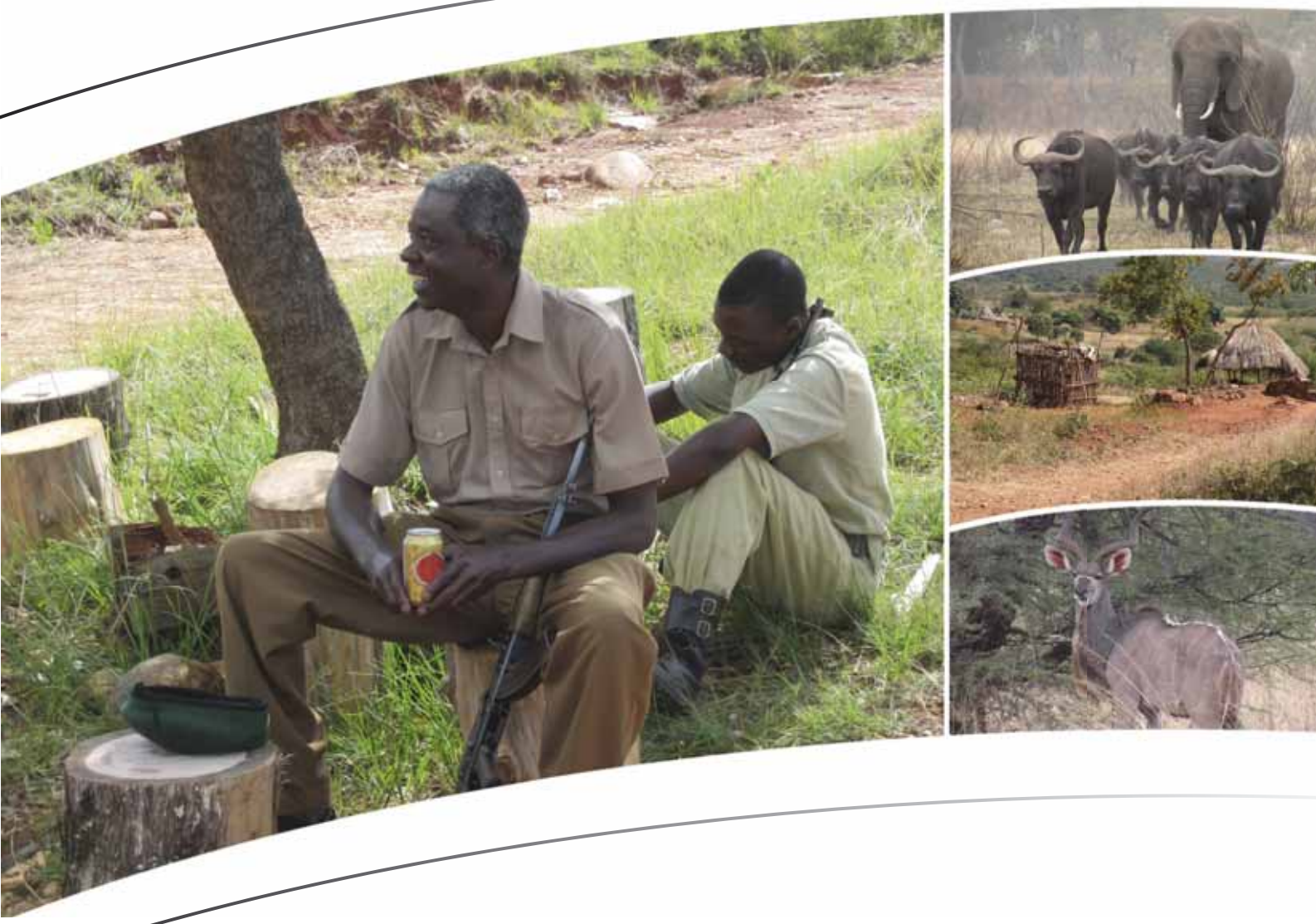

Contribution of Wildlife to National Economies

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Contribution of wildlife to national economies

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Preface
By Gaoju Han
FAO Sub-regional Representative for Southern Africa

At its 16th Session of the African Forestry and Wildlife Commission (AFWC), held in Khartoum in 2008, the Commission requested FAO and partners to assist countries in their efforts to document the value which wildlife brings to local, national and regional economies.

The request was motivated by the belief expressed by member countries, that the wildlife sector contribution is not adequately reflected in the national accounting systems and therefore underestimated and given lower priority which limits funding by national decision makers. However, the wildlife sector has enormous potential to contribute to livelihoods improvement and food security by generating revenues and producing valuable proteins at local, national and regional levels. Yet, some contributions from the wildlife sector are "hidden" or not properly accounted for in the national statistics.

Based on this request, FAO commissioned a study to publicise the wildlife sector's financial contribution and discuss various aspects of monetary and other benefits related to the sector.

Given the complexity of the wildlife sector's contributions, the study was divided in two different papers, one dealing with consumptive use of wildlife through the formal hunting sub-sector, prepared by well known and experienced economist and wildlife consultant Vernon Booth, and a second paper dealing with non-consumptive use of wildlife through ecotourism and wildlife viewing, authored by Harrison Kojwang, former Regional Representative of the World Wide Fund for Nature (WWF) at the Southern African Regional Programme Office, who was in position to cover these large but under-documented aspects.

The draft papers were distributed for comments at the 17th Session of the African Forestry and Wildlife Commission, held in Brazzaville in February 2010. We are pleased to publish the final version of these papers in the joint FAO/CIC Technical Series to share more widely best practices in wildlife management and conservation among the practitioners and decision makers and to support sustainable economic development of the wildlife sector.

The Contribution of Hunting Tourism:

How Significant is This to National Economies?

Vernon R. Booth

July 2010

TABLE OF CONTENTS

1 PREFACE

At its 16th Session of the African Forestry and Wildlife Commission (AFWC), held in Khartoum in 2008, the Commission requested FAO and partners to assist countries in their efforts to document the value which wildlife brings to local, national and regional economies.

The motivation for this request arose from the concerns of the member countries that the wildlife sector contributions are often "hidden" or is not properly accounted for in the national statistics, and therefore are not adequately reflected in the national accounting systems. As a result, the contributions of this sector are underestimated and given low priority by politicians and decision makers and consequently receives limited funding. Yet the wildlife sector as a whole has enormous potential to contribute to livelihood improvements and food security by generating revenues, employment and investment at local, national and regional levels.

In responding to this request, the FAO has commissioned a series of papers to highlight the contributions of the wildlife sector to national economies. This paper examines the contribution of hunting tourism (or "sport hunting") in southern and eastern Africa that is often accused of exploiting wildlife to the detriment of the national economy.

2 ACKNOWLEDGEMENTS

This report is an initiative of the Food and Agriculture Organisation of the United Nations (FAO). The author, Vernon Booth, wishes to thank Dr. René Czudek (FAO Forestry and Wildlife Officer in the Sub-regional Office for Southern Africa) and several colleagues and independent reviewers for their constructive criticism and helpful comments.

3 EXECUTIVE SUMMARY

Hunting tourism, recreational and subsistence hunting is widely practiced across southern and eastern Africa, with hunting tourism (or "sport hunting") regarded as being highly profitable yet is often accused of contributing little to national economies. Data from government agencies and the private sector is used here to evaluate what this contribution might be.

Approximately US$3.2 billion was generated from nature-based tourism by ten of the fourteen Southern African Development Community countries (SADC) in 2000/1. In comparison revenue generated by hunting tourism in seven SADC countries in 2008 is approximately US$190 million. These data cannot be compared with the magnitude of the hunting industries in America and Europe, yet its potential to contribute significantly to economic growth and development encourages its promotion in southern and eastern Africa. However at the political level, there is considerable debate whether hunting tourism can or does contribute to economic growth. Much of this debate stems from the lack of understanding of how this industry is structured coupled with the fact that economic data are gathered at different times using different methods and parameters. Deriving comparable data is therefore extremely difficult especially as the various stakeholders involved in the industry each have a wide variety of economic drivers.

The estimated gross income of hunting tourism in Tanzania and Botswana are used to illustrate the revenue flows to government and the private sector. For Tanzania, these data suggest that the potential gross income of the industry in 2008 was approximately US$56 million, and that the private sector recorded steady growth over the previous 18 years. Direct revenue to the Wildlife Division had remained static however, and it was this data that politicians used to judge the contribution of hunting tourism to the economy. The "hidden" revenue streams that accrue to government in the form of taxes are not immediately obvious. Using the example of Tanzania it can be demonstrated that direct and indirect tax flows to government is approximately 44% of the estimated gross income of the industry (~US$24 million). Using a different approach, it has been demonstrated that in Botswana 75% of the gross income generated by hunting tourism remains in the country and of this 49% remains at the district level (~US$6.3 million). This equates to approximately ~US$5/head when translated to an income per capita at the national level, however, when this is attributed to the main hunting districts, then the per capita income is US$48.5 per head.

To assess the contribution of hunting tourism to national economies it is necessary to calculate its asset value. Using data from Tanzania, an example is provided to show how this can be achieved using the following assumptions:

1 Determining the value of the quota, number of hunting concessions and fee structure imposed by the regulating authorities.
2 Calculate the number hunting clients based on the utilisation of key mammal species.
3 Calculate the level of effort (hunter days).
4 Calculate the gross income to the wildlife agency/authority from licenses, permits, fees and other charges.
5 Calculate the potential gross income of the hunting operations.

Working through these assumptions, the gross income of the Tanzanian hunting tourism sector in 2007 was approximately US$76.5 million. By applying various parameters such as income/ha or income/capita, these accounts can be used to demonstrate the direct value of hunting in remote areas where hunting tourism takes place, and then be compared with economic data from the agricultural sector or non-consumptive tourism sector.

This is regarded as essential if hunting tourism is to justify its role in conservation, and demonstrate that governments are fully benefiting from the use of the resources by this sector.

4 GLOSSARY

AFWC	African Forestry and Wildlife Commission
BWMA	Botswana Wildlife Management Association
CBO	Community Based Organisation
CHAs	Controlled Hunting Areas
CITES	Convention for the International Trade in Endangered Species
CSF	Congressional Sportsmen Foundation
EEA	Environmental Economic Accounts
FAO	Food and Agricultural Organisation of the United Nations
GDP	Gross Domestic Product
IEEA	Integrated Environmental and Economic Accounting
PH	Professional Hunter
RBZ	Reserve Bank of Zimbabwe
SADC	Southern African Development Community
TAHOA	Tanzania Hunters Association
TALA	Tourist Licensing Authority (Tanzania)
TAWICO	Tanzania Wildlife Corporation
VAT	Value Added Tax
WD	Wildlife Division (Tanzania)
WTTC	World Travel and Tourism Council

5 INTRODUCTION

Several reports have appeared over the last 10 years where the contribution of hunting tourism (or "sport hunting"[1]) to the national economy of a country has been questioned by politicians and wildlife management authorities. Often these reports accuse the hunting industry of generating huge profits at the expense of government and come about as a result of a lack of understanding of this industry compounded by the lack of economic data.

This paper uses data from Government agencies, the private sector from various countries that are directly involved with hunting tourism and from various publications to evaluate the contribution of the hunting industry both directly and indirectly to the national economy through various taxes and value chain additives that are not immediately obvious, and are not generally captured in the national statistics.

5.1 Hunting Tourism, Recreational, Traditional and Subsistence Hunting

Hunting across the southern and east African region can be broadly categorised into three main sectors: 1) Hunting tourism (also known as trophy or sport hunting), 2) recreational or *biltong* / meat hunting, and 3) traditional and subsistence hunting.

Hunting tourism has been a market entry point for many commercial producers of wildlife in Namibia, South Africa and Zimbabwe (Bond *et al*. 2004). It can operate in areas where there are low populations and diversity of wildlife, because hunters focus on individual trophies rather than diversity that photographic tourists demand (Child 2001), while the capital costs to develop and support it are lower than photographic wildlife tourism (Barnes 1998).

This ability to operate viably in areas of low diversity and populations of game means that hunting tourism has significant links with conservation. Through its various hunting activities it contributes towards the management of these wild areas by generating revenue and stimulating economic activity, and raising awareness and support for wildlife conservation amongst local people, tourists, and policy makers, particularly where state protected area fees go to government treasuries. These linkages to conservation are not always immediately obvious as the links between hunting operations and conservation are largely dependent upon the policy framework within a particular country, the concessional and contractual nature of concession agreements, and how stakeholders (i.e. communities, operators, government, etc.) are engaged in the conduct of the hunting taking place.

Hunting tourism tends to be undertaken by foreign hunters that hunt for reasons of sport for a predetermined number of specific wildlife species, generally with the objective of keeping some part of the animal as a trophy (usually the horns or tusks of mature male herbivores or skins and skulls of carnivores). This form of hunting takes place on all types of land regardless as to whether it is owned privately, communally or by the state. The foreign hunter will generally seek the services of a commercial safari operator and negotiate the cost of hunting a package of trophies in a given time. All species are hunted, with hunting packages for charismatic trophies such as elephant, lion, leopard and buffalo fetching high prices. Hunts of this nature are conducted under the supervision of a professional hunter regardless of the type of land involved, and are strictly regulated by wildlife authorities (Booth 2002, 2009).

[1] "Hunting Tourism" or "Sport Hunting", also known as "consumptive wildlife tourism", involves the killing of wild animals in natural areas as opposed to "non-consumptive wildlife tourism" where wildlife is not physically killed. For the purpose of this study, the term *hunting tourism* is used in place of the terms "foreign hunting", "sport hunting", and "trophy hunting", and is defined as "undertaking hunting activities for one or more specimens of a certain species by a foreign or local hunter, who is willing to pay a fee for the special experience of hunting and/or attaining the trophy in a sustainable and ethical way".

Recreational (or *biltong* /meat) hunters are almost exclusively citizens/residents of the country who combine the experience of hunting with the desire for meat from wildlife[2]. Some consider this form of hunting to be an important cultural practice. The primary objective is not to obtain a trophy, although the skin or horns may be kept depending on the hunters' preferences. Recreational hunters do not need any form of qualification to hunt and, depending on the country concerned, very few statistics of this form of hunting are maintained by the authorities. Recreational hunters will generally hunt the larger and more common antelope species using rifles and high powered bow and arrows, ignoring small animals and the high value charismatic trophies (lion, elephant).

Traditional and subsistence hunting tend to be practiced by local indigenous Africans. Although there are few legal opportunities for this type of hunting, traditional hunting is an accepted and recognized form of hunting with motivations that overlap with those of the recreational hunter. These include the desire for meat, the meeting of emotionally important cultural needs, or to source medicinal material. Traditional and subsistence hunters tend to focus on small antelope (duiker, bushbuck, birds etc.) using traditional weapons (bow and arrow, driven hunts using dogs and nets) but also will use snares made of natural fibres, nylon ropes and wire.

All of the above types of hunting take place in legal and illegal forms which place administrative and management demands on all agencies involved with wildlife conservation. The most arduous of these is dealing with illegal commercial harvesting of valuable species (rhino horn and ivory) by criminal networks and containing the commercial "bushmeat" trade (Yaa Ntiamoa-Baidu 1997, Barnett 2000, 2001).

The high profile of hunting tourism is relatively well known as a result of its prominence in the conservation management strategies in countries where this form of wildlife utilisation is permitted. Data on the performance of this segment of the hunting industry are therefore readily available, and as a result, there are frequent statements that hunting tourism is "a big business". With very few exceptions this cannot be said for recreational and subsistence hunting and therefore it is extremely difficult to include these in any economic analysis. Furthermore these sectors are not well coordinated or structured across the region with the possible exception of South Africa and Namibia. Nonetheless, all forms of hunting have different impacts on the economy at a national level (van Engeldorp Gastelaars 2005).

5.2 Contribution of Hunting Tourism to National Economies

The tourism industry is the largest in the world, with receipts from international tourism expenditure totalling US$474 billion in 2002 (WTO 2003). Besides its ability, as a labour-intensive sector, to create jobs for relatively unskilled workers, it is also an important earner of foreign exchange. According to the World Travel and Tourism Council (WTTC), the travel and tourism industry generated US$39.8 billion of economic activity in Sub-Saharan Africa in 2003, contributed 2.4% to the region's GDP and provided 5.4% of all its employment (WTTC 2003). For these reasons tourism is promoted in southern and eastern Africa since it has the potential to contribute significantly to economic growth and development.

Table 1 summarises the national statistics for nature-tourism in ten of the fourteen Southern African Development Community countries (SADC), that indicates that in 2000/1 the industry generated approximately US$3.2 billion in revenue from over 8 million domestic and international arrivals (Scholes and Biggs 2004).

[2] Bird hunting or "wingshooting" is a form of recreational hunting conducted almost exclusively by nationals, and is most developed in South Africa. Wingshooting can take place on conventional agricultural land as well as in wildlife areas, and is generally considered as an under developed industry across the region but with massive growth potential that can contribute towards uplifting of rural livelihoods and improve habitats (see www.agred.co.za).

Table 1: Nature tourism arrivals and income in SADC countries 2000 - 2001

Country	Nature-tourism arrivals (000s) (Domestic and International)	Income from nature tourism (million US$)
Angola	0.9	0.3
Botswana	472.9	131.3
Malawi	109.4	13
Mozambique	42	8.4
Namibia	360	247.6
South Africa	4,634.5	2,298.8
Swaziland	243.9	27
Tanzania	203.7	299.9
Zambia	459.2	72.8
Zimbabwe	1,494.4	143.5
TOTAL	8,020.9	3,242.6
No data available for Democratic Republic of the Congo, Lesotho, Madagascar or Mauritius		

Although hunting tourism does not support large volumes of tourists, it can be regarded as the highest-valued land use for arid and semi-arid savannas in southern Africa, especially in areas of low wildlife densities and diversity. Lindsey *et al*. (2007) estimate that a minimum of 1,394,000 km^2 is used for hunting tourism in sub-Saharan Africa, which exceeds the area encompassed by national parks.

Table 2 summarises the approximate gross value of hunting tourism for seven SADC countries between 2000 and 2008, with South Africa and Tanzania dominating the industry over this period. These data suggest that hunting tourism generates gross revenues of at least US$190 million per year (Lindsey *et al.* [2007] provide an estimate of US$201 million from a minimum of 18,500 clients).

Table 2: Approximate gross value of hunting tourism in Botswana, South Africa, Namibia, Zambia, Zimbabwe and Tanzania (US$ millions).

Country	Date	Gross Income (US$)[1]	Source
Botswana	2000	$12.6 million	ULG, 2001
	2008	$40.0 million	Martin, 2008
South Africa	2003/2004	$68.3 million	Damm, 2005
Namibia	2004	$9.6 million	Erb, 2001
Zambia	2002	$3.6 million	Child, 2002
Mozambique	2008	$5.0 million	Booth, unpublished
Zimbabwe	2000	$18. 5 million	Booth, 2002
	2007	$15.8million	RBZ, 2007
Tanzania	2001	$39.2 million	Baldus and Cauldwell, 2004
	2008	$56.3million	Booth, this study

[1] Note: Data not adjusted for inflation.

To place this in prospective, the Congressional Sportsmen Foundation (CSF), an advocacy group in America, summarises the contributions of sportsmen to the local economies of three States in America (Table 3, CSF 2004).

Table 3: Approximate gross value of hunting and angling by sportsmen in Texas, Montana and Wyoming in the USA (US$ millions). Source – Congressional Sportsmen Foundation (CSF) www.sportsmenslink.org

State	Spend	Jobs	Salary & wages	Federal & State Taxes	Multiplier effect
Texas	$6.6 billion	106,000	$236 million	$1.4 billion	$11.6 billion
Montana	$721 million	11,500	$270 million	$520 million	$1 billion
Wyoming	$676 million	9,500	$236 million	$137 million	$916 million

In total sportsmen in the USA spend approximately US$76 billion/year on hunting and fishing activities that generate approximately 1.6 million jobs and US$60 billion in federal and state taxes. If the US$76 billion spent on hunting and fishing were the Gross Domestic product (GDP) of a country, sportsmen as a nation would rank 57 out of 181 countries (CSF 2004).

Similarly hunting is an important socio-economic activity in Europe, particularly in rural areas. Kenward and Sharp (2008) estimate that within the European Union alone hunting may be worth €16 billion (~US$22 billion) annually. This does not capture the complexity of values that can be added, derived or offset from hunting activities such as:

- Direct economic benefits - payments by hunters towards hunting fees, equipment accommodation etc
- Environmental benefits - these include aspects related to conservation activities, ecosystem retention and management.
- Social benefits - hunting is often a very important social and cultural activity in many rural areas which has value in binding communities as well as offering useful social integration tools.
- Future bequest benefits - hunting helps retain a link to rural areas and an understanding of ecosystem functioning that serves to retain cultural knowledge and understanding for future generations.
- Opportunity costs – these are related mainly to the costs that would be incurred by Governments in managing wildlife populations and paying for damages incurred by these populations.

6 COMPARISON OF REGIONAL HUNTING TOURISM INDUSTRIES

A common perception that emerges from the various reports regarding the economic contribution of hunting tourism in southern and eastern Africa is illustrated in the following statement: "*This tourist hunting sector (*in Tanzania) *which should be a big source of generating foreign money contributes little revenue, an average of USD9 million per annum only while our colleagues in Zimbabwe in the same industry generate USD30 million per annum" (*quoted in Diallo 2006*).*

Such statements in the political arena confuse the gross income to government coffers with that generated by the private sector. To arrive at a total financial value for the hunting industry and hence its economic "wealth", it is necessary to estimate the total amount spent (including estimates of multipliers along the value chain that support hunting activities) by hunting clients and by the safari operators over the hunting season and add these two figures to obtain the gross turnover, i.e. –

Total financial value = US$ (Hunting client costs + Operator costs)

However, because the hunting industry across the region is not well organised, coupled with the fact that data are gathered at different times using different methods and parameters, it is extremely difficult to arrive at comparable data. Furthermore there are no published definitive examples of the empirical income and expenditure of a safari hunting company – this data for obvious reasons is private and confidential. Nonetheless, there is considerable debate across the region as to the estimated income and recurrent costs of individual safari companies (ULG 2001, Turpie *et al*. 2006).

6.1 Economic drivers of the hunting industry

A summary of the economic drivers of the safari hunting industry, and the linkages that exist between the land authority, the outfitter and the hunting client are provided in Table 4. Each of these stakeholders has different objectives: the land authority is looking for a fair return from the resource; the outfitter is looking to make a profit and the hunting client is looking for the best deal and hunting experience. Bringing all these factors together determines the success or failure of the hunting industry (Booth 2002).

Table 4: The different economic drivers in the hunting industry that determine its economic value.

The Land Authority	Outfitter	Hunting Client
• Comparable prices for concession (or "block) fees. • Availability of hunting blocks. • Level of supply and demand for hunting concessions. • Size and mix of quota. • Comparable trophy prices elsewhere in the country and in the region. • Any legal implications (CITES permits, veterinary restrictions etc).	• Fixed and variable cost of the hunting operation (concession fees, license fees, capital and operational costs including marketing). • The number and mix of trophies on quota. • Trophy quality. • The potential number and duration of the safari that can be sold (i.e. 10 -, 15 -, 21-day hunts). • Comparable prices elsewhere within the industry and the	• Eagerness to secure a particular trophy. • Whether it is his/her first safari to Africa. • The overall cost of the safari (including airfares and taxidermy costs). • Reputation of the country as a hunting destination. • Reputation of the outfitter/professional hunter and of the particular hunting area. • Whether he/she already has a

The Land Authority	Outfitter	Hunting Client
	region. • Marketing success and the number of confirmed bookings. • Time of season (early and late season bookings are often discounted).	specimen of the particular trophy. • Quality of trophies. • Success rate in hunting a particular species in a particular area.

Other factors that drive the competitiveness of the industry include:

- The variety and diversity habitats and landscapes.
- The selection of trophy animals that can be hunted (e.g. Tanzania has more mammal species on offer than any other country in the region).
- Level of development in the professional hunting and game ranching industry.
- Excellence of infrastructure (roads, hotels, airports, hospital facilities, communication etc.).
- Other tourism activities to complement hunting (ecotourism, shopping, beach, fishing etc.).
- The cost of maintaining wilderness areas that support wildlife populations.
- Access to and political stability of the country.
- The policy framework applicable in a particular country and the role that this plays in the competitiveness of the country's hunting industry.

The bottom line is that a hunting outfitter is selling a product made up of a hunting experience and a bag of trophy animals to a highly discerning tourist (the hunting client). The outfitter either has to purchase the "product" from a government agency (or a local community), or he is producing this himself (i.e. through game ranching). The success of the business will depend on the size of the hunting area, and the number and mix of animals, especially big game (i.e. the quota) he has on offer. But crucially the success of the business depends on the outfitter's skill to market the "product".

6.2 Comparison of the Regional Hunting Industries

The data presented in Table 2 above suggests that the gross revenue generation of the hunting industry in Tanzania (~$56.3 million in 2008) is comparable with the industries in Botswana and South Africa, while Zimbabwe lies midway between this group and that of Namibia, Zambia and Mozambique.

The differences between the countries are a result of a number of variables:

- The number of hunting concessions available. For example there are 152 blocks on offer in Tanzania and 17 in Zimbabwe, yet the Zimbabwe industry "out performs" that in Tanzania in terms of gross income/hunting block.
- The animal licenses (i.e. the fee paid to government) and the number and variety of animals on quota vary widely between countries.
- The terms and conditions under which government controlled hunting areas are tendered or auctioned. For example several hunting concessions in the Niassa National Reserve in Mozambique attracted bids ranging from US$200,000/year (from philanthropic investors) to US$20,000/year from small locally based hunting companies.
- The volume of hunters that pass through the country. For example some 7,000 hunters visited South Africa in 2004 and these hunters harvested approximately 55,000 game animals on safaris

averaging 11 days. Without any multiplier affects the total economic value for tourist hunting was estimated at US$68.3 million (Damm 2005).
- The impact of multiplier effects (taxidermy, hotels, flights, sales of sporting goods etc).
- Levels of capital investment in the hunting operations.

To illustrate these parameters, examples of the economic value of the hunting industry in selective countries is discussed below.

6.3 Value of the Tanzania Sport Hunting Industry

Tourism in Tanzania is a key source of foreign exchange earnings, contributing more than 50 percent to total export earnings. The sector is estimated to directly support some 30,000 jobs on the mainland and a further 6,000 in Zanzibar, and probably as many indirect jobs. The prime attractions are wildlife safaris, especially in the Northern Circuit (Arusha, Serengeti), and beach tourism in Zanzibar. As well as the broad categories of wildlife viewing and resort tourism, Tanzania also offers products that appeal to more specialised market segments, some of which show higher demand growth rates than in mainstream tourism. Among the principal niche markets are bird-watching; adventure tourism; mountain climbing (Kilimanjaro); deep sea fishing; scuba diving and snorkelling; cultural tourism; conference and incentive travel, and tourist hunting.

In 2004, the agricultural sector accounted for 46% of the total Gross Domestic Product (GDP) with tourism accounting for an estimated 12% of GDP for Tanzania as a whole and probably in excess of that for Zanzibar. In 2006, total GDP amounted to some US$12.96 billion (Profit Proinvest 2007) and in 2009 the GDP was ~US$20.5 billion.

The Wildlife Division in Tanzania is responsible for the management and administration of all hunting, and receives funds from a variety of sources: revenue accruing from capture permits, game license fees, certificate of ownership, trophy export certificate, trophy dealer license, compounding fees, miscellaneous receipts and CITES fees accounts for approximately 1% of the total revenues, while the bulk (99%) accrue from hunting license and block fees (Mabugu and Mugoya 2001).

Several reports have attempted to assess the gross revenue earned from hunting tourism by the Wildlife Division and by the industry. These data are summarized in Figure 1 and Table 5 and illustrate the inconsistencies in the data with different estimates being provided by different reports for the same year.

Firstly, with regard to the Wildlife Division:

- It received very little revenue (~US$1. 2 million) after it took back control of the industry from the Tanzania Wildlife Corporation (TAWICO) in 1988.
- From 1991 through to 1996, the sport hunting industry came under close scrutiny. A Draft Wildlife Policy was debated and reviewed by a wide variety of stakeholders, and the industry went through several stages of reform. Revenues accruing to the Wildlife Division effectively tripled from ~US$3.5 million in 1991 to approximately US$10 million in 1998.
- From 2000 onwards, the revenues accruing to the Wildlife Division have remained almost static at approximately US$9 million/year. Only recently in 2007 has this changed following the increases in Block and Trophy Fees.

Secondly, various studies have estimated the gross revenue accrued from hunting tourism since 1988 (see Table 5):

- PAWM (1995) estimated this to be approximately US$4.6 million in 1988, and then US$13.9 million in 1992.
- Hurt and Ravn (2000) estimated that the minimum gross revenue (i.e. Wildlife Division + Private Sector + service providers) accrued by the hunting tourism sector in 1995 was approximately US$30 million. They arrive at this figure based on a hypothetical situation where 30 hunting companies fully utilize 80 hunting blocks. Of these revenues 45% would accrue to the private safari companies (~US$13.5 million) and 41% to the Wildlife Division (~US$12.4 million).
- Pasanisi (2001) estimated the value of the industry at US$ 25 million in 2001.
- Baldus and Cauldwell (2004) calculate the value at US$19.4 million in 1996 and then provide various estimates ranging from US$27 million to US$39 million in 2001.

Using simple linear trend line regression and statistical analysis, it is possible to estimate the projected estimated earnings of the Wildlife Division and the private sector using the data presented in Table 5. These data suggest that the private sector generated approximately US$32 million in 2002 and that the industry had steadily grown to approximately US$44 million by 2008. In contrast, the income to the Wildlife Division over the same period remained static at approximately US$9.6 million until the fees were increased in 2007 (Table 5).

This implies that the *potential overall gross value* of the industry (Government + Private Sector) in 2008 is ± US$56 million (Table 6). However there are a number of caveats to these data:

- The early estimates of the gross income generated by the private sector are not based on empirical data, and therefore these estimates could be inflated, although these do not appear to have been challenged by the Tanzania hunting industry, and in some cases have been provided by the industry itself e.g. Hurt and Ravn (2000), Pasanisi (2001).
- The assumption here is that the industry has continued to expand as a result of:
    - An increasing number of outfitters entering the business
    - A steady increase in the number of clients visiting Tanzania coupled with,
    - A steady increase in safari charges.

Figure 1: Revenue Accruement (US$) to Wildlife Division and Private Sector

See Table 5 for data sources. The linear trend lines indicate the differences in the relative growth rates between the Wildlife Division and the Private Sector that suggests that the growth of private sector has been almost three-fold greater than that achieved by the Wildlife Division).

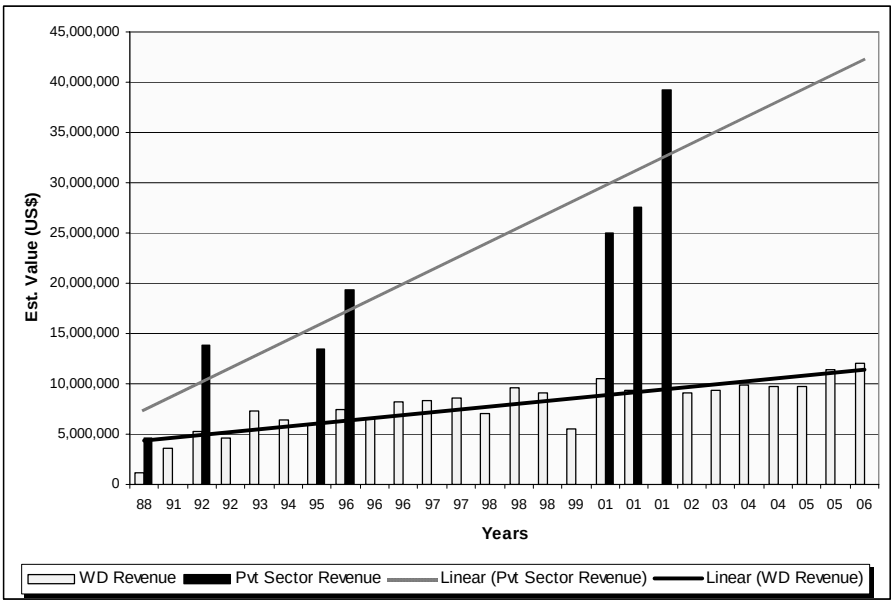

Table 5: A summary of estimated revenue generated by the sport hunting industry in Tanzania between 1988 and 2006. Note: Data not adjusted for inflation.

Year	Revenue accruing to WD (US$)	Data Source	Est. US$ gross income to private sector	Data source
1988	1,200,000	Baldus and Cauldwell, 2004	4,600,000	PAWM, 1995
1991	3,599,271	Kibebe, 1994		
1992	5,300,000	PAWM, 1995	13,900,000	PAWM, 1995
1992	4,645,313	Kibebe, 1994		
1993	7,312,430	Kibebe, 1994		
1994	6,435,374	Kitwara, 1996		
1995	6,004,219	Kitwara, 1996	13,520,000	Hurt & Ravn, 2000
1996	7,400,000	Broomhead, 1997	19,400,000	Baldus and Cauldwell, 2004
1996	6,576,022	Mabugu and Mugoya, 2001		
1996	8,214,055	Wildlife Division		
1997	8,273,254	Mabugu and Mugoya, 2001		
1997	8,559,320	Wildlife Division		
1998	6,989,928	Mabugu and Mugoya, 2001		
1998	9,600,000	TAHOA Address, 1999		
1998	9,133,035	Wildlife Division		
1999	5,508,273	Mabugu and Mugoya, 2001		
2001	10,500,000	Baldus and Cauldwell, 2004	25,000,000	Pasanisi, 2001
2001	9,409,886	Diallo Report, 2006	27,600,000	Baldus and Cauldwell, 2004
2001			39,280,000	Baldus and Cauldwell, 2004
2002	9,130,100	Diallo Report, 2006		
2003	9,322,719	Diallo Report, 2006		
2004	9,824,305	Diallo Report, 2006		
2004	9,807,398	Wildlife Division		
2005	9,775,749	Diallo Report, 2006		
2005	11,435,991	Wildlife Division		
2006	12,030,510	Wildlife Division		

Table 6: The estimated ***overall gross*** value of the Tanzania hunting industry (US$) based on the total revenue accruing to the Wildlife Division and the Private Sector.
The estimated forecast from 2002 to 2008 (shaded area) for the Wildlife Division and the Private Sector is based on projecting the data presented in Table 5 and illustrated in Figure 1.

Year	Wildlife Division	Private Sector	Overall Gross Revenue (US$)	% Accruing to WD
1988	1,200,000	4,600,000	5,800,000	21%
1992	5,300,000	13,900,000	19,200,000	28%
1995	6,004,219	13,520,000	19,524,219	31%
1996	7,400,000	19,400,000	26,800,000	28%
2001	9,409,886 - 10,500,000	25,000,000 - 27,000,000	35,500,000 - 37,009,886	
2002	9,130,100	*31,961,765*	41,091,865	22%
2003	9,322,719	*33,972,574*	43,295,293	22%
2004	9,824,305	*35,993,382*	45,817,687	21%
2005	9,775,749 - 11,435,991	*37,994,191*	47,769,940 - 49,430,182	26% - 30%
2006	12,030,510	*40,005,000*	52,035,510	23%
2007	*11,902,652*	*42,015,809*	53,918,461	22%
2008	*12,353,180*	*44,026,618*	56,379,798	22%

6.3.1 Estimated Income and Recurrent Costs of Tanzania Safari Companies

Hunting companies in Tanzania generate income from a number of sources and incur a range of expenses. These are listed in Table 7 below. Analysis of confidential financial records available to the author provides an indication of the percentage split of the income and expenditure accounts. From this it is possible to draw up an approximate income and expenditure statement of a hypothetical company in Tanzania and guesstimate a gross "profit" before tax.

Table 7: The income and expenditure of the hunting industry in Tanzania.
These data are based on the assumption that the gross income from the 152 blocks available is US$56 million (see Table 6) and that the average expenditure per block is US$350,000.

Estimated gross income (US$)	$56,379,798		
Income/budget line	Percentage	US$	Per Block (N=152)
Safari Income	66.90%	$37,718,085	$248,145
Game Fees	14.70%	$8,287,830	$54,525
Air Charter Income	6.50%	$3,664,687	$24,110
Safari Income (Observer Days)	3.90%	$2,198,812	$14,466
Miscellaneous Income	2.70%	$1,522,255	$10,015
Conservation Fees	2.50%	$1,409,495	$9,273
Community Contribution	1.60%	$902,077	$5,935
Trophy Handling Fees	0.50%	$281,899	$1,855
Hunting Permits	0.20%	$112,760	$742
Trophy Handling	0.20%	$112,760	$742
Vehicle rental	0.20%	$112,760	$742
Trophy License	0.10%	$56,380	$371
Rifle Duty	0.10%	$56,380	$371

Estimated Gross Expenditure (US$)	$53,200,000		
Expenditure/budget line	Percentage	US$	Per Block (N=152)
Operating Expenses	25.00%	$13,300,000	$87,500
Wildlife Division Fees	23.30%	$12,395,600	$81,550
Management Costs	17.90%	$9,522,800	$62,650
Wages & Welfare	11.90%	$6,330,800	$41,650
Support Service Industries	9.90%	$5,266,800	$34,650
Professional Hunter Expenses	5.90%	$3,138,800	$20,650
Area and Community Development	3.10%	$1,649,200	$10,850
Administrative Costs	1.90%	$1,010,800	$6,650
Central & Local Govt Levies/Duties etc	1.10%	$585,200	$3,850
"Profit" before tax	6%	$3,179,798	$20,920

It's not surprisingly that income from the sale of safaris makes up 66.9% of this ($37,718,085) with game fees the next highest source of income ($8,287,830 or 14.7%). The remaining revenue streams make up the balance. Clearly there is a great deal of latitude in these data as none of the financial data has been audited. Some of the larger companies will generate considerably more income, depending on the number of blocks they are allocated and their ability to market and sell the allocated quotas. Equally, some of the smaller companies with fewer blocks and smaller quotas will generate less income.

The expenses incurred by a hunting company against which the various expenses are allocated can be grouped into 9 broad categories to derive a theoretical "profit and loss" account (Table 7).

1. Operating expenses: These cover the cost of supplying the hunting industry and include a large range of goods e.g. food, drink, vehicle and camp maintenance etc.
2. Wildlife Division fees. These include the various charges raised by the Tanzania Wildlife Division, including Game Fees, Conservation Fees, and Trophy Handling Fees etc.
3. Management costs: This includes the cost associated with town and camp management as well as managerial salaries, director drawings, business travel etc.
4. Wages and welfare: These are expenses related to the employment of staff in the industry, including social welfare taxes etc.
5. Support service industries: These include the costs associated with payments for professional services as well as to service providers such as hotels, air charter etc.
6. Professional hunters: These costs cover the remuneration and associated costs of employing professional hunters in the industry.
7. Area expenses and Community Development: These include payments to CBO organizations, payments to communities for concession fees, resource fees, payments for welfare and education etc.
8. Administration Costs: These cover service and utility costs
9. Central and Local Government taxes and levies. These include royalties, duties, various licenses etc.

Other costs include corporate taxes paid to government and depreciation. Capital replacement and commission payments to hunting agents and for professional hunters' commissions for clients which are generally paid outside the country are not included here.

Furthermore, the cost of capital investments in fixed and moveable assets is not included since reliable data are not available. Generally the level of investment by the industry varies greatly between companies, and from one area to another. The tendency is to invest heavily in movable assets (vehicles, tents, plant

equipment etc.) and very little in fixed assets. This strategy is favoured because of the uncertainty of block concession tenure and the short duration of the lease periods.

6.3.2 Revenue Accruing to Government

From the analysis above, it is estimated that the Wildlife Division receives approximately $12 million in direct revenues (23%) with central and local government duties and levies accounting for 1.10% of the estimated expenditure. In some government circles these returns are considered as being low and lend weight to the argument that the hunting tourism sector is not contributing sufficiently to the national economy of Tanzania, and in particular the Wildlife Division is not receiving a fair return from the sale of hunting opportunities (COWI 2005, World Bank 2007).

However, the taxes due to government are in many forms including Value Added Tax (VAT), excise duties, import duties, corporate tax etc. By and large these expenses are "hidden", especially as some funds only find their way to government once they begin to circulate in the local economy. For example, wages paid to workers don't attract tax at the time they are paid to the individual, but when that individual spends his wages, a component of this will end up as VAT. Similarly, spending on operational expenses such as food, drink and fuel will include elements of excise duty, import duty etc.

With the exception of commissions, which are deducted at source by various hunting agencies outside of Tanzania, all subsequent spending circulates in the national economy. What is unknown in these data is the percentage of these revenues that remain in local communities, at the district level and at the country level. Furthermore it is impossible to gauge from these data the level of funds that accrue to external parties (ULG 2001 estimated that in Botswana up to 25% of the funds are externalized). In addition many concessions are leased to outfitters without the capacity to market or manage their own hunting operations, thus promoting subleasing to foreigners (the "wandering professional hunter" syndrome – see Baldus and Cauldwell, 2004). The result is that much of the income generated by the industry never enters the country and the Tanzania Revenue Authority does not access as much of the funds that should be due for taxation (World Bank 2007).

In reality, Government does receive a considerable percentage of the income accruing to the hunting industry. Tax flows to government, both directly and indirectly, including "hidden" taxes such as those accruing from VAT are indicated in Table 8. These data suggest that the direct revenue accruing to the Wildlife Division accounts for 21% while VAT accounts for 13%. Overall the return to government is approximately 44% of the estimated gross income of the industry (~$24 million). The problem is that the Wildlife Division can only demonstrate its direct income from trophy fees and block fees and these appear to be low in the eyes of politicians.

Table 8: Estimated taxes accruing directly and indirectly to the Tanzanian government from the hunting industry assuming an estimated gross income of ~US$ 56 million
Tax Source: Analysed from confidential financial records available to the author.

Tax Source	US$ per block	US$ All Blocks (N = 152)	% of Estimated Gross income
Direct Revenue			
Trophy Fees	$58,904	$8,953,408	15.88%
Block Fees	$7,500	$1,140,000	2.02%
Area fees	$7,347	$1,116,744	1.98%
Conservation Fees	$3,769	$572,888	1.02%

Tax Source	US$ per block	US$ All Blocks (N = 152)	% of Estimated Gross income
Hunting Permits	$1,172	$178,144	0.32%
Govt Trophy Handing Fee	$561	$85,272	0.15%
Other Licenses	$389	$59,128	0.10%
Estimate Total Direct Revenue	$79,642	$12,119,175	21.50%
Corporate and Personal Tax			
Salaries (30%)	$13,650	$2,074,800	3.68%
Corporation Taxes (Estimate)	$6,150	$934,800	1.66%
Payroll tax & NSSF	$5,100	$775,200	1.37%
Directors fees (35%)	$1,500	$228,000	0.40%
NSSF (Employer Contribution)	$1,230	$186,960	0.33%
Casual employee NSSF	$1,200	$182,400	0.32%
Skills & Development Levy	$630	$95,760	0.17%
PH Salaries (Withholding tax)	$325	$49,400	0.09%
Estimate Total Personal Tax	$29,785	$4,527,320	8.03%
Indirect Taxes			
Custom duty	$1,600	$243,200	0.43%
TALA Business License	$1,600	$243,200	0.43%
Resident permits Expat Staff	$1,135	$172,520	0.31%
PH License	$925	$140,600	0.25%
Vehicle License Fees	$550	$83,600	0.15%
TALA PH License	$425	$64,600	0.11%
Radio License	$320	$48,640	0.09%
Company Firearms License	$225	$34,200	0.06%
Rifle Import Duty	$190	$28,880	0.05%
Resident permits (PH)	$105	$15,960	0.03%
Rifle permits	$70	$10,640	0.02%
Duty on Ammunition	$30	$4,560	0.01%
Business license	$25	$3,800	0.01%
Estimate Indirect Tax	$7,200	$1,094,400	1.94%
VAT @ 15% on			
Operating Expenses	$13,125	$1,995,000	3.54%
Wildlife Division Fees	$12,233	$1,859,340	3.30%
Management Costs	$9,398	$1,428,420	2.53%
Wages and Welfare	$6,248	$949,620	1.68%
Support Service Industries	$5,198	$790,020	1.40%
Professional Hunter Expenses	$3,098	$470,820	0.84%
Estimated VAT	$49,298	$7,146,540	12.68%
Total Revenue Accruing	$165,925	$24,887,435	44%

6.4 Value of the Botswana Sport Hunting Industry

In 2001 the Botswana Wildlife Management Association (BWMA) commissioned an economic analysis of the commercial hunting industry in Botswana. Some of its objectives were to demonstrate the positive role that it plays in wildlife management and efficient land-use and to gather information to highlight its contribution to the national and local economy (ULG 2001).

The rationale for this study arose from the pressure that was being exerted on the hunting industry that has grappled for many years with trying to reconcile wildlife utilisation and sustainable rural development. The hunting industry, including hunting undertaken by citizens, has had to constantly justify its existence to the non-consumptive fraternity as well as political leaders across the country despite the fact that it is able to demonstrate that it is fully aligned with important national development objectives, and that hunting tourism is a functional, practical example of a sustainable, ecologically sound rural development economic engine.

6.4.1 Contribution to the national economy

To demonstrate the contribution of hunting to the national economy, a number of models were developed using the national hunting quota, prices of hunting safaris and trophies, and number of hunting clients as quantifiable parameters. The analysis also examined a representative sample of accounts from several industry operations. The sample selected attempted to capture key characteristics of the industry in terms of types of hunting concessions, scale, community involvement and the size of the companies concerned.

Using these parameters, it was possible to determine income, expenses and their effects on the national and local economies, and check the accuracy of these against actual figures of individual operating companies in selected areas. From this, a model was developed to build up a picture of the potential gross income from marketing a variety of safari hunts and the costs using a set quota, and then extrapolating this to a national model (Table 9).

Table 9: Overall contribution various incomes generated by the hunting industry based on the national hunting quota. Source: ULG, 2001.

Income	Total US$	% of total
Daily fee income	$6,419,400	51.0%
Trophy income	$4,161,450	33.1%
License income	$1,143,250	9.1%
Dip and pack	$270,750	2.2%
Other income	$586,205	4.7%
Totals	$12,581,055	100.0%

In summary, the ULG model estimated that some 2,500 trophy animals are taken, with a total level of effort of 5,500 hunter days. Income is dominated by daily fees (51%) and trophy income (33%) with license income, dip and pack and other income contributing the balance of 16%. The total industry turnover, including the commissions, in the year 2000 was estimated at US$ 12.5million.

With regard to expenditure, the budget lines were divided into eight major categories:

- Central and Local Government expenditure, including taxes, levies, licenses, royalties, duties, utility charges etc.

- Cash flows to community organisations (trusts and other CBO's) including payments to communities for concession fees, resource fees, payments to individuals for wages and welfare etc.
- Supplies to the hunting industry
- Cash flows to the supporting service industries
- Management costs including both town and camp management, including professional hunter's remuneration.
- Hunting Agent commissions
- Director's drawings and profit on hunting operations.
- Capital servicing including depreciation and the provision for capital replacement.

The cash flows to these expenses were split into a "first round" and "second round" expenditure. In the first round (i.e. that expenditure as recorded in the books of account of the outfitters) the payments are recorded per category at face value. In the second round, account is taken of taxes and duties levied on the providers and suppliers in the make-up of their goods or services[3].

Details of the individual expenses contained in the broad expense classes, including estimates of percentage expenditure per expense item, are provided in Table 10 below:

Table 10: US$ Expense by Category following second round adjustments (from ULG 2001). *US$ = P4.7414 (January, 2000)*

Expense Category	%	US$ (000)
Agents commissions	23.0%	$2,889
Capital service costs	4.8%	$600
Community payments	15.1%	$1,897
Government (Central and Local)	22.5%	$2,832
Management remuneration	6.2%	$777
Profit including drawings	6.1%	$764
Services	18.3%	$2,301
Supplies	4.1%	$516
Totals	100.0%	$12,576

6.4.2 Revenue Accruing to Government

This analysis suggests that 22.5% of the gross income of the hunting industry accrues to the central and local government (which in 2000 was estimated at ~US$2.8 million). Some of the expenditure items in the industry also attracts further taxes from "hidden" charges such as sales tax, income tax, exercise duty, import duties etc. As in the case of Tanzania, government only begins to accrue income from other classes of expenditure only when they enter circulation – for example wages paid to workers attract no tax until these are spent in the local economy. What is important to note is that a large percentage of expenditure ends up in the central or local government coffers after only two rounds.

Furthermore, ULG (2001) were able to demonstrate that, with the exception of agent commissions (24.8%, which are deducted at source as agent commissions and profit taking), all other spending (wages, supply

[3] For example, the purchase of liquor supplies for the camp are recorded on the operators accounts at retail value. However, in purchasing the goods, the supplier pays taxes and excise duties, which he recovers in the sale price. Additionally the supplier pays sales tax/VAT over to the government. The second round tries to estimate the flow of revenues to Government coffers (supplies, services and salaries) (as opposed to wages). Payments to communities, profits, which are taxed in the first round, wages and depreciation attract no second round transfers.

purchases, services etc.) circulates in the national and local economies. Their analysis suggests therefore that approximately 75% of the gross income of the industry remains in the country, and of this 49% remains at the district level (~US$6.3 million).

When translated to an income per capita at the national level, this equates to approximately ~US$5/head, however, when the portion of the total expenditure (49.5% or nearly US$6 million) is attributed to businesses and individuals in the main hunting districts, then the per capita income is worth nearly ten times this amount at US$48.5 per head.

Martin (2008) and Turpie (2006) have repeated this exercise for Botswana, but using slightly different approaches to derive gross income and expenditure, and contributions to central and local government. Their results are very similar to those provided by ULG (2001) however Martin (2008) estimates that the gross income of the industry had increased to US$40 million – a four-fold increase since 2000[4]. Of this value, US$21,095,470 is generated by the commercial Controlled Hunting Areas (CHAs) and US$18,519,420 comes from the community CHAs.

[4] This came about mostly as a result of increasing the elephant quota from 174 in 2001 to 316 in 2008 which increased the number of safaris to the country.

7 INCLUSION OF HUNTING TOURISM PARAMETERS INTO NATIONAL ACCOUNTING SYSTEMS

Hunting tourism is a legitimate and economically efficient land use and, under some circumstances, can match or surpass other forms of rural economic activity - including photographic tourism and livestock production (ULG 2001, Barnes *et. al*. 2003, Martin 2008). Furthermore hunting tourism is less sensitive than photographic tourism to external factors such as regional instability. This is evident from the near collapse of the tourism industry in Kenya following political disturbances in that country in 2008. A similar situation has occurred in Zimbabwe but in contrast the hunting tourism sector has continued to prosper despite the political upheavals.

It should also be acknowledged that hunting tourism, as a form of land use, serves an invaluable function of maintaining wildlife habitats and provides significant benefits to remote communities where few alternative sustainable land use options exist. In such circumstances hunting tourism should be promoted by the industry and policy makers however the industry does not have simple physical and monetary parameters that can easily demonstrate the magnitude of its contribution to national or local economies.

Various methodologies are used to determine Environmental Economic Accounts (EEA), mostly at the national level (i.e. tourism, forestry, fisheries) and rarely at sector level (i.e. hunting, photographic tourism etc.). In simple form, these accounts use a two-phased approach where the account is constructed using physical units (such as hectares, cubic meters and metric tons) that are then converted to monetary accounts for integration into, and comparison with, other national accounting instruments. This is generally the approach used in the analysis of hunting tourism where an "asset account" is developed using the size and extent of the hunting quota, and then developing "hybrid accounts" that give the assets a monetary value. For example, the Namibian Ministry of Environment and Tourism used the integrated environmental and economic accounting (IEEA) system to arrive at a value of N$10.5 billion (~US$1.4 billion) for the approximately 2 million larger wildlife animals that are used to drive the tourism industry[5].

Generally the hunting tourism sector has tended to use financial rather than an economic approach to determine direct values rather than attempting to define the total economic value of natural resources upon which it relies.

7.1 Determining the Asset Value of the Hunting Tourism Sector

The gross income of the hunting industry can be calculated using the following assumptions:

1 Determining the parameters of the industry (value of the quota, number of hunting concessions and fee structure imposed by the regulating authorities)
2 Calculate the number hunting clients based on the utilisation of key species
3 Calculate the level of effort (hunter days)
4 Calculate the gross income to the wildlife agency/authority from licenses, permits, fees and other charges.
5 Calculate the potential gross income of the hunting operations that market the approved quota.

Establishing the asset value of the commercial hunting industry is therefore relatively simple, and the example from Tanzania is used here to illustrate how this can be determined.

5 See http://allafrica.com/stories/200910150578.html

Assumption 1: Hunting Industry Parameters

Physical parameters of the industry	US$	N
Potential value of the 2007 quota: - 100% Trophy Fees. *Tanzania placed 34,964 animals on quota in 2007 representing 57species of mammals and birds. The Wildlife Division tourism brochure "Safari Hunting in Tanzania" lists the license fee/animal which varies from US$6,000 for an elephant to US$10 for a spurfowl.*	$16,417,865	
Number of Hunting Blocks		152
Number of Companies		51
Fee Structures applied by Wildlife Division	**US$**	**N**
Block Fee per hunting concession	$15,000	
Conservation Fee	$100	
Hunting permits (> 10 days)	$675	
Hunting Permits (< 10 days)	$900	
Trophy handling (> 10 days)	$200	
Trophy handling (< 10 days)	$300	

Assumption 2: Calculation of number of clients based on lion, leopard and buffalo safaris

Tanzania uses a fixed system to market its hunting. Lion and leopard safaris are sold on 21-day packages while buffalo are sold on 16 – day and 10-day packages.

N° key species	National Quota	Utilization	Trophies
Lion utilisation	497	42%	209
Leopard utilisation	555	40%	222
Buffalo Quota utilisation	2,365	68%	1,608
Total 21-day cat hunts (1 x Buffalo allocated to each cat hunt)			431
Buffalo remaining on quota after cat hunts (1608 – 431 buffalo)			1,177
85% are sold as 16-day buffalo safaris			1,001
15% are sold as 10-day buffalo safaris			177
Buffalo Safaris	**N° buffalo/client[1]**	**N° safaris**	**N° Buffalo**
Buffalo - 16 day	One buffalo	60%	601
Buffalo - 16 day	Two buffalo	30%	300
Buffalo - 16 day	Three buffalo	10%	100
Buffalo - 10 day			177
N° on Big Game Safaris (Total buffalo + total cat safaris)			1,608
N° Plains Game Safaris (3% of Big Game Safaris)			48
Unsuccessful hunting safaris (1%)			16
Total Number of Clients			1,673

[1] *In Tanzania a hunting client is permitted to take more than one buffalo on a safari, but at an increased fee per trophy. This does not occur elsewhere in the region (see Booth 2009).*

Based on the above assumptions, it is possible to calculate the potential number of hunting clients that visited Tanzania (~1,673). In theory these data can be cross checked and verified against the data held by the Wildlife Division to determine the accuracy of this figure.

Assumption 3: Calculation of the number of Hunter days

Hunter days is a measure of effort that is used to determine the potential value of a given quota. The number of hunter days that can be generated from a fixed quota is dependent on the number of key species available (elephant, lion, leopard and buffalo), and the marketing skills of the operator.

Safari	Days	N° Hunts	Total Hunter Days
Lion	21 x	222	4,662
Leopard	21 x	209	4,384
Total Cat Hunter days			9,046
Buffalo remaining after cat hunts			1,177
Safari	Days	N° Hunts	Total Hunter Days
Buffalo - 16 day	16 x	1001	16,013
Buffalo - 10 day	10 x	177	1,766
Plains Game	10 x	48	482
Total Buffalo and Plains Game Hunter days			18,262
Total Cat, Buffalo and Plains Game Hunter days			27,308

In this example it is estimated that the industry could potentially generate ~27,308 hunter days from the estimated 1,673 clients and used 222 lions, 209 leopard and 1,771 buffalo. Again, these parameters can be verified by consulting records with the Wildlife Division.

Assumption 4: Calculation of the potential revenue accruing to the Wildlife Division

Using the data gathered from assumptions 1 – 3 above, it is possible to calculate the potential gross revenue accruing to the Wildlife Division and hunting companies.

Revenue streams to Wildlife Division		Units	US$
Trophy fees (40% of total value) *The Wildlife Division requires that each operator has to utilise 40% of the value of the quota allocation*		40%	$6,567,146
Block Fees @	$15,000	152	$2,280,000
Conservation fee	27,308 hunter days @	100	$2,730,765
Hunting Permits			
13% of total clients (225)	Less than 10 days @	675	$151,784
87% of total clients (1,447)	Greater than 10 days @	900	$1,505,050
Trophy Handling			
13% of total clients (225)	Less than 10 days @	200	$44,973
87% of total clients (1,447)	Greater than 10 days @	300	$501,534
Other fees @ 2% of Permit and Trophy Handling Fees		2%	$44,067
Total Potential Revenue Accruing to Wildlife Division			$13,825,318
Potential Revenue per operator (N=51):			$271,085
Potential Revenue per block (N= 152):			$90,956

These data suggest that the Wildlife Division should have received approximately US$271,000 from each of the 51 operators or US$90,956 per hunting block (N= 152).

Assumption 5: Calculation the potential revenue accruing to the Hunting Companies

Safari Packages	Average Daily rate[1]	Days	US$
Lion - 21 day	$3,000	4,662	$13,986,000
Leopard - 21 day	$1,500	4,384	$6,575,310
Buffalo 16 day	$3,200	16,013	$51,243,059
Buffalo 10 day	$2,100	1,766	$3,708,999
Plains Game	$3,000	482	$1,447,380
Potential income from all blocks (n = 152)			$76,960,748
Potential Income per blocks (n=152)			$503,147
Less expenses to Wildlife Division per block			($90,956)
Less expenses per block[2]			($250,000)
"Profit" per block before tax, depreciation & agent commissions			$162,191

[1] *Derived from the average prices of safaris advertised in 2007 Tanzania brochures (Booth, 2009).*

[2] *Expenses are calculated from data provided in Assumption 4: Total expenses less Wildlife Division Fee rounded to nearest $50,000.*

This model suggests that the gross income of the Tanzania industry is approximately US$76.5 million and that "profit/block" is approximately US$162,191 before depreciation and tax are deducted. By applying various parameters such as income/ha or income/capita, these accounts can be used to demonstrate the direct value of hunting in these remote areas. Furthermore, it is possible to compare these parameters with economic data from the agricultural sector or non-consumptive tourism sector.

8 CONCLUSIONS

Martin (2008) demonstrated that the Botswana hunting industry increased from approximately US$12 million in 2000 to approximately US$40 million in 2008, and could potentially double once more if the sustainable quota of key species (elephant, buffalo, lion and leopard) were more fully exploited and if the length of the hunting season were extended. Thus, through careful management and implementing appropriate policy environments, hunting tourism can demonstrate its contribution to national and local economies.

However what is missing completely from the data sets are, firstly, Government's costs in maintaining and protecting the wildlife resource and, secondly, the cost to communities' in managing and protecting the wildlife in their areas. These costs should be added to the gross turnover for the industry.

Furthermore, the analyses undertaken thus far, with the possible exception of South Africa and Namibia, has not captured the contributions of recreational or subsistence hunters that potentially could be greater than the professional hunting industry. For example the relative proportion of bushmeat in the diet of rural Africans compared with domestic meat and fish ranges from 6 percent in southern Africa to 55 percent in central Africa (Chardonnet *et al.* 2002). The production of bushmeat in sub-Saharan Africa exceeds 1 million tons a year (or 2 kg/person/year). More wild meat is consumed in forest ecosystems than in the savannas where domestic livestock are more common. For example in Ghana the black market trade in bushmeat has an estimated annual turnover of US$250 million which is higher than the entire hunting sector in Africa while in Cote d'Ivoire (where big game hunting no longer exists) the bushmeat has an annual turnover of approximately US$148 million (IUCN 2010). There is no doubt that the bushmeat industry is growing across southern and eastern Africa as more and more traditional and subsistence hunters discover that there are lucrative markets in cities where bushmeat is more expensive than domestic meat. However, the bushmeat trade in many countries is the cause of rapid declines and local extinctions of large ecologically sensitive species and may eventually stabilise to a lower value level based on more ecologically robust and rapidly reproducing smaller species, such as duiker.

Much of the blame for this lack of data must be attributed to the disorganisation of the domestic hunting structures and institutions in most of the countries, and the lack of investment in these intuitions by the hunting industry. Without a high level of cohesion, strategic thinking and planning at an industry level, hunting in general will continue to find it difficult to justify its role in conservation, and governments will continue to question whether it is fully benefiting from the use of the resources. The current policy environment heavily taxes the operator and the custodians of wildlife resources on private and communal land thus reducing operator profits and funds available for the land stewards. When the returns from hunting become less than those which might be generated from other forms of land use (i.e. subsistence agriculture, livestock production) then the incentives to manage the land for the long term permanent presence of wildlife, and therefore hunting, disappear.

Given that hunting is a widespread component of rural activities it is vital that its importance to national and local economies is established. This is especially important when one considers that in addition to maintaining wild areas, there is an inherent stability in this industry at all levels, and as such it supports stable flows of benefits to communities, particularly those in more marginal areas. To this end it is important that both the private sector and government support socio-economic evaluations of hunting in order to advance our understanding of the economic benefits, and to better inform policy decisions in rural areas.

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Estimating and Reflecting the Economic Values of Natural Resources in National Accounts:

A Focus on Non-Consumptive Uses of Wildlife, Including Examples From the Forest Sector

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TABLE OF CONTENTS

1 GENERAL INTRODUCTION

That economies in much of Africa depend largely on the use of natural resources is a fact that underlines the need for African Countries to promote their sustainable use, through appropriate policies and the best available technologies. The bulk of the natural resources are usually exported in their raw or semi-processed forms and used for manufacturing mostly in the industrialized world and also in a number of emerging economies, among which China is currently the most prominent. Despite the expectations that much of Africa is bound to industrialize, many projections on economic growth suggest that for the foreseeable future, the majority will remain dependent on natural resources for economic development. These resources include oil, minerals, fisheries, forests, wildlife and water. Among these, Africa's wildlife and tropical forests and beaches have helped to develop tourism which has been recognized for both its significant contributions to the Gross Domestic Products (GDP) of a number of countries, and rapid growth.

1.1 Value Systems and Wildlife Use

This paper was largely motivated by the need to illustrate and highlight the increasing contributions of the wildlife and the entire nature-based tourism sector, to local and national economies. By so doing, it is intended to help elevate the national standings of the wildlife and natural resource sectors in a manner that would generate appropriate policies and legislation regarding their management and associated businesses. To illustrate the values of wildlife, we will use the well known economic values and also highlight the lesser known, but equally important ones. While the definition of 'value' can invite extended philosophical discourse, in this and other papers, it should suffice to say that, the perception of value when it comes to wildlife resources, is often heavily influenced, by cultural and socio-economic backgrounds, scientific facts relating to species and ecosystems, and even religious persuasions. Chardonnet *et al.* (2002) recognize this multifaceted value system regarding wildlife. To some African cultures, the value of a particular species may be religious, since some species are 'clan totems'. To others, the subsistence and economic use values of all ungulates that can be hunted for meat and other traded products such as hides, skins, horns and tusks, are obvious. *Despite that, economic value alone does not translate into sustainable management.* To scientists, buffaloes and elephants, are not only mega-herbivores but are also 'keystone species' since they have the power through their 'herbivory', to change habitat conditions, both for themselves and several other smaller species. Such a scientific view will often generate a management system different from that of the hunter. To nature lovers, ecosystems and the species of wildlife that typify them ought to be conserved, both for their existence, biodiversity, cultural and spiritual values. To entrepreneurs in Africa and local communities who have gained their way into the formal tourism industry, the management of wildlife rich habitats and ecosystems enables both the enjoyment of economic and other cultural and religious values. *The point is that to large extent, value systems underpin key management objectives and the philosophies behind consumptive and non-consumptive uses of wildlife, of which non-consumptive use is further elaborated in this paper.* The actions of governments and the international community are globally influenced by conventions such as that for the conservation of biological diversity and trade in wildlife species and products. As such the protection and rational management of ecosystems, habitats and species directly or indirectly cater to a myriad of value systems associated with wildlife and nature. Hence it is the public duty of governments guided by national and international policies to protect and manage such ecosystems, so that today's and tomorrow's societies can derive all the possible benefits, thereof. For purposes of this paper, wildlife is treated as 'biological capital', from which all types of values can be derived. The values can be spiritual, cultural, subsistence, economic or merely existential. The combination of values assigned to wildlife will generally tend to determine management objectives to protect and regulate their use. Drawing from experiences from East and Southern Africa, this paper concentrate on the non-consumptive aspects of wildlife use and how the economic benefits associated with that, can be best estimated and presented to policy makers.

1.2 Benefits of Wildlife Use and Statements of National Accounts

In a number of countries in Africa, particularly Sub-Saharan Africa, the tourism industry is largely based on wildlife and over the last two decades, and besides major oil discoveries such as those in Angola and Equatorial New Guinea, tourism has proven to be one of the fastest growing industries. Despite this realization, the wildlife and environmental departments of governments are not as recognized through budgetary allocations and supportive policies, to the extent that you would expect of a fast growing industry that depends on the conservation of natural places and their species.

In East and Southern Africa particularly, nature based tourism has grown tremendously over the last two decades and in countries such as Botswana, Kenya, Namibia, Tanzania and South Africa, it is among the top earners of foreign exchange (Novelli *et al.* 2006). These countries have the constant task of clearly depicting or illustrating the contributions of their tourism sectors to their Gross Domestic Products. However, the problem is that traditionally, the tourism sector is not directly reflected in National Accounts. This is because in the statements of national accounts, most countries use the International Standard Industrial Classification (ISIC) which does not identify tourism as an industry as opposed to sectors such as, agriculture, mining, fishing and logging. Tourism which is a demand-based concept does not fit in the classification system (Poonyth *et al.* 2001), hence consumption by tourists or tourism economic activity is hidden within different industries, such as services, manufacturing, fishing, transport. This problem of separating out the contributions of the tourism sector from the main activities reflected in the Statement of National Accounts is possible through Satellite Accounts (Poonyth *et al.* 2001, Namibia Tourism Board, 2008) which are described in the next section. The same concept of satellite accounting can be applied to demonstrate the contributions of the forest sector besides commercial logging, to any given economy.

As stated in the previous paragraph, the problem of accounting for the contribution of tourism and by extension wildlife can be overcome using methods of accounting which can be more easily communicated to the public and policy makers in a way that present day national statements of accounts cannot. This is in recognition of the fact that, while most governments are consciously and correctly putting emphasis on tourism as an economic growth sector, important policy decisions affecting the sector such as property rights, protection of investments, movement of venture capital and community participation require fairly accurate data on the contribution of the wildlife based tourism sector. This paper therefore highlights the method of 'satellite accounting', which is a way of capturing tourism sector contributions in away that enables them to be presented alongside formal system of national accounts.

In describing the non-consumptive use aspects of wildlife, we have chosen to use two case studies which, describes two countries; Kenya, which permits only non-consumptive uses and Namibia which permits both consumptive and non-consumptive uses.

1.3 Uses of Wildlife Resources: Consumptive and Non-Consumptive Uses

The economic activities involving the use of wildlife can be placed under two categories namely, consumptive and non-consumptive uses. Consumptive uses include hunting, live sales, meat, skins, hides, ivory and other products (Novelli *et al.* 2006). Non-consumptive use includes all aspects of eco-tourism, game viewing, photographic safaris and other activities such as catch and release sport fishing. This paper has concentrated on wildlife (nature) based tourism, that is non-consumptive in nature. In the discussions, reference is made to countries such as Kenya which permit only non-consumptive tourism and others such as Namibia, which promote and permit a combination of consumptive and non-consumptive forms. The two countries mentioned herein are both important tourist destinations in both East and Southern Africa respectively.

Both of them boast iconic game parks such as Masai Mara and Etosha Game Parks and coastal environments which are both attractive but in vastly different ways.

In Southern Africa the commercial utilization of wildlife has been actively promoted and takes place on private, communal and public lands. It involves a range of activities such as *wildlife viewing tourism, safari hunting tourism, community use of wildlife, game ranching and intensive farming of certain species such as, ostriches and crocodiles*. The consumptive products are generally *meat, hides and skins, ivory and live sales*. These activities provide income to modern entrepreneurs and also to, historically disadvantaged rural communities, for whom such income is complementary to local livelihood activities such as subsistence farming and livestock rearing. After describing and discussing consumptive and non-consumptive uses of wildlife, an attempt is made to make recommendations on how economic returns from wildlife use can be maximized and in so doing, help increase the visibility of the wildlife based tourism sector. This will also help ensure stronger support for protected area systems and other land use systems, outside formally protected areas, but which support conservation of nature, than is the case today.

In national parks and forest reserves where land has been specifically designated for conservation, non consumptive use is predominant. In fact, in both East and Southern Africa, non-consumptive wildlife tourism is the most economically important wildlife use (Novelli *et al.* 2006) and it has boomed in Africa since the 60s and more so, over the last 20 years. As the world becomes more urbanized and household incomes increase, the opportunity to reconnect with nature tends to become attractive and the support for nature which is viewed as threatened by modernity, pollution, wasteful consumption and improvident behaviour of society, is considered highly virtuous. This is further promoted by media documentaries and travel programs, which feature unique natural environments; both terrestrial and marine, and their iconic species of flora and fauna.

1.4 Products of the Tourism Industry

Regardless of whether a country promotes consumptive or non-consumptive wildlife based tourism, such tourism is supported by a number of characteristic products such as accommodation, food and beverages, transport, travel and tour, cultural and recreational services. In addition to these, are tourism connected products such as financial, health and communication services and crafts. Table 1 illustrates the full range of tourism products.

2 ESTIMATING THE ECONOMIC VALUE OF WILDLIFE IN NATIONAL ECONOMIES

2.1 Introduction to Satellite and Natural Resource Accounts

As mentioned in the introduction, the contributions of the tourism sector which is dominated by wildlife based tourism are not directly reflected in the Systems of National Accounts. This is because of two main issues which have to do with the way the system of national accounts (SNA93, SNA08) is constructed. Both the SNA93 and SNA08, categorize economic activities on the basis of production systems or industries such as agriculture, mining, fishing, services. Tourism does not fit into such a classification system but is hidden under production systems such as services, fishing and manufacturing. In addition, the SNA93 does not include most natural assets in the definition of capital. This is a major omission because a number of production systems in Africa, particularly tourism are based on the use of natural environment. As such the concept of natural resource accounts was developed to address this gap (UN 2000). At this point it helps to note that the natural environment provides vital services such as climate amelioration, carbon capture and a depository of waste. In that regard, any national accounts that does not account for the depletion, degradation or appreciation of the natural asset base is fundamentally incomplete. Because tourism uses natural assets such as beaches, mountains and wildlife, Poonyth *et al.* (2001) coined the term Tourism Asset Resource Accounts (TARA) as a special form of natural resource accounts.

Because of these two issues, tourism satellite accounts (TSA) collects data on economic activities relevant to tourism separately and then presents its findings as annexes to national accounts (CEC *et al.* 2001).

Table 1: A checklist of tourism products (Source: Poonyth *et al.* 2001)

A) Specific products	***B) Non-specific products***
Tourism characteristic products	*Goods*
Accommodation	*Services*
Hotel and other lodging services	
Second homes on own account or for free	
Food and beverage services	
Restaurants	
Beverage serving establishments	
Transport	
Passenger transport	
Rail transport services	
Road transport services	
Air transport services	
Water transport services	
Support services	
Transport equipment	
Rail transport equipment	
Road transport equipment	
Rental	
Own vehicle	
Fuel, oils, etc	
Air transport equipment	
Travel agency, tour operator and tour guide services	
Travel agency services	
Tour operator services	
Tourist information and tour guide services	
Cultural services	
Recreational and other entertainment services	
Tourism connected products	
Goods	
Services	

2.2 Definitions in Satellite Accounts

Normally, the data for compiling Tourism Satellite Accounts are derived from two main sources namely, tourism expenditure data; collected by provincial and national tourism agencies and production data, which describe the characteristics of the producers of tourism products. Since production data is normally hidden within national accounts as stated earlier, they can be extracted if the tourism ratios (see definition) are known.

For purposes of this report a list of definitions (Poonyth *et al.* 2001) are provided to aid in the understanding of terms used to estimate the economic contributions of wildlife based tourism to national economies.

- tourism
- tourism industry
- tourism ratio
- tourist satellite accounts
- tourism consumption
- environmental assets
- tourism impact.

Tourism is defined as the activities of persons travelling to and staying in places outside their usual environment, for not more than one consecutive year for leisure, business and other purposes, not related to the exercise of an activity remunerated from within the place visited.

Tourism industries are hereby defined as groups of establishments producing the goods and services purchased by tourists (CEC *et al.* 2001). Tourism industries in turn produce tourism products which can be characteristic (would not be produced without tourism), connected (partially characteristic) or non-specific (general consumer products) (CEC *et al.* 2001:39).

Tourism ratio is the proportion of gross output, value added, employment, capital or other measure of an industry that is attributed to tourism.

Tourism consumption is the expenditure made by or on behalf of, a visitor before, during, and after the trip and which expenditure is related to that trip and which trip is undertaken outside the usual environment of the visitor (CEC *et al.* 2001:39).

Impact of tourism can be measured in terms of gross output, value added and employment. In this context the direct impacts (consumption) and the indirect impacts (linkages) and induced impacts (multipliers) are measured.

Environmental assets are all those non-produced natural assets that function as providers, not of natural resource inputs for production but of environmental services such as waste absorption, ecological functions such as habitat and flood and climate control, or other non-economic amenities such as health and aesthetic values (UN 200:26).

Tourism Asset Resource Accounts *are the physical and monetary accounts of the natural assets which make up the base for tourism.*

Tourism satellite accounts *are physical and monetary accounts of tourism activity in the economy, offset from national accounts.*

From an accounting standpoint another set of definitions and descriptions are offered. These are:

- expenditure accounts
- production accounts
- supply and expenditure accounts
- tourism value added accounts
- tourism employment accounts
- tourism capital accounts.

Expenditure accounts show the consumption of tourists by category of tourist (domestic, foreign, inbound, outbound, same day, overnight, business, leisure, nature and non-nature based etc) and by specific tourism product or commodity (hotel, restaurants, car hire etc.).

Production accounts show the gross tourism output for each tourism industry (hotels, lodges, eating, drinking places, passenger rail and busses, taxis etc) and by product. They also show intermediate inputs, value added as well as employee compensation by industry. It also includes tourism and non-tourism industries that supply tourist demand.

Supply and expenditure accounts show production in producer prices (imports, government sales, wholesale and retail trade margins by tourism industry) and consumption (as intermediate consumption, personal consumption, exports, private investments, changes in inventory) by industry.

Tourism value added accounts represent further development of the production of accounts and show more detail on the computation of value added resulting from tourism production. Tourism ratios derived from specific surveys are used to calculate the proportion of each industry applicable to the definition of tourism.

Tourism employment accounts present the values on total employment and compensation by industry. Tourism ratios are again used to get the values applicable to tourism.

Tourism capital accounts provide data on the capital flows and stocks by industry, the former providing information on capital information and the latter on the stocks of capital at the end of the relevant period. Specific surveys are done to provide capital values and tourism ratios are also applied. The distinction between investments and consumption of capital (*a flow concept*) and assets (*a stock concept*) needs to be made clear, since only economic capital assets are included in the TSA in accordance with the SNA93 Rules.

2.3 Resource and Satellite Accounting in Wildlife

2.3.1 Experiences in Kenya and Namibia

In satellite and resource accounting, conventional macro-economic national accounts have been extended to natural resources, such as forests and wildlife. In doing this, the annual contribution of a resource such as wildlife to the national income is measured in a production or flow account. In addition, the value of all existing stock of the resource is estimated as an asset account. The value of the stock as a national capital asset is measured in terms of its potential to generate resource rent (economic rent) in the future. The flow and asset accounts pertaining to wildlife have been well illustrated in Namibia.

Namibia

To illustrate this type of accounting in wildlife a case study from Namibia is presented. Namibia has been chosen here for two main reasons. The first is that the Government now estimates and routinely calculates *Tourism Satellite Accounts* which is also reported internationally through the World Travel and Tourism Council. The second and quite interesting reason is that Namibia is one of the few countries that, has also undertaken a *Wildlife Resource Accounting* (also known as Tourism Asset Resource Accounting or *TARA*) which entailed an inventory in 2004, of key wildlife species in the country. The tourism economic activity data and that of the numbers of wildlife have enabled the estimation of the economic values of tourism attributed to wildlife use and have also made it possible for the wildlife asset base to be assigned economic values. The wildlife asset accounts are crucial because Namibia practices consumptive forms of wildlife use which includes hunting and trade in live animals; in addition to non-consumptive forms. Hence the wildlife resource accounting methodology is useful in depicting the value of wildlife stocks, which forms the basis for its practice of sustainable use in the country.

Kenya

In addition to Namibia, some data from Kenya which only practices the non-consumptive forms of wildlife use are also presented. Kenya like Namibia has a large and rapidly growing tourism industry. It also prepares Tourism Satellite Accounts which is reported nationally and internationally through the World Travel and Tourism Council (WTTC) but unlike Namibia, it has not applied the natural resource accounting methodology to its wildlife in the way that Namibia has. It is encouraging however, that recently it has made an attempt to conduct a natural resource accounting on its natural and planted forests. Since Namibia has also done a similar exercise on its forests, a summary of the methodologies applied and the results are presented in this report.

Following a presentation of the satellite and natural resource accounts a discussion on the merits of pure non-consumptive (Kenya), as opposed to mixing consumptive and non-consumptive forms of use (Namibia) is presented. While direct comparisons between Namibia and Kenya are made difficult because Kenya has not done wildlife flow and asset accounts, an attempt is made to show that Kenya has the potential to derive much more economic values from its wildlife resource than is currently the case.

2.3.2 Namibia wildlife case study

In their study, Barnes *et al.* (2009) defined wildlife as all wild animals other than fish, and forest dwelling invertebrates. For purposes of asset accounts, wildlife stocks were measured as estimated numbers of the large wildlife species, and ostrich. Obviously the choice of wildlife to include in the accounts may vary from country to country but it is reasonable to expect that key large mammals and bird species will feature in virtually all countries.

The total land mass of Namibia which is 840,000 km^2, was divided into 5 zones (1-5) which represent different land tenure systems (Protected areas, communal land and private lands) and types and levels of wildlife use (consumptive use and non-consumptive use areas).

The concept of total economic values was applied, which embraces direct, indirect and non-use values. Direct use values derive from the direct use of the resource, that is, the production of tangible goods, usually with a market value. Indirect use values derive from the resource's value in ecological services such as soil and water. Non-use values derive from the value of conservation of a resource to enable some future use, hence option

value or simply for its existence (existence value) or to bequeath to future generations (bequest value). However, preliminary wildlife accounts deal exclusively with direct use values.

2.3.3 Approach

The asset flow account was developed according to standardized methodology for natural resource accounting; the Integrated Environmental and Economic Accounting / IEEA Manual, developed by the United Nations (2000) and later refined (UN, EC, IMF, OECD & WB 2003). The IEEA Manual was developed to complement the internationally adopted System of National Accounts (SNA) used to measure the economic performance of many countries around the world (CEC, IMF, OECD, UN & WB 1993). Conventional national accounting applies national capitals accounts but restricts the use of assets that are owned or man-made. The IEEA system includes accounts for natural resources that are not man-made, such as natural forests, fish, wildlife, in the national economic data.

As stated before, the physical wildlife assets included estimates of the number of all larger wildlife species, mainly mammals but including ostrich in Namibia. The data was collected from aerial and ground surveys; both of which are quite well developed in protected areas, private game reserves and communal wildlife conservancies. The data collected covered all the three categories of wildlife areas. The physical accounts were then valued to produce monetary accounts, segregated by species. This enabled estimations of future values or changes in the capital value of wildlife stocks.

The current annual use of the wildlife asset base is detailed in flow accounts, which measure use in terms of output, contribution to gross national product (GNP) and employment in terms of SNA.

The methods of valuation of wildlife, which is a renewable natural asset, are many but in the Namibia case study, they used the net present value method (NPV), which estimates the present value of all future returns in resource rent from the use of the resources. In the Namibia study Barnes *et al.* (2007) applied the NPV Method, using streams of rents from expected growth in use over the next 30 years.

2.3.4 Valuation of flow and asset accounts

In this Namibia case study, monetary values are given in Namibia Dollars (NAD) which was the same value (1:1) with the South African Rand (ZAR) in 2004. *The significance of the year 2004 is that it was the year in which a full national inventory data on wildlife was collected.* The value of the current and potential output of wildlife resources was computed as the product of the volumes produced and the market prices. A proportion of this output represents the direct contribution of the resource in terms of value added to the gross national product, as measured in the flow account. Another portion represents the resource rent that the resource use generates.

To value wildlife use, gross figures for output of particular uses derived from available data and literature were used and these were allocated to the 5 wildlife use zones in Namibia. To get the output on wildlife based tourism, the output for leisure tourism in the national tourism satellite accounts was multiplied by the proportion of tourism value that is attributable to wildlife; a kind of 'wildlife ratio', as opposed to uses such as scenery, sense-of-space. The wildlife ratio is not easy to determine, but in this case study, data from a survey of tourists was used. Respondents were asked questions on which attributes attracted them most on their trips to Namibia and from their responses (Table 2) the proportion claimed by wildlife as a component of total protected area tourism value was estimated. The figure claimed by wildlife was estimated as 51% (SAIPAC 2007).

In addition to the above, gross output data for trophy hunting tourism was compiled from concession records. Data on biltong (a processed dried meat product popular in Southern Africa) hunting was also generated from permit records. Gross output for live game sales, small scale meat production and commercial meat cropping were derived from a report by a Government Official (Erb 2003). Craft outputs were generated from existing records (Terry *et al.* 1994 and Terry 1999).

The accounting process also applied an empirically-based enterprise model (Barnes 1998) to measure the financial and economic values associated with natural resource use. For monetary flow accounts the model was used to calculate value added to the GNP. The value added / output ratios were then applied to the flow accounts to determine the direct economic contribution of wildlife use activities. The direct economic contribution creates further demand in the broader economy through indirect multiplier and linkage effects, which then represents the total economic contribution, or impact of wildlife use in the economy. A multiplier of 1.86 developed by Turpie *et al.* (2004) was used.

By subtracting the costs of production, including employee compensation, consumption of fixed capital and normal profit from gross output, the resource rents generated in wildlife use were calculated. The rent calculations were used in valuing the assets, using the net present value method. The portion of the natural wildlife assets that was not used economically in the next 30 years was given a value of zero in the monetary asset account.

Furthermore, the asset values of wildlife were further allocated according to the species in the asset list. To do this a blend price per head for each species was calculated by averaging the live game auction value, a basic meat value and a hunting trophy value. The blend price for each species was multiplied by the number of animals of each species in each use zone.

2.4 Summary of Key Results: The Value of Namibia's Wildlife Assets (Barnes *et al.* 2009)

The physical wildlife asset (Table 2) comprised of an estimated 2.04 million larger wild animals, which produced a gross output (Table 3) of some NAD 1.5 billion (USD 200 million) and directly contributed NAD 700 million (USD 100 million) to the gross national product (GNP). Of interest is that the most significant component of wildlife use was non-consumptive wildlife viewing tourism which generated some 62% of the total wildlife sector GNP contribution. Hunting tourism contributed some 19% and live game production contributed some 10%. Other wildlife use activities contributing between 2 and 3% of the total sector GNP were meat production, intensive ostrich farming, and taxidermy. The wildlife use sector represented approximately 2.1% of national GNP in 2004 as compared with 4.6% for agriculture, 5% for fishing, 6.8% for mining, and 3.4% for tourism. In a further analysis growth in wildlife use values over the next 30 years show the contributions from the sector could actually triple its economic contribution to the national economy and bring it close to its full spatial potential. Further increases in direct use value from wildlife will likely occur through intensive farming.

Namibia's standing wildlife assets (Table 4) were estimated to have a value of NAD 10.5 billion (US 1.5 billion) in 2004, which is quite close to values estimated for fish and minerals. The authors (Barnes *et al.* 2009) suggest some policy implications namely;

- The development of the wildlife sector should continue to place emphasis on tourism activities, both consumptive and non-consumptive.

- Appropriate property rights notably through the concessions policy and the community-based natural resource management (CBNRM) programme should continue to be an important cornerstone policy.
- Investments in building up stocks of wildlife in the communal lands, particularly driven by the CBNRM programme should continue to be encouraged and facilitated.
- As wildlife use through tourism becomes more established on private land and replaces livestock, introductions of high value key wildlife species should be permitted and facilitated.

The results of the resource accounting process are presented in a set of tables (Table 2 to 5) which present results on wildlife stock (asset) numbers, flow accounts regarding wildlife use activities, estimated wildlife resource rents and a monetary wildlife asset accounts.

Table 2: Physical wildlife asset account, 2004 - estimated wildlife stock numbers in Namibia*

Species	Wildlife utilisation zone					Total
	1	2	3	4	5	
Buffalo	1,025	250	90	0	0	1,365
Cheetah	706	149	405	270	2,970	4,500
Eland	1,704	524	245	0	34,743	37,216
Elephant	9,043	24	735	155	0	9,957
Gemsbok	11,450	3,115	18,670	5,084	350,092	388,411
Giraffe	3,683	229	666	68	5,769	10,415
Hartebeest red	1,468	115	700	0	122,805	125,088
Hippopotamus	1,262	0	300	0	0	1,562
Impala, black-faced	1,500	0	0	0	1,870	3,370
Impala, common	77	0	385	0	14,980	15,442
Kudu	2,063	1,484	1,545	1,000	345,801	351,893
Lechwe	0	0	250	0	284	534
Leopard	1,970	430	960	640	4,000	8,000
Lion	574	23	109	22	0	728
Ostrich	3,947	530	2,840	2,020	36,336	45,673
Rhino, black	816	43	45	75	134	1,113
Rhino, white	54	62	0	0	75	191
Roan	440	120	95	0	435	1,090
Sable	256	60	15	0	902	1,233
Springbok	33,811	1,771	37,150	37,270	621,561	731,563
Tsessebe	0	15	0	0	162	177
Warthog	148	61	40	0	173,866	174,115
Waterbuck	0	0	0	0	4,475	4,475
Wildebeest blue	4,975	224	470	0	16,623	22,292
Zebra, plains	18,098	0	20	0	7,303	25,421
Zebra, mountain	8,564	4,347	2,130	2,175	55,520	72,736
TOTAL	107,634	13,576	67,865	48,779	1,800,706	2,038,560

**Excludes an additional 22 000 domesticated ostrich, used in intensive production in Zone 5, and about 800,000 Cape fur seals used for skins and other products mainly in Zone 2*

Table 3: Wildlife flow account 2004 - estimated gross output and direct and total contributions to GNP made by wildlife utilization in Namibia (only totals converted to US Dollars)

Wildlife use (Flow acc)	Wildlife utilisation zone					Total in Namibia Dollars (000)	Total in US Dollars (000)
	Zone1	Zone 2	Zone3	Zone 4	Zone 5		
Gross output in wildlife use sector (NAD '000, 2004)							
Gross output	268,473	76,929	80,093	29,877	1,019,517	1,474,889	
Direct contribution to gross national product (GNP)* by utilisation zone (NAD '000, 2004)							
Wildlife viewing	107,497	12,366	7,361	4,089	302,976	434,289	60,318
Hunting tourism	1,754	0	26,312	7,017	99,368	134,451	18,611
Live game	17,511	7,511	0	0	35,023	70,045	9,728
Commercial meat**	0	2,836	0	0	1,529	4,365	606
Small scale meat	0	0	484	0	15,641	16,125	2,239
Ostrich farming	0	0	0	31	11,186	11,217	1,558
Crocodile farming	0	0	0	0	1,955	1,955	271
Guano harvesting	0	3,400	0	0	0	3,400	472
Meat processing	0	0	48	3	3,031	3,083	428
Taxidermy	133	0	2,024	532	9,445	12,133	1,685
Crafts production	0	0	2,148	3,436	3,007	8,591	1,193
Total	126,895	36,113	38,377	15,108	483,159	699,653	97,174
Total (both direct and indirect) contribution to GNP*** (NAD '000, 2004)							
Total impact (NAD)	236,025	67,170	71,382	28,382	28,101	1,301,354	USD 180,744

Table 4: Monetary wildlife asset account 2004: Estimated asset value for wildlife in Namibia by species

Species	Wildlife utilisation zone					Total in Nam Dollars	Total in US Dollars
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5		
Asset value by species @ 6% discount (NAD '000, 2004)							
Buffalo	61,604	29,839	3,192	0	0	94,634	13,143
Cheetah	15,658	6,548	5,298	1,921	21,320	50,744	7,048
Eland	28,780	17,576	2,442	0	190,008	238,806	33,167
Elephant	462,409	2,437	22,178	2,543	0	489,568	67,996
Gemsbok	143,634	77,601	138,203	20,466	1,422,036	1,801,940	250,269
Giraffe	70,542	8,710	7,527	418	35,779	122,977	17,080
Hartebeest, red	18,460	2,872	5,194	0	500,026	526,552	73,132
Hippo	33,803	0	4,742	0	0	38,544	5,353
Impala, black-faced	26,995	0	0	0	10,897	37,892	5,263
Impala, common	919	0	2,712	0	57,893	61,523	8,546
Kudu	26,775	38,249	11,833	4,165	1,453,220	1,534,242	213,089
Lechwe	0	0	2,821	0	1,759	4,580	636
Leopard	48,004	20,808	13,804	5,005	31,561	119,182	16,553
Lion	18,685	1,482	2,098	228	0	22,493	3,124
Ostrich	45,582	12,155	19,354	7,486	135,877	220,454	30,619
Rhino, black	144,913	15,165	4,716	4,274	7,705	176,774	24,552
Rhino, white	3,992	9,103	0	0	1,795	14,891	2,068
Roan	34,265	18,558	4,366	0	10,969	68,158	94,663

Sable	13,805	6,426	477	0	15,750	36,458	4,786
Springbok	386,924	40,248	250,870	136,870	2,303,185	3,118,097	433,069
Tsessebe	0	605	0	0	1,065	1,670	232
Warthog	1,682	1,376	268	0	639,645	642,971	89,302
Waterbuck	0	0	0	0	25,694	25,694	3,569
Wildebeest, blue	68,151	6,094	3,799	0	73,734	151,777	21,080
Zebra, plains	246,904	0	161	0	32,261	279,326	41,295
Zebra, mountain	132,000	133,060	19,373	10,758	277,093	572,285	79,484
Total value @6%	2,034,485	448,913	525,427	194,136	7,249,271	10,452,232	USD 1,451,699

The total asset value of 10, 452 million Namibia Dollars compares quite well to Fish (NAD 12,000 million), Minerals (14,300 million), Forests (18,700 million) and Manufactured capital (82,000)

Table 5: Estimated resource rent*generated in wildlife use activities in Namibia in 2004 (NAD '000)

Wildlife use	Wildlife utilisation zone					Total in Nam Dollars	Total in US Dollars (000)
	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5		
Wildlife viewing	63,580	7,314	4,354	2,419	179,198	256,865	35,676
Hunting tourism	1,008	0	15,116	4,031	57,084	77,238	10,727
Live game	10,060	10,060	0	0	20,119	40,239	5,588
Commercial meat	0	1,629	0	0	878	2,507	348
Small scale meat	0	0	278	0	8,985	9,263	1,286
Ostrich farming	0	0	0	6	2,358	2,365	328
Crocodile farming	0	0	0	0	970	970	135
Guano harvesting	0	2,025	0	0	0	2,025	281
Meat processing	0	0	28	1	1,319	1,348	187
Taxidermy	90	0	1,374	361	6,410	8,234	1,144
Crafts production	0	0	513	821	718	2,052	285
Total resource rent	74,738	21,028	21,662	7,638	278,041	403,106	USD 55,987

**Resource rent or economic rent or excess profit = gross output less costs of production, including a reasonable rate of return*

2.5 Tourism Satellite Accounts: Namibia and Kenya (2004 – 2008)

2.5.1 Applying wildlife ratios to tourism incomes

Recalling the earlier statement that Kenya has not conducted any wildlife resource or asset accounts, direct comparisons with Namibia in that regard is not possible. However, both countries in conjunction with the World Travel and Tourism Council have published Tourism Satellite accounts, which show data from 2004 to 2009. The results of these accounts give a clear indication of the contribution of the tourism sector to the overall Gross Domestic Products of the two countries. Since we are concerned with the portion that is attributed to wildlife use; whether consumptive or otherwise, it is recommended that a *wildlife ratio* be used to estimate the contribution of wildlife to the total direct economic contributions of tourism to their GDPs. Based on readings (SAIPAC 2007, MET 1997, Omwanda 2007) from both Kenya and Namibia, an average wildlife ratio of 62 % seems applicable to Namibia and for Kenya the ratio is 77%. These could be used to estimate the portion of direct tourism earnings that is attributed to wildlife use.

2.5.2 Tourism Satellite Accounts

The tables 6 and 7, show statements of satellite accounts for Kenya and Namibia respectively and covers the years 2004 to 2009. The figures for 2008 are estimates since some of the data had not been fully collected and the 2009 figures are forecasts. In addition, 10-year projections on the expected performance of the sector have also been made, hence the expected figures for the year 2019. In 2004 for example, the total direct contribution of the tourism sector to the GDP of Kenya was USD 782.0 million (*see the rows on Travel and Tourism Direct Industry on table 6*) but the total impact on the economy (GDP) was USD 1.753 billion (*the travel and tourism economy row on table 6*). Likewise in Namibia the total direct contribution of the tourism sector to the GDP of Kenya was USD 187 million but the total impact on the economy, was USD 790.7 million in 2004. By 2007 both countries had registered tremendous growth in their tourism sectors and the direct contributions to the GDPs of Kenya and Namibia from tourism were 1.423 billion and USD 217 million respectively. The total impacts to their respective GDPs were equally high; USD 3.19 billion for Kenya and USD 937 million for Namibia.

The forecast figures for 2009 suggest that for Namibia, which has a smaller economy than Kenya, the direct contribution of tourism to the GDP was 3.2% but the total impact was 13.9. For Kenya, the direct contribution is 3.7 % of the GDP and the total impact is 8.8%. Again the projected 10-year trends show significant growth in both countries (Tables 6 and 7). *Applying the wildlife ratios to the direct contributions of tourism to GDP gives a conservative measure of wildlife's contribution to the economy as a whole.* This point should be highlighted in major communications from the wildlife departments of countries.

2.6 Benefits of Wildlife to Kenya and Namibia's National Economies

Some tourism statistics in Kenya and Namibia, 2000 – 2007

In **Kenya** and according to the Kenya National Bureau of Statistics (KNBS), tourism obviously plays a major role in the growth and development of Kenya's economy. Currently it accounts for about 10% of the Gross Domestic Product and is third behind agriculture and manufacturing. In 2007 the sector recorded 2 million visitors which was a 12.5% over the figure for 2006 and the earnings changed from KES 56.2 billion (USD 790 million) to 65.4 billion (USD 908 million), which was an 11.6% growth in income in 2007. Today tourism it has the highest growth in Kenya's economy at 13% per year, 12% of the GDP (2006) and 9% of total wage employment. For purposes of this paper, an estimated 77% of tourists visit parks and reserves to view wildlife (Omwanda 2007).

Table 6: Tourism arrivals and earnings in Kenya and Namibia (2000-2007)

KENYA / Year	2000	2001	2002	2003	2004	2005	2006	2007
Tourist arrivals (000')	1,036.5	993.6	1,001.3	1,146.2	1,360.7	1,479	1,600.6	2,000.0
Visitors to Parks & Reserves (both local and foreign)	1,644.9	1,650.3	1,784.1	1,575.9	1,820.2	2,132.9	2,363.7	-
NAMIBIA / Year	2000	2001	2002	2003	2004	2005	2006	2007
Tourist arrivals	655,586	670,497	757,210	695,221	716,078	777,890	833,345	928,912

Sources: 1) Kenya National Bureau of Statistics (2000-2007), 2) Source: Ministry of Environment and Tourism. Namibia Statistical Report 2006 & 2007, Namibia Tourism Board, 2008. * Preliminary estimate, **Tourists only, other foreign visitors are excluded.

Table 7: Tourism satellite accounts – Kenya

KENYA Travel and Tourism – USD mn	2004	2005	2006	2007	2008E	2009F	2019F
Personal Travel & Tourism	490.1	573.8	717.2	928.9	1,139.2	1,291.5	2,482.7
Business Travel & Tourism	276.2	361.4	407.9	512.0	638.1	731.6	1,448.2
Corporate	241.0	316.6	359.7	452.3	566.5	652.5	1,281.4
Government	35.2	44.8	48.2	59.8	71.6	79.2	166.8
Government Expenditures – Individual	60.1	68.6	77.6	98.0	123.2	141.4	274.4
Visitor Exports	798.8	969.1	1,181.0	1,506.8	1,111.0	1,143.3	3,028.1
Travel & Tourism Consumption	1,625.2	1,972.9	2,383.8	3,045.8	3,011.4	3,307.8	7,233.3
Government Expenditures – Collective	138.1	157.0	178.5	224.8	282.2	324.8	628.6
Capital Investment	427.4	314.9	589.3	826.3	984.9	1,100.1	2,187.0
Other Exports	50.7	64.2	67.0	77.3	84.9	91.9	189.7
Travel & Tourism Demand	2,241.4	2,508.9	3,218.6	4,174.2	4,363.4	4,824.7	10,238.7
Travel & Tourism Direct Industry							
Employment ('000)	195.0	214.7	209.1	217.6	168.2	167.7	242.2
Gross Domestic Product	*782.0*	*988.4*	*1,115.3*	*1,423.4*	*1,349.3*	*1,517.9*	*3,497.3*
Travel & Tourism Economy							
Employment ('000)	442.0	445.7	464.8	493.3	406.1	407.2	567.6
Gross Domestic Product	*1,753.0*	*2,034.4*	*2,452.6*	*3,191.0*	*3,217.7*	*3,639.2*	*8,099.8*
Travel & Tourism 2000 Constant USD mn	2004	2005	2006	2007	2008E	2009F	2019F
Personal Travel & Tourism	432.4	454.6	506.6	558.4	561.6	574.8	800.5
Business Travel & Tourism	243.7	286.3	288.1	307.8	314.5	325.6	467.0
Government Expenditures – Individual	53.0	54.3	54.8	58.9	60.7	62.9	88.5
Visitor Exports	704.8	767.7	834.2	905.8	547.7	508.9	976.4
Travel & Tourism Consumption	1433.9	1,562.9	1,683.8	1,830.9	1,484.5	1,472.3	2,332.3
Government Expenditures – Collective	121.8	124.4	126.1	135.1	139.1	144.6	202.7
Capital Investment	377.1	249.4	416.3	496.7	485.5	489.6	705.2
Other Exports	44.7	50.8	47.3	46.5	41.9	40.9	61.2
Travel & Tourism Demand	1977.6	1,987.6	2,273.4	2,509.3	2,150.9	2,147.4	3,301.4
Gross Domestic Product							
Travel & Tourism Industry	690.0	783.0	787.8	855.7	665.1	675.6	1,127.7
Travel & Tourism Economy	1547	1,611.7	1,732.4	1,918.2	1,586.2	1,619.7	2,611.7

E - Estimate; F – Forecast
Source : WTTC 2009, www.wttc.org

In Namibia, the wildlife based tourism industry in 2004 (Barnes *et al.* 2009) produced (as shown above in Table 3) a gross output of some NAD 1.5 billion (USD 200 million) and directly contributed NAD 700 million (USD 100 million) to the gross national product (GNP). With the figures for 2005 to 2008 on Table 8, Namibia's tourism earnings have registered significant growth and given a 'wildlife ratio' of at least 62%, the contribution of wildlife has also seen significant increases.

Table 8: Tourism satellite accounts – Namibia

NAMIBIA Travel and Tourism – USD mn	2004	2005	2006	2007	2008E	2009F	2019F
Personal Travel & Tourism	362.3	364.4	365.0	395.1	394.0	395.1	1,019.7
Business Travel & Tourism	91.0	93.1	93.7	99.5	97.1	95.7	237.5
Corporate	70.8	74.0	72.2	78.8	77.2	76.2	191.4
Government	20.2	19.1	21.5	20.7	20.0	19.5	46.0
Government Expenditures – Individual	1.6	2.0	2.0	2.2	2.1	2.1	5.2
Visitor Exports	452.0	492.7	506.1	560.5	525.6	535.2	2,172.7
Travel & Tourism Consumption	906.9	952.2	966.8	1,057.3	1,018.9	1,028.1	3,435.0
Government Expenditures – Collective	38.1	47.0	45.3	49.5	48.4	47.8	120.2
Capital Investment	151.0	159.0	194.6	229.4	223.4	220.6	554.2
Other Exports	28.9	32.6	31.7	46.0	44.8	44.0	106.1
Travel & Tourism Demand	1,124.9	1,190.9	1,238.4	1,382.1	1,335.5	1,340.6	4,215.6
Travel & Tourism Direct Industry							
Employment ('000)	18.1	18.5	18.8	18.9	19.0	20.1	41.2
Gross Domestic Product	*187.0*	*199.3*	*179.8*	*217.7*	*210.0*	*215.8*	*959.8*
Travel & Tourism Economy							
Employment ('000)	69.8	71.3	72.7	74.8	74.5	77.4	130.0
Gross Domestic Product	*790.7*	*844.3*	*782.8*	*973.0*	*927.7*	*933.2*	*3,233.5*
Travel & Tourism 2000 Constant USD mn							
Personal Travel & Tourism	229.3	224.1	235.0	246.5	262.4	273.9	440.8
Business Travel & Tourism 60.5	59.3	58.9	59.9	62.2	63.7	97.4	
Government Expenditures – Individual	1.1	1.3	1.3	1.4	1.4	1.4	2.2
Visitor Exports	287.4	311.0	345.2	366.5	365.5	386.7	967.5
Travel & Tourism Consumption	603.0	606.9	607.2	674.3	691.4	725.7	1,507.9
Government Expenditures – Collective	25.8	30.6	29.7	31.1	32.4	33.2	51.4
Capital Investment	98.6	98.6	121.8	137.6	142.5	146.3	226.5
Other Exports	21.4	19.8	18.0	25.0	25.8	26.4	39.2
Travel & Tourism Demand	747.9	759.0	777.8	867.9	892.2	931.6	1825.0
Gross Domestic Product							
Travel & Tourism Industry	124.3	127.0	112.9	131.1	134.5	143.6	393.6
Travel & Tourism Economy	526	538.1	491.7	585.8	594.0	620.9	1325.8

E - Estimate; F - Forecast
Source: WTTC 2009 (www.wttc.org)

3 EXAMPLES OF NATURAL RESOURCE ACCOUNTING FROM THE FOREST SECTOR

3.1 Introduction

Namibia (2004) and more recently Kenya (Kenya Forest Service, 2009) made attempts to estimate Forest Resource Accounts. Besides the well known values of commercial timber or round wood, the forest sector is another example whose total contribution to the national economy is normally understated.

In conducting the studies the two countries applied the System of Integrated Environmental and Economic Accounts (SEEA). While the SEEA extends the asset boundary of the SNA to include all natural resources in the economy but it is still, somewhat limited in providing guidelines on the entire scope of benefits supplied by forestry resources. For that reason the Kenyan exercise also used the Millennium Ecosystem Assessment (MA) of the UN in addition to the SEEA, to deal with this.

3.2 Methodology

While there were slight variations between Namibia (Barnes *et al.* 2005) and Kenya (Kenya Forest Service 2009) the approaches were essentially and logically similar. They both involved developing physical accounts for natural and planted forest assets in the form of standing volumes in each administrative region. After that, the current annual use of these resources was detailed in flow accounts; the volumes and economic characteristics of this use, which were used to measure use in terms of output, contribution to gross national product (GNP), and employment, in conformity with the SNA. The physical accounts were then valued in order to produce monetary asset accounts, so that changes in the capital value of forests could be measured. As done for the wildlife accounts, the value of natural assets is measured as the resource rent that can be generated from their use in the future. In Namibia, the valuation of the forest assets was done using the Net Present Value Method, which in the case of forests, is the Stumpage Value Method. The NPV Method estimated streams of rents from expected growth in use over the next 30 years. The accounts were developed for the year when the national inventory data had been compiled; which was 2004 for Namibia and 2008 for Kenya. Asset accounts should include consideration of depletion, degradation, conversion and accumulation of stocks during the accounting year. The changes in volume and value of stocks can then be accounted for over time.

Asset accounts involved the description of the assets (cover types) and the estimation of physical forest assets (area and volume data) including changes brought about by planting, rehabilitation or deforestation and degradation and the estimation of monetary accounts associated with the physical asset accounts. The physical accounts refer mainly to area data for each forest cover type.

For example, in Kenya the total area under indigenous forest cover (including riparian strips) was is reported to be 1.88 million ha. Furthermore, the dry land forest cover, using the DRSRS/Africover estimate, was 42,345,952 ha, but data changes are not available. Plantation areas had decreased from 150,000 ha in 1990 to 109,720 ha in 2008. Privately owned plantation forests had increased from 70,000 ha to 73,289 ha. In total, the total Plantation forest estate of Kenya has reduced from 240,000 ha in 1990 to 204,009 ha in 2008, of which the planted area have reduced from 220,000 ha to 183,009 ha. The area under forest cover was the key input variable into the calculations and algorithms required to develop the physical forest resource accounts.

In that regard, a production formula (Kenya Forest Service, 2009) is provided: *Change in stock of a forest ecosystem service over the analysis period = Volume of forest products at the beginning of the accounting period + (average growth rate of the particular forest x average forest area over the full accounting period).*

Flow accounts also referred to as hybrid accounts in the Kenyan case, were presented as input-output variable table with the main elements being, the total consumption of round wood in 2005 for Kenya which was 29.1 m^3, whereas 1.8 million m^3 was supplied from plantations (562,437 m^3)and the rest from indigenous forests and dry woodlands.

3.3 Monetary Accounts: The Contribution of Forestry to National Accounts

3.3.1 Kenya

The GDP of Kenya in 2005 was KES 1,261,183 million (USD 17 billion) and Kenya National Bureau of Statistics estimated the contribution of the Forestry and logging sector to Kenya GDP to be 1.1% or KES 15,333 million (USD 212 million). This is an underestimate because the values of round wood through manufacturing, provision of goods (timber and non-timber) to the subsistence economy, supply of cultural services to Kenyans and foreign visitors and the supply of ecosystem services (water regulation, carbon sequestration, biodiversity and others), have not been reflected.

From the assessment and despite the preliminary nature of the data, the study has made some interesting and significant conclusions regarding the contribution of forest resources to the economy of Kenya. These are:

1. The value of the Forestry sector value chain to the economy (GDP) of Kenya is at least three times larger than the current estimates of KES 15.333 million (USD 212 million) in 2005.
2. The sector provides the non-monetary economy with at least KES 6,988 million (USD 97 million) per year worth of unaccounted raw materials. Similarly, the charcoal manufacturing sector, worth an estimated KES 12,460 million (USD 173 million) per year to GDP, is not accounted for in the national accounts. The national GDP of Kenya is therefore understated by approximately 1.4%.
3. The forestry and logging sector supplies round wood to a manufacturing value chain with a combined value added of KES 21,587 million (USD 300 million). The forestry and logging sector therefore has an economic production multiplier effect of 2.73.
4. The value added contribution to the water sector is KES 1,287 million (USD 18 million) per year. This estimate may increase if the opportunity cost of replacing the forests with impoundments of transfer schemes is considered.
5. The contribution of forestry to the tourism sector and to carbon sequestration was not estimated here due to lack of adequate data.
6. In conclusion, the preliminary estimate of the partial contribution of forestry in Kenya to the economy of Kenya is 3.6% per year, or KES 44,441 million (USD 617 million).

3.3.2 Namibia

1. The value of current forest use in 2004, in terms of the gross output, was some NAD 1.2 billion (USD 167 million).
2. This made a direct contribution of NAD 1 billion (USD 138 million), which is about 3% of the total GNP, compared with estimated proportions of 6.8% for agriculture, 5% for fishing, 6.8% for mining, and 6% for tourism.
3. The total direct and indirect economic impact of the forest use sector on the broader economy was estimated at NAD 1.8 billion.
4. Namibia's standing forest assets (the natural capital stock) were estimated to have a value of NAD 19 billion (USD 2.63 billion) in 2004.

4 CONSUMPTIVE AND NON-CONSUMPTIVE USES OF WILDLIFE – DISCUSSIONS FROM A BENEFITS PERSPECTIVE

4.1 Introduction.

As stated in the introduction section of this paper, a number of countries whose tourism industries are largely based on wildlife either choose to permit consumptive uses alongside non-consumptive forms, while others only permit non-consumptive forms. In general, those who permit consumptive use, automatically have non-consumptive forms as well, since the majority of tourists subscribe to the non-consumptive forms (Barnes *et al.* 2007, Krug *et al.* 2002, Omwanda 2007).

It should be noted that the choice between consumptive and consumptive uses of wildlife depends, on several factors such as belief, religion, conservation philosophy and the status of species populations. As such, it is not without its own controversies and this paper will avoid that discussion and merely concentrate on how the two systems have fared in Africa. Another general observation worth noting is that in Southern Africa all the major wildlife countries (Botswana, Mozambique, Namibia, South Africa, Zambia and Zimbabwe) subscribe to the concept of sustainable use of their natural resources, including wildlife. Hence, all of them allow the use of their wildlife resources in line with international conventions such as that on the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and also their own national policies and laws on sustainable use. In Kenya however the philosophy of non-hunting has been upheld for over two decades and Kenya's position on international Ivory Trade is well known and is always the subject of highly animated discussions between herself and its Southern African counterparts.

It is instructive to point out that Southern Africa's embrace of sustainable use has its origins on its tradition of wildlife conservation with the traditional participation of the state, coupled with the strong participation by the public and particularly the private sector. Historically, wildlife conservation outside Nationals Parks or reserves was facilitated in Botswana, Namibia, South Africa and Zimbabwe by policy and legal reforms which enabled the ownership and regulated use of wildlife on private lands. Initially, such rights to own wildlife were confined to the formerly privileged classes in these countries and later and particularly after political independence, the right to own and use wildlife on communal lands was also awarded to previously marginalized local communities. The results of these developments are that today the wildlife management in Southern Africa is not dominated by the state but is shared among many stakeholders. In addition and for some species, production systems operate in the same manner as for livestock. As such, one finds protected areas, private game ranches and reserves, ostrich and crocodile farms and community based wildlife conservancies. In national parks no consumptive use is allowed but they can provide populations for restocking elsewhere. However, private parks, conservancies, ranches and farms may practice sustainable use usually through controlled trophy hunting and cropping, in the case of ranches and the more intensive crocodile and ostrich farms.

In the case of Kenya, wildlife is managed in national parks, game reserves and forest reserves which may be owned by the central or local governments. In addition, there are private reserves and game ranches. All of these operate strictly on a non-consumptive use basis.

4.2 Possible Criteria for Comparing the Effects of Consumptive and Non-Consumptive Uses of Wildlife

Given the two contrasting systems one can ask a few questions, the answers to which could shed some light on the influence of either system on conservation and the benefits to the countries that practice them. These questions have dominated debates on those who are for or against use.

- Effects on the conservation of endangered threatened species (rhino, elephants)
- Effects on poaching, illegal trade of wildlife and associated products
- Possible effects on adaptation to climate change
- The social and economic benefits of both systems (direct benefits, indirect benefits)
- Facilities for public participation in wildlife management, job creation and income generation, including its distribution in the context of the wildlife tourism industry
- The relative opportunity costs of either system.

To aid our discussions, some economic data from Namibia's tourism industry, which permits the two systems of use and those of Kenya which only allows non-consumptive use, are presented.

4.3 Basic Tourism Products

In general, countries offer tourist attractions such as parks, forests, beaches, mountains and to support and service the industry they offer products as listed herein:

- Tourism characteristic products are
  - Accommodation
  - Food and beverage services
  - Transport
  - Transport equipment
  - Travel agency, tour operator and tour guide services
  - Cultural services
  - Recreational and other entertainment services
- Tourism connected products (Goods and Services)
- Non-specific products (Goods and services).

The products depending on their nature and national policies can be offered by both the private and public sectors but the tendency is that they tend to specialize in certain types of products. In addition to the basic tourism products, a general list of common uses (both consumptive and non-consumptive) include:

- Wildlife viewing
- Hunting tourism
- Live game sales
- Commercial meat
- Small scale meat
- Ostrich farming
- Crocodile farming
- Meat processing
- Taxidermy
- Crafts production.

While most national parks and reserves in much of Africa are publicly owned for the most part, in southern Africa, particularly Botswana, Namibia, South Africa and Zimbabwe, there are a number of communally and privately owned conservancies and reserves.

4.4 The Comparative Benefits of Non-Consumptive and Mixed Forms of Wildlife Use

4.4.1 General background

In *Section 4.2* it was suggested that the two wildlife use systems could be compared based on criteria, which assess the effects on conservation, particularly of endangered species, illegal trade, climate change adaptation, participation of communities and the public in conservation, economic benefits and income distribution and the opportunity costs of both. In both, *Kenya and Namibia, tourist numbers have increased significantly over the last 10 years and command respectable shares in the GDPs of the two countries. However, the different status and availability of data, particularly on wildlife resources, between the two countries do not make it easy or simple to comment on the virtues of non-consumptive over consumptive use or vice versa. One can still assess how each system has performed based on some objective criteria, such as the 5 points in section 4.2, and it is important that the chosen criteria have a direct or indirect but discernible bearing on wildlife management. There is of course room for more criteria to be suggested or the same criteria stated in different ways. Based on the above criteria, a few observations on the two systems are hereby suggested for further discussion.*

1. Namibia has generally done well in the conservation of endangered species particularly rhinos and elephants. However, the only free ranging rhinos are to be found in one of its un-fenced communal conservancies in the desert area of the northwest. In addition, a peculiar fact is that wildlife populations in Namibia have increased in conservancies despite the influence of sustainable use.
2. As to which system has an influence, positive or negative, on *poaching and illegal trade of wildlife* and associated products, there is no conclusive evidence to make any suggestions. However, reports indicate that poaching levels in Namibia which permits consumptive use are lower or no worse than in Kenya.
3. On the possible effects on *adaptation to climate change,* the one thing that sustainable use has brought about is the facilitation of communal conservancies that are linked to, and offer buffers to protected areas. Because of that the conservancies may offer critical conservation corridors that would have been curtailed by other forms of land use. The negative effects of fenced settled and cultivated land on wildlife movements are well known. Kenya has a few private conservancies that can perform this function but the potential for more of those is quite high and would create a community empowerment system that could be quite exciting.
4. On the *social and economic benefits* of both systems (direct benefits, indirect benefits) it can be said that both systems have economic benefits. The one issue that can be discussed is equity for the wider public, most of who have to pay the 'opportunity costs' of staying and interacting with wildlife. In that regard alone, the countries with both use systems seem to offer more alternatives than in the Kenyan systems in which participation is dominated by the government and big tourism industries. The mixed consumptive and non-consumptive use systems of Southern Africa seem more attractive than the strictly non-consumptive use countries because of their ability to enable the *wider participation of local communities* in conservation, through community based conservancies. From employment creation and income distribution

perspectives, the conservancies provide an additional facility for employment and empowerment than the current systems in much of Africa where the Government (through its parks) and the private sector (accommodation and services) dominate the tourism sector. To illustrate the point, the next section highlights the benefits of community-based conservation in Namibia, which is based on the concept of sustainable use. The programme as described does not seem to have any parallels in East Africa, particularly Kenya, even though Kenya has District Wildlife Forums, which can be fully supported with enabling policies and laws in addition to private conservancies.

5. It is recommended that the opportunity costs of each system are estimated using agreed and objective criteria and methodology, which are devoid of value systems and ideology, which tend to influence the choice of use systems. The use of economic criteria is therefore strongly recommended.

Based on the above criteria, the major point for consumptive use as it is practiced in Southern Africa is its ability to draw in local communities as active owners of wildlife resources and participants in conservation, supported by enabling laws and policies. The next section gives a brief description of community based conservation as it is practiced in Southern Africa in general and Namibia in particular.

4.4.2 Sustainable use and development of Namibia's Communal Conservancies

While the conservancy movement is now well documented starting from the CAMPFIRE Projects of Zimbabwe (Shackleton and Campbell 2000), a recent paper by Weaver *et al.* (2009) describes 15 years of work in Namibia and details the social and economic benefits that have been occasioned by the conservancy movement in Namibia. The evolution of conservation philosophy to enable wildlife management on private land stems from Namibia's pre-independence 1967 Nature Conservation Ordinance and later defined by Nature Conservation Ordinance Number 4 of 1975. This was to be followed much later by the Communal Conservancy Act of 1996 which devolved rights to communal land owners to manage and use wildlife. Today a total of 55 communal conservancies have been registered of which the first registered in 1998, with the 51 coming into being over a relatively short 10 year period.

The result of all this is that in the period 1994 to 2007 significant benefits have been accrued to communal conservancies in Namibia, despite the realization that improvements can still be made. The benefits are illustrated in Figure 1 and Table 10. Furthermore, wildlife population figures (Figures 2 and 3) are presented for two communal conservancies to indicate that sustainable use is not necessarily detrimental to growth in managed wildlife populations.

Figure 1: Benefits derived from Namibia's CBNRM Programme and affiliated conservancies from 1994-2007 (NACSO, 2008)

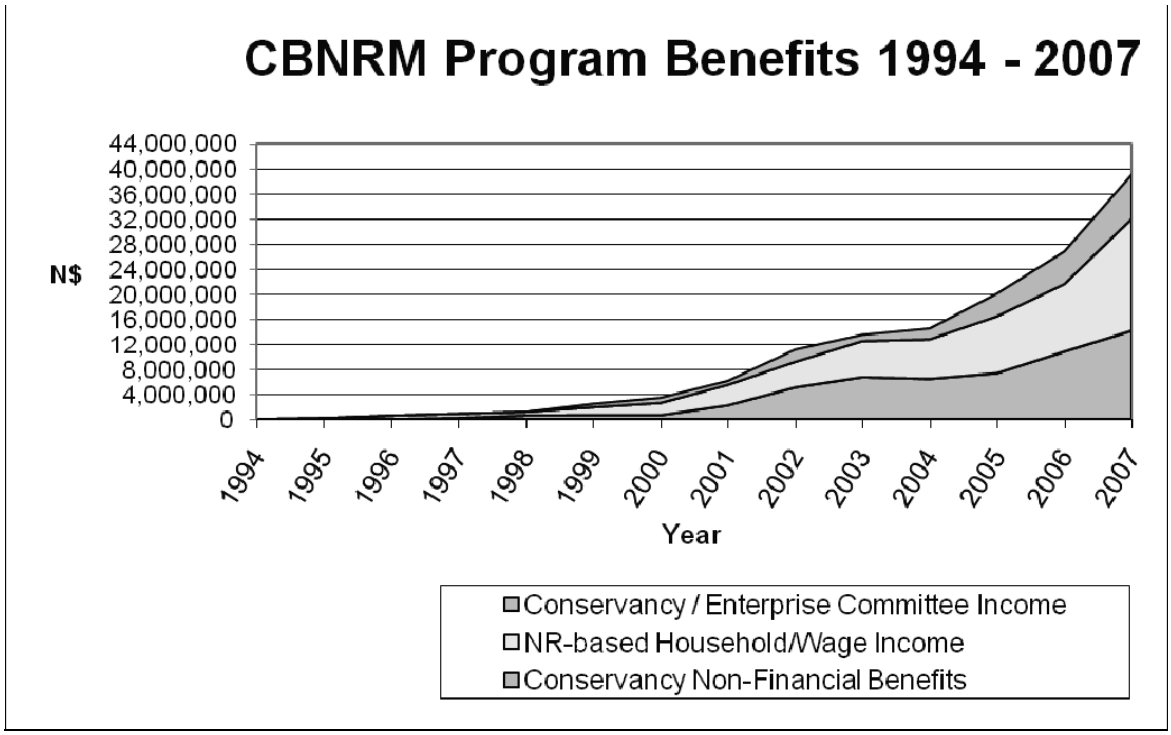


Table 1: Benefits generated (all figures in Namibia $) from sustainable use of wildlife in communal conservancies from 1994-2007 (NACSO, 2008)

Form of Use	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Totals
Trophy Hunting	165,900	430,736	644,397	789,855	1,326,619	1,844,907	2,146,368	2,455,472	5,182,560	6,327,938	7,257,206	28,571,958
Meat Value/ In kind	24,000	32,000	171,832	310,016	520,720	738,096	822,504	2,046,774	2,569,981	3,824,410	3,056,050	14,116,383
Salaries	9,500	17,750	44,731	43,288	100,724	164,778	268,418	389,723	469,230	757,119	474,016	2,739,279
Premium Hunting	-	-	-	-	-	-	8,280	25,150	43,600	65,330	132,152	274,512
Catch Keep and Sell	-	-	-	-	132,000	211,748	110,100	195,600	-	283,300	-	932,748
Shoot and Sell	-	-	-		-	-	11,064	102,379	504,883	557,630	799,372	1,980,512
Total	199,400	480,486	860,960	1,148,343	2,080,063	2,959,529	3,366,735	5,217,104	8,772,260	11,817,734	11,720,805	48,623,418

Figure 2: Estimated game populations in Nyae Nyae Conservancy from aerial game counts (1995, 1998, 2004) , water point counts, and local knowledge from 1995-2007 (NACSO, 2007)

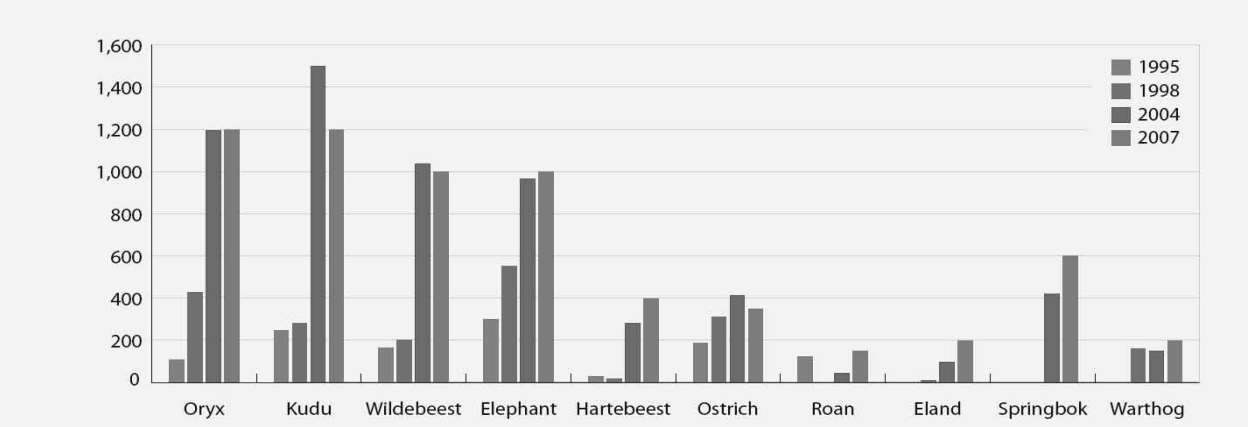
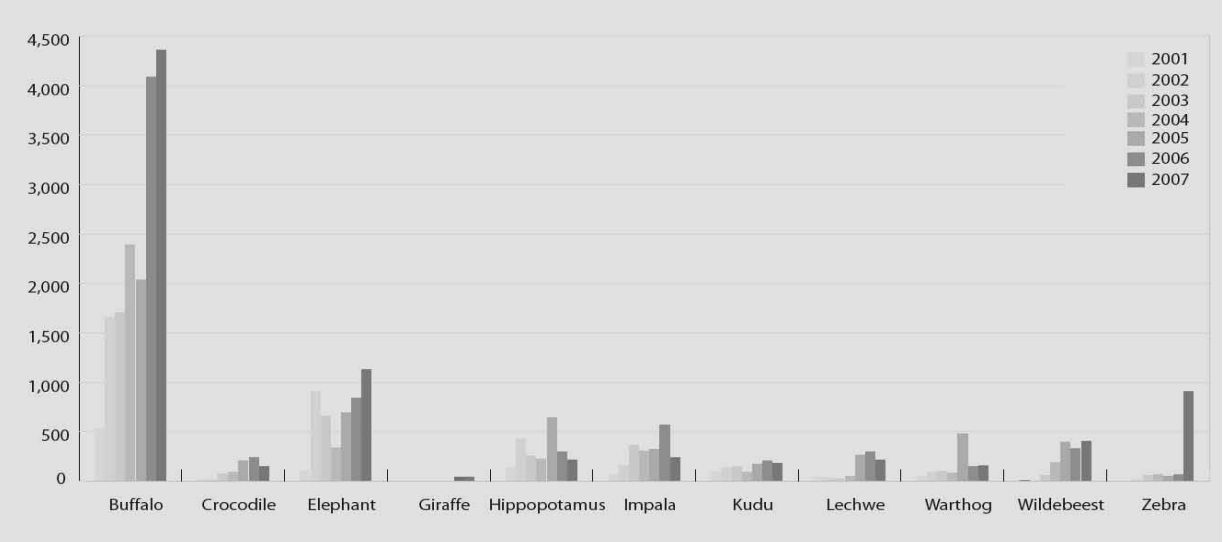


Figure 3 Estimated game populations in seven well-established communal conservancies in East Caprivi from 2001-2007 (NACSO, 2007)



5 MAXIMIZING THE CONTRIBUTIONS OF WILDLIFE TO NATIONAL ACCOUNTS – A DISCUSSION

This paper has highlighted the contributions of wildlife and forests to national economies and has also demonstrated, using agreed methodologies, that the total economic contributions of the two sectors are often understated. It is pleasing that the concept of resource accounting as an aid to policy and decision making in natural resource management has gained currency over the last decade or so. It is incumbent upon wildlife and forest management specialists and lobbyists to use all available tools to raise the profiles of these two important but understated sectors. In conclusion, a few suggestions are made here on possible ways to further maximize the contribution of the wildlife sector to the national economies of Africa. The suggestions have their roots in the capturing of rents and also in improved management of the resource base. The recommendations suggested here are not necessarily exhaustive, but they nonetheless give an indication of where more effort should be put.

5.1 The Participation of Local Communities in Conservation and Tourism

A number of protected areas where wildlife flourish were often created in the colonial era through the appropriation and proclamation of traditional or ancestral grazing lands, without due compensation to local communities. Despite the spectacular conservation successes that followed the proclamation of these parks, adversarial relationships between local communities and park management officials have been one of the unintended consequences. In another perspective, it is local communities who have paid the opportunity costs of conservation because of the economic opportunities forgone through official proclamations of conservation land. As such, policies which enable the meaningful participation of local communities in conservation and conservation related businesses are a crucial step in building both resource management and business relationships between parks and their neighbours. Several models of participation can be developed but for now, community based wildlife conservancies appear to be a workable and practical model (Weaver *et al.* 2009).

5.2 Improved Revenue Capture Through Park Pricing

One way of maximizing the returns from wildlife based businesses, is the use of rational and well researched park pricing systems. In an important study, Krug *et al.* (2002) came to some conclusions which suggest that this is a legitimate area for capturing more income from the parks. Their main findings and conclusions were:

- Parks and game reserves in Eastern and Southern Africa are underpriced and there are large revenues, resulting from large consumer surpluses (ability and willingness to pay) that are not captured by park management.
- Many international tourists, as well as some regional and domestic tourists, believe that the entry fees for each of the locations they visited are too low and the average willingness to pay for all tourists was substantially higher than the actual prices charged for both parks used in the study.
- Park pricing could benefit from a three-tiered fee structure, for domestic, regional and other international visitors.
- Charging different fees for different parks, depending on their popularity, accessibility and the amenities offered within the park is another possible mechanism to use and is already being practised in some countries. This enables the cross-subsidization of those parks that are important for conservation but cannot support themselves through entry fees.

- Park managers and tourism authorities should cooperate when setting prices to ensure that the combined cost of entering and staying in protected areas is not excessive. Historically, park fees do not seem to have been set with these factors in mind.
- If prices are set at economically efficient levels, it would be possible to maximise the revenues from parks and game reserves which could, in turn, contribute to improved park maintenance and biodiversity conservation.

Clearly, there is scope for many countries to improve their park pricing policies and practices. It is however encouraging that a number of countries already apply some of the recommendations here, including charging daily usage park fees. In fact, Moran (1994) using a contingent valuation survey of expressed preference in Kenya estimated the consumer surplus attached to current non-consumptive use of protected areas by foreign visitors at some USD 450 million per annum; a figure that is greater than double the best available estimate of opportunity cost and appears to justify current resource use, and represents an opportunity for increased income capture from tourists.

A policy which can be linked to increased revenue capture through park pricing is *cross-subsidization*. Hence, revenue from highly popular and therefore self financing parks can be used to maintain less visited by biologically important parks or reserves.

5.3 The Application of Both Consumptive and Non-Consumptive Uses of Wildlife

For countries that have no ideological problems with consumptive use, it is quite clear sustainable use and the inclusion of community based conservation programmes are value added to any existing tourism industry. The models from Southern Africa, which are based on sustainable use, have amply demonstrated this, both from conservation and economic perspectives.

5.4 Infrastructure Development

A number of tourism boards deal with marketing but also lobby governments and the private sector to improve infrastructure for tourism. This includes activities such as construction and reconstruction of roads, revamping rail lines and introducing rail based holiday packages, as well as increasing and improving accommodation facilities. A number of national tourism reports already contain such considerations.

5.5 Developing New Tourism Circuits / New Tourism Products (e.g. Cultural Products)

In a number of countries, tourist routes have remained the same since independence when in fact there is potential to open up new circuits and develop cultural tourism attractions that have not seen their economic potential. A number of East and Southern African countries can relate to this.

5.6 Creative Marketing

This can be a very large and nebulous subject but suffice to say that it is important for the tourism industry to tailor their marketing strategies to the profiles of their consumers and examine ways in which new customers could be lured to visit. Furthermore, promotions should be sensitive to how tourist attractions are advertised since in some cases, promotional materials may inadvertently appeal mainly to male tourists or simply to younger ones.

6 CONCLUDING REMARKS

1. Clearly tourism based on wildlife has proven its economic worth and its asset value should encourage serious public investment in conservation and mechanisms to adapt to the ravages of climate change.
2. The publishing of satellite and resource accounts should target the major players in society; youth, communities, the industry and policy makers.
3. Satellite and resource accounting should be popularized among natural resource managers, who should also be substantively participate in or oversee data collection, analysis and interpretation, to enable the practice to be used more widely. In the current situation, satellite accounting has remained in the realms of academia, which is not where it should be confined.
4. There is a lot of scope to improve park pricing and maximize economic returns from wildlife based tourism.
5. One major area of improvement is the participation of local communities within and outside protected areas. This is one way of redistributing tourism income through employment, ownership of tourism businesses, product sales and political empowerment of formerly neglected partners in conservation.

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