

The Economic Value of Namibia's Protected Area System: A Case for Increased Investment

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EXECUTIVE SUMMARY

Introduction

This study was commissioned by the UNDP/GEF project on Strengthening the Protected Areas Network in Namibia (SPAN). The project aims to safeguard biodiversity conservation and enhance the contribution of protected areas to Namibia's development process. The main aims of this study were to describe the economic value of the parks and investigate the economic implications of increased investment in the system.

Background: wildlife and tourism in Namibia

Namibia's economy is heavily reliant on its natural resources. Although not a traditionally recognised 'sector', tourism has recently been shown to be one of Namibia's most important industries, and much of this is dependent on wildlife and natural resources.

Almost half of Namibia's land area is freehold, 36% is communal (predominantly in the north), and 18% is state land. Some 17% of Namibia is formally protected in some 22 protected areas. The majority of the protected estate encompasses the coastal desert areas. Protected areas can be grouped into four categories – the desert parks, such as Namib-Naukluft Park and /Ai-/Ais Hot Springs, the developed wildlife parks – Etosha and Waterberg Plateau, the less developed wildlife parks, all of which are found in the north-eastern parts of the country, such as Mamili National Park and Caprivi Game Park, and numerous small reserves, resorts and recreational sites, such as Popa Game Park and Hardap Recreation Resort.

The protected areas are supplemented by clusters of adjoining conservancies and privately protected areas on private and communal lands which add a further 14% of the land surface area to the conservation estate. Wildlife is by no means confined to the protected area system, with over 90% of large game species and 80% of their numbers occurring outside protected areas. Populations of game on private and communal lands have increased dramatically since new property rights systems were put in place. About 75% of farmers hunt wildlife, 15-25% commercially, and there are about 400 registered commercial hunting farms. Wildlife viewing is also being offered on private farms to an increasing extent, and there are about 148 registered private nature reserves. The establishment of private conservancies is generally encouraged. Wildlife use is also integral to the livelihoods of communal land residents. Wildlife hunting and viewing have become important in these areas since new legislation in 1996 allowed the establishment of conservancies which could generate income to residents from these activities. There are a total of 59 registered conservancies, containing at least 20 joint venture agreements with the private sector.

The tourism industry in Namibia has undergone rapid growth since the late 1980s, with an average increase in international arrivals of 15% per year. Tourist numbers increased

steadily until 2000, but suffered following the 9/11 attacks on the USA in 2001, and only began to increase again in 2005. Over 70% of international visitors are from African countries, especially South Africa. Regional visitors tend to be visiting Namibia alone, whereas overseas visitors are generally visiting at least one other country. Holiday visitors spend an average of 12.4 nights in Namibia. It is unknown how many days visitors spend in protected areas, but hunting visitors spend an average of 4.2 days on hunting trips. Expenditure by tourists in Namibia provides the turnover in the tourism industry, which in turn provides the direct value added to the economy. The total value added is the direct value added plus the indirect value added due to linkages to other sectors and consequent multiplier effects. The most recent estimate Tourism Satellite Accounts (2007) suggests that tourism directly contributed 3.9% of GDP and its direct plus indirect contribution amounted to 14.2% of GDP.

This turnover supports over 2200 tourism-related businesses, of which two-thirds are in the accommodation sector. Some 60% of accommodation establishments are hunting farms, guest farms or lodges, these being found away from the urban centres.

Nature-based tourism activities are the top-stated reasons for visitors coming to Namibia. Protected areas feature strongly in the attractions cited by visitors to Namibia. However, the nature-based segment of the tourism market is difficult to isolate. It has been estimated that some 73% of visitors are nature-based tourists, and that they account for 65-75% of all holiday expenditures. Nature-based tourism is dominated by non-consumptive activities, with only 2-4% of visitors being on hunting trips, and 9% on fishing trips. Wildlife viewing tourism was estimated to be worth N\$280 million to Namibia (including N\$30 million of Namibian consumer surplus) in 1995. In comparison, consumptive use of wildlife was estimated to be worth N\$335 million in 1996. Protected areas were estimated to be worth N\$245 million in terms of all wildlife use in 1996. Since these estimates were made, the development of conservancies in communal lands has considerably raised (possibly doubled) the contribution of wildlife to the economy.

The tourism value of the protected area system

The main direct use values associated with the protected area system are derived from tourism activities. Tourists visiting protected areas spend money both within and outside them. This generates value added in the tourism industry, and further value added for the Namibian economy as a whole through linkage and multiplier effects. Additional expenditures that take place outside of Namibia are leakages from the economy, but should ideally be considered if quantifying the global value of Namibia's protected area system.

There has been relatively little quantitative analysis of the value of Namibia's protected area system, mostly due to a lack of primary data. Visitor exit surveys have not specifically investigated the role of protected areas, and visitor data for parks have not been computerised or collated by the Directorate of Parks and Wildlife Management (DPWM).

This study relies on data from Namibian Wildlife Resorts (NWR), a parastatal that runs the tourist accommodations in protected areas, from park wardens and from past studies on Etosha National Park in order to estimate visitor numbers and origins. Data on visitor behaviour and expenditure in Namibia are taken from the most recent visitor exit survey (2003), previous surveys conducted in various parks and a survey of park visitors conducted in 2006.

Foreign visitors dominate six parks, with overseas visitors making up more than half of visitors to Etosha and Namib-Naukluft, and almost half of visitors to Waterberg Plateau, and regional plus overseas visitors dominating in /Ai-/Ais, Popa Falls and Khaudum. Domestic visitors make up more than half of visitors to the remaining parks, and more than 75% of visitors to Gross Barmen, West Coast and Von Bach.

The actual numbers of visitors differs dramatically from park to park. Etosha attracts by far the highest number of visitors (approximately 220 000), followed by Cape Cross, Namib-Naukluft, Waterberg and /Ai-/Ais (all 40 – 85 000). All other parks receive under 15 000 visitors per year, with several receiving fewer than 2000 visitors. The numbers of visitors to each of the parks are not strictly additive, since many visitors will have visited more than one park in the same trip. Based on average trip lengths, the total number of visitors to Namibian parks was estimated to be in the order of 180 000 in 2008, of whom 22% were regional and 47% were overseas visitors. Domestic tourists are thus estimated to make up 31% of people that visit parks in a given year.

The above estimates were used as the basis for estimates of total expenditure by protected area tourists. Based on recent estimates of average trip expenditure in Namibia by domestic, regional and overseas visitors to protected areas, overall expenditure by wildlife-viewing protected area tourists was estimated to be in the order of N\$2.35 billion. An additional N\$96 million is estimated to be spent by tourists attracted by hunting concessions in protected areas, bringing the total to N\$2.45 billion.

The distribution of this expenditure was estimated on the basis of visitor exit survey data, which suggests that 36% of overall expenditure is on accommodation, the rest being on a variety of industries such as restaurants, car rentals, and shopping. While standard linkage and multiplier effects might apply to most of these, the accommodation establishments used by protected area tourists may not reflect the distribution of types of accommodation establishments in the country as a whole, however. About N\$74 million is spent on accommodation in parks. Many protected area tourists stay in accommodation establishments around parks and visit the parks as day visitors. The distribution of accommodation expenditure among different types of accommodation establishments was estimated on the basis of the establishments found in close association with parks and the levels of occupancy expected from day visitors to parks. Expenditure in these establishments was estimated to be roughly N\$375 million. Remaining accommodation

expenditure (N\$398 million) was assumed to reflect the range of accommodation offered in the rest of the country.

The overall expenditure by tourists generates direct value added to the Namibian economy (~ contribution to GDP by the protected area tourism sector). This is the income generated in the tourism sector as a result of this expenditure. In addition, businesses in this sector spend money on the purchase of intermediate goods and services, which stimulates production in other sectors. This is the indirect value added to the Namibian economy, which contributes to the total value added. Direct value added by tourism expenditure on accommodation was estimated by constructing generalised enterprise models of the different types of establishments. This and the distribution of their intermediate expenditure was used to modify the 2004 Namibian Social Accounting Matrix to create a protected area tourism sector, in order to calculate multipliers and total value added. The results are summarised in Table I. The *direct* contribution to GDP was estimated to be N\$1113 million, roughly 2.1% of GDP in 2008. The total contribution to GDP was estimated to be N\$2048 million, or 3.8% of GDP.

About 13 and 16% of the total income generated by protected area tourism goes to skilled and unskilled labour, respectively, and a further 4% goes to communal households. Less than 1% represents income to communal land areas in the form of rents and royalties associated with conservancies.

Other values generated by the protected area system

In addition to the direct non-consumptive and consumptive use tourism values described above, protected areas provide other direct use value in the form of game harvesting for live sales. These are sold to private enterprises, supply game to neighbouring conservancies through translocation programmes and provide game meat to drought relief programmes.

Indirect use values are generated by outputs from the protected area system that form inputs into production by other sectors of the economy, or that contribute to net economic outputs elsewhere by saving on costs. Ecosystems potentially provide a wide range of such services. For example Namibia's protected areas may contribute to some extent to carbon sequestration, water supply and regulation and provide refugia for species which are valued elsewhere. However, these values have not been quantified in physical or monetary terms.

Non-use values include option and existence value. Option value is the value of retaining the option to use resources in future, and is often associated with genetic diversity of protected areas, the future potential value of which is unknown. Existence value is the value that society derives from knowing that the biodiversity in protected areas is protected. These values are measurable to an extent and are often shown to be much larger than direct use values. Some partial estimates of these values have been made for Namibia. Namibian tourists have been shown to be willing to pay a total of N\$28.7 million. International

willingness to pay is also reflected in donor contributions to the wildlife sector, which amounted to some N\$54 million in 2003/4/

Is increased investment in the protected area system economically justifiable?

Although the protected area system can be shown to generate significant benefits to society, it is important to evaluate these benefits in the light of the costs that they incur. These costs include the annual development and management costs incurred by government, tourism costs incurred by Namibian Wildlife Resorts, indirect costs to surrounding areas, and the opportunity costs maintaining the protected area estate for conservation. The DPWM budget has varied considerably over the last decade, but increased markedly to almost N\$300 million in 2007/8, of which about N\$82 million was allocated to the protected areas programme. In addition to this, budgeted operating costs for tourism enterprises within the parks were in the order of N\$152 million prior to the recently-introduced injection of funds associated with its Turnaround Strategy. Indirect and opportunity costs have not been estimated for Namibia's protected areas, but are assumed to be relatively small in comparison to the above costs. The costs of the protected area system are clearly outweighed by the economic benefits described above.

Even if the current costs are justifiable, the protected area system is not adequately meeting its conservation objectives, and could provide greater benefits if better managed. A vision for the protected area system and the institutional structure and support required to facilitate the effective implementation of this vision was developed in 2005. Here we address the question as to whether the increased investment required for this vision would be economically justified, by means of a cost-benefit analysis.

The costs of a more efficient protected area system were estimated using a spreadsheet model which generates a staff structure and annual recurrent expenditure budget for parks based on factors such as park size and priority issues. The high-level institutional structure suggested in Subproject 2 was applied. This entails the DPWM being divided into three directorates, each governing conservation activities in different parts of the country: (1) the North West (incorporating Etosha and Skeleton Coast), (2) The North-East, and (3) the South-Central Region. It is estimated that the effective management of this system would require some 1500 staff, of which 438 are in tourism-related activities. An annual recurrent expenditure of N\$157.3 million would be required for conservation management. These costs are low in comparison to park management in South Africa.

In addition to annual operating expenditures, the development of Namibia's protected area system is estimated to have a total capital cost requirement of about N\$541 million.

These investments would be expected to improve management and facilities in the parks, probably resulting in improved biodiversity and a better tourism product overall. The main benefits are expected to be generated through the development of up to 77 concession

areas within the parks. Increased investments in the parks alone (excluding NWR investments) are estimated to generate a return of 42%. The total investment in parks and NWR yields a rate of return of 37%. Thus investment in the parks system, along the lines of the parks development vision, will be economically very efficient.

If Namibia is to meet its stated Vision 20/30 and national development plan targets in tourism and conservation, these investments will be essential.

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1 INTRODUCTION

Namibia's national protected area system, managed by the Directorate of Parks and Wildlife Management (DPWM), provides the core protection for its biodiversity. Forest reserves, private game reserves and communal wildlife conservancies also play an important role in extending the conservation of populations and habitats, and maintaining ecosystem processes through providing buffer and corridor areas.

Although the protected area system has significant economic value from the direct and indirect income it generates through tourism and wildlife industries, its management is heavily dependent on a limited budgetary appropriation which has been far from sufficient. Shortages of funds have left the protected area system struggling to meet its conservation objectives, and until recently, there has been little investment in the protected area system. This situation arose at least partly because of a failure to recognise the current and potential economic value of protected areas.

In 2004, the Government of Namibia, through the Ministry of Environment and Tourism (MET) secured funding from the United Nations Development Programme (UNDP)/Global Environment Facility (GEF) for a project on Strengthening the Protected Areas Network (SPAN). The project aims to safeguard biodiversity conservation and enhance the contribution of protected areas to Namibia's development process. Three studies were commissioned under the grant to assist in the preparation of the SPAN Project Document:

1. An economic and financial study (Turpie *et al.* 2004);
2. An institutional and human capacity assessment (Booth *et al.* 2005);
and
3. A needs assessment from a biodiversity conservation perspective (Brown *et al.* 2005).

More recent data on park visits, park related tourist trips, trip expenditures, and willingness to pay for park tourism and park entry were obtained in a survey of some 400 park tourists conducted by SIAPAC (2006). The results of the survey enabled a revision of the first valuation of the parks system to reflect conditions in 2008. It also enabled revision and expansion of the cost-benefit analysis undertaken in 2004 for the parks development vision.

The Turpie *et al.* 2004 report has been updated in two parts: (a) the economic value of the protected area system and implications of increased investment (this report) and (b) a financing plan for the protected area system (Barnes *et al.* 2009).

2 BACKGROUND: WILDLIFE AND TOURISM IN NAMIBIA

2.1 INTRODUCTION

Namibia's economy is largely based on the natural resource-based sectors such as mining, fisheries and agriculture, which alone account for approximately 30% of Gross Domestic Product (GDP) and 85% of exports (Lange 2003). In 2008, primary industries contributed N\$17.75 million (24.4%) of the total GDP of N\$72.9 billion (National Accounts 2008).

It has been recognised for some time that the economy requires increased diversification and structural change away from its dependence on a few key sectors, such as mining and the government, in order to achieve truly sustainable growth (Richardson 1998; Lange 2003). This is particularly important due to the apparent long term decline, lack of potential for sustained growth and unpredictability associated with these sectors (Lange 2003). Furthermore, the dependence of the economy on sectors based on the extractive use of mineral resources has been identified as a potential driver for increased environmental degradation (Richardson 1998). This has led to initiatives to assess the importance and potential of Namibia's natural resources, including new resources and alternative uses of resources, to contribute to sustainable growth and development in the country (Ashley & Barnes 1996; Lange 2003).

Although not a traditionally recognised 'sector' of the economy, recent work has highlighted tourism as being one of Namibia's most important industries, much of this being dependent on wildlife, as is discussed in the following sections. Indeed, purchases of services by foreign tourists were estimated to make up 24.4% of the total value of exports of goods and services (National Accounts 2003).

The tourism sector, in turn, is highly dependent on natural resources, with up to 70% of total tourism expenditure having been attributed to nature-based tourism. Protected areas form an integral part of the package of attractions for tourists visiting Namibia. This chapter provides the context for aspects of the valuation of protected areas by describing

- the wildlife resources that support the tourism industry,
- the overall demand for general and nature-based tourism,

- the industry that has emerged from this, and
- the overall value of tourism and nature-based tourism in Namibia.

2.2 WILDLIFE RESOURCES AND CONSERVATION IN NAMIBIA

Wildlife use is widespread in Namibia, and an integral part of the Namibian economy (Ashley & Barnes 1996). The development and value of the nature-based tourism and wildlife sectors has been the subject of a variety of studies on private and communal lands with relatively little work done within protected areas, though values identified within the latter regions would undoubtedly be applicable (Ashley, Barnes & Healy 1994; Barnes 1995a, b; Barnes & De Jager 1995; Ashley 1996; Ashley & Barnes 1996; Richardson 1998; Barnes *et al.* 2002; Barnes & Humavindu 2003; Humavindu & Barnes 2003; Bandyopadhyay *et al.* 2004). These studies have focused primarily on assessing the financial and economic values of the sector, particularly as a competitive land use option in various areas of Namibia. Indeed, wildlife use has been shown to be a favourable land use option in some areas and under certain conditions, such as in mixed game-livestock models (Barnes 1995a, b; Barnes & De Jager 1995; Barnes & Humavindu 2003). This competitive advantage in conjunction with favourable government policies is attributed with promoting the development of numerous nature-based tourism enterprises, particularly those based on wildlife, and an associated increase in the diversity and numbers of larger wildlife species outside of protected areas (Barnes & De Jager 1995; Humavindu & Barnes 2003).

2.2.1 Ownership and control of resources

Freehold land, which is primarily private but includes some property owned by various authorities linked to the state, makes up 46% of Namibia's area, followed by communal land (36%) and state-owned land (18%) (Figure 2.1). The majority of state-owned land corresponds to potential and existing officially designated protected areas (see Figure 2.2 for protected areas). The majority of communal land is located in the northern areas of the country.

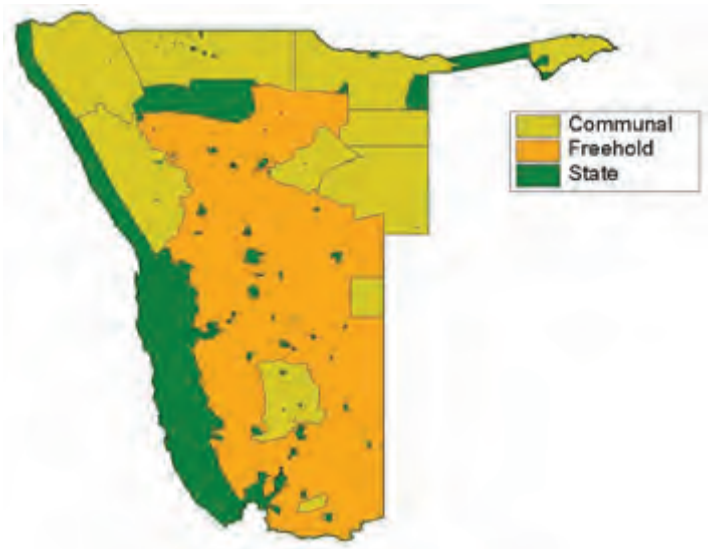


FIGURE 2.1. ALLOCATION OF LAND IN NAMIBIA IN 2002. BASED ON MET (2002).

2.2.2 The protected area system

Approximately 17% of Namibia is formally protected within 22 national parks, game reserves and recreational areas (Mendelsohn *et al.* 2003, updated). The majority of protected land is located along the coast, which is almost entirely under protection. Other large areas proclaimed at the northern and southern extremes of the country (Figure 2.2).

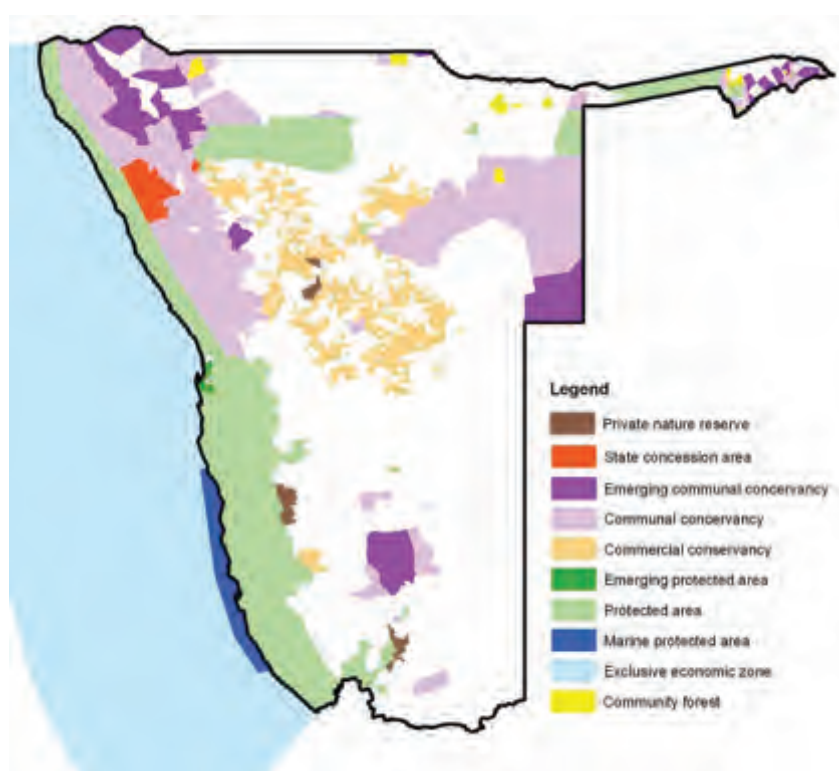


FIGURE 2.2. THE DISTRIBUTION OF EXISTING AND PROPOSED PROTECTED AREAS AND PRIVATE AND COMMUNAL CONSERVANCIES AND OTHER CONSERVED AREA IN NAMIBIA.

Namibia's protected areas can be classified into four main categories (*sensu* Krug *et al.* 2004) based on the attractions and infrastructure on offer and accessibility based on distance from the capital, Windhoek (Table 2.1). The desert and developed wildlife parks represent the most important parks in terms of attracting visitors (SIAPAC 2003; see also Figure 2.8). Etosha is Namibia's flagship protected area, and the primary attraction for visitors. It hosts the big five and numerous other biodiversity attractions. Yet the tourist zone covers only 12-15% of the park area. Only a fraction of the tourists that visit Etosha go to the restricted western zone (37% of the park), which is accessible to registered tour companies (Mendelsohn *et al.* 2000). The salt pan

covers 23% of the park, and the remaining 18% is out of reach of the existing road network (Krug 2003). There is thus considerable development potential in this and other parks.

TABLE 2.1. TABLE SHOWING DESIGNATED PROTECTED AREAS AND RECREATIONAL SITES IN NAMIBIA AND THEIR CHARACTERISTICS. BASED ON KRUG ET AL. (2002).

Protected area	Big game viewing	Area km ²	Distance from capital (km)
Desert Parks			
Namib-Naukluft Park (incl. Sossusvlei/Sesriem)		49 768	300
Skeleton Coast Park		16 390	580
National West Coast Recreational Area		7 800	
National Diamond Coast Recreational Area			
Sperrgebiet		25 240	
/Ai-/Ais Hot Springs (Fish River Canyon & Hobas)		461	630
Huns Mountains		3 000	
Developed Wildlife Parks			
Etosha National Park	X	22 270	530
Waterberg Plateau Park	X	405	250
Less Developed Wildlife Parks			
Mamili National Park	X	320	>1200
Mudumu National Park	X	1 010	>1200
Caprivi Game Park	X	6 000	>1000
Mahango Game Reserve	X	225	950
Khaudum Game Reserve	X	3 842	700
Mangetti Game Reserve		480	700
Small reserves, resorts and recreational sites			
Popa Game Park		0.25	>1200
Hardap Recreation Resort		252	260
Daan Viljoen Game Park		40	20
Von Bach Recreation Reserve		43	60
Gross Barmen Hot Springs		1	
Naute Recreation Resort		225	
South West Nature Park		0.04	
Cape Cross Seal Reserve		60	500

All protected areas are managed by the Directorate of Parks and Wildlife Management (DPWM) within the Ministry of Environment and Tourism (MET). Since 1999, the resorts within the protected area system have been managed by Namibia Wildlife Resorts Limited (NWR), a parastatal company. In addition, NWR was entrusted to collect entry fees for the parks until the end of March 2004.

The protected area system provides an important core to a greater system of conservation areas which are both ecologically and economically linked. The parks are supplemented by a cluster of adjoining conservancies and similar privately protected areas on private and communal lands which add a further 17% of the total Namibian land surface to the conservation estate. The majority of this additional land (62%) occurs as registered or developing conservancies on communal lands. The remainder is on freehold land (33%) or classified as "forest conservancy" (4%). This pattern of conserved lands surrounding designated protected areas suggests that protected areas may have value in acting as regional magnets for development of private and communal nature-

based tourism and wildlife enterprises (Ashley & Barnes 1996). Protected areas are considered important for increasing the value of lands outside and adjacent to them by offering attractions which complement and build on those available in private and communally managed tourism enterprises (Barnes 1995b). One example is that protected areas are able to offer high-value wildlife species such as elephant which are not available outside their borders (Humavindu & Barnes 2003).

Nevertheless, the current system of protected areas is considered to be a legacy of ideological, sociological and veterinary factors with little consideration of biodiversity conservation requirements (Barnard *et al.* 1998). As a result, its ability to conserve a representative set of Namibian diversity has been described as seriously inadequate (Barnard *et al.* 1998). The proposed improvement of the protected area system is discussed in detail in Brown *et al.* (2005).

2.2.3 Wildlife use and conservancies on private lands

Over 90% of Namibia's large mammals occur outside protected areas, with some 80% in privately owned commercial agricultural lands, including the largest cheetah population in Africa (Barnes 1995b; Richardson 1998). The large game populations that occur naturally within private lands contribute to their economic competitiveness by reducing the need for investment in stock (Richardson 1998; Barnes *et al.* 2002). Landowners were granted rights to the wildlife on their lands in 1967. Since then, numbers of large mammals are estimated to have increased by some 70% and species diversity by 44% (Barnes & de Jager 1996, Krug 2003). Over this period, the economic contribution of wildlife increased from 5% to 11% of the total economic value of privately owned rangelands (Barnes & De Jager 1995). An increase in the diversity of non-indigenous species has been attributed to the desire for private enterprises to increase value for hunting and game viewing (Barnes & De Jager 1995).

About 75% of farmers hunt wildlife for own consumption, and 15-25% of private farmland is used for commercial game production (ranching, hunting, live game capture and wildlife viewing), often in combination with domestic livestock. There are about 400 registered commercial hunting farms, ranging from 3000 – 10 000 ha (MET 2000). About 80 000 wild animals were hunted in 1990, of which kudu, oryx and springbok accounted for almost 90% (Krug 1996). Of this, 19% was by farmers and farm employees, 26% was for biltong, 9% was safari hunting, 8% was shoot and sell and 38% was culled for the meat market (Krug 1996). By 1996, total offtake was estimated to be around 100 000 animals per year (Ashley & Barnes 1996).

Wildlife viewing also occurs on private lands to an increasing extent. Private nature reserves compete with public protected area systems by offering upmarket accommodation and high quality service. Namibia had 148 registered private nature reserves in 2000, covering over 760 000 ha (MET 2000). This also includes mixed ranches. One of the largest private nature reserves is the 175 000 ha Namibrand Nature Reserve, which contains five exclusive concessions to tour operators who pay 10-15% of their turnover to the reserve (Krug 2003). The set carrying capacity is one tourist bed per 2000 ha. The reserve has been a shining example in terms of its economic success.

Overall the amount of private lands under wildlife is growing, and the establishment of private conservancies is encouraged in Namibia, through official recognition. Conservancies and private nature reserves may not carry the same level of protection as formally protected areas but they certainly add to the genetic and ecological strength of the protected area system.

2.2.4 Wildlife use and conservancies on communal lands

Natural resource use has always been an integral part of the use of communal land areas, and has been shown to make an important contribution to local livelihoods. For example, wild foods contribute around a third of total household consumption in some areas of Namibia, with regions in the northern areas being most dependent on these resources (Richardson 1998). This dependence on wild foods is believed to contribute to the resilience of local communities adapted to variable environmental conditions in Namibia by diversifying risk (Ashley 1996). In general, the most valuable products are non-game food products, particularly beverages and fresh fish which account for around two-thirds of the value of all non-agricultural natural resource use values (Richardson 1998). Tools, such as baskets, pounding sticks and brushes, contributed 13% of value, followed by fuelwood with 0.26% (Richardson 1998). Game make up about 15% of the value on average. However, wild game make up as much as 50-80% of the total value of all wild products used in four regions: Karas, Omaheke, Otjondjupa and Hardap (Richardson 1998).

This use of wildlife on communal areas has historically been primarily for subsistence use. However, new legislation enacted in 1996 provided the opportunity for communities on communal lands to tap into the growing tourism market by setting up conservancies. A registered conservancy acquires the right for conditional ownership and use of game, including for trophy hunting, local consumption, cropping for meat sales or capture for live sales. They also provide opportunities for establishing community-based tourism

enterprises and entering into joint venture agreements with private sector entrepreneurs (NACSO 2004). This provided an incentive for sustainable wildlife management on communal lands and has not only reversed trends of degradation, but has led to dramatic recoveries of wildlife in certain areas. There are now a total of 59 registered conservancies of which some 42 are immediately adjacent to protected areas or in the corridors between them. Conservancies in communal lands now cover some 12 million ha, and contain approximately 190 000 people, of whom over 70 000 are registered members (NACSO 2004). At the end of 2008, conservancies employed some 450 staff. In addition, there are now at least 20 joint venture agreements for private tourism and trophy-hunting ventures in these conservancies, which employ some 716 staff and involve some 114 beds.

2.3 THE TOURISM SECTOR

2.3.1 Numbers of tourists

The tourism industry in Namibia is widely viewed as having major potential for economic growth and development, with international arrivals having grown steadily over the past decade and a half to over 900 000 in 2007 (Figure 2.3), with an average growth rate of some 15% per annum over this period. This growth is reflected in the growth in output of the tourism industry, which averaged 14% per annum between 1991 and 1996, significantly higher than growth rates in other areas of the economy during the same period (Suich 2001). Tourism arrivals dipped in the period following the “9/11” attacks on the USA in 2001, resulting in effectively no growth from 2000 to 2005, but growth has since resumed at its former pace (Figure 2.3).

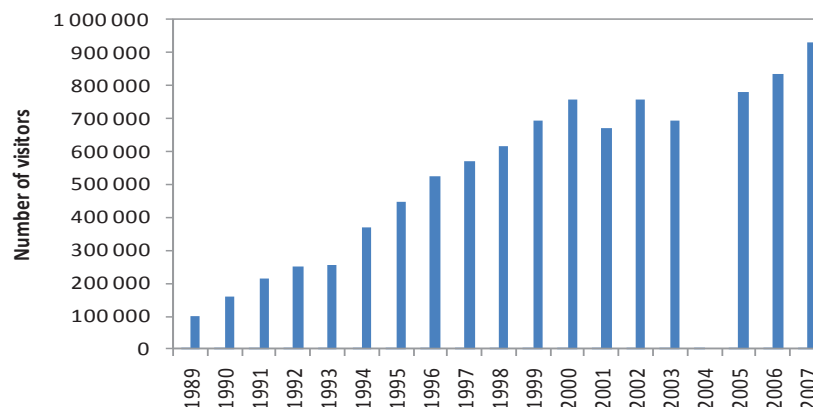


FIGURE 2.3. TRENDS IN TOTAL INTERNATIONAL ARRIVALS TO NAMIBIA BETWEEN 1989 AND 2003. 1989-1990 DATA ARE ESTIMATED NON-DOMESTIC STAY-OVER ARRIVALS BASED ON SCHALKWYK (1992) CITED IN WEAVER & ELLIOTT (1996); 1991-2000 DATA ARE DIRECTORATE OF TOURISM DATA IN KRUG *ET AL.* (2002), 2001-3 DATA FROM MET (2004), 2005-7 DATA FROM NTB.

2.3.2 Origins and profile of visitors

Some 74% of visitors to Namibia in 2008 came from within Africa, mainly from Angola and South Africa (Figure 2.4). Germans dominate the overseas visitors. The main purpose for visits to Namibia is for holiday (60%), followed by business (27%) and visiting family or friends (13%) (SIAPAC 2003). The majority of visitors from non-African countries stated “holiday” as their main reason for visiting. More than half of all visitors have been to Namibia before (54%), this figure being slightly lower for holidaymakers (47%) (SIAPAC 2003).

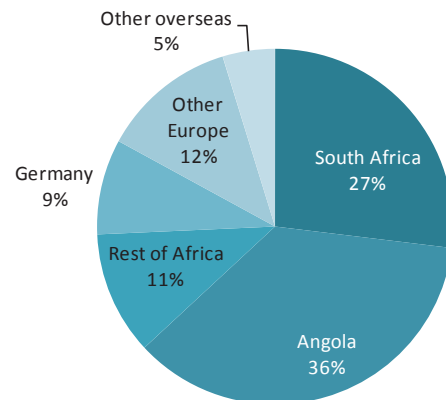


FIGURE 2.4. COUNTRIES OF RESIDENCE FOR ALL VISITORS TO NAMIBIA IN 2002. BASED ON SIAPAC (2003).

2.3.3 Trip characteristics

The average group size for visitors ranges from 2.9 for holidaymakers to 2.1 for business visitors in 2002 (SIAPAC 2003). Average group sizes are higher for German (3.3) and other European (3.5) visitors. Some 1% of visitors are in groups of 17 or more (SIAPAC 2003). The majority of all visitors (72%) and holidaymakers (68%) do not visit other countries in the region during their whole trip, but this is attributed to the large number of South Africans sampled. The majority of visitors from Germany (43%) and the United Kingdom (51%) visit at least one other country during their trip.

Holidaymakers spend an average of 12.4 nights in the country, slightly more than business visitors (8.8) and those visiting family and friends (9.1). Non-African groups undertake longer trips of between 9 to 14 nights, as opposed to the median of 6 nights spent by African visitors (SIAPAC 2003). Hunting visitors spend an average of 4.2 days on hunting trips (Humavindu & Barnes 2003).

2.3.4 Tourism contribution to GDP

Tourism Satellite Accounts (TSA) are a relatively standardised method of national accounting for tourism developed by the United Nations (UN) and World Tourism Organisation (WTO) in conjunction with others organisations (Eurostat/OECD/WTO/UN 2001). This approach to assessing the economic

impact and value of the tourism sector is being widely adopted in the southern African region and will form the basis for future monitoring and assessment (Poonyth *et al.* 2001a,b). According to Namibia's Tourism Satellite Accounts for 2006, tourism directly contributed 3.9% of GDP and its direct plus indirect contribution amounted to 14.2% of GDP. In addition, tourism accounted directly for 5.1% of employment in Namibia, half of which was in the accommodation sector.

2.3.5 Types and distribution of businesses

In a survey of the tourism industry, over 2200 tourism-related businesses were identified, of which 300 were subjected to intensive surveys (Stubenrauch Planning Consultants 2004). The majority (67%) of tourism-related businesses are in the accommodation sector, with tour operators making up 12% and restaurants 10%. Within the accommodation sector, 60% of accommodation establishments are some kind of hunting farm, guest farm or lodge (Figure 2.5). Nearly 70% of all businesses are located within only 3 regions: Khomas (32%), Erongo (20%) and Otjondupa (17%), effectively clustering within the centre of the country (Figure 2.6). These first 2 regions are also the main source of tour and travel operators, car hire companies and other tourism-based businesses. In contrast, fewer than 8% of all businesses are found in the northern regions (Caprivi, Kavango, Oshana and Oshikoto) combined.

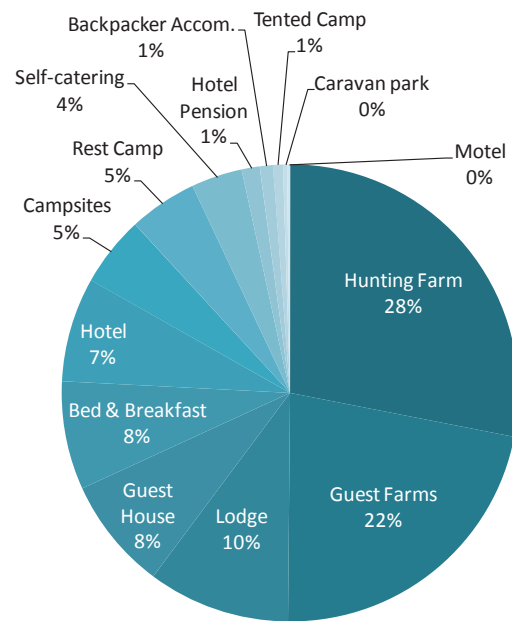


FIGURE 2.5. PROPORTION OF ACCOMMODATION BUSINESSES OF DIFFERENT TYPES IN NAMIBIA. BASED ON STUBENRAUCH PLANNING CONSULTANTS (2004).

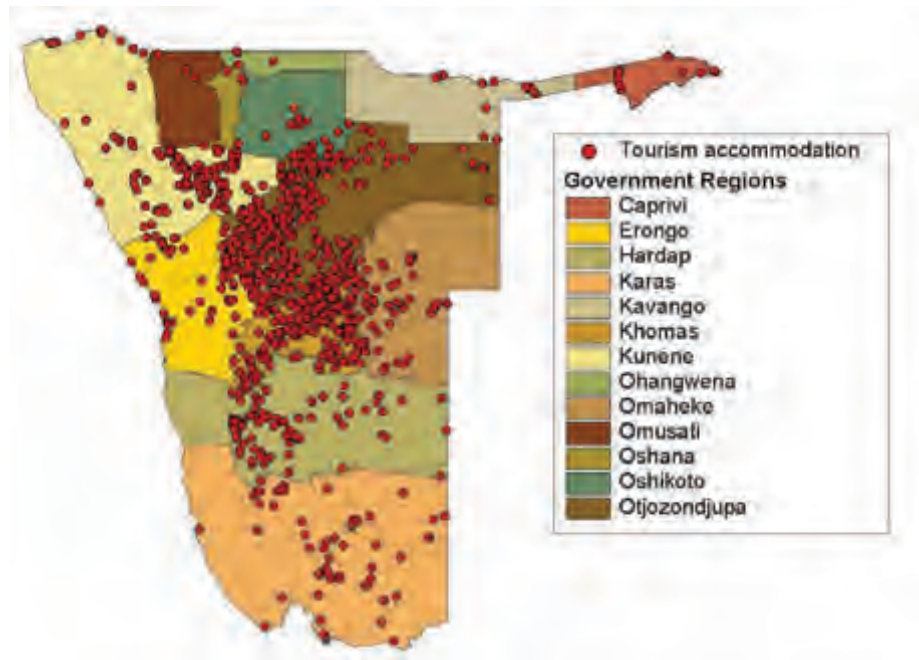


FIGURE 2.6. DISTRIBUTION OF KNOWN TOURISM ESTABLISHMENTS IN NAMIBIA BASED ON VARIOUS SOURCES COMPILED BY MET, IN RELATION TO THE GOVERNMENT REGIONS OF NAMIBIA.

2.4 THE IMPORTANCE OF NATURE-BASED TOURISM

2.4.1 The contribution of nature attractions to visitor activities

Nature-based tourism can be defined as: *“Tourism that involves travelling to relatively undisturbed natural areas with the specific objective of studying, admiring and enjoying the scenery, fauna and flora, either directly or in conjunction with activities such as trekking, canoeing, mountain biking, hunting and fishing”* (adapted from Krug 2003)

Nature-based tourism activities are the top stated reasons for visitors coming to Namibia (1997: game viewing - 73% and bird-watching - 62%; 2003: nature and landscape touring - 51%; game viewing - 45%; MET 1997, SIAPAC 2003). These are also the most commonly named leisure activities after shopping (Figure 2.7). About 2-4% of visitors are on hunting trips (see Figure 2.7), and about 9% engage in fishing (SIAPAC 2003). Nature-based tourism activities were also rated by respondents as the most important leisure activities they took part in (nature/landscape touring: 32%; game viewing: 26%), followed by shopping (11%) and fishing (8%). Hunting was rated as most important by only 4% of respondents (SIAPAC 2003).

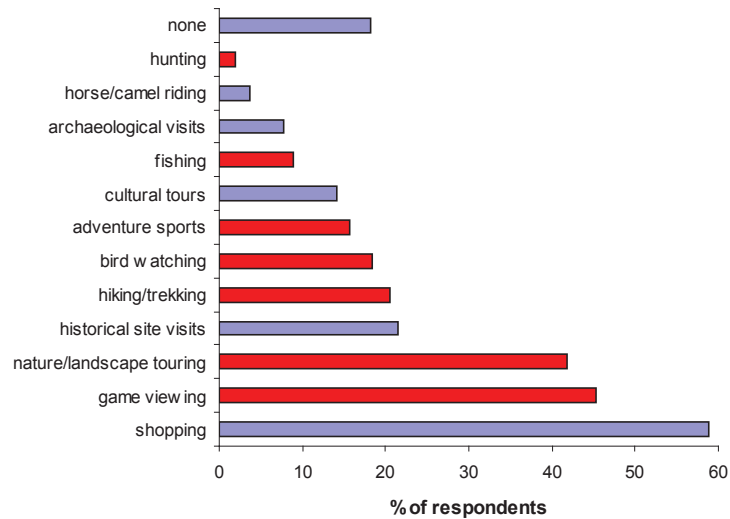


FIGURE 2.7. LEISURE ACTIVITIES UNDERTAKEN BY SURVEYED VISITORS. RED BARS INDICATE NATURE-BASED TOURISM ACTIVITIES. BASED ON SIAPAC (2003).

In terms of attractions, natural areas, on communal or private land, and designated protected areas made up half of the locations which attracted 10% or more of surveyed visitors, the remainder being towns and cities (SIAPAC 2003) (Figure 2.8). Nine of the locations correspond to areas falling inside protected areas. These patterns were confirmed by SIAPAC (2007).

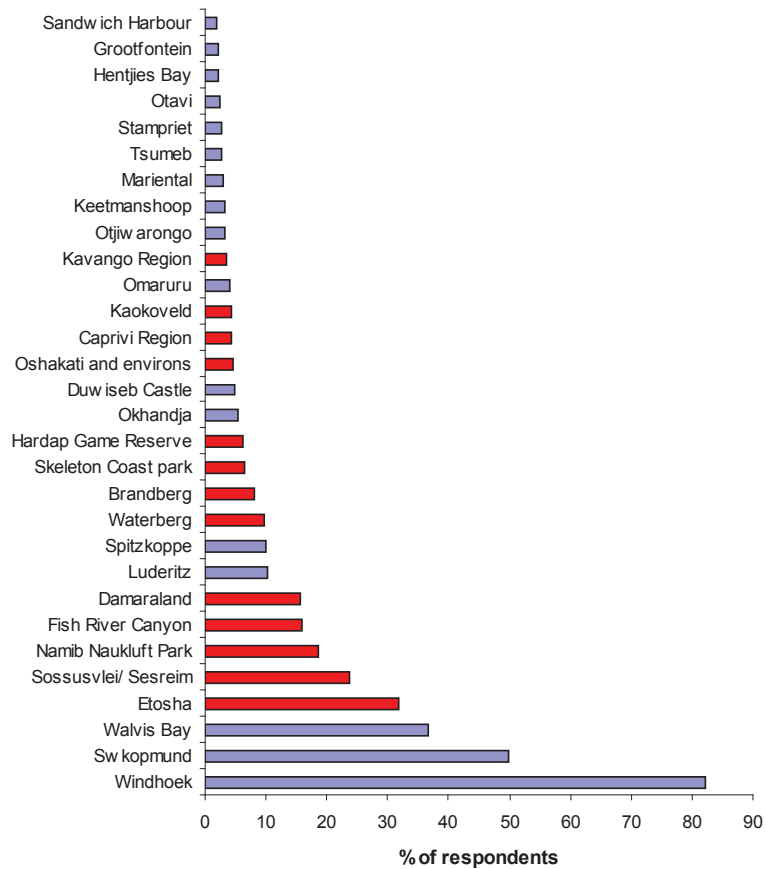


FIGURE 2.8. PERCENTAGE OF VISITORS VISITING VARIOUS LOCATIONS IN NAMIBIA. RED BARS INDICATE DESIGNATED PROTECTED AREAS AND OTHER NATURAL REGIONS. BASED ON SIAPAC (2003).

2.4.2 Value derived from nature-based tourism

The nature-based segment of the tourism market has been difficult to isolate from overall tourism within Namibia but is likely to be a large part of the market. Expenditure in this segment of the market has been estimated to contribute 65% of all holiday expenditures (Hoff & Overgaard 1993 cited in Richardson 1998; Krug *et al.* 2004). Humavindu & Barnes (2003) estimate the contribution of nature-based tourism to the tourism sector as 75%. The importance of nature-based tourism in the accommodation segment of the tourism industry, namely hunting lodges, guest farms and lodges, in terms of number of businesses (60%) and levels of employment in the industry (67%, including rest camps) is particularly high (Stubenrauch Planning Consultants 2003) (see Figure 2.5). The labour-intensive nature of nature-based tourism enterprises has been identified as one of the key factors contributing to their economic advantage over traditional livestock farming models in Namibia (Barnes & De Jager 1995).

The direct economic use values associated with wildlife-viewing tourism in 1995 were estimated by Barnes *et al.* (1997) to be in the region of N\$398 million per annum (US\$108m). About 40% of this value is consumer surplus. After subtracting foreigners' consumer surplus and an adjustment for foreign exchange, the total value accruing to Namibia was estimated to be N\$280.3m, of which N\$30.3 million was Namibian tourists' consumer surplus.

Wildlife use was estimated to contribute US\$78 million (N\$335 million) to the Namibian economy in 1995 (Barnes & Ashley 1996; Table 2.2). Protected areas were then estimated to be worth N\$245 million in terms of all wildlife use.

TABLE 2.2. ESTIMATED NET VALUE ADDED TO NATIONAL INCOME FROM WILDLIFE-RELATED ACTIVITIES (US\$ '000, 1996)

	Protected areas	Communal land	Private land	Total
Tourism activities				
Wildlife viewing	53 181	1 376	3 221	57 778
Trophy/safari hunting	215	681	3 655	4 551
Recreational hunting	0	0	2 229	2 229
Shore and river angling	3 391	91	0	3 482
Non-tourism activities				
Venison production	0	24	1 299	1 323
Live game sales	138	46	378	562
Own game consumption	0	28	3 978	4 006
Ostrich farming	0	0	3 556	3 556
Crocodile farming	0	0	265	265
Artisanal fisheries	0	344	0	344
Total	56 925	2 590	18 581	78 096
	73%	3%	24%	100%

Source: Barnes & Ashley 1996, cited in Krug 2003.

Since Barnes & Ashley's (1996) study, communal areas have attracted considerably more value from wildlife activities due to directed interventions. Income from community-based natural resource management on communal lands rose from nothing in 1994 to over N\$20 million in 2008 (R. Diggle pers. comm. 2009), of which almost N\$12 million was attributed to conservancies. Tourism related activities account for most of this benefit. Including the income going to the private sector and the linkage and multiplier effects, wildlife use in communal areas was estimated to contribute some N\$53 million directly, and N\$99 million in total, to net national income in 2004, most of which was tourism-related (Barnes et al. 2009). In other words, if the above estimates are accurate, the value of wildlife-related activities could have been doubled by the interventions in communal areas in recent years.

In privately-owned conservation areas, approximately 30% of net income in wildlife enterprises is attributed to non-consumptive tourism while 10-15% is attributable to consumptive uses (Richardson 1998). The remaining value generated by these enterprises is from consumptive uses not related to tourism (Richardson 1998).

The trophy hunting market is a small but significant part of the nature-based tourism industry, contributing around 14% to the value associated with the tourism industry as whole and 18% to nature-based tourism (Humavindu & Barnes 2003). It thus appears that hunting tourism is a high value per capita activity in terms of the relatively small number of visitors engaged in such activities yet who contribute a significant portion to nature-based tourism and tourism value as a whole. Indeed, Stubenrauch Planning Consultants (2004) found that hunting lodges were the most important segment of the accommodation market in terms of numbers of businesses and employment within the accommodation sector. In addition to hunting tourism, recreational fishing is an important activity in Namibia, generating substantial value (Barnes *et al.* 1998, Barnes *et al.* 2000, Zeybrandt 2000, Barnes *et al.* 2009).

Whereas non-consumptive wildlife tourism is considered to have high potential for development and growth in the tourism sector (Barnes 1995b; Richardson 1998), growth in hunting tourism may be limited as existing hunting and fishing quotas may already reflect maximum sustainable yields possible (Richardson 1998). Consumptive use may, however, offer a lucrative complementary activity within private conservation areas and improve economic resilience (Ashley *et al.* 1994; Barnes 1995b; Barnes *et al.* 2002; Barnes *et al.* 2009). Hunting in Namibia, though representing a significant part of tourism income based on a minimal proportion of overall visitors, does offer potential for increased returns through restructuring of hunting and game allocation. Humavindu & Barnes (2003) and Novelli *et al.* (2006) found that though overall

income from hunting was similar in Botswana and Namibia (US\$12.6 and US\$11.5 million respectively), the number of hunting days and game taken were nearly three and four times higher respectively in Namibia. Namibian trophy hunting is thus dominated by hunting of low value species on private lands, whereas Botswana has a larger section of the hunting market based on high value game hunted in public lands (Botswana: 21%; Namibia: 3%). This potential for increased value in the trophy hunting sector through increased use of high value game in public lands has direct implications for the generation of income for protected areas.

It is also likely that the relative importance of consumptive versus non-consumptive tourism would vary from region to region, as was found in a study of the contribution of the value of non-agricultural land uses in four communal areas by Barnes (1995b). Potential for increase in the relative contribution by consumptive tourism value was only found in one area (Bushmanland), while potential for relative increase in non-consumptive tourism existed in all regions studied.

Within protected areas, the main tourism values are associated with non-consumptive wildlife or landscape viewing, with much of this value derived from foreign visitors, although trophy hunting and sales of live animals represent a relatively minor but important contribution to overall values (Ashley *et al.* 1994; Barnes 1995b, Richardson 1998; Humavindu & Barnes 2003, Barnes *et al.* 2009)). These values are further explored in the following chapters.

3 THE TOURISM VALUE OF THE PROTECTED AREA SYSTEM

3.1 INTRODUCTION

The main direct use values associated with the protected area system are derived from tourism activities. In addition to generating expenditure within parks (e.g. through entry and accommodation fees), tourists visiting parks spend money outside parks *en route*, much of which can be attributed to the presence of the parks. This generates value added in the tourism industry. Moreover, all of the tourist expenditure attributed to parks generates further value added for the Namibian economy through linkage and multiplier effects. For example, tourist lodges support other sectors by buying food and equipment.

The degree to which the economy benefits from expenditure by protected area tourists depends on the efficiency with which tourism values can be captured and retained in the economy. The balance of domestic and imported goods and services bought by the suppliers of tourism goods and services will determine the degree to which income is retained by Namibia. Thus it is important to understand the multiplier effects and leakages associated with international and domestic tourism.

Unfortunately, data collected on tourism are often insufficient for the kind of statistical data analysis required to value natural assets such as protected areas. This has certainly been a problem in the past in Namibia. Even basic data such as the numbers of tourists visiting parks are difficult to find, let alone the additional data required to estimate their contribution to the economy as a whole.

In this chapter, we analyse available information from various sources to estimate the numbers of tourists visiting protected areas in Namibia in 2008, their expenditure within parks, and the overall tourism expenditure that can be attributed to parks. We then use a combination of enterprise models and a macro-economic model of the Namibian economy (the preliminary Social Accounting Matrix) to estimate the full impact of this expenditure on the Namibian economy. The analysis is based primarily on the situation in 2008, and all prices, unless otherwise stated, are in 2008 Namibia dollars (N\$).

3.2 ORIGINS AND NUMBERS OF VISITORS TO NAMIBIAN PARKS

The origin of visitors is particularly important since overseas visitors spend more per day and have higher consumer surpluses than Namibian and regional tourists (Stoltz *et al.* 2001), and willingness to pay for also differs significantly between local, regional and overseas tourists (Stoltz 1997, Stoltz *et al.* 2001).

Possibly on the basis of Barnes *et al.* (1997), it is widely asserted that about 30% of Namibia's tourists (e.g. Suich 2001), and 30% of visitors to Namibia's protected areas (e.g. Krug 2003, p. 147) are Namibian residents, the remainder being regional or overseas visitors. One might expect that the increase in foreign tourism will have decreased the percentages of domestic and regional tourists to some extent. Indeed, estimates for Etosha in 2000 suggest that Namibians made up only 20% of visitors (Table 3.1). However, a comparison of several studies suggests that the ratio of visitors from different origins has remained relatively constant, at least for Etosha. The ratios given by Krug (2003) for domestic, regional and overseas tourists to Etosha in 1999 are probably the most robust data available.

TABLE 3.1. COMPARISON OF VISITOR ORIGIN PROPORTIONS FROM VARIOUS DATA SOURCES.

Visitor origins	Domestic	Regional	Overseas
All visitors to PA's and national exit points (1992/93) ¹	30%	48%	22%
Days occupied in Etosha (1997) ²	35%	23%	42%
Visitors in Etosha (1999) ³	37%	16%	47%
Visitors in Etosha (2000) ⁴	20%	14%*	?
Days occupied in PA's (2002) ⁵	29%	28%	43%
Days occupied in PA's (2003) ⁶	35%	18%	47%

¹ Barnes *et al.* (1997); ^{2,3} Krug (2003); ⁴ Söderström (2002); ^{5,6} NWR data for tourists of known origin.

* South Africans only.

Bed-night occupancy data for overnight visitors from Namibian Wildlife Resorts (NWR) suggest that parks such as Etosha are not particularly representative of what happens in the protected area system as a whole (Figure 3.1). Three parks (Etosha, Namib-Naukluft and Waterberg) are dominated by overseas visitors, and /Ai-/Ais, Popa Falls and Khaudum are dominated by foreign visitors, especially regional visitors. The remaining parks for which data were available are dominated by Namibian visitors.

Although visitor origins were only known for about 35% of these bed-nights in the NWR database, the ratios recorded for Etosha were within the range of those recorded by Krug (2003) and Söderström (2002) in their relatively comprehensive analyses of visitor statistics for Etosha National Park. This

suggested that the ratios in the NWR database were sufficiently representative to be used in further analyses.

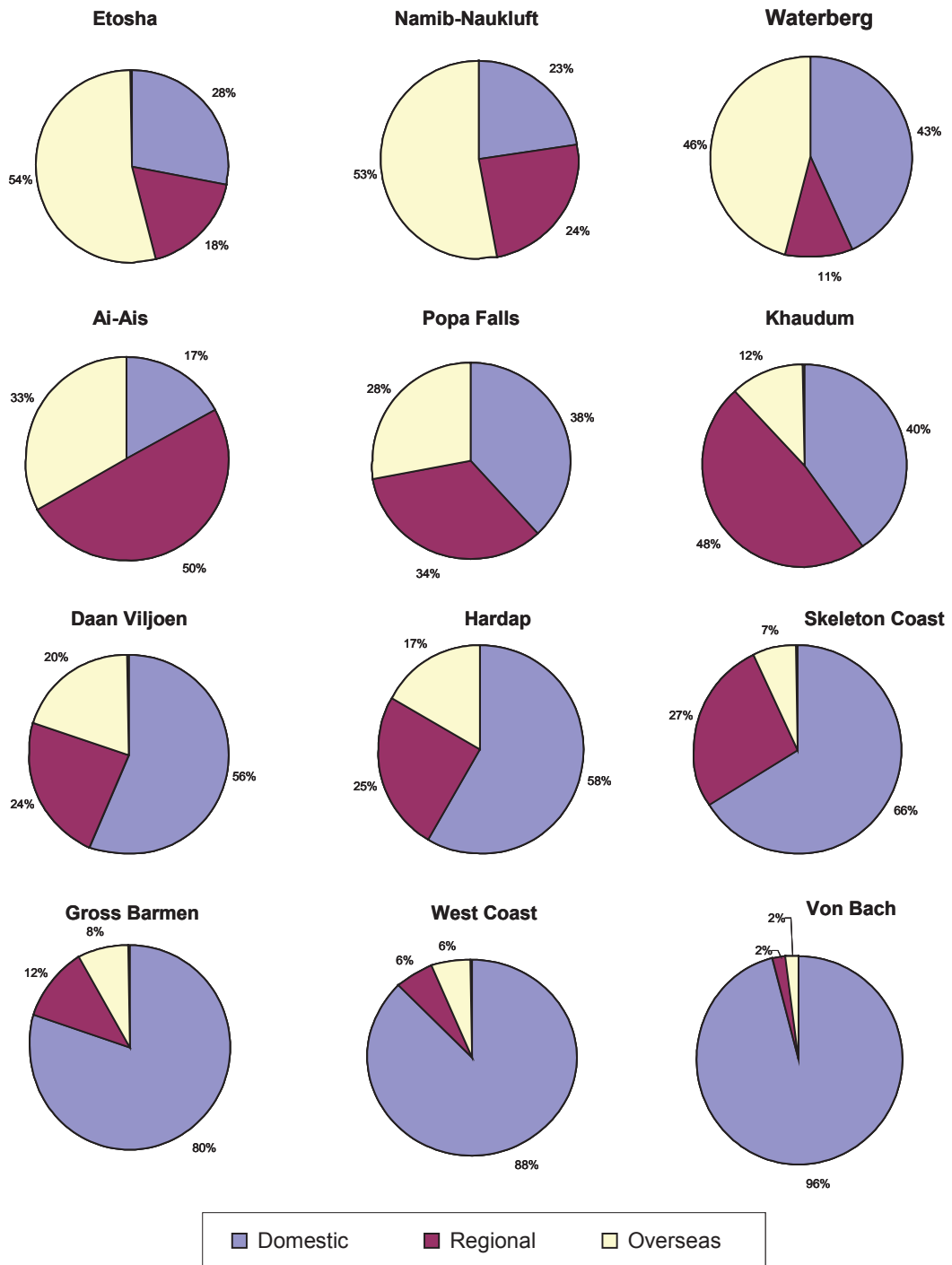


FIGURE 3.1. COMPARISON OF VISITOR ORIGIN PROPORTIONS FOR OVERNIGHT VISITORS IN DIFFERENT PROTECTED AREAS (BASED ON NWR DATA).

Numbers of tourists visiting each of the parks were estimated on the basis of 2003 bed-night occupancy data supplied by NWR. NWR are responsible for all

tourist accommodation within the protected area network. The data covers booked and paid bed nights by all guests at all sites from 1 January to 31 December, excluding cancellations, no shows or otherwise unpaid for bed nights. This analysis only included the 24 different resorts, camping areas or hiking trails within 12 of the country's protected areas, and excluded Duwiseb Castle, Reho Spa and Shark Island resorts which also fall under NWR.

The raw data provided by NWR did not include any information on numbers of day visits or on the total numbers of visitors to the different parks. These numbers were obtained from previous forecast data for the 2004 financial year (NWR 2003). For comparative purposes, Krug (2003) is the only data source which presents estimates of total visitor numbers and day visits in conjunction with bed-night data, in this case for Etosha National Park in 1999. These estimates are updates based on earlier work by Macgregor (1999 cited in Krug 2003). For the remaining protected areas without any NWR accommodation facilities, numbers of visitors were obtained directly from the park wardens and staff who record the data.

Numbers of visitors to the different parks were estimated based on data for Etosha in Krug (2003) and Söderström (2002), and data on average length of stay by overnight visitors (Krug 2003). 2003 data/estimates for all parks were updated to 2008 estimates using information on the growth in overall tourism (WTTC 2006, NTB 2008).

Besides Etosha, parks with relatively large numbers of visitors (40 – 85 000) are Cape Cross, Namib-Naukluft, Waterberg and /Ai-/Ais. All other parks receive under 15 000 visitors per year, with several receiving fewer than 5000 visitors (Table 3.2).

An estimated total of about 918 000 visitor-days were spent in parks. The numbers of visitors to each of the parks are not additive, since many visitors will have visited more than one park during the same trip.

Recognising that many visitors are likely to have visited more than one park, it was necessary to estimate the average number of parks visited per visitor in order to calculate the total number of tourists involved. The visitor exit survey (SIAPAC 2003) suggests that at least 58.3% of foreign visitors had visited at least one national park, based on the proportion of respondents that answered questions about the quality of service in parks. Coincidentally, Hoff & Overgaard (1993) estimated that wildlife-based tourism contributed 60% of the overall tourism market. This estimate, in conjunction with the percentage of respondents that had visited individual protected areas listed in the survey, suggested that foreign visitors that did visit parks visited 2.3 parks on average.

The 2006 survey found that foreign visitors visited a median number of 3 parks in a median number of 1 visit per year (SIAPAC 2007), while the corresponding numbers for Namibians were 3 parks in 2 trips per year. A survey by Turpie *et al.* (2009) also found that foreign visitors visited an average of about 3 parks per trip. These estimates suggest that the total of 180 000 visitors made in the region of 235 000 trips to parks in 2008. Of these 124 000 were foreign visitors (Table 3.3). The estimated composition of visitor was similar to the ratios generally cited for wildlife tourists.

TABLE 3.2. ESTIMATED NUMBER OF VISITORS TO PROTECTED AREAS FOR 2008

Protected area	Bed Nights 2003 ^{1,3}	Over-night visitors 2003/4 ^{2,3}	Inferred nights/visit	Day visitors 2003/4 ^{2,3}	Total visitors	Domestic visitors	SADC visitors	Overseas visitors
/Ai-/Ais *	68 646	35 999	1.9	4 488	40 487	6 883	20 243	13 361
Cape Cross	0	0	0.0	82 967	82 967	19 082	19 912	43 973
Caprivi	0	0	0.0	979	979	391	470	117
Daan Viljoen *	14 956	2 045	7.3	7 050	9 095	5 093	2 183	1 819
Etosha *	383 251	154 157	2.5	65 513	219 670	61 507	39 541	118 622
Gross Barmen *	16 405	5 138	3.2	3 739	8 877	7 102	1 065	710
Hardap *	13 731	3 239	4.2	7 480	10 719	6 003	2 787	1 929
Huns Mtns	-	-	-	-	-	-	-	-
Khaudum *	5 479	2 740	2.0	1 165	3 904	1 562	1 874	469
Mamili	0	0	0.0	268	268	107	129	32
Mahango	0	0	0.0	14 805	14 805	7 403	3 701	3 701
Mangetti	-	-	-	-	-	-	-	-
Mudumu	0	0	0.0	1 657	1 657	464	298	895
Namib-Naukluft *	82 109	75 312	1.5	7 614	82 926	19 073	19 902	43 951
Diamond Coast	-	-	-	-	-	-	-	-
West Coast *	19 954	3 141	6.4	0	3 141	2 073	848	220
Naute	-	-	-	-	-	-	-	-
Popa *	6 603	1 496	4.4	299	1 795	682	610	503
Skeleton Cst *	32 523	2 565	12.7	0	2 565	1 693	692	180
South West	-	-	-	-	-	-	-	-
Sperrgebiet	-	-	-	-	-	-	-	-
Von Bach *	2 073	470	4.4	7 480	7 950	7 632	159	159
Waterberg Plateau *	63 583	44 050	1.4	3 384	47 434	20 397	5 218	21 820

* Parks with NWR resorts

*# NWR data are augmented by data on camping visitors supplied by the manager of the Namib section

¹Raw data for 2003 supplied by NWR; ² NWR 2003 for parks with NWR resorts, else data for 2003 directly from parks; exception for Etosha NP explained in text; ³ 2003 data updated to 2008 estimate using a factor of 1.41 increase in overall tourism (calculated from WTTC 2006 and NTB 2008)

TABLE 3.3. ESTIMATED TOTAL NUMBER OF TRIPS MADE AND PEOPLE THAT VISITED PROTECTED AREAS IN NAMIBIA IN 2008, BASED ON 1.5 AND 3 PARKS PER TRIP, AND 2 AND 1 TRIPS PER YEAR FOR DOMESTIC AND FOREIGN VISITORS, RESPECTIVELY

	Domestic	Regional	Overseas	TOTAL
Number of trips	111 431	39 878	84 153	235 461
Number of visitors	55 715 (31%)	39 878 (22%)	84 153 (47%)	179 746

3.3 OVERALL TOURISM EXPENDITURE ATTRIBUTABLE TO PROTECTED AREAS

Various estimates of trip expenditure by tourists in Namibia have been made in the past, including the relatively recent 2006 and 2009 surveys (Table 3.4). The most recent estimates were then multiplied by the number of tourists of different origins, on a park by park basis, using the ratios in Figure 3.1. Total expenditure by wildlife viewing tourists was estimated to be in the order of N\$2.35 billion (Table 3.5), though this estimate is sensitive to the assumed number of parks visited per year. In addition, the hunting tourism expenditure in Namibia due to existing hunting concessions within the parks was estimated to be N\$96 million, bringing overall expenditure to an estimated N\$2.45 billion.

TABLE 3.4. VARIOUS ESTIMATES OF AVERAGE TRIP EXPENDITURE (N\$ PER PERSON PER TRIP) BY NATURE TOURISTS OF DIFFERENT ORIGINS. ALL VALUES APART FROM THE LAST HAVE BEEN CONVERTED TO 2008 PRICES FOR COMPARISON.

Source	Include International airfare	Domestic	Regional	Overseas
Etosha visitors (1997, n=803) ¹	Yes	1 298	7 781	35 873
Sossusvlei visitors (2000, n=451) ²	Yes	4 675	6 737	24 737
All visitors to national exit points (2002/03, n=2447) ³	No		4 656	12 493
Wildlife viewing tourists to PA's and national exit points (1992/93, n=660) ⁴	No	3 616	4 859	12 251
Wildlife viewing tourists to PA's and adjacent areas (1994/5, n=641) ⁵	No		4 831	11 345
Protected area visitors (2006, n = 400) ⁶ (mean number of days in parentheses)	No	2 056 (7)	7 742 (15)	21 567 (17)
Protected area visitors (2009, n = 394) ⁷	No	1 784	6 288	21 818

^{1,2} Krug (2003); ³ SIAPAC (2003); ⁴ Barnes *et al.* (1997); ⁵ Stoltz (1996); ⁶ SIAPAC 2006. ⁷ Turpie *et al.* 2009

TABLE 3.5. ESTIMATES OF THE TOTAL EXPENDITURE BY WILDLIFE-VIEWING VISITORS TO NAMIBIA'S NATIONAL PARKS (N\$ MILLIONS).

Domestic	Regional	Overseas	TOTAL from wildlife viewing tourism	TOTAL including hunting tourism
229.1	308.7	1 814.9	2 352.8	2 446.0

3.4 DISTRIBUTION OF EXPENDITURE

3.4.1 Distribution among major sectors

Visitors to Namibia spend some 36% of their in-country budgets on accommodation, the remainder being spread among a variety of types of

expenditure (Table 3.6). This spread was assumed to be similar for tourists visiting protected areas (although the percentage allocated to shopping is likely to be a slight overestimate in this case) and is assumed to be similar for domestic and foreign tourists.

TABLE 3.6. ESTIMATED DISTRIBUTION OF EXPENDITURE ON ACCOMMODATION AND OTHER INDUSTRIES BY VISITORS TO PROTECTED AREAS WHILST IN NAMIBIA (N\$ MILLIONS)

	% for all foreign visitors ¹	N\$ millions
Accommodation	36	847.0
Meals and drinks	28	658.8
Car Rental	7	164.7
Domestic Travel	3	70.6
Tour Operators/Guides	4	94.1
Handicrafts	3	70.6
Recreation/Cultural	6	141.2
Shopping	14	329.4
Total expenditure	100	2352.8

¹Siapac 2003

3.4.2 Distribution of expenditure within the accommodation sector

The estimated amount of expenditure on accommodation was in the order of N\$847 million. This is spent in a variety of accommodation establishments inside and outside of protected areas. Without survey data which explicitly address the way in which protected area tourists spend their budgets outside protected areas, the distribution of expenditure had to be estimated based on the most likely pattern. The starting assumption was that much of the expenditure takes place in the accommodation establishments surrounding protected areas. The remaining expenditure is likely to follow patterns of tourists in general. We thus concentrate on examining the proportion of different accommodation types available around protected areas that are likely to be highly dependent on their proximity to protected areas for their business.

Non-hunting, non-urban-associated accommodation establishments within 20km of protected areas were identified using spatial analysis of the most recent and comprehensive database of accommodation establishments within Namibia (MET 2004). The resulting set of establishments was assumed to adequately capture the source of day visitors to protected areas. Average data on beds, rooms, rates and other characteristics for the remaining establishments (n = 103) were obtained from the database and used to determine maximum bed-nights available. Averages were required due to some or all of this information being missing for many of the establishments in the sample. Occupancy rates for these establishments were based on

occupancy rates recorded by NWR and various other studies. Protected areas received an estimated 209 000 day visitors in 2003. Assuming that they stayed in the identified establishments, and based on average prices, this suggests day visitors contributed a total of R375 million to the revenues of neighbouring accommodation establishments. The distribution of this expenditure among different types of establishments was estimated on the basis of the proportion of beds and occupancy.

Visitors to protected areas also spend on accommodation in areas not associated with parks, including in cities. The way in which the remaining expenditure on this was spread among various types of accommodation establishments was estimated on the basis of data in SIAPAC (2003). The overall estimated spread of protected area tourist expenditure on accommodation is summarised in Table 3.7.

TABLE 3.7. ESTIMATED DISTRIBUTION OF EXPENDITURE (N\$ MILLIONS) ON ACCOMMODATION BY VISITORS TO PROTECTED AREAS WHILST IN NAMIBIA

Accommodation type	NWR resorts in parks	Other park-associated accommodation	Rest of Namibia	Total
Campsites	14.0	2.5	52.5	69.0
Campsites (communal areas)		1.0	0.0	1.0
Rest Camps	59.9	17.8	0.0	77.7
Tented Camps		14.1	0.0	14.1
Hunting Camps		0.0	0.0	0.0
Lodges		235.9	77.8	313.7
Lodges (communal areas)		34.9	0.0	34.9
Guest Farms		32.3	36.6	68.9
Self Catering Accommodation		10.2	21.8	31.9
Guest Houses		17.5	104.0	121.5
Hotels		8.6	105.6	114.2
Total	73.8	375	398.4	847.0

3.5 IMPACT ON GROSS NATIONAL INCOME

3.5.1 Introduction

The expenditure by protected area tourists generates income in the economy which would not otherwise exist, and at least some of this is received by poor households. This impact can be estimated to some extent by measuring the income generated directly by tourism activities—wages paid to skilled and unskilled workers, operating surplus to traditional agriculture and commercial

agriculture, rents and royalties on communal land used for tourism, and other returns to capital. However, this only gives part of the overall impact on the national economy since protected area tourism generates income and employment in two ways:

The first source is the *direct* income, or ‘value added to national income’ resulting from the total expenditure generated through the purchase of tourism services, as mentioned above. In other words, value added is different from expenditure and is that part of the expenditure that becomes income generated within the tourist sector. Tourism activities providing services directly to tourists include accommodations, restaurants, transportation services, crafts, recreation and cultural services, other products. For example, Tented Camp accommodations generate \$463 000 of income for every million dollars of output sold to tourists. Of this, skilled and unskilled employees receive \$132 400. This measure is called the direct impact on Gross National Income (GNI).

The second source of income is the *indirect* income that comes about from the demand generated in the rest of the economy by the tourism industry. In order to provide accommodation services to tourists, hotels and lodges must purchase goods and services used as inputs to production, such as food, textiles, petroleum products, thatch for roofing, telecommunications services, etc. Industries supplying these goods and services must, in turn, employ workers and purchase inputs to produce their goods and services. In addition, when people are employed and earn wages, those wages are used to purchase consumption goods, which must be produced, requiring additional employment and generating more income. This indirect effect is sometimes referred to as the “backward linkage” or “upstream linkage” in the supply chain. Thus, even though tourism enterprises may operate in remote areas, they have an impact throughout the entire economy.

The *total* economy-wide impact of tourism is a sum of the direct plus the indirect impacts. The ratio of the total to direct impact (on sectoral output, incomes, employment or any other variable relevant for policy) is called a “multiplier” because it measures how a change (increase or decrease) in one sector’s level of activity will affect the entire economy.

The Social Accounting Matrix (SAM) is an economic tool designed for economic impact analysis. SAMs expand the national accounts in the format of a table that shows the linkages among all components of an economy: production and generation of income, distribution of income, expenditures, savings and investment, and foreign trade. Because SAMs provide detailed information about different types of households—how they receive and spend their income—SAMs are used to analyse the distributional impacts of policy, that is,

the effects on employment, incomes and poverty of different industries and household groups.

There is an extensive literature, based on hundreds of studies, on using SAMs and related input-output models¹ for tourism analysis (UN 1999, Sinclair 1998, Lutz & Aylward 2003). Most studies conduct impact, or multiplier analyses—the direct and indirect impact of tourism on employment, incomes, tax revenues, and balance of payments. But SAMs have also been used for more complex scenario analysis of alternative tourism policy to model the likely outcome of changes in pricing structures, foreign exchange rates, and other factors.

3.5.2 Estimating direct value added

The primary measure of the economic value of the direct use of natural resources is its direct contribution to *national income*. This is the income received by the factors of production (labour and capital), and is the equivalent of national product, which is the ‘value added’ generated in these activities. Value added is the total value of the goods and services produced, less raw materials and other goods and services consumed during the production process.

Value added by tourism expenditure on accommodation was estimated using enterprise models constructed in MS Excel for different types of accommodation enterprises. These were largely based on models that have been constructed for specific existing enterprises, and were adjusted to be more generally applicable where appropriate. Data sources included a variety of published models developed by Barnes and co-workers (e.g. Barnes 1995, Barnes & de Jager 1995, Barnes *et al.* 2002, Barnes & Humavindu 2003, Barnes *et al.* 2009), as well as a set of models recently constructed by Anton Cartwright (DEA, unpublished data). The basis of the different models is described in Table 3.8.

For accommodation types for which no detailed enterprise models have been constructed (guesthouses, including B&Bs, backpackers and hotel pensions, and hotels), value added as a proportion of turnover was estimated on the basis of general macroeconomic models for Namibia (see below). The results are summarised in Table 3.9.

¹ Input-output tables and associated models are roughly equivalent to SAMs without the detailed information about income distribution and household expenditures.

TABLE 3.8. MAIN DATA SOURCES FOR ENTERPRISE MODELS AND/OR CALCULATION OF VALUE ADDED AS A PROPORTION OF TURNOVER.

Accommodation type	Based on
Campsite	Sptizkoppe campsite model (DEA unpublished, 2004) Caprivi campsite model
Restcamp	Based on data from lodge and campsite models
Tented camp	Kunene Lodge model
Lodge	Gondwana Canon model (Barnes & Humavindu 2003) Damaraland Lodge model (DEA unpublished, 2004) Caprivi Lodge model (Barnes unpubl. 1999)
Hunting camp	Torra hunting camp model (DEA unpublished)
Hunting farm	'Hunting farm 1' model (DEA unpublished)
Guest farm	Based on hunting farm model, but with lower tariffs, all year round use
Self-catering	Based on data from lodge and campsite models, same as rest camp model

TABLE 3.9. ESTIMATED TYPICAL BREAKDOWN OF TURNOVER INTO INTERMEDIATE EXPENDITURE, LABOUR COSTS AND GROSS OPERATING SURPLUS (= VALUE ADDED) FOR DIFFERENT TYPES OF ACCOMMODATION ESTABLISHMENTS. CONTRIBUTIONS TO COMMUNAL LAND OWNERS AND THE AVERAGE NUMBER OF JOBS PER UNIT OF TURNOVER ARE ALSO GIVEN.

Accommodation type	Percentage of turnover			
	Intermediate expenditure	Labour costs	Gross operating surplus	Rent/royalties to communal lands¹
Campsite	24.4%	46.2%	29.4%	8.0%
Restcamp	40.0%	29.7%	30.2%	n/a
Tented camp	55.7%	13.2%	31.0%	7.3%
Lodge	55.7%	13.2%	31.0%	7.3%
Hunting camp	31.1%	21.1%	47.8%	15.4%
Hunting farm	41.3%	11.2%	47.5%	n/a
Guest farm	41.3%	11.2%	47.5%	n/a
Self-catering	40.0%	29.7%	30.2%	n/a

¹only applicable where accommodation enterprise is located within a communal land area

3.5.3 A Namibian SAM for Protected Area Tourism

The framework for the Social Accounting Matrix (SAM) was first developed in the 1950s as an extension of the core national accounts in order to integrate economic and social aspects of development (Pyatt & Round, 1985). The SAM began to be more widely used for policy in the 1970s when it became clear that economic development, measured by growth in GDP, could not ensure poverty reduction, and that a tool to monitor income distribution was needed. The SAM is now included as part of the 1993 revision of the System of National Accounts, the framework used by virtually all countries for compiling national accounts (UN, 1993). The SAM is a comprehensive, economy-wide database using a double-entry bookkeeping approach to present the data in a square table format. A Basic SAM was constructed for Namibia for the year 2002 (Lange *et al.* 2004, Lange 2004).

The Basic SAM was modified for the analysis of PA tourism by expanding the number of Accommodations from a single sector (hotels & restaurants) to 7 types of Accommodation and a separate sector for Restaurants. Tourism was also disaggregated to distinguish protected area tourism from all foreign tourism. Finally, an additional category of income—rents and royalties for communal land—was added, in order to better represent the benefits of local communities from PA tourism.

The Protected Area SAM required additional data about tourist expenditures and the production structure of additional types of tourist accommodations used in this study. For tourist expenditure, “shopping” was distributed among Other processed foods (2%), Textile products (10%), Light manufacturing (87%), and Communications (1%). The Basic SAM included only one type of accommodation, which was combined with Restaurants, in the single product/activity category, Hotels & restaurants. This industry, Hotels & restaurants, was split by estimating the input structures for each component. Then input structures for the remaining 6 categories of accommodations identified in this study were estimated using enterprise survey data collected by Anton Cartwright for a study of Community-Based Natural Resources Management.² The input structures provided information on intermediate consumption of goods and services, as well as labour inputs, operating surplus, and rents/royalties paid to communities for use of land in communal areas.

For three types of accommodations, Lodges and Campsites, there were additional subsectors. These subsectors had the same inputs for intermediate consumption and labour, but the distribution of surplus differed among GOS, Rents to communal lands and Royalties to DPMW. An average of the values for each component of the surplus, weighted by the output of each subsector, was used for the industry.

Multiplier analysis was used to estimate the contribution of protected area tourism to the Namibian economy in 2008, using accounting multipliers (Pyatt & Round 1984)

3.5.4 Contribution to Gross National Income

The impact of protected area tourism on the national economy was calculated using the estimated protected area tourism expenditure. The *direct* contribution to GNI was estimated to be N\$1113 million, roughly 2.1% of GNI in 2008. The total contribution to GNI was estimated to be N\$2048 million, or

² The surveys were conducted for establishments rather than enterprises, but the survey has used the term enterprise.

3.8% of GNI. The GNI multiplier—the indirect stimulus from PA Tourism to the rest of the economy—is approximately 1.84. That means, for every N\$1.00 of income generated from direct services provided to tourists, an additional N\$0.84 of income will be generated because of the demand for products to produce those services, and the products households buy with their additional income.

TABLE 3.10. CONTRIBUTION OF PROTECTED AREA TOURISM TO GNI, 2008 (MILLIONS OF N\$)

Total PA Tourism expenditure ¹	2353
Contribution to GDP	
Direct impact	1113
Total impact	2048
Multiplier	1.84
PA Tourism share of GDP (GDP in 2008 = \$ 53 800 million)	
Direct impact	2.1%
Total impact	3.8%

¹ Estimate from this study, as presented in Table 3.5.

3.5.5 Distribution of income among households

Incomes are generated in production activities and are distributed to different categories of households. The income a household receives depends in part on its supply of factors of production: labour, capital, and land. But it also depends on redistribution of incomes: remittances from one household to another, transfers from government, and most important, the distribution of after-tax GOS by companies. The SAM includes 9 types of institutions: 6 types of households plus business enterprises, government, and NPISH (non-profit institutions serving households).

Households receive 37% of all incomes, of which rural households receive 16% and urban households 20% (Table 3.11). Another 39% is received (from GOS) by Enterprises. Government also receives a large share (20%), from taxes on production and products (seen in Table 2) plus a portion of GOS for certain government enterprises. NPISH receive less than 1% of total income.

Imports account for 4% of incomes earned—imports in this instance refer to the import of factors of production, not the import of goods. The imports comprise 95% capital income (GOS), representing the return on investments by foreigners in the Namibian economy, and 5% payments to skilled, non-resident workers. The share of income that accrues to non-residents is an important component of the SAM, because imports do not lead to any multiplier impacts on the rest of the economy. There was no information about the share of factor incomes accruing to non-residents for tourism activities, so the average share for the

Namibian economy was applied. Further investigation may determine whether a different share should be used for tourism-related activities.

TABLE 3.11. PRIMARY DISTRIBUTION OF TOTAL INCOME FROM PROTECTED AREA TOURISM BEFORE TRANSFERS (N\$ MILLIONS)

	million \$	percent
Urban households		
Wage & salary earners	369	18%
Business & Livestock farmers	20	1%
Other: pensions & gifts	20	1%
Rural households		
Wage and salary earners	82	4%
Business and commercial farmers	82	4%
Subtotal for households	758	37%
Non Profit Institutions Serving Households	4	0.2%
Enterprises	799	39%
Government	410	20%
Imports, 95% GOS and 5% skilled labour	82	4%
Total	2048	

3.5.6 Imports

In a small, open economy like Namibia, many goods and services are imported, including the services of factors of production (labour and capital). These do not benefit the domestic economy. The direct purchases of tourists are dominated by services that are provided domestically—accommodation, restaurants, and transportation, whereas these services in turn tend to be more reliant on imports. Thus the import multiplier was estimated to be over 5.

With the exception of petroleum products, it is likely that many of the imports are obtained from other countries in the region, especially South Africa. So, although the imports may not benefit Namibia, they may benefit the region. Further analysis of imported commodities and the origin of these imports would identify regional benefits from Namibia’s protected area tourism.

3.5.7 Leakages

Much of the expenditure by foreign tourists takes place outside the country on tours, airfares and travel gear. These expenditures are effectively leakages from the Namibian economy. To the rest of the world, these leakages are the benefits of biodiversity conservation abroad (Krug 2003). Some of the money spent by foreign tourists within Namibia also leaves the country as leakages.

This occurs when tourism-related goods and services have to be imported from abroad. All of these leakages dilute the economic impact of the total expenditure by foreign tourists. For example, an estimated 61% of the expenditure by foreign visitors to game parks in Zimbabwe does not benefit Zimbabwe (Brown *et al.* 1995). However, a recent study in Namibia suggests that leakages are relatively small in this country due to a relatively high proportion of local ownership of tourism enterprises (see Relly 2004).

4 OTHER VALUES GENERATED BY THE PROTECTED AREA SYSTEM

4.1 DIRECT USE VALUES

4.1.1 Live game sales

Live game are captured for sale on auction from time to time, though this activity occurs only relatively rarely. The game auction in 2004 at Waterberg was the first in ten years. This auction raised \$4.7 million (B. Beytell, pers. comm. 2006). The reason for the infrequency of game auctions is that the game capture unit are already operating at the maximum capacity that their current competency allows, just dealing with capture required for other management purposes and for the Rhino custodianship scheme (B. Beytell, pers. comm. 2006).

4.1.2 Drought relief and game transfers

Protected areas supply game to neighbouring conservancies through translocation programmes. For example, nearly 300 game of different species were translocated to the Uukwaluudhi Conservancy during 2002.

DPWM also contributes game meat to drought relief programmes when called upon to do so. For example, in 2002, it contributed about 3 tons of game meat to the drought relief programme in the Caprivi, Kunene and Kavango regions. Funds may also be raised for drought relief through auctioning of game on the open market.

4.2 INDIRECT USE VALUES

4.2.1 Carbon sequestration

Carbon is taken up by plants in the growth process and stored in above and below-ground plant biomass. In addition, litter production and other processes lead to the accumulation of carbon in soil. The amount stored in plant biomass is a relatively constant function of total mass, but the rate of carbon uptake from the atmosphere depends on the growth rate of these plants. The amount stored in soils differs according to vegetation cover and land use.

The sequestration of carbon is an important service which offsets the damage caused by increasing atmospheric carbon and resultant global climate change. It has been conservatively estimated that climate change in South Africa will carry a cost of about 1 - 2% of Gross Domestic Product by 2050 (possibly up to 6%), due to changes in ecosystem productivity, ecotourism opportunities, disease vectors and agricultural production and due to infrastructural damage, among other effects (Turpie *et al.* 2004). The estimated damages are equivalent to about R80 per ton of carbon emitted, taking into account the fact that carbon contributes about 60% of total greenhouse gas emissions in South Africa (Scholes & van der Merwe 1995, Rowlands 1996). The sequestration of carbon by ecosystems thus has a positive economic value.

While it is relatively straightforward to determine the standing stock of carbon in a landscape, the rate of carbon sequestration is a more complex issue. This is related to the rate of carbon storage, but also to how permanently the carbon is stored. While long-lived indigenous trees are typically considered as good carbon sinks, faster growing vegetation may result in high levels of soil carbon sequestration, even if biomass carbon is not stored for long.

Carbon sequestration in Namibian protected areas has not been well studied. Based on studies in other dryland and semi-arid regions, carbon sequestration in such areas, particularly in Africa, may be of some importance, however most of this is based on research in agricultural areas (Lal 2000). Research does suggest that conserved natural systems within dryland areas would have higher value as carbon sinks than degraded or heavily grazed areas outside protected areas (Su *et al.* 2003). It must however be noted that a variety of ecosystems are captured within the protected area system of Namibia such that carbon sequestration capacities would be expected to vary substantially. Carbon storage tends to increase as organic soil content and vegetation cover increase, suggesting that woodland and savanna areas would have higher value than the coastal desert regions (Lal 2003; Su *et al.* 2003).

4.2.2 Water supply and regulation

Namibia is an arid country with limited water resources, with 50% of the population dependent on groundwater and ephemeral rivers (Heyns *et al.* 1998). The role of protected areas in conserving watersheds and water supplies does not appear to have been researched but based on the flow characteristics, location of protected areas and main dams and river basins (Heyns *et al.* 1998) would be expected to be minimal for the country as a whole. Locally, in northern areas such as Etosha and Caprivi where larger rivers and substantial

wetlands systems do exist, protected areas may act as important areas for water supply to local communities and livelihoods.

4.2.3 Refugia

Protected areas provides an important refuge for a number of species, including several red-data species that might otherwise be faced with imminent extinction. They also provide a source area for genetic material and biota that are to be found outside of protected areas. This service is very much linked to other services such as provision of raw materials, genetic diversity and cultural services, especially where consumptive use of species, such as mammals or medicinal plants, may depend on reproductive outputs from protected areas. Its value is largely reflected in the national and international funding that is directed at maintaining the area, as discussed below.

Income from wildlife use and nature-based tourism generated by communal areas has been found to be higher for those areas outside and adjacent to established protected areas (Barnes 1995b). The link between protected areas and dependence on wildlife in these areas requires further investigation and may also be influenced by the existence of private conservation areas. Nevertheless, in general, areas which generate high values from the use of natural resources, as well as high potential for increase in the value contributed to national economy, tend to occur outside and directly adjacent to protected areas (Barnes 1995b). This was attributed to lower human and livestock densities and higher wildlife populations in these areas (Barnes 1995b). The nature of the link between this phenomenon, particularly as they relate to wildlife populations, and protected areas has not been adequately researched, however. Indeed, it is possible that the high value around protected areas may actually be an artefact of the distribution of high value agricultural land (i.e. in areas away from protected areas) and not necessarily linked to the distribution of protected areas themselves (Barnes (1995b).

4.3 OPTION AND EXISTENCE VALUES

Option values are largely derived from the conservation of resources that have the potential to be valuable in future. This value is often associated with the genetic diversity of protected areas, the future potential of which is readily acknowledged but completely unknown. There are many examples of the discovery of new species or genetic material which have turned out to have enormous value in the global pharmaceutical industry. It has been estimated that the loss of 50 000 species in the world would mean the loss of 25 potential

new prescription drugs with a value of US\$25 billion (Scott 1993). The horticultural industry may also derive substantial benefits from species conserved in Namibia's protected areas. This is already evident in the collection of succulents for propagation from at least one of Namibia's protected areas. Wild genetic resources are also important in the development of new agricultural crops and varieties. Option value cannot be estimated, however. The closest measure available is quasi-option value, which is equal to the amount that society is willing to pay to retain the option of using these resources in future.

Non-use values do not involve any current or future use of protected areas. The existence value of the protected system is the satisfaction or utility derived from the knowledge that the areas are protected, and bequest value is the satisfaction obtained from the knowledge that the resources can be enjoyed by future generations. Non-use values are theoretically reflected in society's willingness to pay to ensure the continued existence of protected areas. Individual values are often reflected in the donations they make or are willing to make to conservation agencies.

Barnes *et al.* (1997) found that 72% of surveyed visitors to wildlife tourism areas were willing to contribute towards conservation in the form of a trust fund. For all tourists, including those who did not express an interest in paying, the average willingness to pay was N\$104 per person. This equates to N\$28.7 million for all Namibian tourists for the conservation of wildlife.

The willingness to pay by visitors represents only a small fraction of global willingness to pay for the protection of Namibia's biodiversity. Research in South Africa suggests that citizens alone have an aggregate willingness to pay of R393 million per year for biodiversity conservation (Turpie 2003a). This does not include the additional willingness to pay by the international community.

International willingness to pay is at least partly expressed by donor funding which is aimed at biodiversity conservation. International donors have provided varying amounts of funding for environmental projects in Namibia over the years, generally indicating a substantial willingness to pay on the part of the international community for biodiversity conservation and natural resource-linked management and use. Some N\$54 million in donor funding was raised for conservation-related projects in Namibia in 2003-4, of which up to about N\$2.5 million was specifically for use in protected areas (Turpie *et al.* 2004). This reflects a strong mandate in the donor community for projects which contribute to poverty alleviation, possibly coupled with a lack of realisation of the important links between protected area status and poverty alleviation.

5 IS INCREASED INVESTMENT IN THE PROTECTED AREA SYSTEM ECONOMICALLY JUSTIFIABLE?

5.1 INTRODUCTION

Although the protected area system can be shown to yield significant benefits to Namibian and global society, the maintenance of a protected area system also incurs costs to the economy. These include not only the direct costs associated with their establishment and maintenance, but also the indirect costs that they incur on surrounding populations, and the opportunity costs in terms of the foregone benefits from alternative uses of the land. These costs are described as far as possible in the following sections. Direct costs are separated into those associated with conservation and tourism, since these are undertaken by different institutions. Current costs are briefly evaluated in the light of the benefits currently generated by the protected area system.

Even if current costs are economically justifiable, the protected area system is not adequately meeting its conservation objectives. Brown *et al.* (2005) addressed the conservation priorities for Namibia and how best the protected area system might fulfill the country's biodiversity conservation needs, and developed a vision for an effective protected area system. Booth *et al.* (2005) addressed the institutional structure and support required to facilitate the effective implementation of this vision. We thus address the question as to whether the increased investment required to realise this vision would be economically justified.

5.2 CURRENT COSTS OF THE PROTECTED AREA SYSTEM

5.2.1 Development and management costs of the protected area network

The budget allocation to the Ministry of Environment and Tourism has been variable over the past decade, but increased markedly to N\$299.9 million in 2007/8, partly due to the upgrading of infrastructure in Etosha in 2007. The budget has remained roughly at this level, with a budget of N\$305.6 million for 2009/10. The Ministry of Environment and Tourism budget is divided among six

programmes, with protected area management receiving about 45% of the budget, or N\$136 million in 2009/10 (MET data).

5.2.2 Tourism-related costs

The costs associated with tourist facilities are borne by Namibian Wildlife Resorts, a government parastatal. The organisation employed approximately 655 staff in 2004 (Turpie et al. 2004). Annual operating costs of NWR budgeted for 2003/4 were approximately N\$116 million (NWR 2003), equating to N\$152m in 2008. Just about all of this can be assumed to be spent within protected areas, since 97% of the beds within NWR resorts are in protected areas (the remainder being in Duwiseb Castle, Reho Spa and Shark Island).

5.2.3 Indirect costs

The indirect costs of protected areas are the negative impacts that result from the protection of wildlife. Animals from protected areas can be a nuisance on surrounding lands, causing crop damages, livestock losses, damage to infrastructure and injury or death of people. Although many parks, such as Etosha, are fenced, migration cues, dispersal behaviour and hunger or thirst sometimes cause animals to break down fences and make excursions into surrounding lands. In Etosha, elephants and lions move into the populated communal areas to the north and west, leading to loss of crops and livestock, and occasionally human life. While many such incidents have been documented, there has been no systematic data collection or statistical analysis that could yield an estimate of the total indirect costs of Namibia's protected areas at this stage.

5.2.4 Opportunity costs

Protected areas can carry substantial opportunity costs, depending on their location. In Kenya, for example the protected area system is estimated to have an opportunity cost of US\$203 million in terms of income forgone from agricultural use of the land, compared with tourism revenues of US\$42 million (Norton-Griffiths & Southey 1995). South Africa's protected areas were estimated to have an annual opportunity cost of at least US\$26 million in terms of foregone agricultural income 1994 (Turpie & Siegfried 1996). In Namibia, no estimates have hitherto been made of the opportunity costs of protected areas, and this was also beyond the scope of this study. Nevertheless, these are probably relatively low. Much of the protected area estate is desert which has little or no agricultural value. Most of the remaining area is north of the veterinary cordon, which limits the export of cattle and most game animals.

We have not included indirect or opportunity costs in further analysis in this study, under the assumption that they would not make a significant impact on the results or the conclusions reached.

5.3 THE COST OF DEVELOPING A MORE EFFECTIVE PROTECTED AREA SYSTEM

5.3.1 Human resource and operating costs

Park conservation management costs were taken from recently drawn up management plans for /Ai-/Ais, Namib-Naukluft, Etosha, the North East Parks and Sperrgebiet, and the project budgets for parks included in the Millennium Challenge Account (MCA) plans. The remaining park budgets and headquarter costs were taken from a spreadsheet model developed in 2004 by Rowan Martin based on several exercises carried out over the past few years using spreadsheets to develop staff structures and operating budgets for protected areas (Martin 1997, 2003, 2004). The detailed methods and assumptions are described in Appendix 1. The model estimated the ideal human resource and operating costs of a more efficient protected area system. This was based on factors such as park size and priority issues, and applying the high-level institutional structure proposed by Booth *et al.* (2005). This entailed the DPWM being divided into three directorates, each governing conservation activities in different parts of the country – the North West (incorporating Etosha , (2) parts of the country: (1) the North West (incorporating Etosha and Skeleton Coast), (2) The North-East, and (3) the South-Central Region, including Sperrgebiet. It is estimated that the effective management of this system would require some 1500 staff, of which 438 are in tourism-related activities. An annual recurrent expenditure of N\$157.3 million would be required (Table 5.1).

These costs are modest in comparison with South African National Parks (~\$1200/km² compared with ~R11 000/km²), even when only comparing the flagship parks which are a similar size and both in savanna areas (~N\$2100/km² compared with > R6000/km²).

Under the NWR Turnaround Strategy, recurrent costs were budgeted to increase by N\$101.5 million in the first year (over and above previous budgets), escalating to N\$141.4 million over 3 years and remaining at this level thereafter.

TABLE 5.1. ESTIMATED TOTAL REQUIRED COSTS OF THE PROTECTED AREA SYSTEM (N\$ 2008).
CLUSTER AND HEAD OFFICE COSTS ARE CENTRALISED BUT ASSIGNED HERE TO PARKS IN PROPORTION TO
THEIR INCOME-GENERATING CAPABILITY. PARK MANAGEMENT COSTS ARE DERIVED FROM MANAGEMENT
PLANS FOR PARKS MARKED WITH *, OTHERWISE FROM MARTIN MODEL.

PARKS	Park management	Cluster & head office costs	Total
North-West			
Etosha*	26 700 000	16 667 314	43 367 314
Skeleton Coast	8 819 258	4 032 133	12 851 391
Cape Cross	3 222 300	747 047	3 969 347
West Coast RA	10 667 921	911 689	11 579 610
North-East			
Caprivi/Babwata NP*	4 912 490	1 423 380	6 335 870
Mudumu*	3 366 000	1 287 544	4 653 544
Mamili*	1 870 000	898 778	2 768 778
Mahango*	5 797 000	3 950 732	9 747 732
Poppa Falls	741 017	1 132 990	1 874 007
Khaudum*	7 480 000	530 239	8 010 239
Mangetti*	1 309 000	28 563	1 337 563
Waterberg	5 924 834	7 480 150	13 404 984
South-Central			
Namib-Naukluft	13 504 933	4 741 087	18 246 019
Sperrgebiet*	441 000	125 904	566 904
Ais-Ais*	2 770 491	1 238 444	4 008 935
Hardap RR	4 218 551	1 875 733	6 094 284
Naute RR	1 517 622	347 417	1 865 039
Von Bach RR	1 076 892	308 981	1 385 873
Daan Viljoen	1 171 481	898 374	2 069 855
Gross Barmen	1 508 777	1 740 925	3 249 701
Total	107 019 566	50 367 423	157 386 989

5.3.2 Capital costs

Capital requirements to meet the parks vision include upgrading of buildings such as staff quarters, purchase of equipment and vehicles, fences and construction or upgrading of roads, as well as upgrading of NWR tourism infrastructure.

Total capital requirements for park development (excluding NWR resorts) over the next 5 years are anticipated to be in the order of N\$541 million (Table 5.2). The highest capital expenditure is required for Etosha and the Namib-Naukluft park, mainly due to required road infrastructure. /Ai-/Ais also requires substantial capital investment. The park lacks basic infrastructure in many parts. Most of the anticipated development is along the Orange River where currently the impacts are highest and most control and management is required. It is also the interface between the South African portion of the Transfrontier Park and a new point of entry. Most of the North-East parks

(Khaudum, Mahango, Kwando/Caprivi, Mudumu, Mamili and Mangetti) are severely lacking in infrastructure, staff quarters are in poor condition, and there is limited equipment. These parks are rustic in nature, but substantial investment is required nevertheless. Detailed estimates of capital requirements for these parks were provided in the Integrated Development Plans developed in 1999.

In addition to these requirements, NWR's Turnaround Strategy requires an initial capital expenditure budget of N\$103.64 million (2008). The above capital costs all exclude the implementation costs involved (e.g tender process, costs of a project co-ordinator).

TABLE 5.2. ESTIMATED INITIAL CAPITAL EXPENDITURE REQUIRED (N\$ 2008) BASED ON MANAGEMENT PLANS AND OUR ESTIMATES.

Park	Capital costs	Park	Capital costs
/Ai-/Ais	16 361 900	Mudumu	6 401 384
Cape Cross	6 550 000	Namib-Naukluft	116 000 500
Caprivi	12 063 277	Diamond Coast	0
Daan Viljoen	6 550 000	West Coast	14 108 919
Etosha	276 591 126	Naute	0
Gross Barmen	0	Popa	0
Hardap	14 108 919	Skeleton Coast	6 550 000
Huns Mtns	0	KPP	16 231 000
Khaudum	14 831 312	Sperrgebiet	6 550 000
Mamili	4 027 980	Von Bach	0
Mahango	14 260 495	Waterberg Plateau	6 550 000
Mangetti	3 388 440		
Total N\$			541 125 251

5.3.3 Total costs

Total costs of implementation of the vision are estimated in Table 5.3. Initial capital costs are assumed to be spread over a five year period, with the spread based on existing business plans. Thereafter, it is assumed that annual capital costs would be in the order of 5% of the initial 5-year investment. The overall additional cost of realising the vision is estimated to be about N\$882 million over the first 5 years, and N\$96 million per annum thereafter.

TABLE 5.3. PROJECTED TOTAL PUBLIC SECTOR COSTS ATTRIBUTABLE TO THE PARKS SYSTEM (EXCLUDING NWR) WITH IMPLEMENTATION OF THE PARKS VISION IN NAMIBIA, BASED ON 2007/8 BUDGET (N\$ MILLIONS, 2008 CONSTANT VALUES).

Measure of costs	Year 1 2007/8	Year 2	Year 3	Year 4	Year 5	Year 6-20*
Current costs						
Capital costs	6.2	6.2	6.2	6.2	6.2	6.2
Recurrent costs	84.4	84.4	84.4	84.4	84.4	84.4
Total	90.6	90.6	90.6	90.6	90.6	90.6
Additional costs to implement the vision						
Capital costs	72.7	99.9	173.9	119.6	43.9	20.8
Recurrent costs	73.0	73.2	73.6	73.9	74.2	74.4
Total	145.7	173.1	247.5	193.6	118.1	95.3
Total costs of implementing the parks vision						
Capital costs	78.9	106.1	180.1	125.9	50.1	27.1
Recurrent costs	157.4	157.6	158.0	158.3	158.6	158.8
Total	236.3	263.7	338.1	284.2	208.7	185.9

* Year 6 includes replacement capital costs prorated, in constant prices, to year 20

5.4 A COST-BENEFIT ANALYSIS OF FURTHER INVESTMENT IN THE PROTECTED AREA SYSTEM

The economic benefits of the protected area system clearly outweigh the costs involved in its management: total current costs in the order of N\$230 million yield economic benefits in the order of N\$2048 million. Here we investigate whether increased investment in an improved protected area system would be economically justified, by means of a simple cost-benefit analysis.

The vision for the protected area system includes investment in the park infrastructure and management and the development of revenue-generating tourism concessions in many of the parks. In addition, it was envisaged that existing NWR resorts will be upgraded.

It is assumed that the improved parks system will result in visibly better biodiversity, and that better facilities will make an important contribution in creating a better tourism product overall. This would lead to an increase in the overall demand for protected area tourism, and higher aggregate willingness to pay. This willingness to pay, if adequately captured, will lead to greater overall expenditure and value added to Namibia's economy.

In addition to the tourism benefits, the improved management of the park system will facilitate the recovery of wildlife populations in areas where poor management has allowed them to drop below carrying capacity or could increase carrying capacities where they have been limited by water supply.

Although carrying capacity is a highly dynamic measure, overall stock levels can be expected to improve, and this has economic value in terms of natural capital formation.

In the cost-benefit analysis we compare the incremental benefits that arise due to the additional capital and operating costs incurred over the next twenty years. Benefits are derived in terms of income from new concessions, increased consumptive value of wildlife stocks, and increased income to NWR. The latter was taken from NWR projections. It is anticipated that a total of 77 new concessions will be developed in the parks over the next 20 years (Table 5.4). The benefits associated with these (employment, direct and indirect contribution to Gross National Income, rentals and park fee incomes and taxes) were estimated on the basis of detailed modeling of the proposed concessions done for the Kunene Peoples Park (Massyn *et al.* 2008).

TABLE 5.4. NUMBER OF NEW LODGES/CAMPS IN PARKS IN NAMIBIA WITH IMPLEMENTATION OF PARKS DEVELOPMENT VISION, AND ESTIMATES OF THE RESULTANT BENEFITS

Park	Year 1	Year 10	Year 20
/Ai-/Ais	0	2	2
Cape Cross	0	2	2
Caprivi	0	6	8
Etosha	2	7	16
Huns Mtns	1	2	2
Khaudum	0	2	2
KPP	2	7	12
Mamili	0	3	3
Mahango	0	2	2
Mangetti	0	1	1
Mudumu	0	2	2
Namib-Naukluft	1	4	12
West Coast	0	3	3
Skeleton Coast	1	3	3
Sperrgebiet	0	3	4
Waterberg Plateau	0	2	2
TOTAL	7	51	77
Estimated total employment	200	1 600	2 500
Estimated direct contribution to GNP (N\$ million, constant 2008 prices)	27	249	456
Estimated direct + indirect contribution to GNI (N\$ million, constant 2008 prices)	50	460	842
Estimated government rentals derived (N\$ millions)	7	51	78
Estimated park entry fees derived	3.8	27.6	42.2
Government tax revenues derived	5.3	38.0	58.2

Increased investments in the parks alone (excluding NWR investments) are estimated to generate a return of 42%. The total investment in parks and NWR yields a rate of return of 37% (Table 5.5, Figure 5.1).

TABLE 5.5. RESULTS OF THE COST-BENEFIT ANALYSIS OF IMPLEMENTATION OF THE PARKS DEVELOPMENT VISION IN NAMIBIA

Perspective	Economic rate of return (ERR) % over 20 years	Economic Net Present Value (NPV) N\$ million @ 8%
New investments excluding NWR*	42%	2 368
All new investments	37%	2 557

* excludes costs and benefits associated with renovations and improvements to the operations at existing NWR establishments

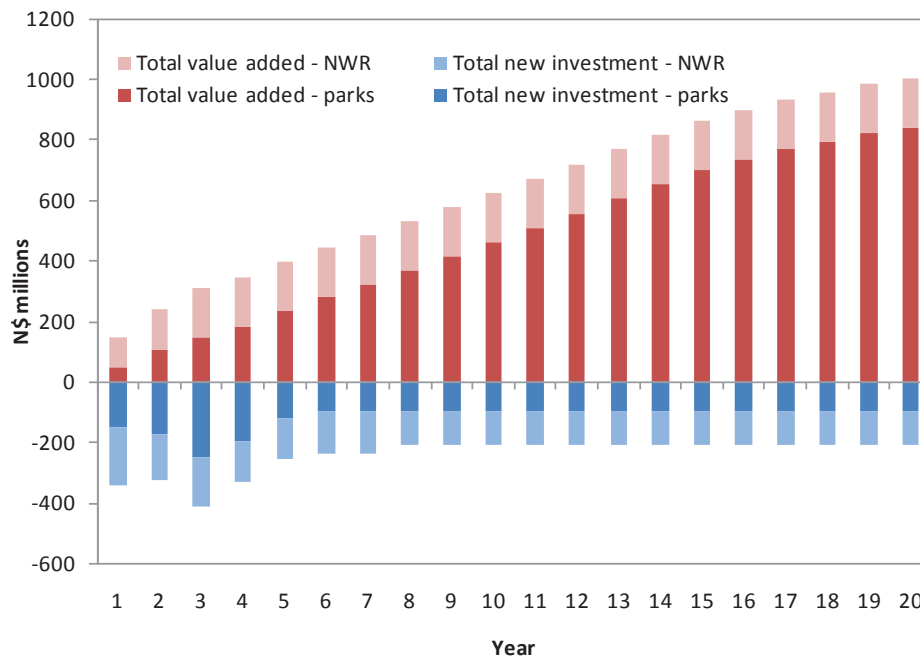


FIGURE 5.1. GRAPHIC ILLUSTRATION OF COST-BENEFIT ANALYSIS OF INVESTMENT IN PARKS DEVELOPMENT VISION NAMIBIA 2008 – MEASURING TOTAL ECONOMIC IMPACT IN AND OUT OF PARKS OF NEW PARK-ATTRIBUTABLE TOURISM

Thus, investment in the parks development vision continues to be economically very efficient in 2008, as found by Turpie et al. (2004) using a slightly different approach. This analysis benefited from more in-depth analysis of the potential benefits generated by concessions, as well as updated projections of NWR. Besides being a measure of the economic efficiency of investment in the parks development vision, in effect, the cost-benefit analysis also effectively serves as an appraisal of the implementation of the MET’s Concessions Policy (MET, 2006).

5.5 CONCLUSION

From the foregoing analysis it can be concluded that the parks system in Namibia has very significant economic value, in terms of its contribution to income and employment. It provides a very important underpinning of much of the national tourism sector. In addition, cost benefit analysis of investment in the parks system, along the lines of the parks development vision, will be economically very efficient.

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8 APPENDIX 1. ASSUMPTIONS IN ESTIMATION OF RECURRENT COSTS FOR THE PARK 'VISION'

8.1.1 Introduction

This work builds upon several exercises carried out over the past few years using spreadsheets to develop staff structures and operating budgets for protected areas (Martin 1997, 2003, 2004). The database used here was developed from one designed for South African National Parks. This work benefited from good information provided at the outset by MET on the organisational structure, exact numbers of staff in each part of the structure and the relevant civil service salary scales.

The spreadsheet model generates a staff structure and annual recurrent expenditure budget for the conservation and management of any park based on its size and some information about the priority issues in the park. The steps which the model uses to derive the final budget are, firstly, to design the staff structure, secondly, to calculate the human resources costs of this structure using the salary scales currently in place and, thirdly, to estimate the operating costs needed for this staff complement to be able to function effectively.

The approach used to calculate numbers of staff in the main divisions (field, tourism, scientific, technical services and administrative) is largely 'bottom-up'. For example, the number of scouts needed to protect a park is allocated mainly on a ratio basis (e.g. one Senior Scout for every 8 scouts) and, at the most senior level, warden posts are allocated according to the number of camps in the park.

The initial calculations in the data base are performed on tables which include all parks. From these master tables, individual staff structures and budgets are produced for each park and for each staff category (field staff, tourism staff, scientists, technical services and administration) in each park. A similar exercise is carried out for the overarching cluster levels under which parks are grouped. Such a system assumes that budgets will be fully devolved to each section in each park – which is not the case at present.

The model appears to satisfy two objectives. It establishes some thresholds for the minimum annual recurrent expenditure needed to ensure that the conservation and management needs of any national park are being met and it

provides a consistency check on the funds allocated over a range of parks of different sizes with different conservation and management priorities.

The model estimated operating costs for the protected areas only. Capital investment required was estimated on the basis of the existing management plans for protected areas. This section does not take into account any potential incremental effect of increasing the number of tourist beds on conservation costs.

8.1.2 Institutional structure used in the model

The high-level institutional structure used here was generated by Booth *et al.* (2005) of this project to give effect to a Vision Statement which seeks to form geographic linkages between the protected areas. The Namibian parks were organised into three major regions: (1) the North-West (Etosha and the Skeleton Coast), (2) the North-East (Caprivi and Northern Kalahari) and (3) the South-Central region (the coastal zone from the Namib-Naukluft to the Orange River including /Ai-/Ais, and six small protected areas in the interior of Namibia). In this proposed new structure, these three regions would have the status of Directorates, each headed by a Director (Table 8.1 **Error! Reference source not found.**).

8.1.3 Factors influencing staffing and costs

The model makes provision to input scores for variables which influence the staffing structures and overall costs of management. Parameters and their scores are listed in Table 8.2. These include:

- size and vegetation characteristics (reflected by rainfall),
- numbers of visitors and visitor facilities,
- the presence of dangerous animals such as elephant, buffalo, rhino or lions,
- conservation importance and international status
- the presence of valuable species
- ecological challenges to management such as alien species, propensity for fires, and
- human challenges to management, reflected in perimeter length and neighbouring populations.

Having set the scene, the model uses a set of formulae to produce estimates of required staff numbers and operating costs.

The main calculations are performed in the following sequence –

1. Field staff – human resources numbers and costs

2. Field staff – operating costs
3. Tourism staff – human resources numbers and costs
4. Tourism staff – operating costs
5. Scientific staff – human resources numbers and costs
6. Scientific staff – operating costs
7. Technical services – human resources numbers and costs
8. Technical services – operating costs
9. Administration – human resources numbers and costs
10. Administration – operating costs

TABLE 8.1. PROPOSED NEW STRUCTURE OF THE DEPARTMENT OF PARKS AND WILDLIFE MANAGEMENT

	Parks	Region	Area (km ²)	Shore (km)
Directorate	North-West Namibia		46,520	900
Division	Etosha National Park	Kunene	22,270	
Division	Coastal		24,250	900
Park	Skeleton Coast Park	Kunene	16,390	600
Park	National West Coast Recreation Area	Erongo	7,800	300
	Cape Cross Seal Reserve	Erongo	60	
Directorate	North-East Namibia		14,503	
Division	Caprivi		9,956	
Section	East Caprivi		4,230	
Park	Kwando Section – Caprivi Game Reserve	Caprivi	500	
Park	Mudumu National Park	Caprivi	1,010	
Park	Mamili National Park	Caprivi	320	
Park	Forest Reserve	Caprivi	2,400	
Section	West Caprivi		5,726	
Park	Babwata – Caprivi GR Central Section	Caprivi	5,000	
Park	Buffalo Area – Caprivi GR West Section	Caprivi	500	
Park	Mahango Game Reserve	Caprivi	225	
Park	Popa Game Park	Caprivi	1	
Division	Northern Kalahari and Karst		4,547	
	Khaudum National Park	Okavango	3842	
	Mangetti Game Reserve	Oshikoto	300	
	Waterberg Plateau Park	Otjozondjupa	405	
Directorate	South-Central Namibia		79,791	825
Division	Coastal		79,229	825
Park	Namib-Naukluft Park	Erongo *	49,768	450
Park	Sperrgebiet	Karas	26,000	375
	National Diamond Coast Recreation Area	Karas	20	
Park	Ais-Ais National Park	Karas	3,461	
	Ais-Ais Hot Springs	Karas	461	
	Huns Mountains	Karas	3,000	
Division	Inland		562	
Park	Hardap Recreation Resort	Hardap	252	
Park	Naute Recreation Resort	Karas	225	
Park	Von Bach Recreation Resort	Otjozondjupa	43	
Park	Daan Viljoen Game Park	Khomas	40	
Park	Gross Barmen Hot Springs	Otjozondjupa	1	
	South West Nature Park	Khomas	1	

The model adheres fairly closely to the existing titles of posts in the Namibian civil service. However, several new posts have been introduced in the field staff structure to bridge some large continuity gaps in the promotional scale. Salaries are generally rounded to the nearest thousand Namibian dollars: within any salary grade, individuals are sitting at various levels of advancement and any greater precision in salaries is not warranted. Ultimately, this factor limits the final accuracy of the model.

Comparisons of the new proposed structure with the existing establishment were carried out wherever possible when developing the formula for each staff position. However, the manner in which the present establishment is organised limits the number of cases where this is possible.

The special requirements of coastal parks are catered for by taking into account the length of coastline to be protected. The costs of running the existing tourist facilities in the parks are estimated from the number of beds and campsites in each park. Although the tourist resorts in the Namibian parks are in fact run by a separate parastatal (National Wildlife Resorts), it was nevertheless considered worthwhile for comparative purposes to calculate the required staff numbers and budgets.

The number of conservation scientists needed for each park is based on the extent of the areas to be monitored. A new feature of this model is the inclusion of social scientists in the science structure – considered essential for developing co-management institutions in the areas linking parks. The number of social scientists in any park is based on the surrounding human population density and the length of the perimeter of the park. The technical support and administrative staff structure is based on the total number of staff in the other categories, the number of camps and the extent of the tourist infrastructure in the park.

Operating costs were estimated in a two-stage process –

1. A nominal budget was calculated making the assumption that staff salaries should not exceed a given proportion of the total budget (i.e. it was assumed that, having placed staff in a park, there would be a need to provide a working budget roughly equivalent to the amount spent on their salaries, regardless of the types of activities they would undertake).
2. This 'first-cut' budget was then adjusted according to a check-list of factors which were likely to give rise to higher than average operating costs (Table 8.2).

TABLE 8.2. FACTORS INFLUENCING PARK COSTS AND THE SCORES USED IN THE MODEL

PARKS	Area (km ²)	Rainfall	MSUs	Access	Gates	Camps	Visitors	Visitor/km ²	Big Game	World Heritage	TFCA	Valuable Species	Population	Artificial Water Mgmt	Fire Control	Erosion	Landscape	Alien Species	Wildlife Disease	Distance from town	Visitor Usage	Road Maint	Fence Type	Nearest town km	Park perimeter	
North-West																										
Etosha	22,270	450	4	3	3	259,154	11.6	1	1	1	1	3	2	3	2	1	1	1	3	3	4	5	3	110	820	
Skeleton Coast	16,390	50	2	5	2	1,819	0.1	1	1	1	1	3	1	3	1	3	1	1	8	0	2	2	400	560		
West Coast RA	7,800	50	2	1	5	2,228	0.3	1	1	1	1	3	2	3	3	3	1	1	3	0	2	2	150	300		
Cape Cross	60											1							3	0	0			120		
North-East																										
Kwando Section	500	600	1	2	1	0	0.0	1	1	2	3	2	3	3	3	2	2	1	1	3	0	3	120	100		
Mudumu	1,010	550	1	2	1	2,000	2.0	1	1	2	3	1	3	3	1	3	2	1	1	3	1	3	130	150		
Mamili	320	500	1	2	1	2,060	6.4	1	1	2	3	2	3	3	3	2	1	1	4	3	3	3	160	60		
Forest Reserve	2,400	650	1	2	1	0	0.0	1	1	2	1	2	3	3	3	1	1	1	2	0	3	3	60	170		
Babwata	5,000	650	1	2	1	2,000	0.4	1	1	2	1	3	3	3	3	2	1	1	6	0	1	300	500			
Buffalo Area	500	650	1	1	1	2,000	4.0	1	1	2	3	2	3	3	3	2	1	1	5	2	3	230	100			
Mahango	225	550	1	1	1	2,857	12.7	1	1	2	3	2	3	3	3	2	1	1	4	4	3	200	50			
Popa Falls	1	550	1	1	1	1,273	1,273	0	1	1	1	1	3	3	1	1	1	1	4	5	3	200	3			
Khaudum	3,842	600	1	2	1	2,826	0.7	1	2	3	3	2	3	3	3	1	1	1	6	0	4	300	300			
Mangetti	300	500	1	1	1	0	0.0	1	1	1	2	1	2	1	1	1	1	1	2	0	1	3	90	60		
Waterberg	405	400	1	1	1	33,641	83.1	1	1	3	3	3	1	3	2	2	3	2	2	5	4	3	80	100		
South-Central																										
Namib-Naukluft	49,768	100	3	4	4	54,601	1.1	0	1	1	3	3	3	3	3	3	3	1	3	3	1	3	1	150	1,250	
Sperrgebiet	26,000	75	3	2	2	618	0.0	0	1	1	3	3	3	3	3	3	3	3	3	0	4	2	150	400		
Diamond Coast RA	20																		0					1		
/Ai-/Ais	3,461	100																	3				2	1	150	450
/Ai-/Ais Hot Springs	461	100	1	1	1	26,911													4					200		
Huns Mountains	3,000	100	1	1	1	1,803													3					130		
Hardap RR	252	200	1	1	1	7,602	30.2	0	3	3	1	1	1	1	1	1	1	1	1	1	5	1	3	20	80	
Naute RR	225	150	1	1	1	0	0.0	0											1	1	0	1	2	40	90	
Von Bach RR	43	350	1	1	1	5,638	131.1	0											1	1	5	1	2	10	40	
Daan Viljoen	40	350	1	1	1	6,450	161.3	0											1	1	5	2	3	20	30	
Gross Barmen	1	350	1	1	1	6,296	6,296.0	0											1	1	5	1	1	50	2	
SW Nature Park	1	350	1	1	0	0	0.0	0											1	1	0	0	1	1	1	

MSUs – Number of Management Sub-Units. This number may be updated at any time

A '1' in the column 'Big Game' indicates the presence of dangerous animals such as elephant, buffalo, rhino or lions.

In the columns of the 'FACTORS AFFECTING OPERATING COSTS', the importance of each factor for each park is rated on a scale of 1-3, 1-5 or 1-10

8.1.4 Required staff numbers, human resource costs and operating costs

The expected overall staff requirements and associated human resource costs are summarised in Table 8.3. Even when tourism functions are excluded, the necessary staff complement is estimated to be substantially higher than the approximately 900 people employed in the DPWM. When administration and technical services are added to the present establishment, current staff numbers are about 1100. Note, however, that the model includes the full set of tourism costs, a new staff component of social scientists and the full complement of administrative and technical staff needed to service the parks establishment. When both tourism and social science components are removed from the model structure, the total number of staff is reduced to about 1500.

TABLE 8.3. TOTAL STAFF NUMBERS AND HUMAN RESOURCE COSTS REQUIRED, INCLUDING IN TOURISM ESTABLISHMENTS

	Staff numbers				Human resource costs			
	Parks	Clusters	HQ	Total	Parks	Clusters	HQ	Total
Field	576	115	11	702	16 958 400	4 044 000	1 399 134	22 401 534
Tourism	438	44	0	482	10 026 000	720 000	0	10 746 000
Science	136	219	55	410	4 713 600	4 910 400	3 928 260	13 552 260
Technical	233	80	33	346	6 602 400	2 731 200	1 169 932	10 503 532
Admin	126	48	41	215	4 044 000	2 294 400	2 215 508	8 553 908
Total	1 509	506	140	2 155	42 344 400	14 700 000	8 712 834	65 757 234
Total excl tourism	1 071	462	140	1 673	32 318 400	13 980 000	8 712 834	55 011 234

An annual recurrent expenditure of about N\$127 million appears to be needed to meet the requirements of all the parks (Table 5.1), of which slightly more than half is in human resources costs. This includes the costs of managing the tourism establishments. Excluding the latter, the total operating costs amount to some N\$106 million. Of this, N\$67 million is allocated at the park level, and the remainder would go to cluster and headquarter levels.

Through the model structure, an attempt has been made to elevate the entire status of the wildlife agency so that it has a real chance of achieving the high level goal of the Vision statement. Accordingly, the three regional management agencies would have the status of Directorates each headed by a Director and corresponding improvements are in place at the level of Divisions and Sections within each department. The costs in the model are modest in comparison with South African National Parks. If the institutional structure in this model were to be adopted, Namibia would be spending N\$127 million to conserve 138,000km²: South Africa spends about R340 million to conserve 40,000km² (leaving aside its Head Office costs). A large part of the Namibian parks estate

is desert and a more useful comparison is between the two flagship parks, Etosha and Kruger. Both are around 20,000km² in extent and both are in savanna areas with less than 500mm annual rainfall. Excluding tourism costs in both cases, Kruger spends about R105 million on conservation and management: the corresponding amount required for Etosha under this model is N\$13 million.

It is a common conception that conservation problems can better be solved with more money. Indeed, the DPWM has already expressed that they need more than double their current budget in order to manage their parks well, or at least adequately. Of course this is true to an extent, but it is also important to spend the money wisely and efficiently, and if such measures are taken, then much more can be achieved for each dollar spent. The vision also involves improving the connectivity between protected areas and surrounding private and communal lands. This could theoretically lower the costs of managing the protected area system, particularly those associated with patrolling, poaching and damage costs to surrounding areas.

TABLE 8.4. ESTIMATED TOTAL REQUIRED COSTS OF THE PROTECTED AREA SYSTEM (N\$). CLUSTER AND HEAD OFFICE COSTS ARE CENTRALISED BUT ASSIGNED HERE TO PARKS IN PROPORTION TO THEIR INCOME-GENERATING CAPABILITY

PARKS	Direct conservation costs	Cluster costs	Head office costs*	Tourism costs
North-West				
Etosha	12 108 749	3 139 923	8 472 869	6 494 221
Skeleton Coast	5 927 903	2 549 598	528 366	804 355
West Coast RA	6 024 756	576 479	119 467	2 118 695
North-East				
Kwando Section	1 582 413	747 895	35 454	117 221
Mudumu	1 840 764	747 895	35 454	207 129
Mamili	1 465 345	770 332	36 518	213 390
Forest Reserve	2 346 212	544 455	25 810	113 559
Babwata	3 757 488	451 562	25 810	212 595
Buffalo Area	1 697 397	886 087	50 646	216 927
Mahango	1 163 815	886 087	50 646	210 675
Poppa Falls	221 757	818 117	46 761	343 905
Khaudum	3 649 825	231 500	50 096	322 605
Mangetti	1 214 157	23 854	5 162	115 617
Waterberg	2 377 555	4 694 216	1 015 822	2 145 219
South-Central				
Namib-Naukluft	8 997 320	2 050 292	1 568 858	1 311 789
Sperrgebiet	5 974 225	1 071 122	819 609	648 354
Ais-Ais	2 701 680	1 131 309	865 664	1 765 698
Hardap RR	1 757 077	1 153 158	278 699	1 463 191
Naute RR	1 079 941	213 584	51 620	78 549
Von Bach RR	396 309	189 954	45 909	425 746
Daan Viljoen	425 897	552 300	133 482	468 363
Gross Barmen	249 628	1 070 281	258 669	902 110
Subtotal	66 960 212	24 500 000	14 521 390	20 699 914
Cumulative TOTAL			105 981 602	126 681 516

