodges in Kabale, Kisoro town and community campgrounds at park gates all generated substantial income as a result of the standby arrangements.

Unfortunately, the standby arrangements were abused by all parties concerned and as a result UWA had to stop the practice. The subsequent result has been reduced community earnings and local operations revenues. Hence the annual economic impact of gorilla tourism at the community level is lessened.

5.5 Mountain Gorillas as Catalysts

For the tourists interviewed, the mountain gorilla was clearly the main reason for their visit to Uganda, followed by appreciation of scenery and photography. Appreciation of culture and water-related tourism (e.g. white water rafting) were next (**Table 1**). It is this catalytic role of the mountain gorilla as a tourism attraction that needs to be further developed.

Secondly, although the tourists came to Uganda to primarily view the mountain gorilla, they were also able to visit other attractions. Of the total number of tourists interviewed, 72.4% visited other attractions (**Figure 5**).

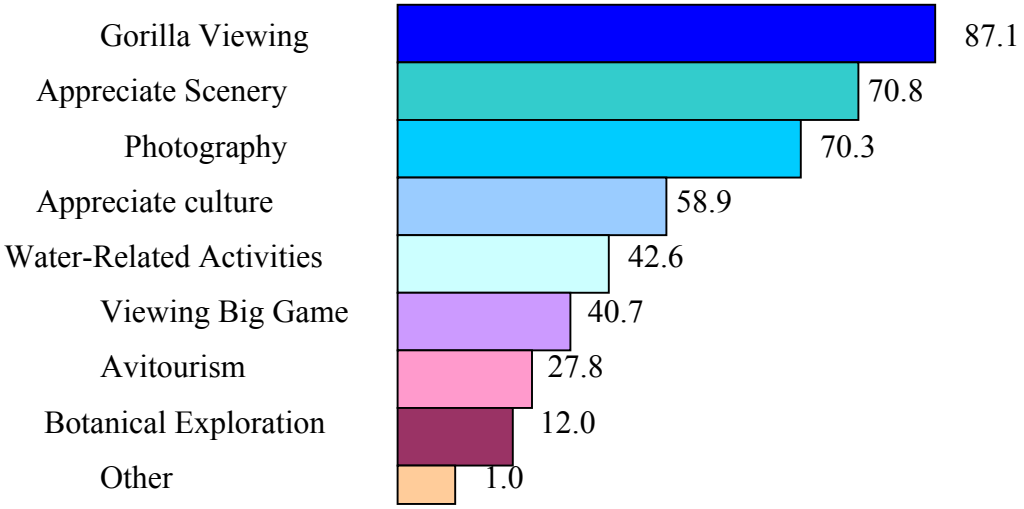
Thus the valuation of the mountain gorilla as a tourism product which was presented earlier is an under-estimate of the true value, to the extent that the catalytic effect was not captured in the analysis.

Table 1. Other Attractions Visited

Attraction	Response	
	Number	Percent

Queen Elizabeth National Park	42	20.1
Murchison Falls National Park	39	18.7
Kibaale National Park	35	16.7
Semiliki National Park	1	0.5
Mt. Elgon National Park	14	6.7
Lake Mburo National Park	6	2.9
Whitewater Rafting (Nile)	6	2.9
Ngamba Islands	6	2.9
Lake Bunyonyi	1	0.5
Entebbe Botanical Gardens	1	0.5
No other visits	57	27.6
	207	**100.0**

Figure 5 Participation in Wildlife-Related Activities While in Uganda



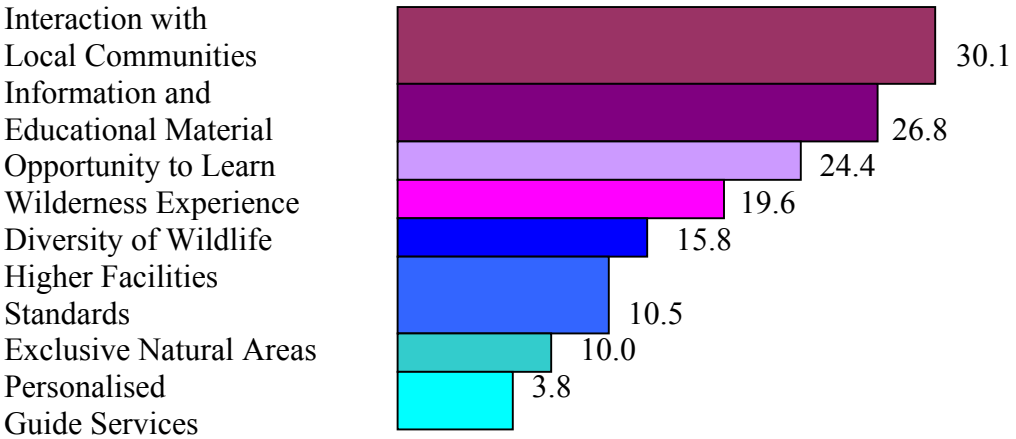
*** - percentages represent multiple choices**

5.6 Opportunities for Improving Tourist Experience

When respondents were asked of their opinion on how their tourism experience could have been made better, the majority wanted more interaction with local communities. This was followed by provision of information and educational material; then opportunity to learn more about the country and protected areas; and greater wilderness experience as shown in

Figure 6. Diversity of wildlife, higher standards for facilities, exclusive natural areas, and personalised guide services followed.

Figure 6 Options for Improvement of Tourism Experience

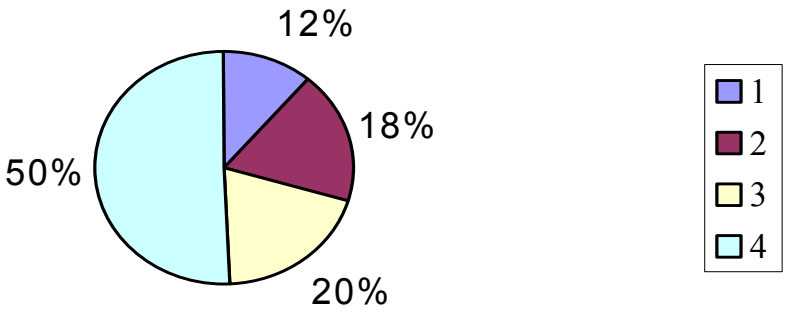


5.7 Willingness to Make Donations

Respondents were also asked if they would be willing to make donations towards conservation, research and community welfare, and supporting a fund for these purposes. Close to 51% of the respondents said no; while 46% answered affirmative. The remaining

3% had no response. Of those willing to make the additional contributions towards a fund, the majority preferred individual flexibility as opposed to rigid schedules (**Figure 7**).

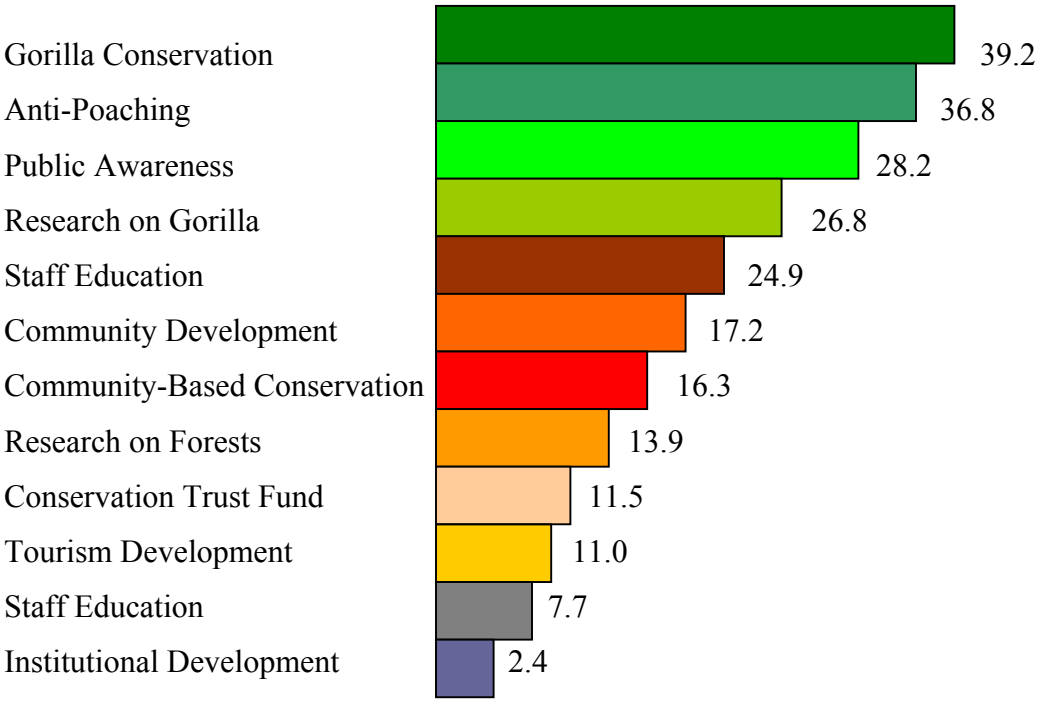
Figure7 Modalities of Contributions Towards a Trust Fund



Where; 1 - One Time Pay 2 - Every Trip
3 - Once Year 4 - Other Mechanisms

When respondents were further probed as to what they would like their donations used for, the majority preferred gorilla conservation, followed by law enforcement (anti-poaching activities), and then public awareness (**Figure 8**).

Figure 8 Respondents' Choices of Use of Funds



6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

An attempt has been made to present the economic significance of gorilla tourism. At full capacity utilisation, with three groups habituated for viewing, the economic value of gorilla tourism was estimated at $ 7.8 – 34.3 million depending on the discount rate used. The total sales impact for the whole country was estimated at $ 8.8 million / year; net foreign exchange earnings of about $ 4.4 million; employment income of about $ 3.9 million; government revenue through various taxes at $ 2.7 million; and an employment opportunity of 946 person years all from direct tourist expenditures of $ 7.6 million. The local communities around Bwindi and Mgahinga also would receive significant benefits from gorilla tourism with an estimated gross sales effect of $ 678,000 per annum and provision of 73 person years of employment opportunities. At full capacity and prevailing tariffs, the Uganda Wildlife Authority has the potential to realise over $ 2 million annually. The foregoing are clearly under-estimates to the extent that the mountain gorilla has a catalytic role on other aspects of Uganda's tourism.

Tourists still enjoy considerable net surplus from gorilla tourism, about $ 196 per person, up and above what they actually spend. There is, therefore, scope for increasing tariffs to the benefit of UWA and the local communities. Also, at higher levels of tariffs, UWA should consider giving more to the communities even if this is not a statutory obligation. The abolition of the standby arrangements have clearly undermined the benefits local communities used to receive. Tourists no longer spend much time at their locales. The abolition was a management decision by UWA. This is an added reason why at higher tariffs, the Authority should consider sharing the incremental value with the communities.

Perhaps, tourists could also be encouraged to stay longer when they visit the parks. The tourists expressed an interest to have more interaction with the local communities. Organisations such as the Uganda Community Tourism Association (UCOTA) should be supported to tap this potential so as to increase community benefits from gorilla tourism. The tourists also expressed a desire for more information and educational material. The Uganda Tourist Board (UTB) should be encouraged to provide the materials at convenient points in their countries and immediately when they enter Uganda.

Many of the tourists are willing to make voluntary contributions to support gorilla conservation, improve law enforcement and support community conservation. The Wildlife Statute 1996 created the Wildlife Fund. Mechanisms could be developed within the Fund to allow for collection of such contributions.

Finally, although attempts were made to have quantitative estimates, there is room for improvements. First, both the value and economic impacts of gorilla tourism should be estimated as a matter of routine based on annual surveys. Second, additional work should be done in conjunction with the Uganda Bureau of Statistics (UBOS) to improve upon estimates of multipliers, through the development of input-output tables and economic base models.

6.2 Recommendations

From the foregoing, the following recommendations were made:

- Review the gorilla tourism tariff structure, with a view to increasing benefits accruing to UWA and the local communities;
- Revisit the standby arrangement that existed before;
- Promote more interaction with local communities while avoiding any adverse social impacts, so as to encourage tourists to stay longer and spend more in the communities;

- Promote the availability of information and educational materials at tourists' point of departure;
- Design, pre-test, and annually administer tourist survey questionnaires in all wildlife protected areas and other areas of tourism interest so as to allow for calculations of net economic benefits (resource values), and economic impacts; and
- Improve upon estimates of regional multipliers through collaboration with institutions such as UBOS.

7.0 Annexes

Annex 1

Estimates of Economic Impacts of Uganda's Tourism Industry and Gorilla Tourism, 1992 – 1997 (inclusive).

Annex 1

Table 2 Estimates of the Economic Impact of Total Tourist Expenditures in Uganda, 1992- 1997 (inclusive)

A. SALES BENEFITS FROM TOURISM	
1. Enter estimated non-Ugandan tourism	-
2. Enter no. of visitors	-
3. Enter average expenditure / visitor	-
4. Calculate total visitor spending	$500.00 million
5a. Estimate the Capture rate for Uganda	65%

5b. Enter Sales Multiplier	2.00
6. Calculate total sales effects (4x5ax5b)	$650.00 million
7. Estimate net foreign exchange earnings (4x5a)	$325.00 million
B. TAX REVENUE BENEFIT FROM TOURISM	
1. Enter total sales (from A6)	$650.00 million
2. Enter aggregate tax rate	26%
3. Calculate tax collections from tourism (1x2)	$169.00 million
4. Enter sales to income ratio	20%
5. Enter Average Income tax rate (PAYE, GPT, etc)	25%
6. Calculate income tax revenue (1x4x5)	$32.50 million
7. Compute total tax revenue (3+6)	$201.50 million
C. INCOME AND JOB BENEFITS FROM TOURISM	
1. Enter total sales	$650.00 million
2. Estimate job to sale ratio	108
3. Estimate income multiplier	0.45
4. Compute total employment effects (1x2)	70,200
5. Compute total income effects (1x3)	$292.50 million

Annex 1

Table 3 Estimates of the Economic Impact of Gorilla Tourism in Uganda for the Period 1994 - 1999 (inclusive)

A. SALES BENEFITS FROM TOURISM	
1. Enter estimated non-Ugandan tourism	88%
2. Enter no. of visitors	17,546
3. Enter average expenditures / visitor	$ 768

4. Calculate total visitor spending	$11.86 million
5a. Estimate the Capture rate for Uganda	65%
5b. Enter Sales Multiplier	2.0
6. Calculate total sales effects (4x5ax5b)	$ 15.40 million
7. Estimate foreign exchange earnings surplus (4x5a)	$ 7.70 million
B. TAX REVENUE BENEFIT FROM TOURISM	
1. Enter total sales (from A6 above)	$15.40 million
2. Enter aggregate tax rate	26%
3. Calculate tax collections from tourism (1x2)	$4.00 million
4. Enter sales to income ratio	20%
5. Enter Average Income tax rate (PAYE, GPT, etc)	25%
6. Calculate income tax revenue (1x4x5)	$ 0.77 million
7. Compute total tax revenue (3+6)	$ 4.77 million
C. INCOME AND JOB BENEFITS FROM TOURISM	
1. Enter total sales	$15.40 million
2. Estimate job to sale ratio	108
3. Estimate income to sales ratio	0.45
4. Compute total employment effects (1x2)	1,663
5. Compute total income effects (1x3)	$6.93 million

Annex 2

Resource Valuation

Natural Resource Valuation Techniques[1]

General

Where markets for the resource or its services exist, assessment is relatively straightforward. Market-based techniques include: the *market price approach*, the *appraisal method*, and the *replacement cost method*. Otherwise, when market data is not available, valuation requires the use of non-market techniques to derive information on

[1] Unless specific reference is made in the text, much of the material for this section is derived from Ulibarri and Wellman (1997).

individual willingness to pay. The most widely recognized non-market techniques include the *travel cost method (TCM)*, the *hedonic price method*, and the *Contingent valuation method (CVM)*. Also, cross-cutting methods have been used as a way to combine market-based and non market methods of valuation, such as the *benefit-transfer method* or the *unit-day value method*. Other more recent approaches have focused on the valuation of ecological functions.

The foregoing list of valuation techniques provides a relatively broad picture of the economic thinking that goes into the monetary valuation of natural resources. However, it is worth noting that despite considerable progress over the last twenty some years, the monetary valuation of the natural resources (or environmental commodities) remains in a state of flux. Thus, even when monetary estimates of natural resource values are given, they should be regarded as approximations – at best, an order-of-magnitude indication of the actual numbers.

Specific Techniques

A. Market-Based Techniques

The pioneers of natural and environmental resource valuation relied on the " law of demand" as a way to measure the values for natural resources and environmental amenities. While the same is true today, the degree of sophistication in the measurement of these

Annex 2

values has increased considerably. Three market-based techniques that have recorded a significant history of natural and environmental resource valuations are: the market price approach, the appraisal method, and resource replacement costing.

A1. Market Price Approach – Demand for natural resources is measured on the assumption that many factors that might influence demand, such as personal income, the prices of related goods and services, and individual tastes and preferences, remain unchanged during the study period.

A2. Appraisal Method – Appraisal methods are particularly well suited to cases involving natural resources that have been damaged. In the case of land, for example, the appraiser identifies the fair market value for comparable properties in both the uninjured and injured conditions. The fair market value of the resource (land) is roughly defined as the amount a knowledgeable buyer would pay a knowledgeable seller for the resources. This value should reflect as closely as possible, the price at which the resource would actually sell in the market place at the time of the injury.

A3. Resource Replacement Cost Method – The costs of replacing natural and environmental resources are sometimes a useful way of approximating resource values under specific conditions. The resource replacement cost method determines damages for natural resources based on the cost to restore, rehabilitate, or replace the resource or resource services without injury to the level of the resource stock or service flow.

B. Non-market Valuation: Indirect Techniques

Using market-based techniques to measure the monetary value of natural resources is feasible provided there is sufficient market data. In many cases, however, market information relating to prices and quantities is often not available to estimate the value of

the resource or resource service. In these cases, researchers must employ what are referred to as non-market valuation methods. These methods include indirect techniques that rely on observable behaviour in order to deduce how much something is worth to individuals. Value estimates using indirect non-market valuation techniques are conceptually identical to the otherwise unobservable market value. The indirect non-market valuation techniques considered in this section include the travel cost method, the random utility method, the hedonic pricing method, and the factor income method.

B1. Travel Cost Method (TCM)

The travel cost method is popular for describing the demand for the natural resource service(s) and environmental attributes of specific recreational sites. Designated wilderness areas, ecological parks, fishing and hunting sites, and scenic sites are examples. People visit such sites from diverse distances or points of origin. This observed "travel behaviour" is then used to evaluate the willingness to pay to visit the site; essentially, the different travel costs from these diverse points of origin serve as proxies for the willingness to pay to visit the site. Intuitively, one would expect that the environmental attributes of sites influence the use of these sites. As such, changes in visitation rates may reflect changes in the quality of natural resources particular to the site, thereby providing an estimate of the value of changes in natural resource and environmental quality.

By gathering information on the number of visits to a particular site, the analyst can estimate a demand function for the site that relates the number of site visitations to the amount of travel costs incurred per visit, taking into consideration a set of independent household variables. If first-hand information on individual visitation rates is not available to the analyst, users of the site can often be grouped into travel zones around a site. Variations in visitation rates across zones can then be used to estimate the demand function. In this way, travel cost models provide benefit measures for changes in

environmental quality found at sites, based on the observed behavior of recreational site users.

In addition, the travel cost method can be easily implemented using phone, onsite or mail surveys, or site registration data. In some cases, survey data may be available from local and central government and other stakeholders to obtain travel cost estimates of site values. The technique is generally not perceived as being particularly controversial, partly because of its long history in forestry economics, but mostly because it mimics common empirical techniques used elsewhere in economics.

The greatest disadvantage of travel cost and other indirect techniques is that they cannot be used unless there is some easily observable behaviour that can be used to reveal values. In addition travel cost methods can be technically and statistically complicated. Data must be employed to statistically estimate increasingly sophisticated econometric models that take into account sample selection problems and nonlinear consumer surplus estimates. Furthermore, the resulting estimates sometimes have been found to be rather sensitive to arbitrary choices of the functional form of the estimating equation, the treatment of the value of an individual's time, the existence of multiple stops during the travel period, and the recognition of substitute sites.

B2. Contingent Valuation Method (CVM)

Given the potential shortcomings in applying indirect non-market valuation techniques, researchers have advanced the use of a more direct approach, namely contingent market valuation. Contingent market analysis has estimated a wide variety of use and nonuse values.

Annex 2

The most obvious way to measure non-market values is to ask people how much they would be willing to pay for the resource or avoid any damages that might be sustained by the resource. Alternatively, one could ask how much people would be willing to accept as compensation for damages to the resource. Measures obtained using this technique rely on people's hypothetical willingness to pay rather than actual market- information on their behaviour: hence the term contingent valuation (CV). The contingent valuation method (CVM) is a survey-based approach to the valuation of non-market goods and services. It uses questionnaires to elicit information about the preference-related value of the natural resource in question. The value is said to be contingent upon the existence of a hypothetical market as described in the survey put to respondents. In principle, contingent valuation

could be used to estimate the economic value of almost anything. By default, it is the only method that holds the promise of measuring non-use values since all other methods depend on observing actual behaviour associated with the natural resource.

Contingent valuation surveys may be conducted as face-to-face interviews, telephone interviews, or mail surveys based on a randomly selected sample or stratified sample of individuals. Face-to-face interviews are the most expensive survey administration formats, but they are generally considered the best, especially if visual material needs to be presented. The central goal of the survey is to generate data on respondents' willingness to pay for (or willingness to accept) some programme or plan that will impact their well being.

When conducted according to the exacting standards of the profession, these studies can be very expensive because of the extensive pre-testing and survey work. In addition, while this technique appears easy, its application involves numerous technical challenges. For example, applications of the method are prone to strategic biases on the part of respondents or to structural problems in the design of the questionnaire (Mitchell and Carson, 1989). Question framing, mode of administration, payment formats, and interviewer interactions can all affect the results of contingent market valuation (Cummings *et al*, 1986). Also, the

quality of a contingent valuation survey questionnaire is sensitive to the amount of information that is known before hand about the way people think about the underlying natural resource. Thus, information on who uses the resource and who knows about it is critical.

B3. Other Non-market Valuation Methods

There are a number of other non-market valuation methods that are also in use although not specifically mentioned as a subject for study in this assignment. Brief descriptions of these methods are presented below.

a. Random Utility Models (RUMs)

RUMs are conceptually linked with the travel cost models in that they seek the same sorts of values and use the same sort of logic. However, random utility models provide a different structure in which to model recreation demand, one which focuses attention on choices among substitute sites for any given recreational trip instead of the number of trips taken to a given site. The models are especially suitable when substitution among quality-differentiated sites is a predominant characteristic of the problem. Random utility models originated in the transportation literature and only have recently been applied to recreation issues (such as an extensive model of sport fishing in Alaska; (Carson, *et al* 1987).

b. Hedonic Price Method (HPM) – Amenity Value

Hedonic pricing is a useful tool in the assessment of amenity value. Early analysis related residential property values to neighbourhood amenities. These models provided an inferential measure of people's willingness to pay for the amenity under study. The method is used mostly to estimate the willingness to pay for variations in property values due to the presence or absence of specific environmental attributes, such as air quality, noise, and

panoramic vistas. By comparing the market value of two properties having different degrees of a specific attribute, analysts extract the implicit value of the attribute to property buyers and sellers. However, one should be aware of caveats pertaining to the values obtained from hedonic price functions. In particular, the resource values that are obtained directly from the estimated hedonic price function are subject to fairly restrictive assumptions. It may be necessary to employ additional information from multiple commodity markets relating to the resource under consideration.

c. Hedonic Price Method (HPM) – Value of Life

Hedonic pricing methods have also been applied in the estimation of economic damages associated with occupational health and safety risks. There are two basic hedonic damage values: the **insurance value** and the **deterrence value**. Insurance value is the amount that an individual is willing to pay to ensure a preferred level of welfare. Meanwhile, deterrence values are used by leading practitioners as the appropriate measure of compensation value that should be charged from the standpoint of the accident victim.

d. Factor Income Method (FIM)

The factor income method is used as a means of valuation in applications where natural resources are used as inputs in the production of other goods and services. Accordingly, the resulting economic costs of production are an important source of information in applying the factor income approach. There are several types of resources for which the factor income approach is potentially well suited, including surface water and ground water resources, forests, and commercial fisheries. There are, however, potential problems in applying the factor income approach. For example, a particular treatment option might not be the least cost or optimal response. Second, it is possible that other things may change, particularly price and output levels. These potential problems can complicate the analysis

and require the researcher to obtain additional technical information concerning the supply and demand of the underlying resource or resource service.

C. Cross – Cutting Methods

At the present time, there is considerable professional interest in natural resource valuations that are based on cross-cutting methods. These valuation techniques combine elements from market-based methods with pre-existing methods of natural resource values based on either direct or indirect non-market valuation techniques. The interest in applying cross-cutting techniques is motivated by the relative simplicity of using a pre-existing study based on an accepted method, as well as the cost considerations in undertaking a fresh

natural resource valuation study. Two cross-cutting resource valuation techniques that have gained increased professional attention due to their simplicity and economy of application are the: benefit transfer; and unit day value.

C1. Benefit Transfer

Benefit transfer is the use of the estimated values or demand relationship in existing studies to evaluate a site or event for which no site-specific study is available. Given the expense and time associated with the estimation of values of non-market natural resources and services, benefit transfer is a reasonable method by which to determine such values under well-defined conditions.

Once a final set of values has been chosen, consideration should be given to the general magnitudes of the values. If the existing value estimates differ significantly from one another, consideration should be given to whether they differ in a predictable and consistent manner.

Annex 2

C2. Unit-Day Valuation Method

The unit day value method is similar to the benefit transfer method, except that an average value is derived based on multiple value estimates from existing studies. Consequently, the unit day value of the underlying resource reflects a resource having average preference – related attributes, amenities, or qualities. Any of the valuation approaches described above can potentially serve as underlying studies from which unit day values are drawn. The application of the unit day value method may also involve groups of experts attempting to interprete from the existing set of estimates (regardless of method used in the original study) a best estimate for each of a set of generic types of environmental resources or activities. The unit day value approach then combines and converts these estimates into a

standardised unit of measure that reflects the average value of one unit of the resource on a per-day basis.

D. Ecological Valuation

The conventional natural resource valuation techniques described above have made little progress in providing a framework to assess the monetary value derived from ecological functions. One reason is that ecological functions are often overlooked in terms of providing preference-related value to humans. Thus, the state of the art in natural resource valuation is in search of a framework for addressing natural resource values derived from ecological functions. Two emerging approaches to measure ecological values are: gross primary energy valuation; and non-glamorous resource valuation.

D1. Gross Primary Energy Valuation

This procedure has been applied to the valuation of different wetland types (Constanza, *et. al.* 1989). It is argued that estimates of gross primary production have merit since the entire food chain depends upon this primary production. The methodology is not without

problems, however. For example, it is not well understood whether those species supported by a particular food chain have equal social values.

Recently, an alternative cross-cutting approach to environmental issues has come under the rubric of ecological-economic valuation. For example the EPA (the Environmental Protection Agency of the United States) sponsored a team of ecologists and economists to develop a cross-cutting model of an ecological-economic system for wetlands.

D2. Ecological Resource Valuation

The need for a framework addressing the value of ecological functions is particularly acute in assessing policy choices that affect the integrity of ecological systems. According to Ulibarri and Ghosh (1995), the key objectives of ecological resource valuation are to: (a)

provide a framework that aggregates the values of goods and services rendered by selected ecological functions; and (b) determine defensible upper and lower limits on those values. The possibility of interpolating between these limits would enable a more robust estimation of the value of eco-goods and services, allowing policy makers to form a more complete understanding of the benefits and costs of ecological preservation.

The preliminary work of Scott *et al* (1997) considered social values associated with undeveloped shrub-steppe sites (arid environs traditionally overlooked in landuse decisions – sort of wilderness areas). Relative to the perceived values, the authors attempted applications of the benefit transfer method, the travel cost method, and the method of hedonic damage-pricing. In order to estimate the intrinsic values of natural ecosystems, they applied a replacement cost methodology based on the idea of replacing the functions performed by the natural ecosystem through a human engineered analog. Using the cross-cutting resource valuation techniques, the authors maintained that the economic value of shrub-steppe sites reflects both their ecological services and recreational uses.

Annex 3

Net Economic Benefit - Methodology

Net Economic Benefit

Methodology

In order to achieve the objectives of the proposed study, two valuation methods were used. One is the Contingent Valuation Method (CVM); and the second is the Travel Cost Method (TCM).

The TCM is used as a proxy for the price of a recreational activity. It allows for the use of variation in travel costs and visitation rates to estimate the demand curve in order to

determine the consumer surplus realised from the recreational activity. Demand is estimated in terms of the total number of trips.

An appropriate true value of a tourist product may also be assessed from the individual's willingness to pay (WTP) for the product. Indeed, Krutilla et. al (1975) assert that the individual's WTP for the use of a recreational resource rather than do without it defines the real value of the resource to the individual. The WTP indicates what an individual is willing to pay for a good or service if it can be made available in a better form. It is the same as the compensation variation, which is the quantity of additional money required to keep a person at the initial utility level after an increase in price of one of the goods the person consumes. The WTP is influenced by several factors which include, *inter alia*: income, age, sex, cost of travel, education, distance, fee charged, prices of substitutes, and attractiveness of the resource.

The contingent valuation method measures the value of a natural resource and its services by surveying a sample of the population to provide the price they would be willing to pay to preserve or restore that resource. A variation of the CVM, is the contingent behaviour,

which asks the survey respondents how much they would be willing to modify their behaviour patterns to protect or restore a natural resource.

The Models

Travel Cost Method

Demand for gorilla tracking in Bwindi and Mgahinga National Parks was hypothesised to depend on a number of demand shifters including travel cost, income, distance, and level of education. The number of visits to the parks per year was used as the dependent variable. The model was specified as follows:

$$V_{ij} = v\ (TC_{ij}\ ,\ INC_{ij}\ ,\ ED_{ij}\ ,\ DIST_{ij})$$

Where V_{ij} = the number of visits by the i^{th} individual to the j^{th} park

TC_{ij} = the transportation cost for the round trip to the j^{th} park by the i^{th} individual, plus the visitation permit, plus entrance fees.

INC_{ij} = the income of the i^{th} individual viewing gorillas in the j^{th} park.

$DIST^2_{ij}$ = the air distance travelled by the i^{th} individual to the j^{th} location.

Willingness To Pay

An appropriate true value of a tourist product may be assessed from the tourists' willingness to pay (WTP) for a recreation experience. A traditional model for estimating tourists' willingness to pay may be expressed as follows:

$$WTP = b_0 + b_1Y + b_2A + b_3S + b_4E + b_5T + b_6D + b_7F$$

while the double log model may be expressed as:

$$WTP = Inb_0 + b_1\,InY + b_2\,InA + b_3\,InS + b_4\,InE + b_5\,InT + b_6\,InD + b_7\,InF$$

Annex 3

where:

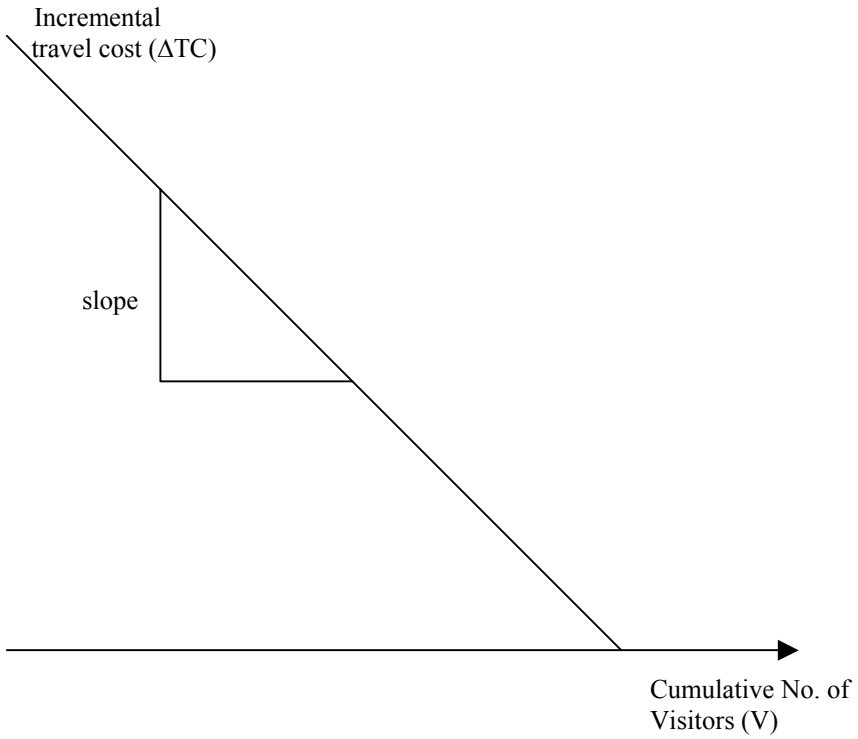
WTP – Willingness to Pay

Y – income S – sex E – educational level D – distance travelled

A – age F – fee charged T – travel cost

The questionnaires administered for this study were limited in both number and range of items covered such that variables like price of a substitute were not captured. Instead, therefore, focus was put on the rather simple relationship between the extra amounts individuals are willing to pay up and above the amount they had actually spent as depicted below.

[2] Distance from place of origin was used as a proxy for the opportunity cost of time.



Mathematically, the model is $\Delta TC = f(V)$

Annex 3

where: ΔTC – change in travel cost

V – cumulative number of visitors willing to pay up and above their respective expenditures

The rationale for using cumulative number of visitors is that if 1 individual is willing to pay the highest incremental cost, say $ 500, the next 10 individuals are willing to pay $ 400 each, then at the latter level, clearly eleven individuals would be willing to pay $ 400 even if the first person was willing to pay $ 500. When this relationship is plotted it is actually curvelinear in reality.

As a linear regression model, therefore:

$$\Delta TC = a + bV$$

Where: "a" is a constant (intercept on the y-axis) and b is the slope of the downward sloping curve.

The slope derived gives the average incremental cost tourists are willing to pay up and above actual expenditures, such that:

Gross WTP = Average Actual Expenditure + Incremental Cost (=b).

Data Collection

Both the TCM and CVM are survey-based estimation techniques. Hence they were derived from a set of survey questions designed to directly interview visitors to both BINP and MGNP. The data, therefore, used in this study was collected using a questionnaire, key informant interview and focus groups discussions for primary data. The secondary data was gathered from various institutions such as UWA, IGCP and UTB. A copy of the questionnaire and key informant interview are available a IGCP or the study authors .

Annex 3

After disaggregating the data and defining the variables, linear regression models were used to estimate the effects of the explanatory variables on the interviewees' decisions.

Results

Travel Cost Method

A multiple regression equation was constructed to estimate demand relationships. All the regressors were converted to natural logarithms, while the number of visits as dependent variable was left in non-log form.

$$V = \sim 12.4 - 0.3TC - 1.08DIST - 0.1EDUC + 0.5INC + \xi$$
$$(-2.82)^{***} \quad (-17.6)^{***} \quad (-3.79)^{***}$$

$R^2 = 0.63$; $\acute{R}^2 = 0.62$; ξ – error term

*** = significant at 1% level of significance

( ) = In parentheses are t ' values.

The *a prior* expectation was that travel cost (TC) and distance (DIST) would have an inverse relationship with the number of visits while the converse would be true for the level of education (EDUC) and average annual income (INC). It was not to be true for the level of education which had a negative relationship. The explanation could probably be the bias introduced by the restrictive group, largely young people, traveling as overlanders.

The co-efficients (elasticities) indicate that at 99% confidence level, the effect of the travel cost, the income effect, the effect of distance and level of education on the number of visits were highly significant. Taking average values of travel cost, income, distance, and level of education (in years), the number of visits established from the equation was 274. In order to derive a demand function relating travel cost and the number of visitors to the parks, another regression equation was constructed with travel cost as the dependent variable.

Annex 3

Accordingly, it was established that at US $ 1048 cost of travel, no visitors would visit the park. At the average travel cost of US $ 874, a total of 274 visitors would be realized. The demand function is as presented in **Figure 6**.

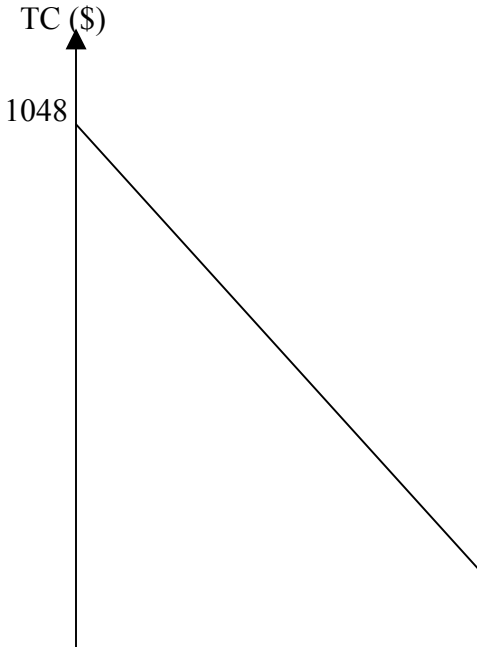


Figure 9 Graphical representation of the TCM results

Annex 3

Willingness To Pay

A multiple regression equation was constructed to estimate the demand relationship, between the change in travel costs and the number of visitors willing to pay up and above their respective expenditures. The change in travel cost being the dependent variable was left in the non-log form, while the number of visitors (the regressor) was converted to the natural logarithm.

$$\Delta TC = 7.45 - 0.011976V$$

The *a prior* expectation was that the incremental travel cost would have an inverse relationship with the number of visitors. As the results show, this was found to be true, as the number of visitors had a negative relationship with the incremental travel costs.

The co-efficients show that at 99% confidence level, the effect of the incremental travel costs were highly significant. Taking average values of the incremental travel costs, the number of visitors established from the equation was 290. From this equation, it was also established that at US $ 1145 travel cost, no visitors would visit the park. While at the average travel cost of US $ 745, a total of 290 visitors would be realized.

Summary of Results

Using the TCM, at travel cost of $ 1,048 no visitors would come to the parks. The same figure for the CVM (WTP) was $ 1,145. The two results are fairly close, as should be expected, and depicted in **Figure 3**. The resulting consumer surplus estimates were as follows:

TCM: $ (1,048 – 474)* 274 ÷ 2 = $ 23,838.

CVM (WTP): $ (1,145 – 745)* 290 ÷ 2 = $ 58,000.

Annex 3

Although 290 questionnaires were administered, eighty one were rejected for incompleteness. Therefore, only 209 questionnaires were considered. Hence, average consumer surplus per visitor for each of the models would be:

TCM: Consumer Surplus / Visitor = $ 114.05

CVM (WTP): Consumer Surplus / Visitor = $ 277.51

Subsequently, average consumer surplus per visitor was estimated at: $ (114,05 + 277.51) / 2; or about $ 196. This value also compares favourably with the estimates of Andersson and Rundquist (1997) of $ 169.

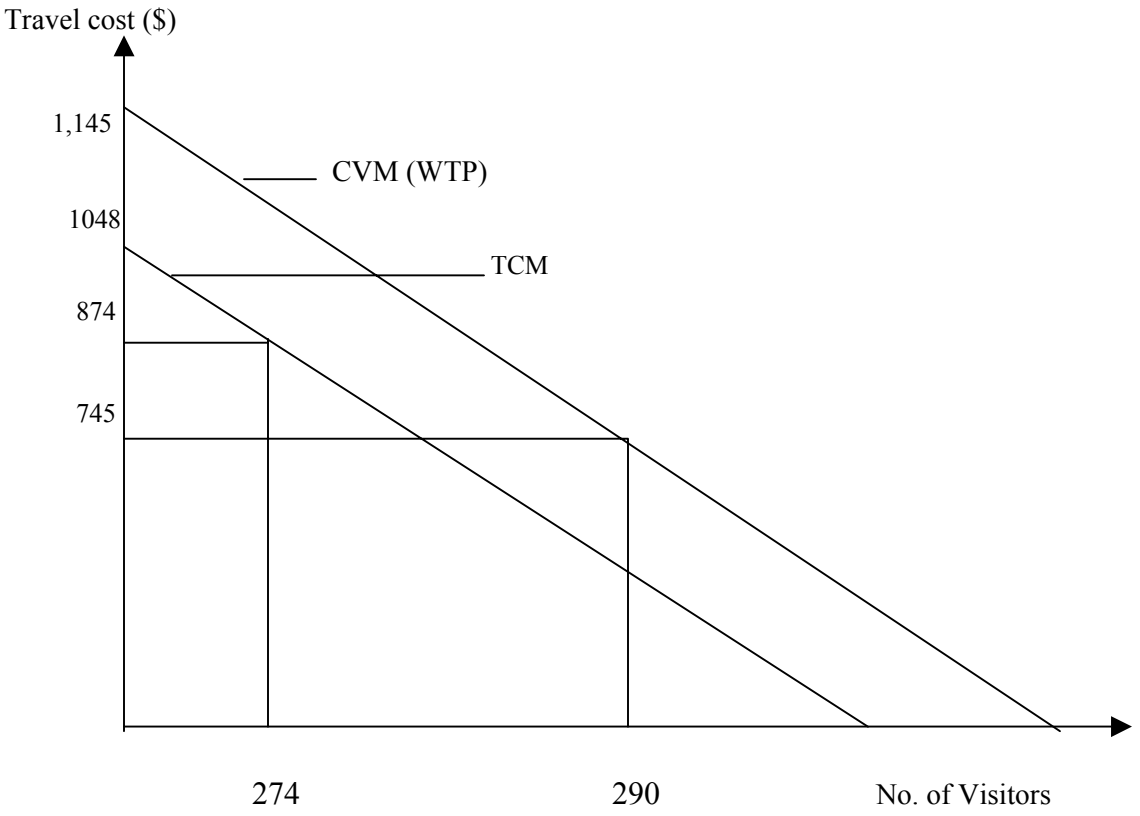


Figure 10 Marshallian and Hicksian Demand Curves derived from Regression Analysis.

Annex 4

Economic Impact of Gorilla Tourism At Full Capacity

Table 4 Estimating Annual Economic Impact of Gorilla Tourism at National Level Assuming Full Capacity.

A. SALES BENEFITS FROM TOURISM	
1. Enter estimated non-Ugandan tourism	88%
2. Enter annual no. of visitors	8,760

3. Enter average expenditures / visitor	$ 874
4. Calculate total visitor spending (1*2*3)	$6,737,491
5a. Estimate the Capture rate for Uganda	65%
5b. Enter Sales Multiplier	2.0
6. Calculate total sales effects (4x5ax5b)	$ 8,758,739
7. Estimate foreign exchange earnings surplus (4x5a)	$ 4,379,369

B. TAX REVENUE BENEFIT FROM TOURISM

1. Enter total sales (from A6 above)	$ 8,758,739
2. Enter aggregate tax rate	26%
3. Calculate tax collections from tourism (1x2)	$2,277,272
4. Enter sales to income ratio	20%
5. Enter Average Income tax rate (PAYE, GPT, etc)	25%
6. Calculate income tax revenue (1x4x5)	$437,937
7. Compute total tax revenue (3+6)	$2,715,209

C. INCOME AND JOB BENEFITS FROM TOURISM

1. Enter total sales	$8,758,739
2. Estimate job to sale ratio	108
3. Estimate income multiplier	0.45
4. Compute total employment effects (1x2)	946
5. Compute total income effects (1x3)	$3,941,433

Annex 4

Table 5 Estimating Annual Economic Impact of Gorilla Tourism at Community Level Assuming Full Capacity

A. SALES BENEFITS FROM TOURISM

1. Enter estimated non-Ugandan tourism	88%
2. Enter annual no. of visitors	8,760

3. Enter average expenditures / visitor	$ 44
4. Calculate total visitor spending	$339,187
5a. Estimate the Capture rate for the Communities	100%
5b. Enter Sales Multiplier	2.0
6. Calculate total sales effects (4x5ax5b)	$ 678,374
7. Estimate foreign exchange earnings surplus (4x5a)	$ 339,187
B. TAX REVENUE BENEFIT FROM TOURISM	
1. Enter total sales (from A6 above)	$ 678,374
2. Enter aggregate tax rate	0%
3. Calculate tax collections from tourism (1x2)	$ 0
4. Enter sales to income ratio	20%
5. Enter Average Income tax rate (PAYE, GPT, etc)	2 %
6. Calculate income tax revenue (1x4x5)	$ 2,713
7. Compute total tax revenue (3+6)	$ 2,713
C. INCOME AND JOB BENEFITS FROM TOURISM	
1. Enter total sales	$ 678,374
2. Estimate job to sale ratio	108
3. Estimate income multiplier	0.45
4. Compute total employment effects (1x2)	73
5. Compute total income effects (1x3)	$ 305,268

Annex 5

References

- Carson, R.T., Mitchell, R.C. and P.A. Ruud. 1990. **Valuing air quality improvements: simulating a hedonic pricing equation in the context of a contingent valuation scenario.** In Visibility and Fine Particles, C.V. Mathai (ed), Air and Waste Management Association, Pittsburg, Pennsylvania.

- Emerton, L. 1996. **Valuing the environment: Case studies from Kenya.** African Wildlife Foundation, Nairobi, Kenya.

- Environment Canada. 1998. **The importance of Wildlife to Canadians.** Environmental Economics Branch.

- Frechtling, D.C. 1987. **Assessing the impacts of travel and tourism – Measuring economic benefits.** Chapter 28 in Ritchie, J.R.B. and Goeldner, C.R. Travel Tourism and Hospitality Research.

- HIID (Harvard Institute for International Development). 1997. **Valuation of the environment: What does it mean for financing biodiversity?** International Environment Program. Cambridge, Mass., USA.

- Leistritz, F. L. and Murdock, S. H. 1981. **The socioeconomic impact of resource development: Methods for assessment.** Boulder, CO: Westview Press.

- Mitchell, R. C. and R. T. Carson. 1988. **Towards a methodology for using contingent valuation to value air visibility benefits.** Draft Report to the Electric power institute, resources for the Future, Washington, D.C.

Annex 5

- MTWA (Ministry of Tourism, Wildlife and Antiquities). 1993. **Ten – year Tourism Master Plan.** UNDP / WTO.

- Scott, M. *et. al.* 1997. **The Valuation of ecological resources and functions.** In Environmental Management.

- Smyth, D. 1998. **Economic impacts of U.S. national parks – A social science study of National Parks.** Research Proposal. Michigan State University. USA.

- Stynes, D. J. 1999. **Approaches to estimating the economic impacts of tourism; some examples.** Michigan State University, USA.
  Stynes, D.J. 1997. Economic impacts of tourism. IIIinois Bureau of Tourism, department of Commerse and Community Affairs.

- Stynes, D.J. 1997. **State and regional economic impacts of Michigan State park visitors.** Report to Public Policy Associates and Parks and Recreation Division, Michigan DNR.

- Stynes, D.J. and Propst, D.B. 1996. **MI-REC manual Version 3.0**. East Lansing, MI: Department of Park, Recreation and Tourism resources, Michigan State University.

- Ulibarri, C.A. and S. Ghosh. 1985. **Benefit – transfer valuation of ecological resources**. Pacific Northwest National Laboratory, Richland, Washington.

- Ulibarri, C.A. and K. F. Wellman. 1997. **Natural resource valuation: A primer on concepts and techniques**. Prepared for the U.S. Department of Energy under contract DE-AC06-76RLO 1830.