STRENGTHENING NAMIBIA'S SYSTEM OF NATIONAL PROTECTED AREAS:

Subproject 1:

ECONOMIC ANALYSIS AND FEASIBILITY STUDY FOR FINANCING

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EXECUTIVE SUMMARY

Introduction

This study is one of three that have been commissioned under a PDF B Grant to assist in the preparation of a Project Document for the UNDP/GEF project on Strengthening the System of National Protected Areas in Namibia. The aim of the overall project is to safeguard the integrity of biodiversity 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 and investigate options for improving financing of the protected area 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, with the latter mainly corresponding to protected areas.

Just over 14% of Namibia is formally protected in 21 protected areas. This area will be greatly expanded with the proclamation of the Sperregebiet. The majority of the protected estate (including the latter) 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 31 registered conservancies, containing at least 16 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 16% per year. Tourist numbers peaked in 2000, suffering a decline in 2001 (probably due to the September 11 attacks on the USA), recovered in 2002, but decreased again in 2003, probably due to the significant strengthening of the rand after a long period of steady weakening of the currency. 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. There are large discrepancies among the existing estimates of the total value of the tourism industry, however, with estimates ranging between 2% and 10% of GDP. The most recent estimate (2004) suggests a total turnover of N$1.5 billion, and total value added of N$1.2 billion, equivalent to about 4% 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.

Values generated by the protected area system

The total economic value generated by protected areas can be categorised into different types of value, providing a useful framework for analysis.

Direct use values are generated by the consumptive and non-consumptive use of park resources. In the case of Namibia's protected areas, most of this value is non-consumptive tourism value. Consumptive values include the tourism value generated by the six hunting concessions within protected areas. These tourism values are examined in more detail below. In addition, protected areas provide a source of live game for sale 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. These outputs are derived from ecosystem functioning. 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, providing refugia and cultural values. 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 N$104 per person towards wildlife conservation, amounting to at least N$28.7 million. International willingness to pay is also reflected in donor contributions to the wildlife sector, which amount to some N$54 million in 2003/4/

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) as well as from previous surveys conducted in various parks.

Foreign visitors dominate six parks, with overseas visitors making up more than half of visitors to Etosha and Namib-Naukluft, and almost have 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 (some 156 000 in 2003), followed by Cape Cross, Namib-Naukluft, Waterberg and Ai-Ais (all 25 – 60 000). All other parks receive under 10 000 visitors per year, with several receiving fewer than 1000 visitors. The sum of these suggests a possible total of 382 000 visitors, or whom just over 272 000 were foreign, and domestic tourists making up 29% of these numbers. However, 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 visitor exit data, it was assumed that foreign visitors visit 2.3 parks on average, and that domestic tourists visit half this amount. Based on this, the estimated total number of visitors in 2003 was 214 000, of whom 40 000 were regional and 78 000 were overseas visitors. Domestic tourists are thus estimated to make up 45% of people that visit parks in a given year.

The above estimates were used as the basis for lower and upper-bound estimates of total expenditure by protected area tourists. Within protected areas, tourists were estimated to spend N$52 million on accommodation and N$16 million on park fees (daily fees plus vehicle entry fees). However, this is only a fraction of what is spent in the country. Average trip expenditure in Namibia by domestic, regional and overseas visitors to protected areas was estimated to be N$2440, N$3650 and N$9183, respectively. Thus overall expenditure by wildlife-viewing protected area tourists was estimated to be in the range of N$1.1 – N$2.3 billion. An additional N$73 million is estimated to be spent by tourists attracted by hunting concessions in protected areas.

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. 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$192 million. Remaining accommodation expenditure (N$147 – 560 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 a recently-constructed (2004) Namibian Social Accounting Matrix to create a protected

area tourism sector, in order to calculate total value added. The results are summarised in Table I.

Table I. Contribution of Protected Area Tourism to GDP, 2003 (millions of N$)

	Lower Bound Estimate	Upper Bound Estimate
Total PA Tourism expenditure[1]	$ 1 172	$ 2 332
Contribution to GDP		
Direct impact	$ 546	$ 1 103
Total impact	$ 1 013	$ 2 022
Multiplier	1.86	1.83
PA Tourism share of GDP GDP in 2003 = $ 32,309 million[2]		
Direct impact	1.7%	3.4%
Total impact	3.1%	6.3%

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.

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 has an operational budget of about N$46 million (varying considerably from year to year), of which an estimated N$21 million is spent directly on protected areas. In addition to the latter, scientific services, administration and support services are provided by other directorates within the Ministry of Environment and Tourism, bringing the estimated total operational expenditure on parks from N$33 million. Including development expenditure, the total government expenditure on protected areas is about N$37 million annually. We use an estimate of N$40 million in the following analyses. In addition to this, budgeted operating costs for tourism enterprises within the parks were approximately N$116 million in 2003/4. 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, with expenditures of about N$160 million compared with benefits of N$940 – N$1900 million.

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. Subproject 3 of the UNDP/GEF project has addressed the way in which the protected area system might better address Namibia's conservation needs. Subproject 2 addresses the institutional structure and support required to facilitate the effective implementation of this vision. 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 (which includes Sperregebiet) would require some 1500 staff, of which 438 are in tourism-related activities. An annual recurrent expenditure of N$127 million would be required, of N$106 is for conservation management and N$21 million is specifically for managing tourism establishments. In comparison, Kruger National Park in South Africa has a conservation management cost of R105 million.

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$225 million.

Would this capital outlay, plus the required increase in operating costs, be economically justifiable? These investments are expected to improve management and facilities in the parks, probably resulting in improved biodiversity and a better tourism product overall. Not only would this provide a stronger basis for marketing, but it would presumably lead to increase in the overall demand for protected area tourism. This demand will be reflected in higher willingness to pay, which in turn will lead to more value added to Namibia's economy. It is difficult to predict how demand might be influenced by improved park management without a directed study. We thus analyse the situation for a range of feasible scenarios. In addition to tourism demand, we consider the potential increases in wildlife stocks that could also take place in certain parks.

If exogenously-determined growth in tourism continues at a modest 5% per annum, and the improvement in parks causes this to increase by a further 2% per annum, then the Net Present Value of the improved park system over the next 20 years would be in the order of N$17 billion, at a discount rate of 6%. The return on investments would be 23%. Most of the benefit is due to tourism, with growth in wildlife stocks contributing only a fraction to this value. However, the actual returns vary according to the assumptions used, and the added investment would potentially not be viable if it leads to increased tourism growth of less than 1% per annum.

Financing a more effective protected area system

The protected area system generates comparatively little in the way of direct revenues, with accommodation and gate fees accounting for over 90% of this. Revenues generated (some N$73 million) amount to less than half of the total operational costs of the protected area system (N$156 million). The vision for the protected area system will entail raising more than N$155 million in capital costs and an additional N$77 million in annual operating costs. Several options exist for securing increased financing for the protected area system. These include increasing government finance through demonstrating the economic benefits of doing so, and increasing the incentive for parks to improve revenue generation through increasing the level of financial autonomy in the DPWM. With these important prerequisites, further revenues could be raised mainly from donor funding, pricing and payment systems, tourism concessions and the consumptive use of wildlife (Table II).

Table II. Potential sources of funding apart from government

Source	Current income	Potential income
Donor funding	< N$2.5 million	Related to fundraising effort and attractiveness of pa system
Visitor fees	N$16 million	N$20 – 25 million
Tourism royalties	<0.5 million	N$16 million
Hunting concessions	N$3.9 million	N$4 – 6.5 million
Live game sales	< N$0.5 million*	N$ 12 - 15 million -
Harvesting of plant material and bioprospecting	None	Unknown value, probably not large
Payments for ecosystem services	None	Unlikely to be viable
Known total	**N$19 million**	**N$52 – 63 million**

* estimated medium-term average based on a single auction

Attracting donor funding will be a critical component of the financing plan for Namibia's protected areas, especially for covering some of the initial outlay required, but it is difficult to estimate how much is potentially available. The amount of donor funding that could be raised will be dependent on the effort dedicated to fundraising (i.e. involving fundraising costs), and will also be contingent on donors being convinced of the long-term benefits to parks and/or economic upliftment.

Sources other than government and donor funding could generate an estimated N$52 – N$63 million, compared to the roughly N$19 million that is currently generated. This would go a long way towards covering the desired recurrent costs of the protected area system of about N$105 million.

Not all of these financing mechanisms are equally easy to implement. The best return for effort will be obtained from increasing park fees. Preliminary analysis suggests that the net income derived from park fees could be similar irrespective of whether a wild card arrangement is introduced. Although visitors could be persuaded to part with significantly more money with the introduction of a wild card system, the transaction costs involved mean that most of the extra revenue may simply accrue to the company administering the card. The actual outcome would depends on the business relationship that would be negotiated with the company, and the degree to which MET could take on the administrative aspects such as sales. Irrespective of the type of payment vehicles offered, it is important that MET invests in an improved system of visitor data collection in order to monitor the use and demand for parks.

Income from consumptive use of wildlife is probably relatively easy to access, but is limited by potential conflict with wildlife viewing activities and ethical considerations. The latter considerations must take precedent since they are far more lucrative, both from a financial and economic perspective. Thus it is safer to be conservative in the amount of revenue targeted from these sources. The establishment of quotas and concessions will involve certain set-up costs, such as research, administration of auction or tendering processes, and monitoring. However, since these processes are not new to the DPWM, it is not anticipated that these costs would be very high.

Tourism concessions potentially provide the greatest new source of finance for the protected area system. Nevertheless, this will also take the longest to realise, especially in view of the financial problems associated with the NWR. Generating this revenue will also involve considerable costs in terms of research into carrying capacities, careful identification of concessions, administration of a tender process, monitoring and fee collection. Potential concessionaires need to be attracted by appropriate infrastructure as well as an efficient system of management, marketing, and a sense of security with regard to the continued good management of the natural resource base upon which income depends. Most of the infrastructure requirements such as roads and water points are covered in the capital requirements already envisaged to improve the overall management of parks (see previous chapter), but there may be additional capital costs needed to attract targeted types of concessionaires.

It is important to accept that some parks will be more inclined to make a profit while others may always make a loss. Furthermore, profitable parks will probably always have to subsidise other parks, as it is unlikely that the parks system will ever reach financial break-even. Nevertheless, the onus is on government to continue its investment in making up this shortfall as part of its obligations to the international community and to future generations. The government should not see this financing plan as a means of reducing its input into park costs. On the contrary, the earlier economic analyses have provided plenty of justification as to why their input should actually increase.

The way forward

This desktop study was based entirely on existing information, necessitating several assumptions in our analyses. Further research is necessary before finalising a development plan for Namibia's protected area system. This includes the improved understanding of

current protected area tourism use patterns, the characteristics of demand for protected areas, further research on the financial implications of introducing a WILD Card system, and the development of improved planning tools for the protected area system.

In addition, the development plan will need to be compatible with broader social and development goals, taking social equity and poverty alleviation into consideration. For example, park pricing strategies should make concessions for poorer groups, and tourism concession agreements need to stipulate conditions that encourage the development and upliftment of local communities.

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1. INTRODUCTION

The Government of Namibia, though the Ministry of Environment and Tourism (MET) has secured a Project Development Facility B Grant from the United Nations Development Programme (UNDP)/Global Environment Facility (GEF) to assist in the preparation of a Project Document for Strengthening the System of National Protected Areas. The overall project aims to:

1. Safeguard the integrity of biodiversity; and
2. Enhance the contribution of protected areas to Namibia's development process.

This study is one of three studies that have been commissioned under the PDF grant to assist in the preparation of the Project Document:

1. An economic and financial study (this study);
2. An institutional and human capacity assessment; and
3. A needs assessment from a biodiversity conservation perspective.

The protected area system is defined here as the protected areas managed by Namibia's Directorate of Parks and Wildlife Management (DPWM), though it must be recognized that this system is supported by other geographically defined areas which are designated or regulated and managed to achieve specific conservation objectives, such as conservancies and forest reserves.

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 is far from sufficient. Shortages of funds mean that the protected area system currently struggles to meet its conservation objectives, and that there is little investment in the protected area system. This situation has arisen at least partly because of a failure to recognise the current and potential economic value of protected areas. Yet ironically, under-funded protected areas are more liable to end up being a drain on public funds than a source of economic benefit.

The survival and success of the protected area system will hinge increasingly on strengthening funding. This includes funding by international grants and government, and also by capturing more of the existing and potential direct use value. The latter is not a straightforward issue, for example increases in use by visitors can lead to congestion, decreasing the value of the experience to visitors.

In order to facilitate more adequate income flows fro enhanced protected area management, the MET wishes to estimate the economic values associated with the protected area system. This will form the basis for planning investments to be made in the protected area system over the next decades, and the full-size GEF project to implement this investment.

In light of the above, the aims of this study (Subproject 1) are briefly as follows:

1. To describe the economic context of Namibia's protected area system
2. To estimate the economic value of the protected area system
3. To undertake a cost-benefit analysis of increasing investment in the protected area system
4. To investigate options for improving financing of the protected area system
5. To develop a rough budget for a financing plan, and
6. To identify further research/activities

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 (Lange 2003), which alone account for approximately 30% of Gross Domestic Product (GDP) and 85% of exports (Lange 2003). In 2003, primary industries contributed N$5 307 million (16.4%) of the total GDP of N$32 309 million.

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 be N$3103 in 2003, making 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 the protected area system

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.

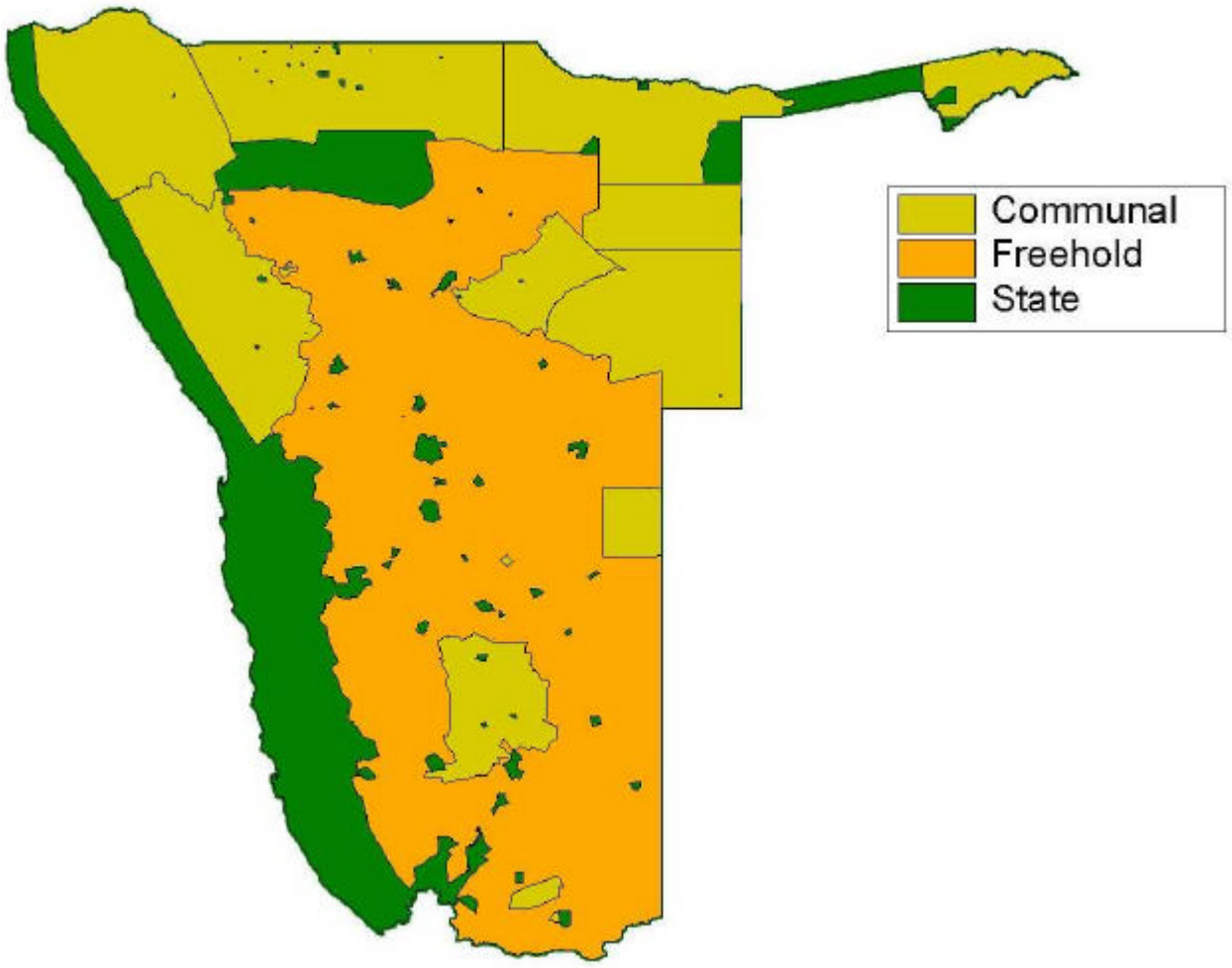

Figure 2.1. Allocation of land in Namibia in 2002. Based on MET (2002).

2.2.2 The protected area system

Approximately 14.1% of Namibia is formally protected within 21 national parks, game reserves and recreational areas (Barnard *et al.* 1998, Mendelsohn *et al.* 2003). This area will be greatly expanded with the proclamation of the Sperregebiet.

The majority of existing and proposed protected land is located along the coast, with other large areas proclaimed at the northern and southern extremes of the country (Figure 2.2). The largest proposed addition is the Sperregebiet in south-west Namibia, on the border with South Africa, which would result in the large majority of the coastal area being protected (MET 2002).

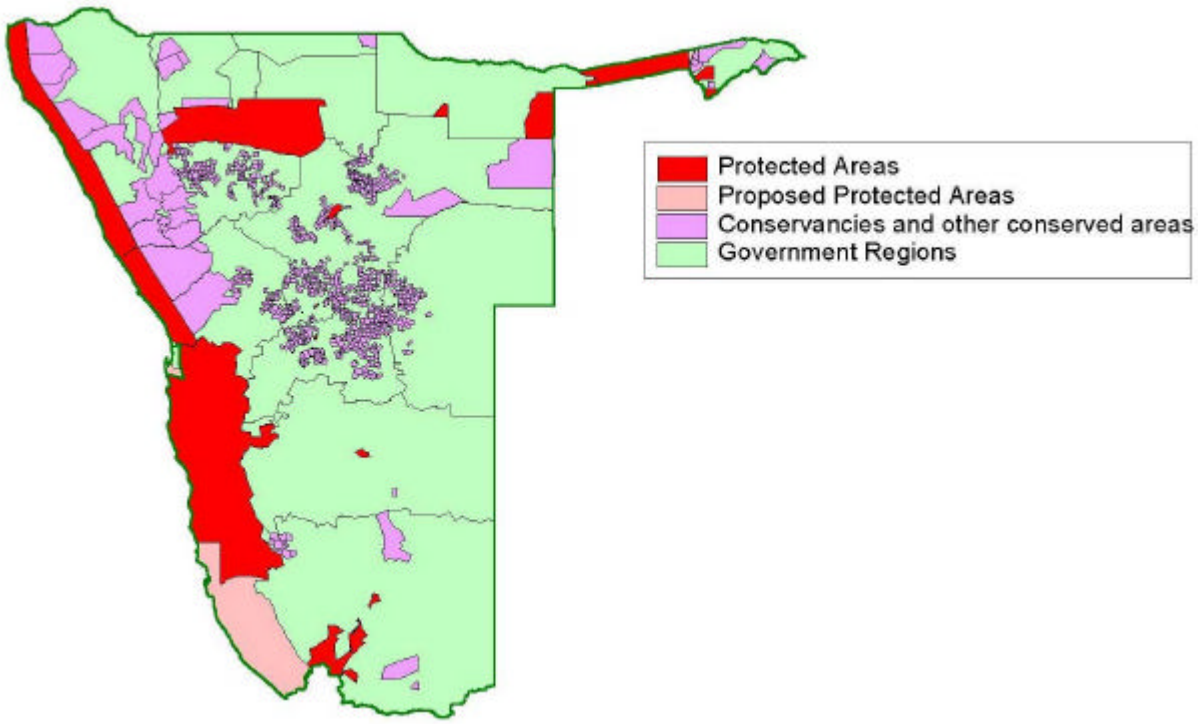

Figure 2.2. The distribution of existing and proposed protected areas and private and communal conservancies and other conserved area in Namibia. Based on MET (2002).

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 2.11). 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	Dist. 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 Sperregebiet (not yet proclaimed)		(-)	
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 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).

Nevertheless, 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 14% 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).

The proposed improvement of the protected area system is discussed in detail in Subcontract 3 of this project.

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 also been documented and 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 is 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 31 registered conservancies of which 17 are immediately adjacent to protected areas or in the corridors between them (Chris Weaver pers comm). Conservancies in communal lands now cover over 7 million ha, and contain more than 100 000 people, of whom over 40 000 are registered members (NACSO 2004). At the end of 2003, conservancies employed 223 full-time and 20 part-time staff. In addition, there are now at least 16 joint venture agreements for private tourism and trophy-hunting ventures in these conservancies, which employ some 207 full-time and 714 part-time staff.

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 600 000 in recent years (Figure 2.3) (MET 2004; Stubenrauch Planning Consultants 2004), with an average growth rate of some 16% per annum over this period. This growth is reflected in the growth in output of the tourism industry, which has 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). Further evidence suggests that this rate may have increased subsequent to this period (Suich 2001).

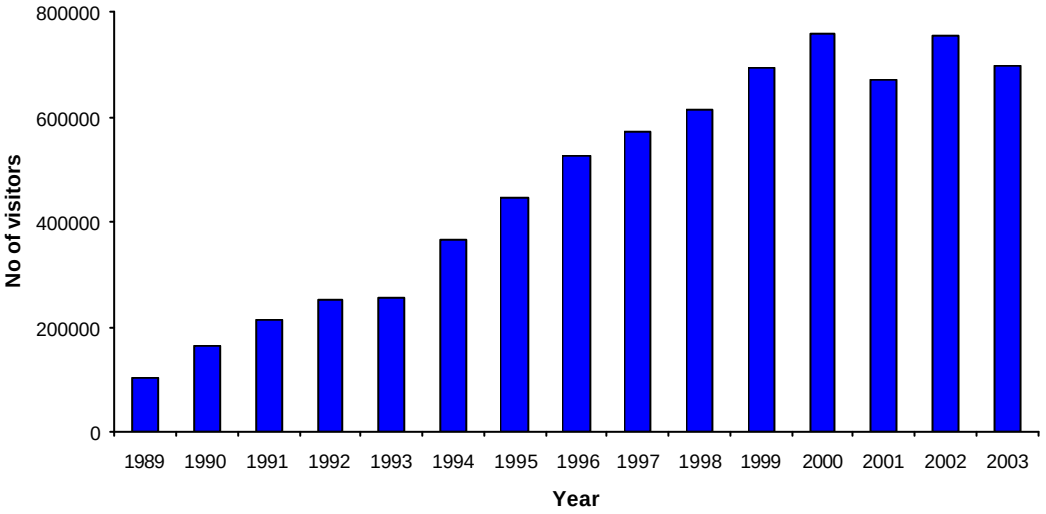

Figure 2.3. Trends in total international arrivals to Namibia between 1991 and 2002. 1989-1990 data are estimated non-domestic stay-over arrivals based on Schalkwyk (1992) cited in Weaver & Elliott (1996); 1991-2000 data are Directorate of Tourism data in Krug *et al.* (2002), 2001-3 data from MET (2004).

2.3.2 Origins and profile of visitors

Over 70% of visitors to Namibia in 2002 came from within Africa, the majority of these originating from South Africa (Figure 2.4) (SIAPAC 2003). The main purpose for visits was for some form of 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 had been to Namibia before (54%), this figure being slightly lower for holidaymakers (47%) (SIAPAC 2003).

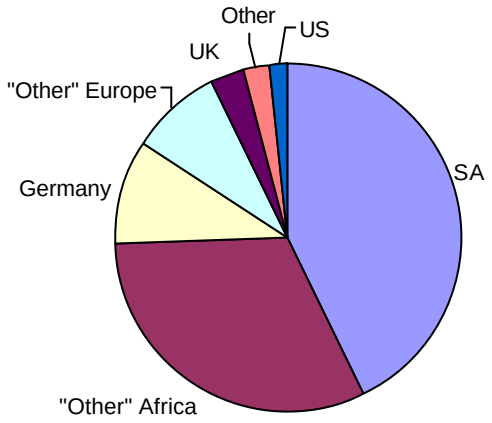

Figure 2.4. Countries of residence for all visitors to Namibia in 2002. Based on SIAPAC (2003).

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%) visited at least one other country during their trip.

Holidaymakers spent 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 undertook longer trips of between 9 to 14 nights, as opposed to the median of 6 nights spent by African visitors (Figure 2.5). Hunting visitors spent an average of 4.2 days on hunting trips (Humavindu & Barnes 2003).

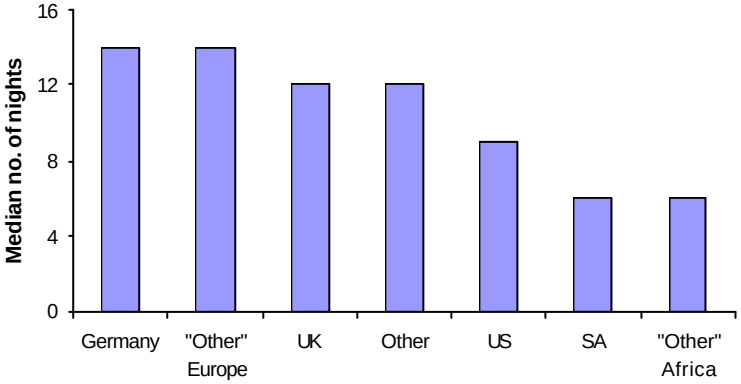

Figure 2.5. Median number of nights spent in Namibia according to visitor origin. Based on SIAPAC (2003).

2.3.4 Expenditures

Foreign visitors spend an average of N$578 per person per day in Namibia in 2002, with US visitors spending the most (N$1 179), followed by Germany (N$749) and other European visitors (N$739) (SIAPAC 2003). In terms of the average expenditure per person during their entire trip in Namibia, non-Africans spent N$6 000 or over, with South Africans and other African visitors spending N$4 000 or less (Figure 2.6). Holidaymakers in general spent an average of N$5 251 per person during their stay (SIAPAC 2003). Humavindu and Barnes (2003) estimated that hunting tourists, 96% of whom were from Europe or the US, spent an average of N$8 675 per person per day in 2000, and N$ 36 774 per trip (Humavindu & Barnes 2003).

In addition, visitors on trips to Namibia spend over twice as much outside Namibia as they do within the country (SIAPAC 2003).

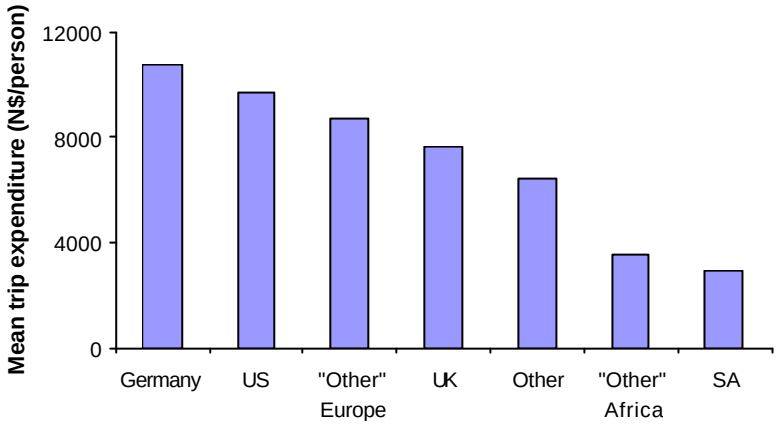

Figure 2.6. Mean expenditure on entire trip in Namibia per person in Namibian dollars. Based on SIAPAC (2003).

2.3.5 Total turnover and contribution to GDP

Tourism expenditure provides the turnover in the tourism industry. The direct value added by this turnover is the turnover less the inputs purchased from other firms. This figure is comparable to the GDP contributions by other sectors such as agriculture. The total value added is the direct plus indirect contribution to GDP, the latter being derived by multiplier effects created by linkages to other sectors.

There are fairly large discrepancies among estimates of tourism expenditure and its contribution to GDP, with methods of data collection and estimation varying considerably. Estimates of the contribution by the tourism industry to GDP in 1996 range from 2.3% (Suich 2001) to 8.1% (WTTC 1999). Tourism was estimated to have reached 9.6% of GDP in 1999 and was projected to reach 11.6% by 2010 (WTTC 1999). The lower estimate by Suich (2001) is based on a relatively standardised method of national accounting for tourism - Tourism Satellite Accounts (TSA) developed by the United Nations (UN) and World Tourism Organisation (WTO) in conjunction with others organisations (Eurostat/OECD/WTO/UN 2001). These TSA's are based on an accounting system designed to explicitly focus on and understand the impact of tourism expenditures in the national economy, which tend to fall outside or cut across the established categories used by most countries in generating national accounting figures (Suich 2001). The differences in these two estimates of GDP contribution was attributed to differences in methods and possibly base data used (Suich 2001). Satellite accounting represents a standardised systematic approach to assessing the economic impact and value of the tourism sector which is being widely adopted in the southern African region and will form the basis for future monitoring and assessment (Poonyth *et al.* 2001a,b).

Tourism expenditure recorded in the national accounts is restricted to expenditure by foreign visitors. Namibia's income from international visitors was estimated to have grown from US$90m in 1990 to US$265 m in 1996 (World Development Indicators 1998, in Krug 2003). While the estimate of expenditure by foreign visitors in the national accounts for 2002 (N$2.377 billion) is considered inaccurate (Lange 2004), the estimate for 2003 is N$3.193 billion, which is similar to the 1996 figure inflated to 2002. Nevertheless, this estimate is more than double the industry turnover estimated by Stubenrauch Planning Consultants 2004 (see below), despite the fact that it only represents expenditure by foreigners.

Stubenrauch Planning Consultants (2004), extrapolating data from a survey of 300 tourism-related businesses, estimated total turnover for the tourism industry to be about N$1.5 billion, excluding some categories of tourist expenditure, entrance and permit fees, as well as general spending in retail businesses, banks and petrol stations. They estimated a contribution of around N$ 1.2 billion in value added to GDP in 2002, equivalent to about 4% of GDP, which was is more than the contribution of the commercial farming sector. Accommodation generated 77% of the value added.

2.3.6 Types and distribution of businesses

In a recent 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 (Figure 2.7). 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 2.8). 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, Ohangwena, Omusati, Oshana and Oshikoto) combined. Within the accommodation sector, 60% of accommodation establishments are some kind of hunting farm, guest farm or lodge (Figure 2.9).

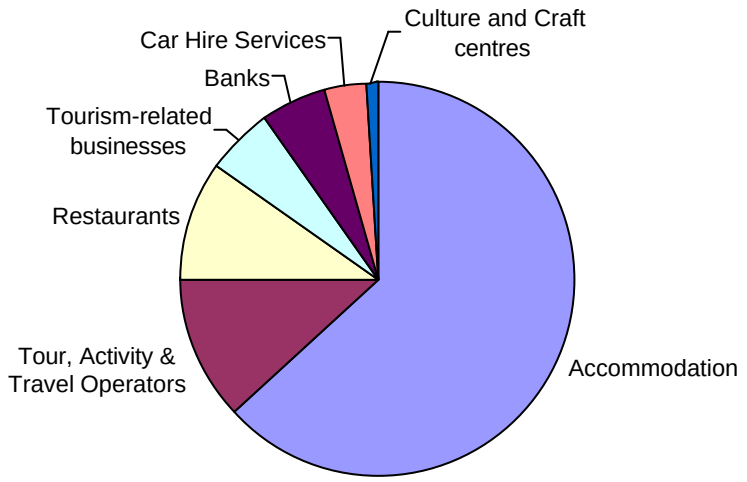

Figure 2.7. Proportion of businesses of different types in the tourism industry in Namibia. Based on Stubenrauch Planning Consultants (2004).

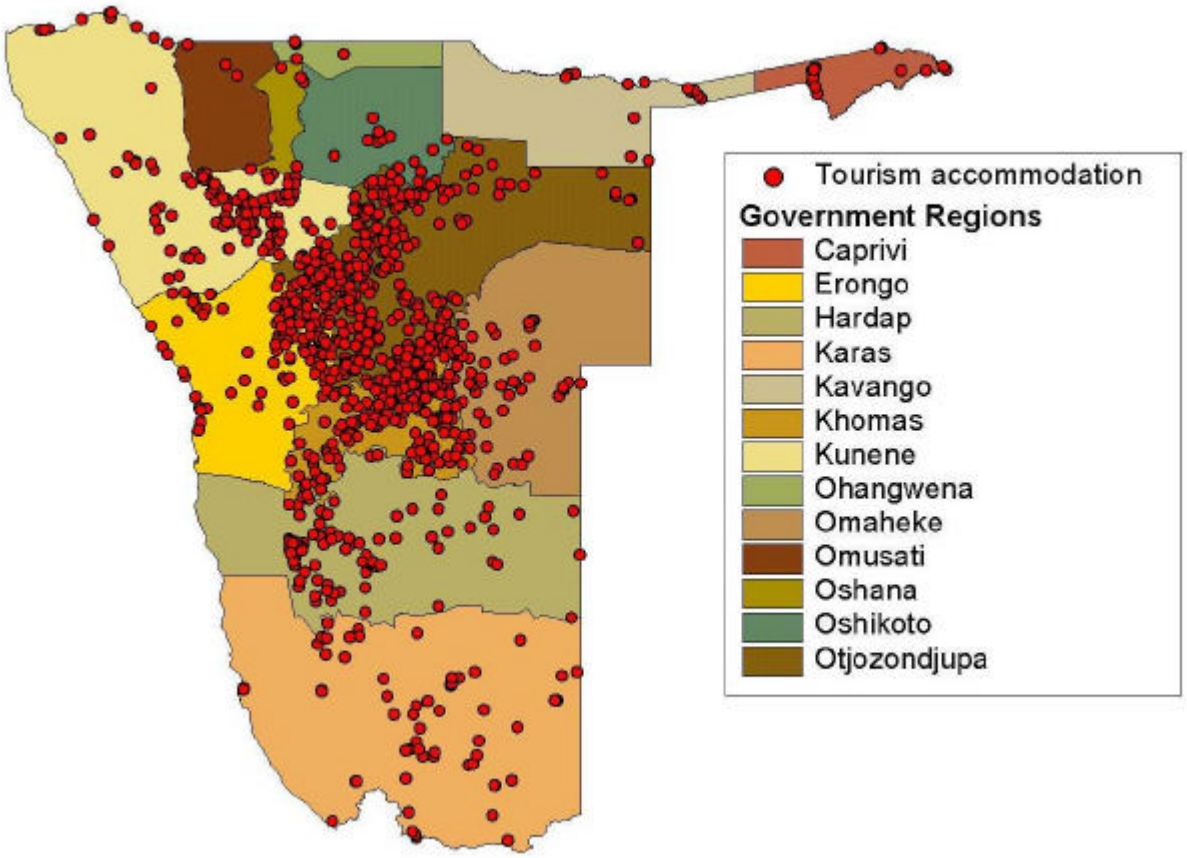

Figure 2.8. Distribution of known tourism establishments in Namibia based on various sources compiled by MET, in relation to the government regions of Namibia.

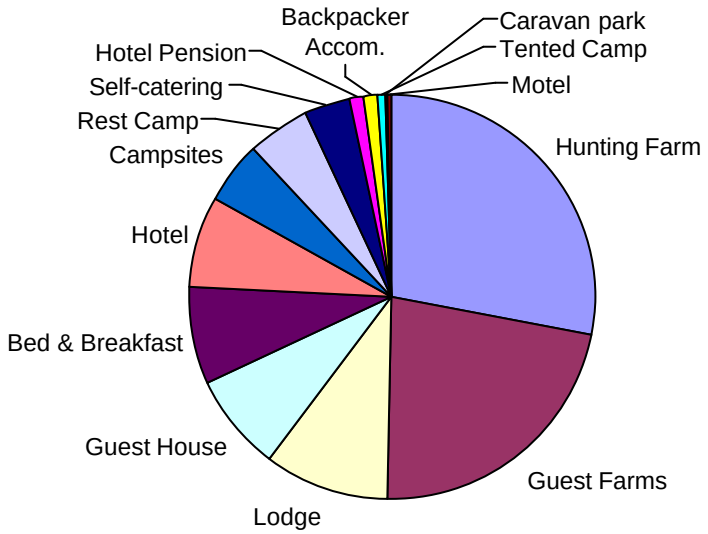

Figure 2.9. Proportion of accommodation businesses of different types in Namibia. Based on Stubenrauch Planning Consultants (2004).

2.3.7 Employment

Estimates of the number of people employed in the tourism industry range from 9 316 in 1997 (some 3% of the Namibian population), receiving total compensation of N$427 million per annum (Suich 2001), to 22 100 in 2002/3 (excluding banks; Stubenrauch Planning Consultants 2004) with a total annual compensation of N$326 million.

The largest employer is the accommodation sector, accounting for 76% of the workforce in the tourism industry (Stubenrauch Planning Consultants 2004). Within this sector, the largest employers were hunting farms (24%), hotels (21%), lodges (19%), guest farms (13%) and rest camps (11%).

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 2.10). About 2-4% of visitors are on hunting trips (see Figure 2.10), 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).

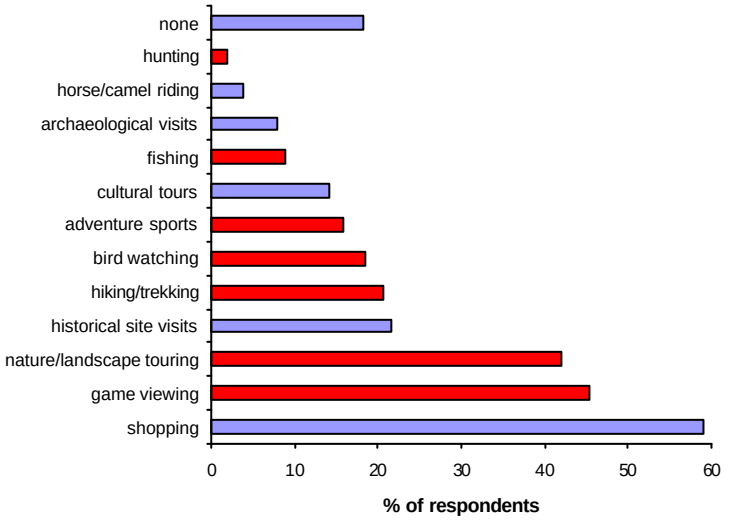

Figure 2.10. Leisure activities undertaken by surveyed visitors. Red bars indicate nature-based tourism activities. Based on SIAPAC (2003).

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 2.11). Nine of the locations correspond to areas falling inside protected areas.

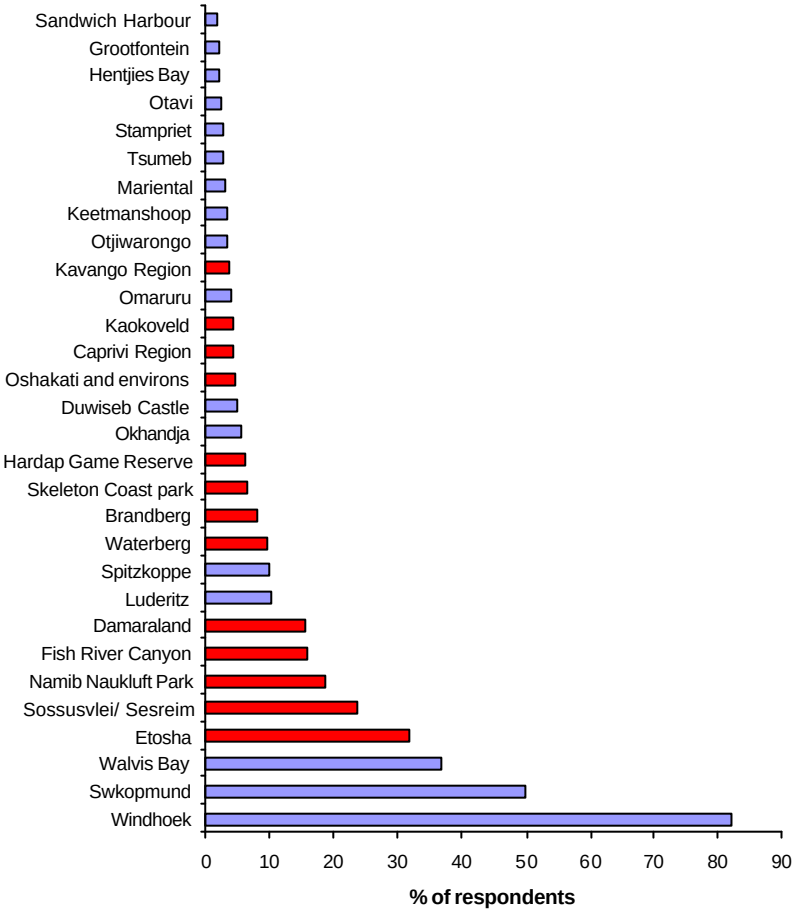

Figure 2.11. Percentage of visitors visiting various locations in Namibia. Red bars indicate designated protected areas and other natural regions. Based on SIAPAC (2003).

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 and 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 2.9). 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's 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), equivalent to about N$468 million in 2004. Protected areas were estimated to contribute 73% of this value, and tourism activities in general accounted for 87% of the total value.

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
Artisinal 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$14 million in 2003 (NACSO 2004), of which almost N$8.5 million was attributed to conservancies. Tourism related activities account for most of this benefit (Figure 2.12). 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$88 million to net national income in 2003, most of which is tourism-related (NACSO 2004). 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.

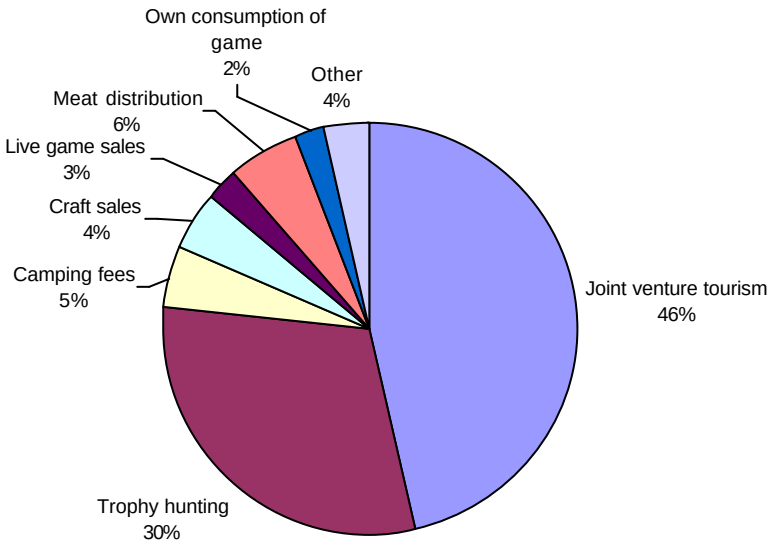

Figure 2.12. Sources of wildlife-related income to conservancies in communal areas

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).

Recent research into the Namibian trophy hunting market indicates that this sector remains 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).

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). 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) 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). These values are further explored in the following chapters.

3. VALUES GENERATED BY THE PROTECTED AREA SYSTEM

3.1 Types of value

The total economic value generated by protected areas is can be categorised into different types of value (Figure 3.1), providing a useful framework for analysis.

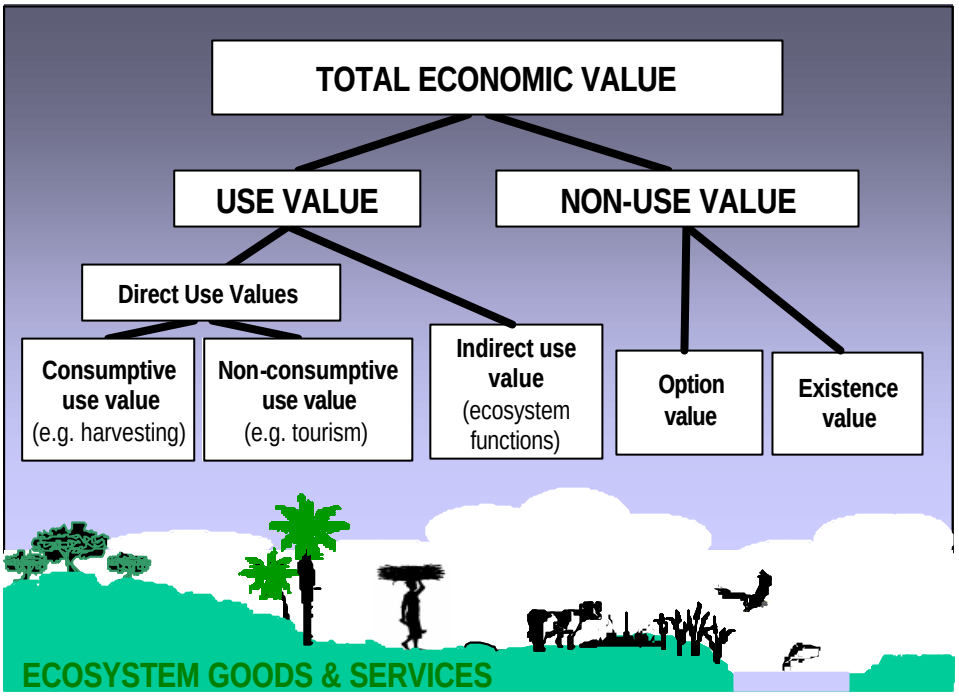

Figure 3.1. The classification of ecosystem values that make up total economic value.

Direct use values may be generated through the consumptive or non-consumptive use of park resources. In the case of Namibia's protected areas, most, if not all, of this use is tourism related, and includes both consumptive (hunting) and non-consumptive (e.g. game viewing) activities. Direct use values are also derived from the sales of live game.

Indirect use values are values 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 in the economy by saving on costs. These outputs are derived from ecosystem functioning such as water infiltration, water purification and carbon sequestration. They would also include benefits (or costs) such as the provision of source areas of wild animal populations.

Non-use values include the value of having the option to use the resources (e.g. genetic) within parks in the future, and the value of knowing that the biodiversity within parks is protected. Although far less tangible than the above values, non-use values are reflected in society's willingness to pay to conserve these resources, sometimes expressed in the form of donations.

This chapter provides a brief overview of these values as far as possible on the basis of existing information. We then concentrate on the quantification of direct use values, for which sufficient data are available to produce reasonably accurate estimates of value, in the following chapter.

3.2 Direct use values

3.2.1 Wildlife viewing

Most of the value generated by Namibia's protected area system is in the form of non-consumptive use value, or wildlife viewing tourism. While various studies have been conducted on the value of individual protected areas (mainly Etosha National Park) and on the value of wildlife tourism as a whole in Namibia, none have been conducted on the value of the protected-area tourism to date. We thus provide a detailed analysis of protected area tourism values in the following chapter.

3.2.2 Consumptive use of wildlife

Relatively little consumptive use of resources takes place within the protected area system. This is mainly in the form of hunting concessions and live capture of game for auction.

Trophy hunting started in Namibia in the early 1970s, and commercial hunting began in protected areas in 1987. The Directorate of Parks and Wildlife identifies possible hunting concessions (the potential annual offtake associated with a specific area of a park), and seeks permission from Treasury to put these concessions out to auction. About 35 big-game hunters qualify for these concessions and bid for them. Once acquired, a concession is held for 5 years. The price determined at the auction is an annual price, which remains fixed for the five years and does not track inflation. There are currently six concessions which expire at the end of 2004. These concessions generate a total income of N$3 978 624 per year.

This revenue accrues mainly to the Game Products Trust Fund, which was established under the Game Products Trust Fund Act in 1997. The trust fund is a mechanism of ensuring that revenue obtained from the sale of wildlife products could be used exclusively towards wildlife conservation both outside and within protected areas in Namibia. The funds are disbursed to projects in response to proposals. In reality most funding goes to projects outside of parks, although applications are made for projects within protected areas (B. Beytell, pers. comm.).

In addition to the revenues generated for the trust fund, the concessions generate substantially more turnover in the tourism industry. This value is explored more fully together with other tourism values in the following chapter.

Live game are captured for sale on auction from time to time, though this activity occurs only relatively rarely. The recent game auction at Waterberg was the first in ten years. This auction raised $4.7 million (B. Beytell, pers. comm.). 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.).

3.2.3 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 Oukwaluudhi 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.

3.3 Value of ecosystem services generated by protected areas

Ecological systems provide services that are critical to the functioning of the Earth's life-support system (Costanza *et al.* 1997). They contribute both directly and indirectly to human welfare, and therefore have economic value. Indeed the earth's ecosystem services have been estimated to be worth in the order of US$33 trillion per annum (Costanza *et al.* 1997). Because these services are not fully traded in commercial markets, however, they are often given very little weight in policy decisions, and the ecosystems which generate them are taken for granted. The fact that they are undervalued means that they are also often under-financed.

Ecosystem services are rather broadly defined by Costanza *et al.* (1997), and include both goods and services supplied by ecosystems (Table 3.1). While most of these services are provided by Namibia's protected area system, the understanding of their magnitude and value is rudimentary at best.

Table 3.1. Ecosystem services identified by Costanza *et al.* (1997), and how they relate to ecosystem functioning

Ecosystem Services	Ecosystem Functions	Examples
Gas regulation	Regulation of chemical composition of the atmosphere	Carbon sequestration, oxygen and ozone production,
Climate regulation	Regulation of temperatures, precipitation at local levels	Urban heat amelioration, wind generation,
Disturbance regulation	Regulation of episodic and large environmental fluctuations on ecosystem functioning	Flood control, drought recovery, refuges from pollution events,
Water supply and regulation	Supply and regulation of water flow	Provision of water for agricultural, industrial and household use [spatially and temporally]
Erosion control and sediment retention	Retention of soil within an ecosystem	Prevention of soil loss by vegetation cover, and by capturing soil in wetlands
Soil formation	Soil formation processes	Weathering of rock by water and accumulation of organic material in wetlands
Nutrient cycling	Storage, recycling, capture and processing of nutrients	Nitrogen fixation, nitrogen cycling through food chains
Waste treatment	Recovery of nutrients, removal and breakdown of excess nutrients	Breaking down of waste, detoxifying pollution
Pollination	Movement of floral gametes	Provisioning of pollinators for the reproduction of plant populations
Biological control	Trophic-dynamic regulation of animal and plant populations	Predator control of prey species, maintain population balance
Refugia	Habitat for resident and migratory populations	Nurseries, habitat for migratory fish and birds, regional habitats for species
Food production	Primary production for food	Production of fish and plants
Raw materials	Primary production for raw materials	Production of craftwork materials, housebuilding materials and fodder
Genetic resources	Unique biological materials and products	Medicine, products for materials science, genes for resistance to plant pathogens and crop pests, ornamental species
Recreation	Providing opportunities for recreational activities	Ecotourism, sport fishing, etc
Cultural	Providing opportunities for non-commercial uses	Aesthetic, educational, spiritual and scientific values of ecosystems

It is important to note that ecosystem services have different meanings at different spatial scales. For example, at a local scale, the maintenance of ecosystem productivity might be seen as an ecosystem service provided to farmers and pastoralists. However, the same land might produce other services, such as carbon sequestration, that are consumed by other actors in society. Servcies that are consumed on-site are the direct values, such as tourism and consumptive use of resources, as discussed above. Indirect use values are associated with services that generate benefits outside of protected areas. Some of the potentially more valuable of these services are discussed further below.

3.3.1 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).

3.3.2 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.

3.3.3 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).

3.3.4 Cultural value

The cultural services of the protected area system include its contribution to education, scientific knowledge and the spiritual wellbeing of Namibians and the global population. Although one could possibly quantify the amount of use of these areas by educational groups, scientists, etc., it would never be possible to quantify the true contribution that this makes to society. For example, the educational experience afforded by the area might influence the way in which new generations treat their environments far from protected areas.

3.4 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 pharamaceutical 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 can not 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. They comprise a composite of values including existence and bequest values, and are commonly just referred to in general as existence value. 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 far more intangible than the above values, but

perhaps more measurable, in that they 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. Global existence value is reflected in the donations that government and non-government organisations around the world make towards the development and maintenance of Namibia's protected areas. In fact, at this level, quasi-option and existence value are very difficult to separate, and are best considered together.

2.6.1 Willingness to pay for conservation by wildlife tourists

A number of studies have addressed the subject of willingness to pay for conservation by visitors linked to nature-based tourism activities (Stoltz 1996; Barnes *et al.* 1997; Krug *et al.* 2002). Willingness to pay, based on nature-based tourism studies in Namibia was recently reviewed by Humavindu (2002). Stoltz (1996) and Barnes *et al.* (1997) differentiated between willingness to pay for wildlife viewing, which represents a direct use of these resources, and willingness to pay for conservation which can be equated with an existence value. The most important findings of these studies is that visitors are willing to pay far more for conservation and access to nature-based tourism, in the form of entrance fess and supporting conservation funds, than is currently the case and that a large potential exists for protected areas to increase their revenue based on the existing resource base (Humavindu 2002).

Barnes *et al.* (1997), in a question specifically aimed at assessing willingness to pay for conservation, as opposed to wildlife viewing, found that 72% of surveyed visitors to wildlife-based tourism areas were wiling to contribute towards conservation in the form of a trust fund. The average willingness to pay for those who did wish to contribute was N$144 per person ($141 to N$334), with no significant differences in the mean amounts offered by Namibians and visitors. (Barnes *et al.* 1997, Stoltz 1996). Within the foreign tourist group differences did exist depending on visitor origin and accommodation types used, with southern African tourists and those using government campsites or bungalows, as opposed to private accommodation, offering less. 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 expressed above represents only a small fraction of global willingness to pay for the protection of Namibia's biodiversity. The above figure is the willingness to pay of people that visited wildlife amenities in one particular year. It does not include that of new visitors in subsequent years, nor of non-users, that would constitute a far greater segment of society. 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.

2.6.2 Donor contributions

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 2003-4, some of which was channelled through the State Revenue Fund's budget for MET (Table 3.2). Although difficult to calculate the exact amount, relatively little of this funding is specifically for use in protected areas, however - probably less than N$2.5 million. 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.

Table 3.2. Development partner funds allocated to environmental projects in Namibia in 2003-4. Source: MET Medium Term Plan (2004).

Development partners	Funds for 2003-4 (N$)
Through State Revenue Fund	
SIDA	1 358 000
Finland	750 000
Outside of State Revenue Fund	
Finland forestry programme	5 765 000
European Tourism Development Programme	8 500 000
Germany: Biodiversity programme	2 114 000
Germany: National programme to combat desertification	1 712 000
USAID: LIFE programme	16 000 000
Germany: Community forestry	960 000
WWF: Rhino conservation, Etosha NP	174 000
SADC Rhino Programme	141 000
FAO Domestication of indigenous fruit trees	3 840 000
FAO Support to national forest programme	510 000
Germany: community forestry	1 200 000
Finland Infocom project	2 250 000
Finland Bush encroachment study	954 000
Sweden SIDA Environmental Economics	1 130 000
UK DFID Wildlife Integration Livelihood Diversification Project	3 530 000
UNDP Enabling activity for climate change programme	660 000
UNDP Naiotnal Capacity Needs self-assessment	1 320 000
GEF/UNDP Desert Margins project	847 000
Norway environmental legislation project	250 000
TOTAL	**53 965 000**

4. THE TOURISM VALUE OF THE PROTECTED AREA SYSTEM

4.1 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 2003, 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 2003, and all prices, unless otherwise stated, are in 2003 Namibian dollars (N$).

4.2 Approach

The detailed methods are explained in each section of the chapter. The overall approach used is briefly outlined as follows:

1. Estimate number of visitor days and number of visitors to parks (separated by visitor origin), first by park, and then in total
2. Estimate direct expenditure in protected areas in the form of park fees and accommodation expenses
3. Estimate total tourism expenditure attributed to protected areas, based on visitor numbers and existing survey data on expenditure patterns
4. Disaggregate this expenditure into different categories, such as accommodation, etc.
5. Further disaggregate the accommodation expenditure into different types of accommodation as far as possible, aided by an analysis of where expenditure takes place in accommodation establishments near to parks
6. For each type of accommodation establishment, estimate the distribution of turnover and the distribution of expenditure on intermediate goods and services, for incorporation into a macro-economic analysis
7. Expand Namibia's Social Accounting Matrix to include the main types of accommodation used by tourists to build a 'protected area tourism' sector
8. Estimate the direct value added and total value added to Namibia's economy by the expenditure generated by protected area tourism.

4.3 Origins and numbers of visitors to Namibian Parks

Various studies have estimated the origins of visitors to Namibia and to Namibia's 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 Namibian, 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 4.1). 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 4.1. 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 4.1). 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.

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.

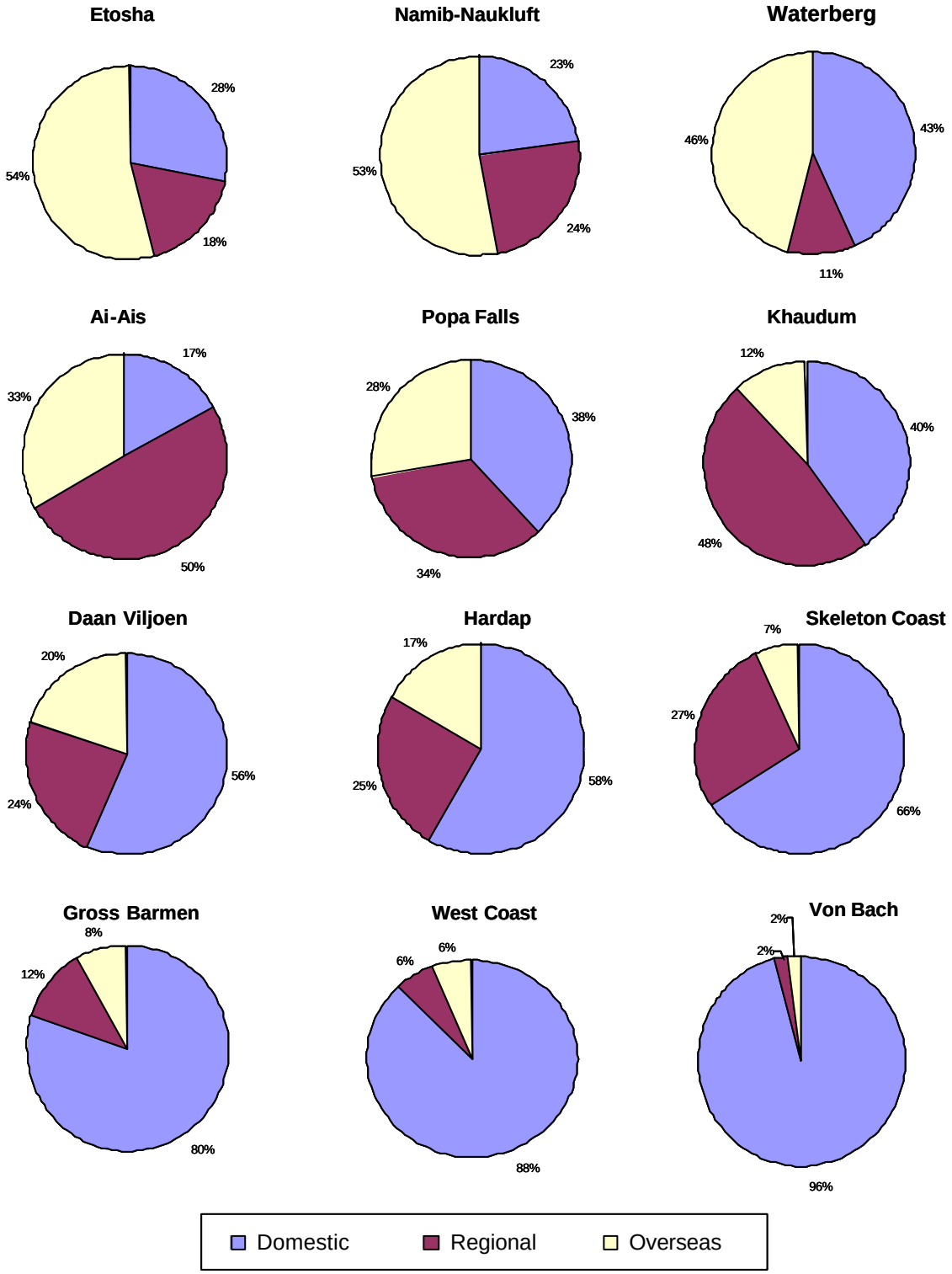

Figure 4.1. Comparison of visitor origin proportions for overnight visitors in different protected areas (based on NWR data).

According to NWR (2003), Etosha was projected to receive almost 178 000 overnight and 81 000 day visitors during 2003/4, totalling 259 000 visitors. This is considered to be far too high considering the actual number of bednights sold in 2003. The only protected area for which there are other relatively recent estimates of total annual visitor numbers is Etosha National Park. Using Krug's (2003) data, the total number of visitors to the park was expected to be in the order of 156 000 visitors. Based on analysis of entrance books, Söderström (2002) counted a total of 111 430 visitors recorded as entering Etosha through the two main gates during 2000. This is a slight underestimate, since it excludes one month of data for Anderson Gate and four months of data for Lindequist Gate. Given this, and the time elapsed, the estimate of 156 000 visitors to Etosha National Park in 2003 is certainly comparable to that obtained by Söderström (2002). Thus the figures for Kruger were adjusted on the basis of average length of stay by overnight visitors (Krug 2003) and the total number of day visitors required to reach an overall total of 155 794 visitors.

Besides Etosha, parks with relatively large numbers of visitors (25 – 60 000) are Cape Cross, Namib-Naukluft, Waterberg and Ai-Ais. All other parks receive under 10 000 visitors per year, with several receiving fewer than 1000 visitors (Table 4.2). The sum of these suggests a possible total of about 382 000 visitors, of whom just over 272 000 were foreign. However, the numbers of visitors to each of the parks are not strictly additive, since many visitors will have visited more than one park during the same trip.

Table 4.2. Estimated number of visitors to protected areas for 2003

Protected area	Bed Nights 2003[1]	Over-night visitors 2003/4[2]	Inferred nights/ visit	Day visitors 2003/4[2]	Total visitors
*Ai-Ais	48 685	25 531	1.9	3 183	28 714
Cape Cross	-	-	-	58 842	58 842
Caprivi	-	-	-	694	694
*Daan Viljoen	10 607	1 450	7.3	5 000	6 450
*Etosha	271 809	109 331	2.5	46 463	155 794
*Gross Barmen	11 635	3 644	3.2	2 652	6 296
*Hardap	9 738	2 297	4.2	5 305	7 602
Huns Mtns		0	-	0	-
*Khaudum	3 886	1 943	2.0	826	2 769
Mamili	-	-	-	190	190
Mahango	-	-	-	10 500	10 500
Mangetti		0	-	0	-
Mudumu	-	-	-	1 175	1 175
*Namib-Naukluft	58 233	53 413	1.5	5 400	58 813
Diamond Coast	-	-	-	-	-
* West Coast	14 152	2 228	6.4	-	2 228
Naute	-	-	-	-	-
*Popa	4 683	1 061	4.4	212	1 273
*Skeleton Coast	23 066	1 819	12.7	-	1 819
South West	-	-	-	-	-
Sperrgebiet		-	-	-	-
*Von Bach	1 470	333	4.4	5 305	5 638
*Waterberg Plateau	45 094	31 241	1.4	2 400	33 641
TOTAL	**503 058**	**234 291**	**-**	**148 148**	**382 439**

* Parks with NWR resorts

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

[1] Raw data 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

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. In the absence of any data it was estimated that domestic visitors visited half this number of parks on their trips. This suggests that the total number of visitors to parks was in the region of 215 000 in 2003, of whom just under 120 000 were foreign (Table 4.3).

Table 4.3. Estimated total number of people that visited protected areas in Namibia in 2003, under different assumptions

	Assumptions	Domestic	Regional	Overseas	TOTAL
Upper bound	1 park per visitor	109,825	92,580	180,034	**382,439**
Lower bound	1.15 parks per domestic visitor, 2.3 parks per foreign visitor	95,500	40,252	78,276	**214,028**

Interestingly, domestic tourists accounted for 29% of the total number of park visitors, with overseas visitors making up 47%, when numbers for all parks are simply added. This is similar to the ratios generally cited for wildlife tourists. When the numbers are adjusted to account for multiple visits, these ratios change to 45% domestic and 37% overseas visitors, respectively.

There is an interesting discrepancy between the estimated total number of foreign visitors to parks and the number one might arrive at using the MET arrival data in conjunction with the exit survey data. An estimated 695 000 foreigners visited Namibia in 2003. If 58.3% of these visited parks, as suggested by the exit survey, we would expect the total number of foreign visitors to parks to be in the region of 403 000. However, part of the discrepancy can be attributed to a bias in the respondents used in the exit survey. For example, only 0.6% of respondents were Angolan, whereas some 32% of visitors to Namibia in 2003 were Angolan (MET 2004). Taken further, 4.6% of respondents were Africans from Angola, Botswana, Zambia and Zimbabwe, whereas these countries made up 44% of foreign arrivals. Most visitors from these four countries come to visit family (MET 204). Correcting for Angolans alone would suggest that fewer than 40% of foreign visitors, or fewer than 276 000, would have visited parks in 2003[1]. This is still substantially higher than the lower bound estimate of 120 000 foreign visitors given above. Given the possibility of further income-bias in the exit survey, it is likely that the total number of visitors to parks fall within the ranges indicated in Table 4.3.

[1] Although weightings are applied to the exit survey data to account for sampling bias, SIAPAC (2003) acknowledges that data for visitors from African countries other than South Africa are not representative of the lower income visitors that enter via land border crossings, and who make up the majority of African visitors.

4.4 Expenditure on accommodation within protected areas

Expenditure on accommodation was estimated on the basis of bed-night occupancy data supplied by Namibian Wildlife Resorts. Included in the bed-night occupancy data was the number of days during the year during which a particular accommodation unit was occupied, and included only days which had been paid for. This was particularly important as many accommodation units are charged on a per unit per night basis and not per person.

NWR accommodation prices and tariffs for 2003/4 were obtained from the Namibian Wildlife Resorts website (http://www.dea.met.gov.na/met/nwr.htm) and information brochures provided online via tourist bureau websites (www.namibia-tourism.com). These sources were cross referenced to ensure as close a match as possible was made between accommodation types described in the database and available price information. Prices from October 2003 had increased by 10% over the previous year, the overall income for 2003 was based on an adjusted estimate of prices, based on the estimated proportion of visitors using parks before October (71%; Söderström 2002).

Income from accommodation was calculated in most cases by multiplying the numbers of days during the year which a specific accommodation unit was occupied by the per unit rate. In the case of hiking trails, the figures for bed nights appeared to relate to person per trip and not true bed nights (i.e. nights occupied). This assumption was based on back calculations done on limited income data provided by NWR for the Fish River Canyon hiking trail and corresponding bed night data. The cost per bed night using this data corresponds roughly to stated tariffs.

Based on the above, tourist expenditure on NWR accommodation within protected areas was estimated to be N$52.4 million during 2003 (Table 4.4). This is higher than the projected 2003/4 income of N$38.7 million from accommodation (NWR 2003). Actual income may lie between these estimates. The unaudited total revenue estimated for NWR for the 2004 financial year, which includes income from restaurants, shops and petrol stations among others, was N$104.3 million (NWR 2003).

Table 4.4 Estimated tourist expenditure on NWR accommodation in Namibian protected areas in 2003 (N$).

Protected areas	NWR Accommodation
Ai-Ais Hot Springs	3 721 000
Daan Viljoen	766 000
Etosha National Park	33 274 000
Gross Barmen Hot Springs	1 313 000
Hardap Recreation Resort	1 093 000
Khaudum Game Reserve	93 000
Namib-Naukluft Park	2 103 000
National West Coast Recreation Area	345 000
Popa Falls Game Park	316 000
Skeleton Coast Park	3 833 000
Von Bach Recreation Resort	66 000
Waterberg Plateau Park	5 447 000
Total	**52 371 000**

4.5 Expenditure on park fees

Gate fees to Namibian parks include (a) a daily park usage fee of N$20 (or N$30 for Etosha and Sossusvlei) and (b) a once-off vehicle entry fee for all users. Namibians receive a 50% discount and children under 16 pay N$2 per day. Due to a lack of information on children visiting parks, all income figures were calculated with the assumption that 90% of visitors were adults. Gate fees were estimated on the basis of visitor numbers and estimated vehicle numbers (see below) for all resorts where these fees are collected by NWR. For the remaining parks, gate fees paid were obtained from park managers[2].

Vehicle numbers were estimated on the basis of survey data from Etosha and Sossusvlei (Table 4.5). Self-driven visitors were assumed to represent car users while other categories were equated to buses, defined by NWR as 11 or more occupants. Parks for which visitor numbers, vehicle numbers and income were known were used to calibrate the assumed average occupancy of vehicles, giving an average of 2.75 visitors per car, and 20 per bus. Income from vehicle fees was calculated from the rate for cars and the mean tariff for buses of various sizes.

Table 4.5. Mean proportion of visitors of various origins using different transportation based on Krug (2003) and estimated vehicles by visitor origin.

Mode of transport	Domestic	Regional	Overseas
Self driven	75%	94%	53%
Tour / overland truck	26%	7%	48%

The estimated total revenue to protected areas generated by 'gate fees' is in the order of N$16.3 million, with over 80% of this from park fees, and the remainder from vehicle fees.

Table 4.6. Estimated income from gate fees

Protected area	Total Park Fees	Total Vehicle Fees	Estimated total
Ai-Ais Hot Springs	862,439	212,475	1,074,914
Daan Viljoen Game Park	205,089	47,759	252,848
Etosha National Park	7,466,919	1,156,544	8,623,463
Gross Barmen Hot Springs	156,522	46,611	203,133
Hardap Recreation Resort	195,836	56,271	252,107
Khaudum Game Park	68,760	20,460	89,220
Namib-Naukluft Park	1,537,010	331,450	1,868,461
Namib-Naukluft Park (Namib section)	303,494	104,980	*408,475
National West Coast RA	145,510	16,498	162,009
Popa Game Park	72,473	9,425	81,898
Skeleton Coast Park	283,396	13,453	296,849
Von Bach Recreation Resort	64,577	41,749	106,326
Waterberg Plateau Park	679,912	249,713	929,625
Cape Cross Seal Reserve	991,488	480,926	*1,472,414
Caprivi Game Park	12,075	5,147	*17,222
Mudumu National Park	19,487	8,712	*28,199
Mamili National Park	3,155	1,410	*4,565
Mahango Game Reserve	178,815	77,852	*256,667
TOTAL	**13,246,958**	**2,881,435**	**16,266,388**

*note these are actual data, and are marginally higher than the sum of estimated park and vehicle fees, which also results in a similar discrepancy in the overall total.

[2] Data could not be obtained for Naute Recreational Resort.

4.6 Overall tourism expenditure attributable to protected areas

Information on trip expenditure by tourists in Namibia was collated from various sources (Table 4.7). The high degree of agreement for total expenditure per person among those estimates which exclude airfares indicates that the use of an average in this case is highly robust. Thus, the mean of the values given by Barnes *et al.* (1997), Stoltz (1996) and SIAPAC (2003) was used to determine spending by non-Namibian tourists. In the case of Namibian tourists, information was limited and so a mean of the figures from Krug (2003) and Barnes *et al.* (1997) was used.

Mean expenditure values were then multiplied by the number of tourists of different origins, on a park by park basis, using the ratios in Figure 4.1. Total expenditure by wildlife viewing tourists is estimated to be in the range of N$1.10 – 2.26 billion (Table 4.8), depending on the degree of overlap in the visitors to different parks that is assumed in calculating overall visitor numbers. In addition, the hunting tourism expenditure in Namibia due to existing hunting concessions within the parks was estimated to be N$73.3 million. This increases the estimates of overall expenditure to N$1.17 - 2.33 billion.

Table 4.7. Various estimates of average trip expenditure (N$) by nature tourists of different origins. All values have been converted to 2003 prices for comparison.

Source	Include International airfare	Domestic	Regional	Overseas
Etosha visitors (1997) (n=803)[1]	Yes	991	5 940	27 384
Sossusvlei visitors (2000) (n=451)[2]	Yes	3 569	5 143	18 883
All visitors to national exit points (2002/03) (n=2447)[3]	No		3 554	9 537
Wildlife viewing tourists to PA's and national exit points (1992/93) (n=660)[4]	No	2 760	3 709	9 352
Wildlife viewing tourists to PA's and adjacent areas (1994/5) (n=641)[5]	No		3 688	8 660
Mean estimates used in analysis	**No**	**2 440**	**3 650**	**9 183**

[1, 2] Krug (2003); [3] SIAPAC (2003); [4] Barnes *et al.* (1997); [5] Stoltz (1996).

Table 4.8. 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
Upper bound (382 439 visitors)	268.0	337.9	1,653.2	2,259.1	**2,332.4**
Lower bound (214 028 visitors)	233.0	146.9	718.8	1,098.7	**1,172.0**

Overall tourist expenditure in Namibia is estimated to be between N$1.49 billion (domestic & foreign; Stubenrauch Planning Consultants 2004) and N$ 4.81 billion (foreign only; Lange 2004), depending on how it has been calculated. The above estimates for protected areas are fairly low relative to this range, being closer to the Stubenrauch estimate, but only 22-45% of Lange's estimate. In comparison, Ashley & Barnes (1996) estimated that wildlife related tourism expenditure (including activities other than visiting protected areas) makes up 70% of total tourism expenditure.

4.7 Distribution of expenditure

4.7.1 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 4.9). 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 4.9. Estimated distribution of expenditure on accommodation and other industries by visitors to protected areas whilst in Namibia (N$ millions)

	% for all foreign visitors[1]	Lower bound	Upper bound
Accommodation	36	417.2	830.3
Meals and drinks	28	331.7	660.1
Car Rental	7	76.2	151.6
Domestic Travel	3	37.5	74.6
Tour Operators/Guides	4	43.4	86.3
Handicrafts	3	30.5	60.6
Recreation/Cultural	6	66.8	132.9
Shopping	14	168.8	335.9
Total expenditure	**100**	**1,172.0**	**2,332.4**

[1]Siapac 2003

4.7.2 Distribution of expenditure within the accommodation sector

The estimated amount of expenditure on accommodation ranges from N$417 - 830 million. Of this, the expenditure in NWR resorts has been estimated above. The remaining amount is spent in a variety of accommodation establishments 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.

Establishments for which turnover was assumed to be highly dependent on the existence of protected areas were identified using the following steps, based on a GIS analysis of the most recent and comprehensive database of accommodation establishments within Namibia (MET 2004)[3]:

- All establishments inside protected areas or within a 20km buffer zone around a protected are;
- Hunting lodges were excluded as it was assumed the main attraction was based on game species occurring on their own land;
- All points in and around larger towns, excluding those inside or on the border of a protected area, were excluded. Those excluded were assumed to have a minimal dependence on protected areas and associated natural resources due to other attractions being linked to these urban areas (e.g. Luderitz and the diamond industry, Windhoek as the capital and other industry/business in general) or the fact that they

[3] This database includes information on number of rooms, beds, rates per person and other useful data for investigating the broader tourism accommodation industry in Namibia.

are on or linked to major transport centres (e.g. Windhoek and airports, Walvis Bay and harbour). The towns included are: Luderitz, Windhoek, Walvis Bay and Mariental.

- Namibian Wildlife Resorts were excluded from this analysis, as they have been subject to a separate analysis.

The resulting set of establishments (Figure 4.2) 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 in Namibian Wildlife Resorts and various other studies (Table 4.10).

Tourist expenditure in these accommodation establishments was estimated as N$295 million. Using the ratio of overnight visitors to bed-nights for protected areas (0.47), the total number of visitors to these establishments was estimated to be about 215 000, including domestic tourists (Table 4.10). The subset of these establishments occurring on communal lands accounted for N$24.1 million of this income and approximately 8% of estimated visitors.

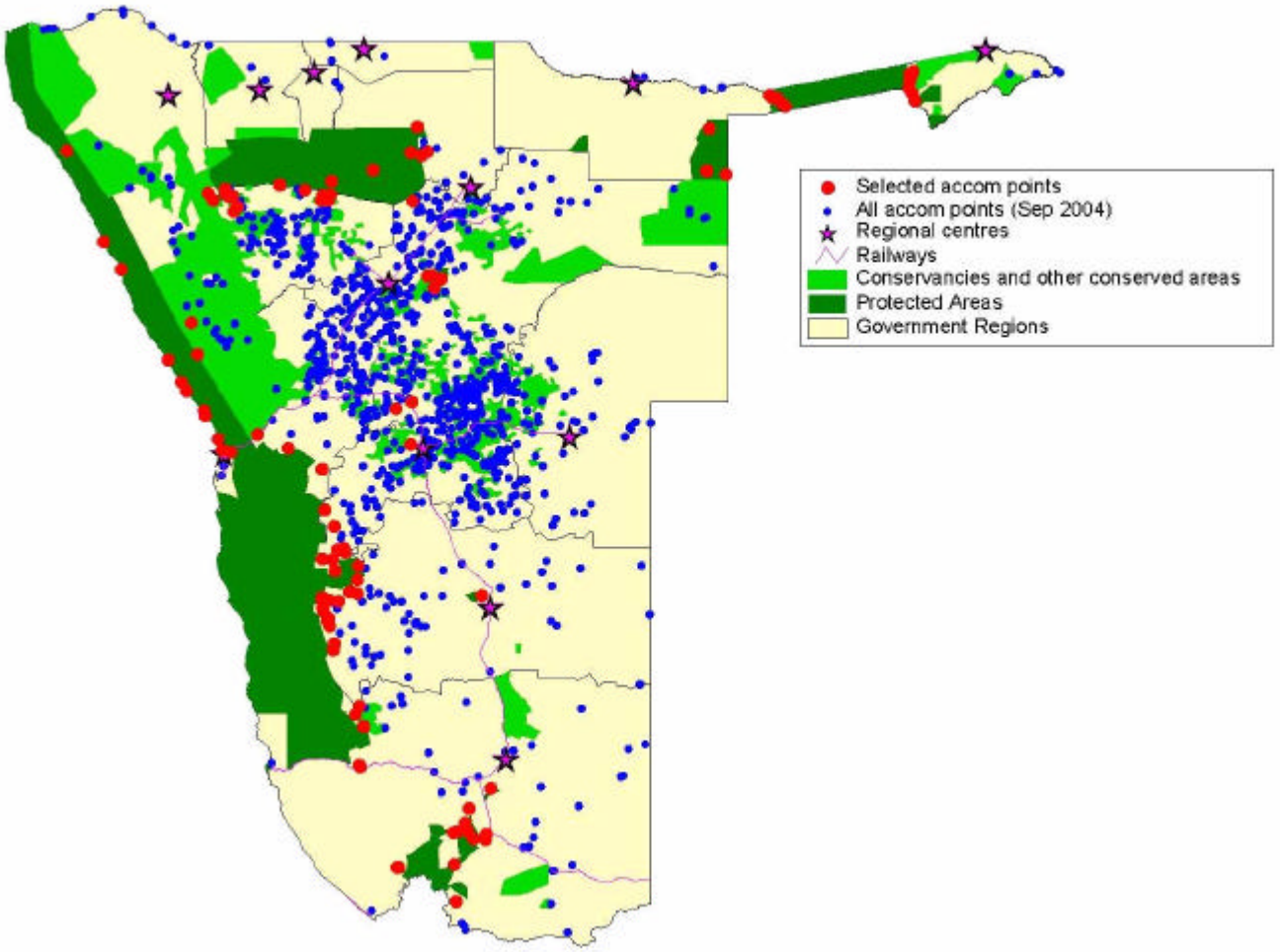

Figure 4.2. Accommodation establishments that are assumed to have significant linkages to the protected area system (shown in red)

Although these establishments may be heavily dependent on the protected area system, not all of this turnover can be attributed to protected areas. Protected areas received an estimated 150 000 day visitors in 2003. Assuming that they stayed in the identified establishments, this suggests day visitors make up about 65% of their guests. We have thus adjusted the turnover by this fraction to reflect the turnover that is directly attributable to protected areas (Table 4.10).

Table 4.10. Estimated bed-nights, income and total visitors to accommodation establishments in areas neighbouring protected areas, and total turnover attributed to non-consumptive use of protected areas. No data was available for the caravan park within the sample.

Type	n	Price pp (2003)	Ave. no beds	% occ	Est total visitors	Turnover (N$)	Turnover attributable to Pas
Campsites	11	60.47	67	12%[1]	15 130	1 946 563	1,270,089
Campsites in communal areas	3	60.47	67	18%[2]	6 190	796 321	519,582
Guest Farms	25	427.00	16	42%[3]	27 972	25 412 478	16,581,068
Guest Houses	10	377.50	20	50%[4]	17 108	13 741 000	8,965,692
Hotels	3	295.00	42	50%[4]	10 778	6 764 940	4,413,970
Lodges	27	973.00	35	55%[5]	89 630	185 553 544	121,069,494
Lodges in communal areas	4	973.00	35	55%[5]	13 279	27 489 414	17,936,221
Rest Camps	7	726.50	18	42%[6]	9 054	13 994 482	9,131,083
Self Catering Accommodation	9	170.00	34	42%	22 095	7 991 802	5,214,470
Tented Camps	4	1,272.50	12	50%	4 106	11 116 560	7,253,304
Total					**215 341**	**294 807 105**	**192,354,974**

[1]Average NWR campsite occupancy 12%; [2]Based on a range of enterprise models for campsites in communal lands (Barnes, unpubl. data); [3]Assumed similar to rest camps; [4]Estimated; [5]Based on a range of enterprise models for lodges in private and communal lands (Barnes, unpubl. data); [6]Occupancy in NWR rest camps ranged from 12% to 66%, with a mean of 42%.

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 4.11.

Table 4.11. Estimated distribution of expenditure (N$ millions) on accommodation by visitors to protected areas whilst in Namibia (based on lower and upper bound estimates of visitor numbers)

Accommodation type	NWR resorts in parks	Other park-associated accommodation	Rest of Namibia		TOTAL	
			Lower	Upper	Lower	Upper
Campsites	9.91	1.27	19.41	73.90	30.58	85.08
Campsites (communal areas)		0.52			0.52	0.52
Rest Camps	42.46	9.10			51.56	51.56
Tented Camps		7.23			7.23	7.23
Hunting Camps		26.1			26.1	26.1
Lodges		120.61	28.73	109.36	149.34	229.97
Lodges (communal areas)		17.87			17.87	17.87
Guest Farms		16.52	13.53	51.51	30.05	68.03
Self Catering Accommodation		5.19	8.04	30.61	13.23	35.80
Guest Houses		8.93	38.43	146.32	47.36	155.25
Hotels		4.40	39.02	148.56	43.42	152.95
Total	**52.37**	**191.62**	**147.16**	**560.26**	**417.2**	**830.3**

4.8 Impact on GDP and income distribution (a SAM-based analysis)

4.8.1 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 (GDP) for every million dollars of output it sells to tourists. Of this, skilled and unskilled employees receive $132 400. This measure is called the direct impact on income and GDP.

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. How does this happen? 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 models[4] for tourism analysis. A recent input-output manual by the United Nations includes a special section on the use of IO models for tourism analysis (UN, 1999). Such models are used routinely by the WTTC (World Travel and Tourism Council) in their analysis of tourism's economic impacts; WTTC has applied these models in many countries throughout the world. A literature survey by Sinclair (1998) also identifies IO and SAM

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

models as one of the common methods for tourism analysis. In South Africa, a SAM multiplier model was used to analyse the regional economic impact of tourism in KwaZulu-Natal (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.

In 2004, a SAM was constructed for Namibia (Lange *et al.*, 2004). This basic SAM has been expanded for analysis of protected area tourism. A detailed description of the SAM framework, the protected area tourism SAM, and the mathematical model used for calculations is provided below.

4.8.2 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 to *net national income,* as considered here, also takes depreciation of capital into account.

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 Jon Barnes and co-workers (e.g. Barnes 1995, Barnes & de Jager 1995, Barnes *et al.* 2002, Barnes & Humavindu 2003), 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 4.12. The generalised lodge model is shown in Appendix 1 as an example. 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 4.13.

Table 4.12. 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 tarrifs, all year round use
Self-catering	Based on data from lodge and campsite models, same as restcamp model

Table 4.13. 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.

	Percentage of turnover			
Accommodation type	**Intermediate expenditure**	**Labour costs**	**Gross operating surplus**	**Rent/royalties to communal lands[1]**
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

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

4.8.3 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 and 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. Data from the National Accounts and statistics about households and other institutions are used to construct accounts for

- Supply of products from imports and domestic production
- Production structure of each industry
- Generation of income by each industry
- Redistribution of incomes among institutions, for example transfers among different groups of households, transfers from government to households, taxes paid by households and enterprises to government, etc.
- Detailed expenditure patterns of households and other institutions
- Saving and investment
- Transactions with the rest of the world (ROW), imports and exports

Each account is represented by a row and column (Figure 4.3). Reading the SAM across a row shows the incomes or sales revenue of an account, while reading the SAM down a column shows the expenditures or outlays of that account. The principle of accounting requires that total revenue (row total) equals total expenditure (column total). A Basic SAM was constructed for Namibia for the year 2002 (Lange *et al.* 2004). The Basic SAM has been 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 components of Namibia's SAM are described in detail in (Lange *et al.* 2004) and summarised in Box 1.

The detailed components of the SAM, extended for Protected Area Tourism, are listed in Table 4.14.

Table 4.14. Detailed components of the SAM

Component	Extended SAM for protected area tourism
Products (37)	4 Agricultural products 4 Processed food products 7 types of tourist accommodation 19 Other products 2 types of tourism* Trade margins
Activities (34)	4 Agricultural activities 4 Food processing 7 types of tourist accommodation 17 Other manufacturing & services 2 types of tourism
Factors of production (7)	Skilled labour Unskilled labour Mixed income in Commercial Agriculture Mixed Income in Traditional Agriculture Rents & royalties on communal land used for tourism Gross operating surplus Taxes net of subsidies on production, including royalties paid to DPWM for hunting
Institutions (9)	Non Profit Institutions Serving Households (NPISH) Enterprises Government 6 Households: Urban (3) Rural (3)
Capital (1)	Savings & Investment
Rest of World (1)	Imports & Exports

*Identifying it as a commodity makes more sense than identifying it as an activity

Figure 4.3. Structure of a Social Accounting Matrix

		PRODUCTION ACCOUNTS		PRIMARY INCOME	INSTITUTION ACCOUNTS			CAPITAL ACCOUNT	REST OF WORLD ACCOUNT	TOTAL INCOMES
		Commodities	**Activities**	**Factor Payments**	**Households**	**Enterprises**	**Government**			
PRODUCTION	**Commodities**	Trade margins	Intermediate use of commodities		Household Consumption Expenditure		Government Consumption Expenditure	Investment & Change in Inventories	Exports	Total use of commodities
	Activities	Domestic supply								Domestic supply of commodities
	Factors		Net Value Added						Factor Income from Abroad	Factor income
INSTITUTIONS	**Households**			Labour incomes	Inter-household transfers	Enterprise income distributed to households	Government Transfers to Households		Remittances from Abroad	Household income
	Enterprises			Undistributed profits			Transfers to Enterprises		Enterprise Income from abroad	Enterprise Income
	Government	Taxes less subsidies on products	Taxes less subsidies on production	Taxes on labour and profits	Taxes on household income & property	Direct taxes on Enterprises			Government Income from World	Government revenue
CAPITAL ACCOUNT			Consumption of Fixed Capital		Household Saving	Enterprise savings	Government Saving		Capital Account BoP	Total savings
REST OF WORLD ACCOUNT		Imports		Factor payments abroad	Remittances abroad	Transfers abroad	Transfers abroad			Total imports
TOTAL EXPENDITURES		Total Commodity Supply	Total domestic output	Total factor outlay	Household expenditure	Enterprise Expenditure	Government expenditure	Capital expenditure	Total exports	

Box 1. Explanation of the detailed components of the SAM

Products and Activities. The SAM distinguishes products (markets for the goods and services) from activities, that is, the domestic production of commodities by industries. This distinction is important in some economies because some activities may produce more than one commodity. For example, farming activities may produce both livestock and crop products, or the fishing industry may produce both fish and processed fish products. Reading down the column of the commodity account shows how much of each commodity is supplied by domestic activities (the detailed SAM will show this for each activity or industry) and how much is imported from the Rest of the World (ROW). There are two additional entries in this column:

- Trade margin, which is the difference between the price received by the producer and the price paid by the purchaser. This difference is the 'markup' added by wholesale or retail traders. Similar margins for transportation from producer to purchaser and other associated services (insurance) are also included, reflecting the cost of moving a product from the producer (or, in the case of imports, from the border) to the purchaser.
- Taxes less subsidies on products include taxes like the fuel levy or import tariffs on specific products.

The sum of this column is the total supply of commodities available in the economy, valued at the prices purchasers pay. Reading across the row shows the uses for all commodities: as inputs to domestic production activities, and to final users including households, government, investment and ROW (exports). Total use of commodities is equal to total supply.

The activity accounts show production by domestic industry: across the activity account rows, the amount of each commodity an industry supplies, down the activity account column, the cost of production which includes the inputs required for production, 'factor inputs' and taxes on production.

Both product and activity accounts are extended from the Basic SAM by including 8 types of accommodation, identified earlier in this report…

Factor accounts. Factor accounts consist of factor inputs to production: labour, capital, and rent on property. Labour is often disaggregated into several types by occupation, skill level or other characteristics. Income to capital often distinguishes the gross operating surplus (GOS) of formally organised enterprises from the surplus earned by the self-employed, which is called 'mixed income.' The earnings of the self-employed, such as farmers, are called 'mixed income' because the surplus of sales revenue over input costs includes both a payment for their own labour as well as a payment for capital inputs. It is difficult to impute the labour cost, so the national accounts simply leaves the surplus as mixed income. An additional category of income is created to represent the rent and royalties received by conservancies in communal areas for use of their land. Some factor income is earned abroad and some payments must be made to the ROW for external factors used in the domestic economy.

Institution accounts. There are three major categories of institutions: households, enterprises and government. Households obtain income (across the row) by supplying labour as a factor in production, but also receive transfers from other households, from government, from ROW, and distributed earnings (interest and dividend payments) from enterprises. The expenditure of households (down the column) includes purchases of goods and services for consumption, transfers made to other households, taxes paid to government, remittances to ROW and savings.

Enterprises receive income from factor markets for the capital they provide and use the income by distributing it to households and ROW, paying taxes, and saving (retained earnings). Government receives income from various kinds of taxes and transfers from ROW, which include development assistance; like the other institutions, government uses its income for purchases of goods and services, transfers, and saving.

Capital account. The capital account consists of Savings across the row and expenditures for Investment down the column.

Rest of the World account. The economy's interactions with ROW are represented in the last row and column. ROW obtains income from sales of imports (of goods, services and factors) to the domestic economy; ROW spends income in the domestic economy from its purchase of Namibia's exports, the use of Namibian factors of production (labour and capital), transfers and foreign net borrowing/lending, which constitutes the balance of payments.

The data sources, adjustments and assumptions used to construct the Basic SAM are described in (Lange, 2004). The data used for the expansion of the Basic SAM into the Protected Area SAM are as follows. The Protected Area SAM required additional data about:

(1) *Tourist expenditures*.

The tourist expenditures described in section 3.1 were mapped into the SAM classification of products. The only category that did not correspond directly to a SAM product was the item "Shopping." Shopping was distributed among Other processed foods (2%), Textile products (10%), Light manufacturing (87%), and Communications (1%).

(2) *Production structure of new types of tourist accommodations*.

An important component of the protected area tourism analysis is the identification of 7 categories of Accommodations. Disaggregation of accommodations was necessary to identify tourism that can be attributed to protected areas, and to identify incomes received by local communities from tourism.

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 were estimated using enterprise survey data collected by Anton Cartwright for a study of Community-Based Natural Resources Management.[5] 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. The input structures for each type of accommodation are shown in Appendix 2.

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. Because there is a slight difference in the shares of subsector output under the Lower and Upper Bound scenarios, different average values were used for the scenarios.

4.8.4 Estimation of protected area tourism multipliers

The SAM itself is simply a database that provides a 'snapshot' of the economy at a point in time. To use this database for analysis, the SAM must be transformed into a model. SAMs are used in many types of economic models, but the two most common approaches to SAM-based modelling are multiplier analysis and computable general equilibrium (CGE) modelling. Multiplier analysis is used either to analyse the present economy to gain a better understand of the linkages, or for impact analysis of the effect of policy change under the assumption that prices, consumption and trade coefficients remain constant. For analysis of changes or estimates of policy impacts, multiplier analysis can also be useful, although CGE models are often used because they are better able to estimate the behavioural response of different groups to changes.

For this study, the contribution of protected area tourism to the Namibian economy in 2003, multiplier analysis is appropriate. The multiplier analysis used accounting multipliers (Pyatt and Round, 1984):

(1) $x = Ax + y$

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

(2) $x = (I - A)^{-1} y$

Where

x is a vector of outputs for every component of the SAM,

y is a vector of exogenous demands for goods and services. Enterprises, government, investment and exports are treated as exogenous sectors,

I is an identity matrix, a square matrix with 1's along the diagonal and 0's everywhere else, and

A is a matrix of coefficients for the endogenous sectors. Coefficients are calculated by dividing each entry in a given SAM column, *j,* by the sum for that column, (x_j). This matrix includes all income generation and household expenditure, so the induced effects of incomes can be included in the multiplier analysis.

Equation 1 says that output, *x*, for each sector is the sum of all goods needed to satisfy endogenous demands (*Ax*) plus exogenous demand (*y*). Equation 2 is used to calculate the impacts of exogenous demand, *y*. In this case, the level of protected area tourism Expenditures is treated as an exogenous expenditure. This allows one to calculate all the impacts of protected area tourism Expenditures independently from other exogenous expenditures in the economy.

4.8.5 Contribution to GDP

Using the PA SAM and the mathematical model described above, the impact of protected area tourism on the national economy was calculated for two scenarios: a lower bound estimate and an upper bound estimate of protected area tourism expenditure.

The first question we address is, what is the total impact of protected area tourism on national income, taking into account both direct and indirect effects? Table 4.15 shows the contribution to GDP under the two alternative estimates of protected area tourism expenditure: the *direct* contribution to GDP ranges from N$546 to N$1,103 million, roughly 1.7% and 34% of GDP in 2003. But the total contribution to GDP is much higher: total income generated ranged from N$1,013 to N$2,022 million, or 3.1% to 6.3% of GDP. The GDP multiplier—the indirect stimulus from PA Tourism to the rest of the economy—is 1.86 or 1.83 under the Lower and Upper Bound estimates, respectively. That means, for every N$1.00 of income generated from direct services provided to tourists, an additional N$0.86 or N$0.83 of income will be generated because of the demand for products to produce those services, and the products households buy with their additional income. The multipliers are slightly different for the Lower and Upper Bound estimates because the composition of tourist expenditures is slightly different for each estimate.

Table 4.15. Contribution of Protected Area Tourism to GDP, 2003 (millions of N$)

	Lower Bound Estimate	Upper Bound Estimate
Total PA Tourism expenditure[1]	$ 1 172	$ 2 332
Contribution to GDP		
Direct impact	$ 546	$ 1 103
Total impact	$ 1 013	$ 2 022
Multiplier	1.86	1.83
PA Tourism share of GDP		
GDP in 2003 = $ 32,309 million[2]		
Direct impact	1.7%	3.4%
Total impact	3.1%	6.3%

[1] Estimate from this study, as presented in Table 4.8.

[2] Source: GDP in 2003: *National Accounts 1995-2003* (National Planning Commission, 2004).

4.8.6 Distribution of factor income

The total income shown in Table 4.16 is paid out to different 'factors of production,' that are necessary for production. These factors include skilled and unskilled labour, returns to capital invested in a business (GOS), rents for the use of communal lands for tourism, and taxes on production activities (including royalties to government for hunting) and taxes on products sold.[6] The distribution of income by factors is the first step toward understanding how much income each household receives.

In all cases, Lower and Upper bound as well as direct and total, Gross operating surplus (GOS) is the largest component of income, ranging from 35% to 46% of total income. This payment must be sufficient to cover all capital costs, including payments for investment and depreciation of capital stock, as well as business profit taxes. The income multiplier for GOS (2.41 or 2.33) is slightly higher than the income multiplier for all factor incomes (1.86 or 1.83), indicating that the indirect impacts generate more GOS than the direct tourism expenditures.

Payments to labour are also high, constituting 31% of direct and 29% of total labour income generated. The multipliers for both types of labour are high—roughly 1.68 for skilled labour and 1.64 for unskilled labour—but not as high as other factor income multipliers.

For Mixed income in agriculture, commercial farmers do not receive much income from direct tourist expenditures (3% of the total), but benefit significantly from the indirect demands, mainly for food products. Traditional agriculture benefits directly from tourism due to the demand for crafts. The indirect demand for traditional agricultural products (and the income this generates) results from the income received by farm households in the communal areas.

Table 4.16. Distribution of factor income from Protected Area Tourism

	Lower Bound Estimate			Upper Bound Estimate		
Factor payments (million N$)	**Direct**	**Total**	**Multiplier**	**Direct**	**Total**	**Multiplier**
Skilled labour	77	131	1.69	154	259	1.68
Unskilled labour	95	158	1.66	196	321	1.64
Mixed income, commercial agriculture	19	48	2.58	35	95	2.76
Mixed income, traditional agriculture	27	39	1.44	53	75	1.41
Gross operating surplus (GOS)	191	460	2.41	395	921	2.33
Rent/Royalties to Communal lands	2	2	1.00	2	2	1.00
Taxes - subsidies on production & products	136	177	1.30	268	349	1.30
Total	546	1,013	1.86	1,103	2,022	1.83

Distribution of factor income	**Direct**	**Total**	**Direct**	**Total**
Skilled labour	14%	13%	14%	13%
Unskilled labour	17%	16%	18%	16%
Mixed income, commercial agriculture	3%	5%	3%	5%
Mixed income, traditional agriculture	5%	4%	5%	4%
Gross operating surplus	35%	45%	36%	46%
Rent/Royalties to Communal lands	*	*	*	*
Taxes - subsidies on production & products	25%	17%	24%	17%
Total	100%	100%	100%	100%

* less than 1%
** including payments to DPWM for hunting in protected areas

[6] The taxes paid on production and products do not include income taxes, property taxes, or business profit taxes. These taxes are represented in another part of the model, as part of the expenditures of households and businesses.

Rent and royalties to communal lands used for PA tourism are generated by specific types of tourist accommodations, tourist lodges and camps in communal lands. There is no indirect demand for these accommodations, so the direct and total income is the same and the multiplier is 1.00. These rents constitute a very small share of total incomes, less than 1%. Overall, one can clearly state that households in communal areas receive at least 4% of direct income generated by protected area tourism from Mixed income to traditional agriculture and Rents for communal land. Some of these households are likely to be employed by the tourist accommodations and receive additional income for their labour, but there is presently no estimate of how much labour is hired from communal areas.

Taxes net of subsidies account for 24-25% of direct income from protected area tourism, but only 17% of total income generated. Net taxes have the lowest multiplier.

4.8.7 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 are classified by location and main source of income: (Table 4.18).

Table 4.17. Classification of households

Urban households:		
	1	Wage and salary earners
	2	Business owners and livestock farmers
	3	Others: pensions, gifts and remittances
Rural households:		
	4	Wage and salary earners
	5	Business owners and commercial farmers (livestock + crops)
	6	Traditional agriculture (subsistence farmers), pensions, gifts

The SAM tracks income in two stages (sometimes more depending on the requirements of the policy analysis):

- the primary distribution of factor incomes earned from production
- the secondary distribution of incomes, which takes into account transfer payments among institutions and payment of taxes on incomes and profits

Primary income distribution. Table 4.18 shows the primary distribution of income before transfers. Households receive 37% of all incomes, of which rural households receive 16% and urban households 20% (they do not sum to 37% due to rounding). 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.

Secondary income distribution. Most institutions are affected only negligibly by the payment of taxes and transfers. The main changes affect government, which receives additional revenue, mainly from the payment of household income taxes and business profit taxes.

Table 4.18. Household distribution of total income from protected area tourism (N$ millions)

	Lower Bound Estimate		Upper Bound Estimate	
Urban households	**million $**	**Percent**	**million $**	**percent**
Wage & salary earners	184	18%	369	18%
Business & Livestock farmers	9	1%	18	1%
Other: pensions & gifts	12	1%	25	1%
Rural households				
Wage and salary earners	43	4%	87	4%
Business and commercial farmers	41	4%	83	4%
	85	8%	167	8%
Subtotal for households	375	37%	748	37%
Non Profit Institutions Serving Households	2	*	4	*
Enterprises	393	39%	787	39%
Government	204	20%	403	20%
Imports, 95% GOS and 5% skilled labour	40	4%	80	4%
Total	1013	100%	2022	100%

* less than 1%

4.8.8 Imports

In a small, open economy like Namibia, many goods and services are imported, including the services of factors of production (labour and capital). Generally, imports do not benefit the domestic economy, because they represent demand for production (and the incomes that go with production) in other countries.

The total import effect of tourism is not immediately apparent from the figures for direct imports for Tourism Expenditures. This is because the direct purchases of tourists are dominated by services that are provided domestically—accommodation, restaurants, and transportation. But these services have a high import content so the import multiplier is quite high, over 5 for both Lower and Upper Bound Estimates.

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.

Table 4.19. Effect of protected area tourism on imports (source: this study)

	Lower Bound	Upper Bound
PA Tourism Expenditures	N$ 1 172 million	N$ 2 332 million
Imports, direct	N$ 97 million	N$ 192 million
Imports, direct + indirect	N$ 498 million	N$ 987 million
Import multiplier	5.16	5.14

4.8.9 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).

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.

Nevertheless, even if current costs are economically justifiable, the protected area system is not adequately meeting its conservation objectives. Subproject 3 of the UNDP/GEF project has addressed the conservation priorities for Namibia and how best the protected area system might fulfil the country's biodiversity conservation needs. It also develops a forward-thinking vision for an effective protected area system. Subproject 2 addresses the institutional structure and support required to facilitate the effective implementation of this vision. In this study (Subproject 1) we estimate the costs of realising the abovementioned vision for the country's protected areas. Finally, 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.

5.2 Current costs of the protected area system

5.2.1 Development and management costs of the protected area network

The present (2003/4) total annual operational budget of the Directorate of Parks and Wildlife Management (DPWM) is about N$46 million, though it varies considerably from year to year (Ministry of Finance data; Table 5.1). This includes approximately N$31 million in human resource costs, although our estimate of human resource costs, based on current staff numbers and packages, is somewhat lower (N$23 million; Appendix 3).

Table 5.1. Actual and projected operational budgets (N$ millions) for the Directorate of Parks and Wildlife Management for 2002-2005 (Source: Ministry of Finance, successive reports)

	2001/2 (actual)	2002/3 (actual)	2003/4 (estimated)	2004/5 (projected)	2005/6 (projected)
Personnel	28.62	35.97	31.18	31.39	30.10
Goods and other services	23.10	31.27	14.76	10.40	14.71
Subsidies & other current transfers	0.62	0.04	0.33	0.19	0.24
Total current expenditure	**52.34**	**67.28**	**46.26**	**41.98**	**45.06**
Acquisition of capital assets	0.44	0.10	0.18	3.01	0.19
Capital transfers	0	0	0	0	0
Total capital expenditure	**0.44**	**0.27**	**0.18**	**3.01**	**0.19**
Total operational budget	**52.78**	**67.38**	**46.44**	**44.98**	**45.25**

Table 5.2 Estimated current human resource costs of the Directorate of Parks and Wildlife Management

	HR Cost	% allocation	Staff numbers	Total HR Cost
Directorate of Parks & Wildlife Management*			831	22 850 585
Directorate of Scientific Services			74	4 687 894
Directorate Administration and Support Services	8 068 495	66.5		5 365 164
TOTAL			**~ 1100**	**32 903 643**

*Details in Appendix 3.

Of course, not all of the DPWM budget is allocated to protected areas. About 46% of the total budget, some N$21 million, is spent directly on protected areas (Figure 5.1; based on Ministry of Finance data for 2004). Based on current human resource data, some 65% of the human resources budget within DPWM is allocated to the Division of Parks, the remainder going to the Division of Wildlife Management (Appendix 3). Note that the social aspects of parks are serviced by a small CBNRM unit within the Division of Wildlife Management.

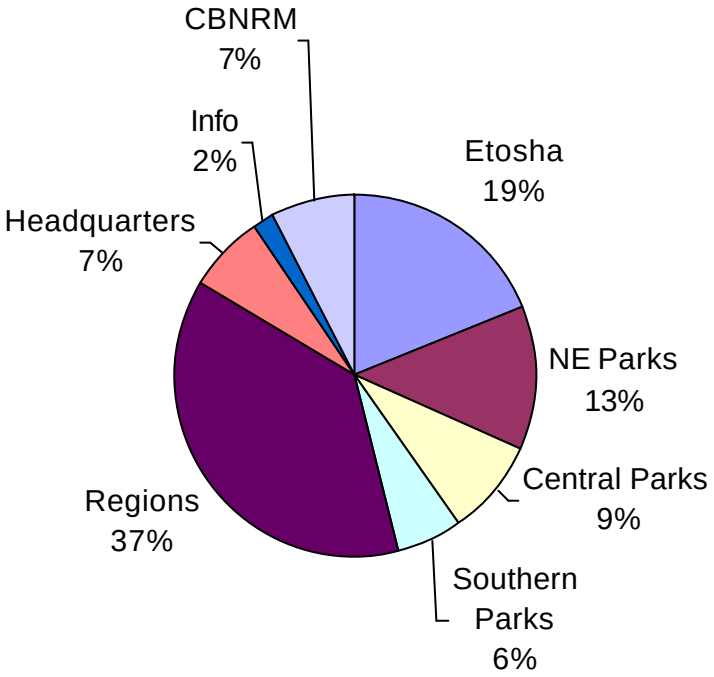

Figure 5.1. Approximate proportional allocation of the DPWM budget

When the costs of scientific services, administration and support services (provided by separate Directorates within the Ministry) are added, current human resource costs for parks and wildlife management rise by about 50% to N$33 million, with a total of some 1100 employees (Table 5.2,Appendix 3). Based on a 50% ratio of HR costs/Total costs, this suggests that the total current government expenditure on protected area management alone is in the region of N$33 million. To this should be added an annual expenditure on protected area development of about N$4 million (Table 5.3), bringing the estimated total to N$37 million. This is somewhat lower than the amount budgeted by the Ministry of Environment and Tourism (MET) for Protected Area Management. The overall MET budget allocated to the Protected Area Management programme stands at about N$43 million (MET Medium Term Plan, 2004). While remaining steady for the next two years, the latter is set to increase to N$67 million by 2007/8.

Table 5.3. Actual and projected development budgets (N$ millions) for the Directorate of Parks and Wildlife Management for 2002-2005 (Source: Ministry of Finance)

	2002/3 (actual)	2003/4 (estimated)	2004/5 (projected)
Goods and other services	-	1.66	0.79
Acquisition of capital assets	5.54	2.72	0.90
Total development budget	5.54	4.38	1.69

For the purpose of this study, we thus estimate the total annual development and operational costs of managing the protected area system to be in the region of N$40 million, as a midpoint of a range of N$37 to N$43 million. This excludes costs associated with tourist facilities, described below.

5.2.2 Tourism-related costs

The costs associated with tourist facilities are borne by Namibian Wildlife Resorts, a government parastatal. The organisation employs approximately 655 staff (P. Mietzner, NWR, pers. comm.). Annual operating costs of NWR budgeted for 2003/4 were approximately N$116 million, but were projected to be N$129 million if development plans are carried out (NWR 2003). Actual expenditure is assumed to fall within this range. 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 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 Overall approach to estimating budgetary requirements

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 earlier in the year and has resulted in several modifications and improvements. 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. Sixty linked spreadsheets make up the entire data base.

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.

5.3.2 Institutional structure used in the model

The high-level institutional structure used here was generated by Subcontract 3 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 5.4).

Table 5.4. 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 Reseve	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	

5.3.3 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 5.5. 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

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 5.5).

Table 5.5. 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 Mgmt	Artificial Water	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	3	2	3	2	1	1	3	3	4	5	3	110	820
	Skeleton Coast	16,390	50	2	5	2	1,819	0.1	1	1	1	3		1		3	1		8	0	2		400	560
	West Coast RA	7,800	50	2	1	5	2,228	0.3	1	1	1	3		2		3	1		3	0	2		150	300
	Cape Cross	60											1						3	0			120	
North-East	Kwando Section	500	600	1	2	1	0	0.0	1		1	2	3		3		2	1	3	0	3		120	100
	Mudumu	1,010	550	1	2	1	2,000	2.0	1		1	2	3	1	3		2	1	3	1	3		130	150
	Mamili	320	500	1	2	1	2,060	6.4	1		1	2	3		3		2	1	4	3	3		160	60
	Forest Reserve	2,400	650	1	2	1	0	0.0	1		1	2	1	2	3			1	2	0	3		60	170
	Babwata	5,000	650	1	2	1	2,000	0.4	1		1	2	1	3	3			1	6	0	1		300	500
	Buffalo Area	500	650	1	1	1	2,000	4.0	1		1	2	3		3		2	1	5	2	3		230	100
	Mahango	225	550	1	1	1	2,857	12.7	1		1	2	3		3		2	1	4	4	3		200	50
	Popa Falls	1	550	1	1	1	1,273	1,273	0		1					1	1	1	4	5		3	200	3
	Khaudum	3,842	600	1	2	1	2,826	0.7	1			2	3	3	3			1	6	0	4		300	300
	Mangetti	300	500	1	1	1	0	0.0	1			1	1	2	1			1	2	0	1	3	90	60
	Waterberg	405	400	1	1	1	33,641	83.1	1			3	3	1	3	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	1	3	1	150	1,250
	Sperrgebiet	26,000	75	3	2	2	618	0.0	0	1	1	3		3		3			3	0	4	2	150	400
	Diamond Coast RA	20			1	1	618												0				1	
	Ai-Ais	3,461	100			2	28,714	8.3	0	1	1	1		1		2			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	1,803												3				130	
	Hardap RR	252	200	1	1	1	7,602	30.2	0			3	1	1			1	1	1	5	1	3	20	80
	Naute RR	225	150	1	1	1	0	0.0	0				1	1			1	1	1	0	1	2	40	90
	Von Bach RR	43	350	1	1	1	5,638	131.1	0				1				1	1	1	5	1	2	10	40
	Daan Viljoen	40	350	1	1	1	6,450	161.3	0				1	1		1	1	1	1	5	2	3	20	30
	Gross Barmen	1	350	1	1	1	6,296	6,296.0	0				1				1	1	1	5	1	1	50	2
	SW Nature Park	1	350	1	1	0	0	0.0	0							1	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

5.3.4 Required staff numbers, human resource costs and operating costs

The expected overall staff requirements and associated human resource costs are summarised in Table 5.6. 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 1,100. 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 1,500.

Table 5.6. 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 5.7), 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 5.7. 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**

5.3.5 Estimated capital cost requirements

Management plans have recently been drawn up for several protected areas, and these include a provision for the capital outlay required for the improved management of the parks. In most cases, this includes upgrading of buildings such as staff quarters, purchase of equipment and vehicles, fences and construction or upgrading of roads. In addition, NWR has devised a plan in which capital expenditure is envisaged to upgrade their tourist establishments.

Total capital requirements for park development (excluding NWR resorts) over the next 5 years are anticipated to be in the order of N$155 million (Table 5.8). The highest capital expenditure is required for the Namib-Naukluft park, mainly due to required road infrastructure. Most other conservation related infrastructure in this park is already in place and is largely adequate. 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.

Table 5.8. Estimated capital expenditure required by protected areas (N$ millions)

	Buildings	Equipment & vehicles	Fence	Roads	Total
Namib-Naukluft	7 310 000	12 490 000	3 250 000	65 500 000	88 550 000
Ai-Ais	4 100 000	2 525 000	540 000	5 325 000	12 490 000
Khaudum	3 364 167	7 406 000	-	-	10 770 167
Mahango	4 191 667	4 811 000	-	300 000	9 302 667
Kwando/Caprivi	4 115 000	3 188 000	-	37 500	7 340 500
Mudumu	1 817 500	2 611 000		15 000	4 443 500
Etosha[1]					3 000 000
Mamili	1 170 000	1 118 000	-	-	2 288 000
Mangetti	732 500	1 295 000	-	-	2 027 500
Remaining parks[1]					15 000 000
TOTAL					**155 212 334**

[1] Rough estimates, this study

In addition to these requirements, NWR's Master Development Plan requires an initial capital expenditure budget of N$70 for infrastructure refurbishments and developments at different resorts, as well as corporate capital expenditure projects (e.g. vehicles, marketing) amounting to N$23 million. Within the resorts, capital expenditure is required for staff housing (N$14 million), refurbishment of existing infrastructure (N$19.5 million), adding additional tourist infrastructure (accommodation and restaurant and reception areas at Sesriem and Terrace Bay, and luxury campsites at Namutoni and Okakeujo) (N$9.8 million) and game drive vehicles (N$1.7 million).

The above capital costs all exclude the implementation costs involved (e.g tender process, costs of a project co-ordinator).

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. Capital costs of the existing system have been met in the past, and total current costs in the order of N$160 million yield economic benefits in the range of N$940 to N$1900 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. While increasing the investment in protected areas can be easily justified in terms of improving their ability to meet conservation objectives, the extra funding requirements will need to be justifiable in economic terms if this goal is realistically to be achieved.

The increased investments (in terms of both increased capital and operational expenditures) will serve to improve management and facilities in parks. It is assumed that this will, in turn, result in visibly better biodiversity, and that better facilities will make an important contribution in creating a better tourism product overall. This provides a stronger basis for marketing by the Tourism Board. Perhaps more importantly, better experiences in the parks will mean that more visitors will return home and advertise the benefits of visiting Namibia's protected areas. In short, investment in the protected area system as envisaged above will lead to an increase in the overall demand for protected area tourism. This demand will be reflected in a higher aggregate willingness to pay, because of a combination of more visitors wanting to visit parks, and visitors being willing to pay more for these visits. This willingness to pay, if adequately captured, will lead to greater overall expenditure and value added to Namibia's economy.

It is difficult to predict exactly how better management will improve tourism demand. Tourism demand for protected areas has been shown to be driven by a complexity of variables. For example, in Hluhluwe-Umfolozi Park, South Africa, viewing the 'big five' contributed most to visitors' enjoyment (38%), followed by enjoying the scenery and wilderness experience (29%), seeing other large mammals and large birds (17%) and seeing the diversity of other species (16%) (Turpie *et al.* in prep). But this differed substantially for different types of tourists. International tourists placed significantly more importance on seeing the Big Five and other large mammals and birds than domestic visitors. Domestic tourists placed more importance on enjoying the scenery and wilderness experience. Visitors who listed animals or plants placed greater value on seeing the total diversity of species than non-listers (Turpie *et al.* in prep). The value of the tourism experience also depended on the numbers of animals seen, such that a marginal willingness to pay could be calculated for each additional animal in the park. Similar analyses have not been performed in Namibia, nor do we accurately know the impact that the envisaged management improvements will have on the animal populations or on other natural attributes that are important to tourists. Similarly, it is difficult to predict exactly how many more tourists would be attracted to parks if facilities such as accommodation and restaurants were greatly improved.

It is thus necessary to make a range of reasonable assumptions about how increased investment in parks would improve tourist demand. Note that the increase in demand could be absorbed by entrepreneurial responses either within or outside parks. The overall impact on the economy is still the same, but the distribution of benefits could differ depending on the type of response encouraged.

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 costs capital and operating incurred over the next twenty years. The additional costs are the difference between existing and proposed capital and operating expenditure,

including both conservation and tourism-related costs. Tourism benefits are derived in terms of increased demand which is additional to the expected growth in tourism due to exogenous effects. In other words, some growth in tourism is expected regardless of investment in parks simply due to growth in global tourism, fuelled in part by population and economic growth. The value of increase in wildlife stocks that would result from increased investment in the parks was estimated on the basis of expected capacity for growth in currently under-stocked parks.

A most likely scenario and a range of possible alternate scenarios is incorporated in the analysis, as follows.

Current value added by tourism: The analysis is performed using the lower and upper bound estimates of current tourism expenditure and value added as the starting baseline.

Exogenously-determined growth in protected area tourism: Past tourism growth has been steady and high until the recent shocks caused by the terrorist attacks on the USA in 2001 and by the strengthening of the Rand from 2003. Given the outlook on the currency, it would be optimistic to assume that the average growth rates of about 16% seen over the past decade could continue. In a similar study on Zambian protected areas, tourism growth rates were projected to be 10%. NWR (2003) is more cautious in applying an overall growth in tourism demand in parks of 3%. In this study, we estimate that the likely exogenously determined growth in tourism would be in the region of 5% (base scenario). However, scenarios of 2% and 8% growth are also considered in the sensitivity analysis.

Additional growth in tourism ascribed to protected area improvements: we have assumed that a 2% additional growth in tourism due to protected area improvements is the most likely scenario, but analyse a range of alternative scenarios from 0.5% to 3%.

Discount rate: The analysis is performed in terms of real, rather than nominal, values. A real discount rate of 6% is applied in the most likley scenario, with rates of 3 – 9% being applied in the sensitivity analysis.

Using the estimates described above, the most likely scenario of incremental growth in total value added to the economy due to increased investment in the protected area system is depicted in Figure 5.2. Under this scenario, the net present value of Namibia's protected area system is estimated to be in the order of N$17 billion. Note that the benefits are dominated by tourism value, and the value of increased wildlife stocks is relatively small. The rate of return on the additional investments proposed above is at least 23%.

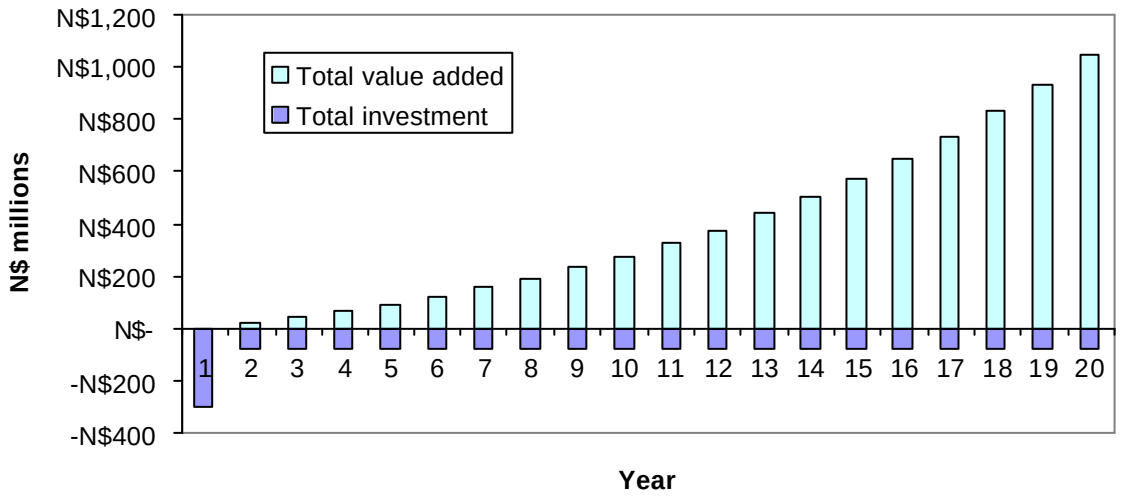

Figure 5.2. Anticipated value added by investment in the protected area system, for the most likely scenario.

The potential value added to the economy due to investment in the protected area system will also contribute to poverty alleviation. Based on the analysis in the previous chapter, some 19.7% of the additional value added generated (see Figure 5.2) can be expected to go to unskilled labour, traditional farmers and communal lands (in the form of tourism-derived royalties).

The results of the sensitivity analysis show that the result is fairly sensitive to some of the assumptions made. Without any additional investment, estimates of the NPV of the protected area system range from N$9 to N$28 billion, or N$19 – N$59, for lower and upper bound estimates, respectively, depending on the discount rate and the assumption of the rate of exogenously-determined tourism growth (Table 5.9). For a 6% discount rate, the ranges are N$11 – 20 and N$24 – 42, for lower and upper bound estimates. Note that the maximum growth rate used in this analysis is half the average growth rate over the past 15 years, and thus that the base scenario described above (which assumes a 5% growth rate) is, if anything, a conservative estimate. A discount rate of 6% is considered to be the most realistic, and is applied in all the following sensitivity analyses.

Table 5.9. Net present value of the protected area system under different tourism growth scenarios, without additional investment (N$ billions). Ranges represent the lower and upper bound estimates based on estimates of current tourism expenditure. The base scenario is shown in bold.

	Exogenously determined tourism growth rate		
Discount rate	**2%**	**5%**	**8%**
3%	15 – 32	20 – 43	28 – 59
6%	11– 24	**15 – 32**	20 – 42
9%	9 – 19	11 – 24	17 – 31

With investment in the protected area system, the addition of the variable for additional tourism growth attributable to the improvements in the protected area system gives rise to even greater potential variability in the estimates (Table 5.10). Estimates of the NPV of the improved system range from N$10 – 26 and N$25 – 57 for lower and upper bound estimates, respectively.

Table 5.10. Net present value of the protected area system under different tourism growth scenarios, with additional investment, for a discount rate of 6% (N$ billions). Ranges represent the lower and upper bound estimates of starting tourism expenditure. The base scenario is shown in bold.

	Exogenously determined tourism growth rate		
Additional tourism growth ascribed to PAs	**2%**	**5%**	**8%**
0.5	10 – 25	14 – 33	19 - 44
1%	11 - 26	15 - 34	21 – 46
2%	12 - 28	**17 - 38**	23 - 51
3%	14 - 31	19 - 42	26 - 57

The most important sensitivity analysis applies to the rate of return on investment. This shows that the assumed additional tourism growth due to improvement in the protected area system is critical in determining whether the investment is worthwhile (Table 5.11). If this incremental growth is less than 1% then the returns could be small or non-existent. However, the latter is considered to be an extremely conservative scenario, and the probability of the investment being worthwhile is relatively high.

Table 5.11. Rate of return on investment in the protected area system under different tourism growth scenarios. Ranges are based on the lower and upper bound estimates of starting tourism expenditure. The base scenario is shown in bold.

Additional tourism growth ascribed to PAs	Exogenously determined tourism growth rate		
	2%	**5%**	**8%**
0.5	Negative – 12%	0 – 17%	5 – 22%
1%	6 – 24%	11 – 28%	16 – 33%
2%	19 – 39%	**23 – 44**%	28 – 48%
3%	28 – 52%	32 – 56%	36 – 61%

In conclusion, investment in the protected area system is likely to yield positive returns and substantial benefits in terms of overall economic growth and poverty alleviation. It is critical that the potential increase in tourism demand created by this investment is realised, however. To this end, it will be important to ensure that the investments are well spent, taking cognisance of consumer needs and wants, and that the added benefits are well marketed by the tourism board.

6. FINANCING A MORE EFFECTIVE PROTECTED AREA SYSTEM

6.1 Introduction: summary of costs and revenues

In spite of generating considerable economic value for Namibia, the protected area system generates comparatively little in terms of direct revenues that accrue to the government and parastatal organisations. In general, the revenues generated annually amount to less than half of the operating costs (Table 6.1). Currently, accommodation and gate fees account for over 90% of income generated. Whereas the income generated by NWR, including a proportion of the gate fees taken, goes directly to the parastatal, the remaining income generated by the parks goes to central treasury and two trust funds.

Table 6.1. Estimated average costs and revenues currently generated by Namibia's protected areas (N$ millions, 2003 values).

Costs & revenues	MET	NWR	Total
Operating costs	**40**	**116**	**156**
Gate fees[1]	16[2]		16
Accommodation[3]		52	52
Live game sales	0.47[4]		0.47
Hunting concessions	4		4
Tourism concessions	0.45[5]		0.45
Filming fees	0.2[5]		0.2
Total revenues	**21**	**52**	**73**

[1] Visitor fees, vehicle fees
[2] Not yet recouped from collection agent (NWR), part (up to 40%) may be lost in transaction costs paid to NWR
[3] Enterprises located within protected areas
[4] Average annual value based on revenue generated by a single auction in a ten-year period (Beytell, pers. comm.)
[5] Estimate based on MET annual report (2001)

Increasing the efficiency with which existing funding is used is of paramount importance when funds are scarce. This is addressed in the preceding chapter. With a more efficiently managed protected area system, which is more effective in terms of meeting its conservation objectives, capital costs of at lest N$155 million will need to be incurred, and operating costs will escalate by about N$77 million per year. Thus even with greater efficiency, the overall costs of managing protected areas as part of achieving the vision of an effective protected area system in Namibia will be considerably higher than they are at present. This vision needs to be financed, and the greater degree of self-sufficiency, the better. This chapter discusses possible options for increasing the revenues generated by the protected area system, leading to the development of a preliminary financing plan.

6.2 Donor grants

Donor funding is already a major source of funding of natural resource management in Namibia, but relatively little is directed at protected areas. Nevertheless, the overall level of funding suggests that this is a route worth pursuing. Donors are not typically interested in committing to covering recurrent costs, but potentially provide a good opportunity to cover some of the capital costs required to establish the vision of a more efficient protected area system. This could include funding for technical assistance, planning, baseline research, and development funding. It is probably worthwhile establishing a dedicated role within DPWM of sourcing such funding.

6.3 Increasing government finance

Government remains the primary source of funding of protected area systems around the world. This is true for at least two main reasons:

(a) Government has an obligation to protect national heritage for all society, including future generations, and
(b) Protected areas typically have a limited capacity to generate the full funding requirements for their development and management.

Nevertheless, the level of government funding varies dramatically from country to country, and is often perceived to be lower than would be justified by the economic value generated from protected areas. One of the main reasons for this is the lack of knowledge of the value of protected area systems. By demonstrating the economic benefits derived from protected areas, it is expected that governments will be more willing to increase the budgetary allocations to protected area systems. This study demonstrates the high value of Namibia's protected area system and justifies increased government investment in it. Nevertheless, it has to be recognised that other priorities on the national agenda will probably preclude governments from meeting the full requirements for optimal development and management of these systems.

Despite their high economic value, protected areas must still compete with other budgets for scarce financial resources from central treasury. Currently only about 40% of the recurrent budgets requested by the parks are met (Ministry of Finance data). Nevertheless, the more direct revenues they generate for government, the better case there is for increasing levels of funding. Maximising the revenues generated by protected areas is thus considered a priority within the MET.

6.4 Creating incentives for parks to improve revenues

One of the greatest problems facing the sustainability of the Namibian protected area system is that the revenues generated are not internalised. By separating income and expenditure within the government accounting system, the incentives are not present to make each unit within the organisation efficient or profitable. This syndrome is further exacerbated by centralising budget control. To create the conditions under which an *esprit de corps* can be instilled into each park requires the full internalisation of all of the components which go into maintaining an effective management agency. Only when each section (field, tourism, scientists, technical services and administration) has its own devolved budget, is accountable for its performance using that budget and can measure the returns against that budget, can it be expected that morale will rise and the visionary aims of this project will be realised.

It might be argued that even under the current set-up, increasing revenues might be perceived to be a useful means of lobbying central treasury for higher budgets. However, in reality, budgets allocated to protected areas are not influenced by the revenues that they generate. On the whole, the situation creates a disincentive for enabling tourism developments, consumptive use or live capture initiatives that might raise revenues, since these all increase the management costs of parks, and stretch the already-limited budgets.

Parks currently have little access to the funds they generate. All income from the sale of game and game products, and levies from the export of game all go into the Game Products Trust Fund. This fund conforms to CITES requirements that money derived from game products goes back into conservation. Nevertheless, relatively little of these funds find their way back into the protected area system itself. The disbursement of the funds is decided by a board, whose current priorities are conservancies and rural development. However, the situation for parks is improving. Recent developments within government will soon allow the direct use of a portion (some 25%) of the revenues generated, via a second trust fund, which may create some incentive for revenue generation by the DPWM. Indeed, under the current institutional set up, the trust funds provide the best opportunity for ensuring that as much as possible of the revenue generated by parks is returned to parks.

It is widely asserted that parastatals have greater incentive than government organisations for increasing the revenues and rationalising the costs of their organisations, since the revenues generated are kept within the organisation. The incentive increases with increasing levels of autonomy of the organisation. The relatively recently established NWR is still highly dependent on government support and may become financially more efficient as this support is withdrawn.

The way in which finances are channelled are not considered further in this study. The institutional issues associated with protected areas are determined by political as well as efficiency considerations and are discussed more fully in Subproject 2 of the overall project.

6.5 Capturing consumers surplus: pricing and payment systems

6.5.1 History of park pricing in Namibia

Up till 1996 visitors to parks were charged a single entrance fee. From 1997 a daily fee was introduced, with higher prices for day visitors than for overnighting visitors. From 1998, fees for overnighting visitors dropped altogether, but they were reintroduced in 2000, with day visitors paying the same fee as overnighting visitors.

Park fees have also been differentiated between different categories of parks. This has varied slightly over time, but the predominant pattern has seen Etosha and Sossusvlei (Sesriem) in a high-price category, Skeleton Coast in a medium price category, and the rest in a low price category, or having no entry fee (Krug *et al.* 2002). The three categories have been priced at N$30, N$20 and N$10 per day, respectively since 1998, remaining unchanged up to 2003. In 2004, Etosha and Sossusvlei/Sesriem remained unchanged, but all other parks are now charged at $20 (Table 6.2). NWR recently attempted to introduce a higher fee for day visitors for 2004 (N$80 for high and medium category parks and N$40 for low category parks) but this was dropped when the responsibility for fee collection was returned to the MET in 2004 (see below).

Table 6.2. Changes in Namibian park entry fees per person per day (Namibians and children receive discounts).

	1998-9	2000	2001	2003	2004
Etosha National Park	30	30	30	30	30
Namib-Naukluft Park (Sossusvlei)	30	30	30	30	30
Namib-Naukluft Park (Namib section)	10	10	20	20	20
Khaudum Game Park	10	30	20	20	20
Waterberg Plateau Park	10	10	20	20	20
Skeleton Coast Park	20	20	20	20	20
Ai-Ais Hot Springs	10	10	20	20	20
Daan Viljoen Game Park	10	10	20	20	20
Hardap Recreation Resort	10	10	20	20	20
Popa Game Park	10	30	20	20	20
Cape Cross Seal Reserve	10	10	20	20	20
Other parks*	10	10	10	20	20

*entry fee is not charged where public access cannot be controlled for logistical reasons, such as in certain parts of the desert parks

Park fees have differentiated between foreign and Namibian visitors since at least 1994, with Namibians receiving a 20% discount until 1995 and a 50% discount thereafter.

The collection of park fees has been undertaken by NWR since 1999 at all parks where there are NWR resorts, while MET has been responsible for collection at the remaining parks. The responsibility for collection of park fees was returned to MET in April 2004. However, NWR still has a large outstanding debt to MET in terms of the fees collected prior to this.

As quoted in Namibian dollars, prices have remained static since 1998. However, in reality, park entry has become cheaper for Namibian and South African tourists since they have not tracked inflation, and they have fluctuated quite dramatically in foreign currency equivalents (Figure 6.1). Overall the parks have become cheaper to most users, although the dramatic recovery of the rand over the last two years has made them relatively more expensive for overseas visitors. Park entry (as well as other tourism costs) became increasingly cheap until 2002, but has now reverted to 1998 levels, possibly largely explaining the recent slow-down in tourism growth. Many countries quote park fees in US Dollars to avoid fluctuations in the value of the local currency affecting demand by overseas tourists. However, tourists prefer being quoted in local currency.

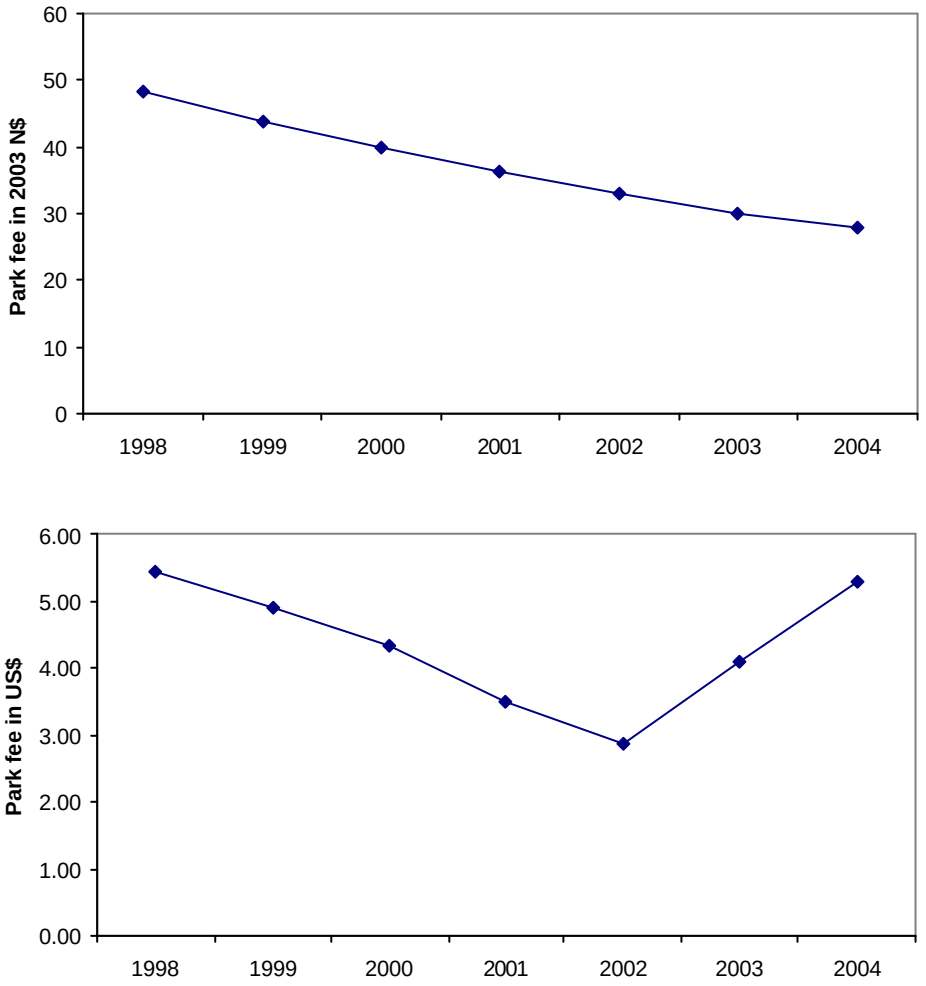

Figure 6.1. Real changes in park entry fees for top-end parks in Namibia for Namibian and South African tourists and for overseas tourists, due to inflation and exchange rate effects.

6.5.2 Willingness to pay for park entry

Fees are usually set without proper analysis of demand and supply, with the result that parks tend to be underpriced. Visitors to protected areas often pay less than they would be willing to pay for entry and services such as accommodation and guiding. The differential between what they are willing to pay and what they actually pay is the consumers' surplus. If the aim is to maximise revenues from park fees, this consumers' surplus should be 'captured' as far as possible. Capturing this consumers' surplus is not entirely straightforward, however, since raising prices has impacts on aggregate demand. This effect is also felt between parks, since raising the price at one park leads to substitution effects among other parks and affects the optimal prices at those parks. It is thus critically important to understand the characteristics of the demand for the use of protected areas.

Willingness to pay for the use of protected areas is usually ascertained by means of the Contingent Valuation and Travel Cost Methods, both of which are survey-based. Studies that have been carried out in southern and eastern Africa suggest that there are large uncaptured values in the form of consumers' surplus, and that most of this is associated with international, rather than regional or domestic tourists (Krug *et al.* 2002, Navrud & Mungatana 1994, Brown *et al.* 1995, Clark *et al.* 1995). The latter is attributable to the large proportion of overseas relative to local tourists, as well as to foreign tourists' having higher consumers' surplus due to disparities in income relative to park prices.

At least four studies have been conducted investigating tourists' demand for wildlife viewing in Namibia (Table 6.3), though two of these (Stoltz 1996, Barnes *et al.* 1997) are based on the same dataset. In addition, Larson & Jarvis (1998) discuss optimal park pricing from a theoretical perspective. Much of this work is reviewed in Krug *et al.*'s (2002) discussion on park pricing and economic efficiency. As with the other southern and eastern African studies, studies in Namibia have found that foreign tourists have a much higher consumers' surplus than local tourists, and account for most of the uncaptured consumers' surplus.

Table 6.3. Empirical studies on tourists' willingness to pay for wildlife tourism and park entry in Namibia

Reference	Scope	Method	Sampled population	Survey sites
Stoltz (1996)	WTP for wildlife and nature tourism in Namibia as a whole	Contingent Valuation	Visitors using wildlife-based tourism amenities; n = 752	Government and private resorts in and outside protected areas; including Etosha, Namib-Naukluft, West Coast RA, Skeleton Coast, Waterberg, Mudumo
Barnes *et al.* (1997)	Tourists' willingness to pay for wildlife viewing generally and for park admission	Contingent Valuation	As above (same sample)	As above
Nyyssölä & Ågren (2002)	Optimal Park Pricing – Etosha	Contingent Valuation, Travel Cost Method	Visitors to Etosha, n = 275	Etosha NP
Krug (2003)	Consumer surplus and park pricing – Etosha & Sossusvlei	Contingent Valuation	Visitors to Etosha and Sossusvlei n=803 + 451	Etosha NP Sossusvlei (Namib-Naukluft)

Given the average length of trips to parks, daily fees result in much higher income to the parks than once-off entry fees (Barnes *et al.* 1997). Barnes *et al.* (1997) estimated that some N$18.2 million could be captured from the direct use values associated with wildlife tourism in 1995, and that $54 million could be captured in total from use and non-use values (Table 6.4).

The 1995 foreign tourists' willingness to pay for park entry in total per trip was equal to US$ 25.90, equivalent to N$160 in today's prices.

Table 6.4. Estimated tourist willingness to pay for park fees and conservation funds in 1995 (Barnes *et al.* 1997)

	Value per tourist (N$)	Total value/year (N$)
Park admissions (foreign tourists)	94*	18.2m
A Namibian wildlife conservation fund (all tourists)	104	28.7m
A community tourism fund (all tourists)	26	7.2m
		54.1m

*based on stated WTP of N$17/day for Etosha and Sossusvlei, and estimated WTP of N$8.50/day for all other parks

Subsequent research has yielded somewhat higher WTP. In 1995, tourists visiting Etosha were willing to pay a daily entrance fee equivalent to about N$29 in today's prices. Although foreign tourists had a higher WTP for single entry fees than Namibian tourists, there was no significant difference when it came to WTP for daily entry fees. However, subsequent studies have found clear discrepancies between Namibian and foreign WTP for daily entry fees (Table 6.5). Changes in the value of the Namibian currency have narrowed the gaps that were found at the time of these studies. Namibian WTP for Etosha was 33% of overseas tourist WTP in 1997, but translates to 44% of overseas WTP in today's prices. The 2002 study showed a change from 46% to 84%.

Table 6.5. Mean willingness to pay for entry to Namibian parks estimated in different studies, giving the WTP at the time of the surveys, and in parentheses, the equivalent in today's prices. The latter are converted using US$ exchange rates for foreign visitors, the Namibian GDP deflator for domestic tourists, and both to estimate a range for regional tourists.

Park	Year	Single entry fee			Daily entry fee			
		All tourists	Over-seas	Namibia	All tourists	Over-seas	Regional	Namibia
Etosha	1995[1]	25 (43)	33 (56)	22 (47)	17 (29)			
Etosha	1997[2]					48 **(65)**	36 **(48 - 64)**	16 **(28)**
Etosha - NGO	*1997[2]*					*68 (92)*	*53 (71 - 94)*	*37 (65)*
Etosha	2002[3]					74 **(44)**	40 **(24 - 44)**	34 **(37)**
Sossusvlei	1997[2]					75 **(101)**	51 **(69 - 90)**	21 **(37)**
Sossusvlei - NGO	*1997[2]*					*104 140*	*74 (100 - 131)*	*46 (81)*

[1] Barnes *et al.* (1997)
[2] Krug *et al.* (2002); NGO refers to WTP for parks if NGO-managed
[3] Nyyssölä & Ågren (2002)

Although always being significantly higher than actual park fees, overseas tourists WTP decreased in terms of the US$ price between 1997 and 2002. This translates to a decrease in terms of current N$ prices from N$65 to N$44 per day. However, the effect could be a result of 'starting point bias' in that visitors paying very low park fees in terms of their foreign currency in 2002 might thus have been inclined to state a lower willingness to pay. It is quite likely that now that overall tourism price levels are higher, that visitors would once again be expecting to pay relatively more for park fees. Another interesting point to note is that WTP

for entry to Sossusvlei is up to 50% higher than for Etosha, presumably because most visitors make shorter visits to the former.

The most recent study of Etosha suggests that regional visitors have a WTP of N$24 to N$44 per day, slightly lower than overseas tourists. Current fees fall within the lower part of this range (Table 6.2).

Again assuming equal reliability of the different studies, Namibian WTP to visit Etosha increased in real terms, from N$16 in 1997 to N$34 in 2002 (Table 6.5). This is more than double the currently charged fee of $15 for Etosha.

Visitors' willingness to pay was also found to be related to the type of institution responsible for fee collection and financing conservation. Local and foreign visitors to Etosha and Sossusvlei indicated a higher willingness to pay if a non-government organisation was responsible for managing park revenues, reflecting a general distrust of government institutions (Table 6.5; Krug *et al.* 2002).

6.5.3 Elasticity of demand

Setting revenue-maximising prices ideally requires an understanding of the elasticity of demand, i.e. the extent to which an increase in price will lead to a decrease in demand. If elasticity is high, then an increase in price can lead to a drop in revenues due to the drop in number of visitors. If the demand is inelastic, then an increase in price will have a relatively small impact on visitor numbers, and will result in an increase in revenues.

The demand for wildlife viewing in southern Africa by foreigners has been found to be relatively inelastic (Barnes 1996). That is, foreign visitors are not particularly sensitive to price, and an increase in price leads to a relatively small decrease in demand. This is understandable when the prices of park entry are set in the context of the cost of travelling to and within Namibia. In addition, park entry fees are still very low in comparison to those in other African countries. Price elasticity may be expected to increase with an increase in the overall level of prices. The demand for regional, and especially for domestic tourists is likely to be much more elastic than that for overseas tourists. Regional and domestic tourists are more likely to seek alternatives in response to increasing prices.

It is also useful to understand how the change in price of one park leads to changes in the demand for alternative destinations, and how the different parks complement one anther in terms of the overall tourism experience. It is important to understand visitor preferences and how demand relates to certain aspects of the quality of the experience and services offered by parks.

6.5.4 The importance of tiered pricing

Understanding of the different levels of willingness to pay and price elasticity for visitors of different origins can be particularly useful in setting revenue-maximising entry fees. This can be done through a combination of tiered pricing for visitors from different origins, and differential pricing for different parks.

If pricing is not tiered then prices are often dictated by the willingness to pay of local and regional visitors, leaving overseas visitors with large consumers surpluses. Willingness to pay studies have demonstrated that willingness to pay is clearly distinguishable in terms of local, regional and overseas visitors. Park prices have been differentiated for Namibian and foreign tourists since at least 1994, with foreigners generally paying twice that of domestic visitors. However, because foreign prices do not distinguish between regional and overseas visitors, they must necessarily accommodate the needs of the group with the lower willingness to pay (i.e. regional visitors). This will still leave overseas tourists with a relatively high consumers' surplus. Increasing the price differentiation to three tiers would allow the latter to be captured more effectively.

Similar principles apply to the pricing of park accommodation. However it is also important to take into consideration that overseas tourists generally have much higher expectations in terms of the quality of accommodation and services offered. NWR have planned a three-tier pricing arrangement through a 10% discount to regional (SADC) visitors and a 35% discount to Namibians, increasing to 50% in the off peak periods (NWR 2003).

6.5.5 The importance of differential park pricing

Differential pricing for different parks serves to spread visitors more evenly throughout the protected area system, avoiding congestion in some of the more popular parks. Domestic and regional visitors may be deterred from prime overseas visitor destinations by higher prices, but can be encouraged to utilise other parks by more favourable prices. At present, the prices are similar for most Namibian parks, but occupancy rates of the smaller parks are particularly low, even though these are already dominated by local and regional visitors. In the case of some of the smaller parks, for which demand is probably relatively price elastic, lower prices may increase overall revenues generated.

6.5.6 The effect of daily versus once-off entry fees

Daily entrance fees, as currently applied in the Namibian parks, are generally preferable to once-off entrance fees in terms of overall revenue generation. They capture more consumer surplus. Daily fees also allow much better monitoring of park use and are also an easier tool for regulating total visitor numbers.

6.5.7 The effect of lower charges for overnight visitors

The idea of charging lower prices for overnight visitors has been instituted by the MET and NWR at different stages during the past. The idea is that this will encourage visitors to use accommodation in the parks, rather than private alternatives outside the parks. However, it is unlikely that this has the desired effect, since the facilities offered outside are not directly comparable with resorts within parks, and therefore not in direct competition. Accommodation outside parks tends to be more upmarket and far more expensive than accommodation in parks. Thus visitors that are willing to pay these prices are unlikely to be influenced by the relatively small discount offered on park entry if they stay within the park.

6.5.8 Revenue-maximising versus optimal park prices

It is important to note that determining optimal park entrance fees may not be based entirely on maximising revenues. Park pricing strategies also need to take social equity and ecological sustainability into account, as well as the ecological and tourist carrying capacities of the parks.

Extracting maximum willingness to pay from foreign tourists may not always be the most desirable solution, since this may detract from the visitors' experience, and possibly reduces the opportunities for capturing consumers' surplus in other areas of the economy, such as in expenditure on private sector and community-based tourism initiatives. In the case of domestic tourists, goals may be to maximise the opportunity for locals to visit parks, which would require low entry fees. Furthermore, Namibians already pay for parks through taxes. These types of considerations may also extend regionally.

While social equity considerations may encourage lower prices for Namibians, the prices still have to be set at sufficiently high levels that discourage visitor numbers from exceeding ecological and tourist carrying capacities. Ecological carrying capacity is the level of visitation beyond which there are negative impacts on the environment and biodiversity of the parks.

Tourist carrying capacities are reached when congestion levels have a measurable impact on visitors' enjoyment of the parks. Increasing park fees to limit tourist numbers (and impacts) is usually compatible with increasing revenues, although this depends on the elasticity of demand, which in turn depends on the availability of substitutes within and beyond Namibia.

6.5.9 Setting optimal prices for Namibia's parks

Based on the willingness-to-pay studies described above (as expressed in Namibian dollars), a motivation was put forward in May 2003 to increase the park fees to slightly more than double existing levels (Table 6.6). It was also proposed that the current system of providing discounts to Namibian tourists be expanded to incorporate separate discounts for Namibian and other African tourists. An increase in the discount offered to Namibian tourists would ensure that Namibians were not faced with a price increase (Table 6.7).

Table 6.6. New park fees that were proposed in May 2003 (MET internal documentation, *in litt*.), in N$.

Park fees	2003 prices (before discounts)	Price changes proposed in 2003
Adults – Etosha, Sossusvlei	30 per day	60 per day
Adults – Waterberg, Skeleton Coast	20 per day	60 per day
Adults – Other parks	20 per day	40 per day
Children (2-16)	2 per day	Under 12 free, over 12 adult fee
Passenger vehicles (10 seats)	20 per entry	10 per day
Bus (11-25 seats)	60 per entry	40 per day
Bus (26-50 seats)	160 per entry	160* per day
Bus (51+ seats)	240 per entry	240* per day

*the figures of N$1600 and N$2400 per day in the documentation are assumed to have been mistyped.

Table 6.7. Proposed change in the levels of discount offered to tourists of different origins

	Overseas tourists	African tourists	Namibian tourists
Existing discount	0%	0%	50%
Discounts proposed in 2003	0%	25%	75%

With the recommended prices, prices for Namibians remain unchanged, for regional visitors they increase by 50% and for overseas visitors prices double. In the absence of quantified demand characteristics, the above recommendations were explored in terms of their possible effects on revenues. Assuming relatively inelastic demand, and no change in external influences on demand, revenues could increase by more than 50% (Table 6.8). The results also indicate that even with a fairly elastic demand response among foreign visitors, revenues could be raised substantially.

Table 6.8. Potential changes in income to parks with proposed price strategy, depending on degree of elasticity of demand

Scenario	% reduction in foreign visitor days*	Visitor fees	Vehicle fees	Total
Status quo	0%	13,246,958	2,881,435	16,128,393
New prices, inelastic	5%	21,834,181	3,165,639	24,999,820
New prices, more elastic	30%	16,758,233	3,165,639	19,923,872

* no reduction in Namibian visitors since prices remain constant for Namibians

Compared with tourists' expressed willingness to pay (taking changes in exchange rate into account), the above proposal is considered to be desirable in terms of meeting the criteria of:

- Capturing more foreign consumer surplus in the form of increased revenues
- Deriving revenues from Namibian visitors without compromising opportunities for visits by poorer citizens.

While willingness to pay estimates have exceeded these prices for foreigners, it would be risky to raise the prices much further in the light of the strengthening local currency.

Revenue generation could be further improved by collecting fees at some parks where there are no gates at present. However, given the current spread of visitor numbers, it is important to first establish whether cost of setting up the required facilities would make this worthwhile.

6.5.10 The effect of payment systems such as the WILD Card

It has been well established that a three-tiered pricing system is desirable from a revenue maximisation and a social point of view. The way in which the fees are presented to visitors has an important impact. The current system of presenting a single price to the public, but offering discounts for visitors of different origin is more subtle than having three prices quoted at the gate, as is done in several countries. Moreover, quoting foreigners and locals in different countries is particularly distasteful to foreigners. In this respect the way in which tiered prices are currently presented to visitors should not be changed.

There is, however, a possibility of introducing a card as an alternative payment vehicle to payments upon entry to parks. The WILD Card system currently used in South Africa is an example of such a system. In South Africa, it is offered as an alternative choice to gate payments, i.e. visitors can choose whether to buy a card or not. The main question is whether the introduction of a WILD Card payment system could increase the gate fee income to Namibian parks, after the transaction costs are taken into account. This might be contingent on whether the card is an extension on the South African set-up or exclusively for Namibian parks. The implications of the former set-up are investigated further below.

6.5.10.1 The WILD Card system

The WILD Card is a system which has been introduced into national and provincial protected areas in South Africa, as a mechanism to improve income collection, visitor statistics and increase income to the parks authorities. It is effectively a partial outsourcing of a management function.

The effectiveness and usefulness to an organisation of introducing this system is determined by the contractual agreement between the company which administers it and the protected area authority. A brief overview of this system as it may apply in Namibia was obtained verbally from Mr Mel Cunningham from Infinity, the company administering the card system in South Africa.

Roughly the following conditions might apply, based on the South African set-up:

- Infinity collects a N$20 (excl VAT) levy as a once-off fee for issuing the card;
- Infinity collects an annual fee of N$24 per card for the maintenance of a database, which will be accessible to all users of the system;
- Infinity charges an 8% fee for the overall marketing of the card.
- Infinity collects an additional 2% transaction fee per transaction;
- There is an 8% commission paid by the conservation agency to whoever sells the card, if it is sold by a body other than the conservation agency or equivalent body, then this fee is paid to the seller;

In addition to this there is a fee of N$2 500 per park per year, for training staff in the use of the system. Each entry point will also require a card reader, at a cost of N$2 000 per reader. In

addition, the parks or offices where the cards are sold will require a bank of equivalent machine for accepting bank cards (such as Visa, Mastercard etc).

In South Africa, the WILD Card is available to park users of any nationality. The user purchases the card and this entitles them to unlimited free access to specified parks for the specified period (usually a year). The price depends on the groups of parks that the purchaser chooses to include. South Africans were initially offered a choice of cards for provincial (Cape Nature) reserves or national parks, or a combination, with SADC nationals only being eligible for the cards for national parks only. The system has now been diversified to a choice of four spatially-defined clusters of protected area, or a card for all clusters, available to South Africans and SADC nationals, with foreign visitors being able to purchase the option for all clusters at a considerably higher price (Table 6.9).

The WILD Card prices can be compared with the general price levels of national parks in South Africa. Full price for international visitors ranges from R60 – R120 per day, depending on the park. SADC visitors pay 50% of this, and South African nationals pay 25% (R15 – 30). Accordingly, South Africans and SADC visitors pay roughly 25% of the international price for a comprehensive WILD Card. The price of the latter is roughly equal to that of a seven-day visit to Kruger National Park.

Table 6.9. WILD Card prices for South Africa

Access	Individual	Couple	Family
Bushveld, Dry or Cape Cluster (each)	R170	R295	R395
River Cluster	R170	R245	R265
All clusters (SA or SADC)	R195	R335	R440
All clusters (International)	R795	R1395	R1795

The card also includes a reward system where certain vendors (e.g. hotels, restaurants, airlines, retail outlets) offer 'CashBack' rewards for purchases from their outlets if the card is produced. These rewards, expressed in monetary terms, and stored in the card's memory, can be redeemed for 'purchases' from the vendors by the owner of the card.

It is also theoretically possible to purchase entry to parks with these points which would have been accrued to the card. The cash equivalent of this will be paid to the parks. This may result in certain entries to parks being paid for but not being used. The magnitude of this is not possible to measure, only time will show how important this will be.

The reward system increases the attractiveness of the card to prospective buyers. Vendors other than the parks benefit from being part of a 'loyalty programme'. Both parks and vendors benefit from the joint marketing involved, although this is difficult to quantify and will need to be explored further. Infinity is keen to expand the card to include a wider range of products and countries. It is currently operational in SANParks, Cape Nature and Msinzi resorts in Kwazulu Natal.

The product has been very successful for SANParks, where income has significantly increased. Discussions with Cape Nature indicate the benefits have not been as good as expected. The SANParks success, it could be argued, can in many ways be attributed to the introduction of a new fee structure at the same time the WILD Card was introduced. There are also large numbers of people making frequent use of the SANParks system. It is thus very attractive for these users to purchase the card, as it makes access significantly more affordable.

The marketing and possible sales of the 'Namibian' WILD Card from South African products, if it is linked to the reward system and the South African system, may offer benefits to Namibia; but this cannot be quantified as no precedents exist and any estimate would merely be speculation.

6.5.10.2 The WILD Card in Namibia

The estimates of visitor numbers given in Table 4.2, together with the general cost provisions described above (it must be stressed that no formal agreement has been drafted as to how these will be applied), were used to develop a simple model to investigate the feasibility of extending the WILD Card system to Namibia's protected areas.

Numbers of visitors that travelled as individuals, in couples or in family groups had to be estimated because cards are priced accordingly. The assumptions applied are summarised in Table 4.8.

Table 6.10. Assumed proportions of visitors travelling as individuals, in couples or in family groups

	Namibian	Regional	Overseas
Individuals	10%	20%	40%
Couples	40%	45%	50%
Families	50%	35%	10%

Gate fees were assumed to be the proposed new fees summarised in Table 6.6 with the associated discount system. WILD Card prices for the Namibian parks cluster were based on the South African model, with individual cards charged at 7 times the top park entry price, and cards for couples and families charged at 1.7 times and 2.3 times the individual card price, respectively.

Table 6.11. Assumed prices of WILD card for Namibian parks, in N$.

	Namibian	Regional	Overseas
Individuals	105	105	420
Couples	180	180	715
Families	240	240	965

In order to estimate the uptake rate, or the proportion of visitors that actually buy cards, it is necessary to consider the way in which the probability of buying a card relates to the days spent in parks and the break even point between the costs of the card versus paying entry fees (Figure 6.2). Even in the most optimistic scenario, it would be expected that fewer than 100% of visitors will buy the cards at the break even point, possibly because some did not know in advance how long they would spend in advance, and others may not trust the system.

The next factor to consider is how many days visitors of different origins spend in parks per year. In the absence of raw data, the only data currently available for Namibian, regional and overseas visitors are average numbers of days spent in Etosha and average number of days spent travelling in Namibia (Krug 2003). These were used to estimate the number of days spent in parks per year (Table 6.12).

These were then used to estimate frequency distributions of the numbers of days spent in parks by users of different origin (Figure 6.3). Note that these preliminary estimates will ultimately need to be followed up with research.

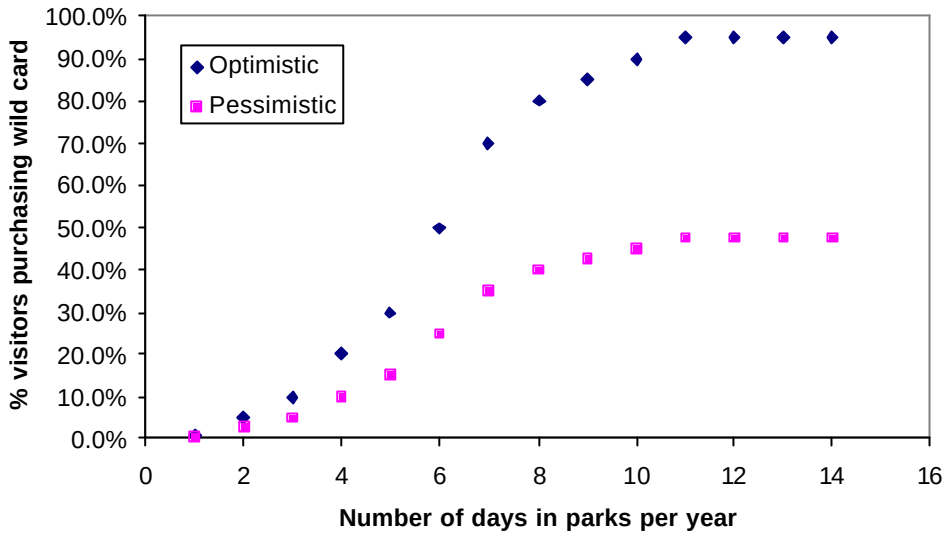

Figure 6.2. Assumed nature of the relationship between probability of purchasing a Wild Card and the number of days spent in parks per year, under optimistic and pessimistic scenarios. Note that the breakeven point for individuals is at 7 days, but is slightly earlier for couples and families.

Table 6.12. Estimated number of days spent in Namibian protected areas per year by different types of visitors

	Namibian	Regional	Overseas
Days spent in Namibia on a trip	7.76	16.75	17.88
Estimated days spent in parks per year	4	8	9

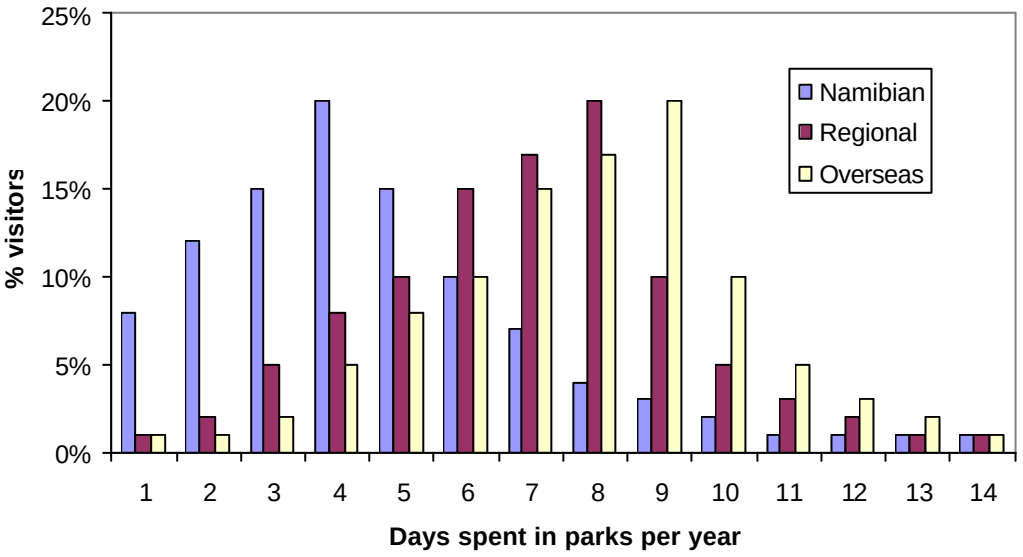

Figure 6.3. Assumed frequency distributions of how long visitors of different origins spend in parks per year.

The combination of assumptions in Figure 6.2 and Figure 6.3 were used to estimate the percentage of visitors in each category that would purchase a card (Table 6.13).

Table 6.13. Estimated proportion of visitors that would purchase the Wild Card under the above-listed assumptions, for an optimistic and pessimistic scenario.

	Namibian	Regional	Overseas
Optimistic scenario	28%	54%	59%
Pessimistic scenario	14%	27%	29%

Note that this does not translate directly to visitor days, since the visitors that buy cards are those that spend longest in the parks. Based on the ratios between the various factors, the number of visitor days covered by card-holders could be calculated. The remaining visitor days would be charged at the gate, at the gate prices.

The model is based on current number of visitors, minus 5% of foreign (regional and overseas) visitors that are deterred by the increase in overall level of prices. Total income is estimated as the total value of Wild Cards sold, plus the gate fees from the remaining visitor-days, at proposed prices (Table 6.14). We have not accounted for a possible increase in demand due to the Wild Card making more people feel that visiting parks is worthwhile. It is more desirable that the system generates more income from existing user numbers than from increasing user numbers, unless it achieves a better spread of users to less utilised parks that have spare capacity.

Table 6.14. Average park fees paid per day in parks by visitors of different origins, under the existing and proposed price and discounting scenarios, based on existing use patterns without a WILD Card

	Namibian	Regional	Overseas
With existing prices	11.36	22.50	24.33
With proposed prices	11.91	32.73	47.18

The overall net income is the gross income less the fees paid to the company administering the cards. These are the once-off card fee and seller's commission associated with the sale of the cards, plus the annual card and marketing fees, and the training fees. The net income is the revenue generated by the DPWM, and can be compared with revenues generated from the existing system of fee collection (but with increased prices). The model suggests that gross revenues could be increased substantially by the introduction of the Wild Card system (Table 6.15). The variable costs associated with the system are high, however, and could reduce the margin relative to current income substantially.

Table 6.15. Indicative costs and revenues (in N$ millions), excluding capital costs, associated with the potential introduction of the WILD Card in Namibia, based on a simple model and assumptions (not including vehicle fees), for a situation of generally upgraded fees

Scenario	Card income	Gate income	Gross revenue	Costs	Net income
Upgraded fees, no Wild Card		20.7*	20.7	#	20.7
Wild Card, pessimistic uptake scenario	17.4	13.3	30.7	7.9	22.8
Wild Card, optimistic uptake scenario	34.7	6.0	40.7	15.8	24.9

*note this is a slightly different estimate from the gate fees estimated in Table 6.8 above because of a slightly simplified model configuration

costs associated with the current fee collection system are unknown, however would still be incurred if the Wild Card system is introduced in parallel.

Capital costs are additional and are estimated to be N$50 000 in total. Up to 50% of the variable costs could theoretically fall away if all cards were bought in an initial period and renewed thereafter. However, in reality, the majority of users, being foreign visitors, are unlikely to be renewing their cards and will be first-time buyers, even in future years. The sellers' commission costs could be reduced, however, if MET undertook to sell a large proportion of the cards.

The potential increases in income suggested in Table 6.15 have wide error margins and are too small to provide a reliable indication as to whether introduction of the system would be worthwhile. In addition to the uncertainties associated with the assumptions outlined above, the actual costs of the current set-up are unknown. In addition, the points system could potentially result in further income for the parks from the partner companies.

The idea that the introduction of the system could increase revenues is counter-intuitive to some extent. Why would some visitors buy the card if the cost of the card is below the cost that would be incurred if they were to pay entry fees at the gate, as suggested in Figure 6.2? This is based on the assumption that the added benefits derived from the CashBack rewards provide sufficient incentive for these users to buy into the system. Nevertheless, the 'pessimistic' scenario might be more realistic than the 'optimistic' scenario. The extent to which the card will increase demand through marketing and selling cards to non-users is not known and the effects of this have not been modelled or accounted for.

Under the existing fee structure in Namibia and the low number of visitors to certain parks, it is unlikely that the WILD Card will offer any direct financial benefits as the overhead costs would be too high. It may be that the overhead fees of administering the WILD Card will be less than the existing system within MET, but a cost breakdown of this is not available and would be very difficult if not impossible to quantify. The benefits from marketing and other rewards have been excluded as these cannot be quantified.

To offset the fixed overhead costs associated with card readers, bank terminal machines and training, will make only those parks with high visitor numbers financially attractive. Depending on the number of entrance gates these overheads will not be less than N$6 500 per park per year, before any visitor has entered the park. Also for bank terminals to operate, a good quality telephone connection will be required. However, this is not essential as this is not required at all outlets.

The overall viability will need to be tested against the agreement where other contractual issues will need to be considered and the associated risks. In addition the fee increases and the pricing of the card will also need to be developed; there are hard and fast numbers on the table at present.

6.6 Income from accommodation and tourism services

6.6.1 Royalties from NWR accommodation

The resorts within the protected areas currently generate turnover in the order of N$40 - 50 million from a capital base and location which belongs to the MET. This presents a significant opportunity for revenue generation for the parks. Ideally, NWR should pay a royalty of 10-15% of turnover, which includes park royalties and a rental for capital assets, or 4 – 10% of turnover for park royalties alone, if they own the infrastructure.

There are two main factors standing in the way of fully realising this potential income source – (a) the current non-profitability of the resorts, and (b) the imminent transfer of the MET tourism infrastructure to the NWR. Both of these factors are also hampering progress on the much-need renovation or modernisation of the resorts.

Of all the NWR resorts, the three Etosha resorts were the only ones to render a profitable return in the 2002 financial year, which generated $9.2 million. The biggest losses were associated with the small resorts (Hardap, Gross Barmen, Daan Viljoen, Reho Spa) and Ai-Ais. Losses at these resorts totalled 9.75 million. Payment of a royalty could further undermine the financial sustainability of the parastatal at this stage.

The transfer of tourism assets (the resort infrastructure) from MET to NWR (without compensation) is viewed very positively by NWR, but will compromise the MET's potential to derive income from these resorts in future. This will limit potential royalties to those from the use of the park. A similar situation occurred in the North West Province, South Africa, when the management of protected area resorts was turned over to Golden Leopard Resorts, a state-owned company. The whole operation was subsequently sold to a private operator and the rental needed to be negotiated under very difficult circumstances when the company was in a poor position to extract the potential market value. The handover of assets to the NWR without payment thus comes at an opportunity cost, in that these assets could have been sold or rented to a private company in return for a substantial income. Ideally, the parastatal should be treated like any business or concessionaire.

Given that the writing across of these assets is a political decision which is possibly irreversible at this stage, the possibility still exists to derive income from the resorts in terms of a percentage of turnover for their being located within the parks. Income derived in this way will only really be viable if the profitability of the resorts is increased.

It is recognised that increasing the profitability of the NWR resorts will involve both an increase in the efficiency of the organisation and the revamping of the somewhat old and outmoded facilities to suit modern trends and tastes. The positive side of the assets being in the hands of the NWR is that it will increase the incentive for the NWR to improve them in order to generate better returns in the business. This also transfers the risks involved from MET to the parastatal. NWR recognises the need for an improvement in efficiency. The organisation took over 840 existing employees in 1999, and now employs about 655, but this is still considered more than necessary (P. Mietzner, NWR, pers. comm.). The model applied in the previous chapter suggests that NWR staffing should be even further streamlined. There is a need for a more performance oriented employment system. NWR also envisages the possibility of outsourcing some of their function through partnerships with the private sector, a possibility that could be realised after MET's capital assets are transferred to NWR. One such function that could benefit from such a transaction is in restaurants and catering. The existing facilities cannot cope when busloads of tourists arrive, and food and service are deteriorating.

6.6.2 Royalties from private-public sector partnerships

The NWR resorts serve a particular niche market in the protected area tourism sector, providing budget and family-type resorts. A significant proportion of tourists opt for different types of accommodation offered elsewhere. It is recognised that many of the parks have the capacity for increased numbers of beds, particularly in the form of mid-to-top-end establishments, such as luxury bush-camps. The development of this potential can yield significant benefits to the parks.

The most efficient way to develop further tourism potential in the parks will be to enter into private-public partnerships with concessionaires. MET would have the responsibility of identifying areas for tourism developments and providing the necessary infrastructure such as road networks and water holes. The costs in setting this up might be reduced if MET identifies areas where development can take place in clusters. Private operators would be responsible for the building and maintenance of the camps. Although this means a lower potential rental on these developments, it also means that the private entrepreneurs are the ones to carry the higher risks. A typical lease period for this type of arrangement is 15 to 45 years, with assets being handed back to the park at the end of the period. The expected royalty amounts to about 4 – 10% of turnover. This could increase once the lease period has expired and the assets are transferred to the parks.

6.6.3 Potential income from accommodation royalties

It is important that there is a balance between the revenue generation and conservation objectives of the parks. Development for the generation of income should not compromise the conservation objectives of the parks. Factors that need to be taken into consideration include roads, water supply and electricity, the potential levels of congestion on the road networks. Water is a limiting factor for tourism developments in most of the parks, except for Etosha and Daan Viljoen, where water is supplied by NamWater. Revenue generation is not a simple function of the number of visitors. A strategy more compatible with conservation objectives is to concentrate on providing quality services, rather than quantity.

A rough estimate of the potential income derived from tourist establishment royalties was made on the basis of planned and estimated capacity for expansion in the different parks, as well as the potential royalties that could be derived from existing NWR resorts (resorts and beds are listed in Appendix 4). Potential new beds for Ai-Ais and Namib-Naukluft were based on the management plans for those parks. Management plans for the north-east parks suggest that there is negligible opportunity for further tourism development in the near future. For Etosha, Skeleton Coast and Caprivi (Babwata), potential was estimated based on the study team's knowledge of the parks. Potential bed prices are described in terms of achieved rates rather than rack rates (advertised prices). The achieved price is typically 30-50% less than the advertised price. It was assumed that most new beds would be in the top or middle bracket. However, it is also recognised that basic accommodation is required in all parks, and that many tourists also enjoy the opportunity to 'rough it'. These opportunities do not contribute greatly to income and are not considered in detail here. It is noted, however, that it is important to maintain a balance of accommodation types on offer.

It is also worth noting that financing parks through tourism concessions within parks may conflict to some extent with other development goals. Lodges within the parks would compete with lodges outside. Some of the potential tourism growth could be absorbed by neighbouring communities, who also want lodges on their land in order to gain income. With this in mind, we have been conservative in the potential growth for Etosha and Caprivi, in order to leave economic opportunities for surrounding areas.

In total, it is estimated that roughly N$16 million could be obtained from royalties from tourist accommodation within parks (Table 6.16). Of this, about N$6 million could be generated from existing resorts. The remainder would result from the development of concessions.

Although the concessionaires would bear the costs of camp construction, there would be some initial outlay required by the parks in order to attract these investors. This would include the construction of roads, waterholes and other basic infrastructure. In many cases, numerous tracks already exist, and upmarket lodges might favour simple tracks over good roads. Nevertheless, it could cost in the region of N$20 million (a very rough estimate) to cover these costs. In addition, managing the tender process could cost N$2-3 million.

Table 6.16. Estimated potential income from royalties from estimated further development potential over the next 10 years in terms of new concessions for tourism accommodation

	Beds	Fee per bed per night	Occupancy	Turnover	% turn-over	Royalties generated
Existing NWR resorts						
Lodges & trails	735	variable	variable	42 462 999	12%	5 095 560
Campsites (x8 beds)	1,400x8	variable	variable	9 907 844	12%	1 188 941
Subtotal existing						**6 284 501**
New development						
Etosha						
3 mid-range camps	180	500	40%	13 140 000	8%	1 051 200
4 upmarket camps	64	1,500	40%	14 016 000	8%	1 121 280
Namib-Naukluft[1]						
Swakop River	20	2,000	40%	5 840 000	10%	584 000
Kuiseb	25	2,500	40%	9 125 000	10%	912 500
Tsondab	20	2,500	40%	7 300 000	10%	730 000
Naukluft	20	2,000	40%	5 840 000	5%	292 000
Sossusvlei	10	2,500	40%	3 650 000	12%	438 000
Aus	15	1,500	40%	3 285 000	5%	164 250
Meob	10	2,500	40%	3 650 000	10%	365 000
Coastal	10	2,500	40%	3 650 000	10%	365 000
Inselberg	15	1,000	40%	2 190 000	5%	109 500
Caprivi (Babwata)						
1 midrange camp	60	500	40%	4 380 000	8%	350 400
4 upmarket camps	64	1,500	40%	14 016 000	8%	1 121 280
Skeleton Coast						
2 upmarket lodges	32	1,500	40%	7 008 000	8%	560 640
Ai-Ais & Huns Mtns[1]						
2 upmarket lodges	62	1,500	40%	13 578 000	8%	1 086 240
2 midrange camp	62	500	40%	4 526 000	8%	362 080
1 hiking trail	10	300	13%	136 875	40%	54 750
1 upmarket trail	8	1,500	13%	547 500	10%	54 750
Subtotal new						**9 722 870**
TOTAL POTENTIAL						**16 007 371**

[1] From existing management plans

6.7 Income from consumptive use of wildlife resources

6.7.1 Increasing the number of hunting concessions

The parks currently generate a total of N$3.9 million per annum from six hunting concessions. However, there is further capacity in the parks to increase this to 15 concessions, which would generate a total of at least N$6.5 million (this is the proposed auction reserve price). While the potential offtake from the parks is obviously much greater (this could be as much as 1-2% of all game populations in the parks), the proposed level of hunting would not interfere with wildlife viewing tourism. Indeed, trophy hunting can generate income without sacrificing conservation principles if it mainly targets old, post-reproductive individuals (B. Beytell, pers. comm.).

6.7.2 Live game sales

The live game market may still have some potential to generate income, especially some species, notably roan and sable antelope, white and black rhino and disease-free buffalo. All of these species fetch very high prices in South Africa, ranging from N$60 000 to over N$300 000 per animal. Namibia holds a reasonable stock of these animals and there is potential to still remove a small annual quota, with a potential income income of at least N$12 million (Table 6.17), or N$15 million if rhinos are also included. While the theoretical sustainable offtake has a value of up to N$42 million, there are good reasons why this would not be realisable. Firstly it is preferabe to harvest less than the annual rate of increase in order to provide some income while still allowing the populations to grow, albeit at a slower rate than without harvesting. Secondly, not all the game in the parks will be available for harvesting even if a potential surplus may exist. The logistics of capturing animals and the low value of many species will mean this is simply not feasible. In some instances it may be possible to cull this excess, but this also has major cost implications and this may only be possible in a limited number of instances. For this reason this has not been pursued as a potential revenue earner.

Some of the animals listed in Table 6.17 lie behind the 'Foot and mouth' corridor fence or 'Red Line'. For some of these species, especially buffalo in the eastern Caprivi, this is a problem and these animals could not be sold as disease free. However the buffalo near Nyae-Nyae could be moved if the appropriate veterinary protocols were followed. This will add a small cost, but the high returns would more than compensate for this. In addition roan and sable could be moved from behind the 'Red Line' and 'cleaned' by placing them in quarantine. This is also possible if the veterinary authorities could be consulted and a procedure agreed to allow for this. This presents very good value. For the best return possible, the market in South Africa should be opened to a least a portion of this potential quota as this will certainly increase the price for these species as the demand will be much higher.

Species such as white and black rhino and Hartmanns zebra can be moved across the 'Red Line' as they do not carry 'Foot and Mouth' and these species also offer some value. It would also place the black rhino in private ownership and spread the risks of ownership of these species.

Much of the game removals could be done with the private sector via a tender process. Here an annual quota in specific areas could be offered and companies invited to tender to remove the animals. This passes the risk and costs of the capture operation to the private sector, leaving the MET with a good margin on this operation. This is a more efficient mechanism of marketing game than via an auction, as auction costs can be high. Also only a limited number can be sold via an auction. If the game is sold at an auction from game holding pens, rather than from a catalogue, then the holding costs and mortality are expected to increase and this with auction commissions reduce the operating net income to MET.

Table 6.17. Estimated potential income from live game sales, giving a range from a conservative lower bound estimate based on selected high-value species to an upper bound estimate based on potential maximum sustainable offtake rates of all species. Population estimates and max offtake rates from Barnes (unpubl. data). Zone 1 and Zone 2 are above and below the 'red line' , respectively.

Name	Offtake rate		Zone 1 pop	Zone 2 pop	Offtake		Live sale value (N$)	
	Lower	Upper			Lower	Upper	Lower	Upper
Buffalo	5%	9.59%	1025	250	13	24	625 000	1 198 750
Cheetah	0%	5.00%	639	126	0	6	-	129 106
Eland	0%	10.22%	1704	380	0	39	-	321 842
Elephant	0%	3.70%	8993	0	0	0	-	-
Gemsbok	0%	12.22%	6950	1315	0	161	-	486 243
Giraffe	0%	6.08%	3383	108	0	7	-	88 023
Hartebeest, Red	0%	10.56%	1468	115	0	12	-	38 367
Hippopotamus	0%	0.00%	1262	0	0	0	-	-
Impala, blck-faced	0%	14.48%	1500	0	0	0	-	-
Impala, common	0%	14.48%	77	0	0	0	-	-
Kudu	0%	12.22%	1613	884	0	108	-	241 376
Lechwe	0%	14.00%	0	0	0	0	-	-
Leopard	0%	5.00%	1670	330	0	17	-	393 494
Lion	0%	5.00%	546	0	0	0	-	-
Ostrich	0%	10.00%	3297	490	0	49	-	70 821
Rhinoceros, black	0%	2.00%	816	43	0	17	-	2 577 000
Rhinoceros, white	0%	2.00%	54	62	0	2	-	278 400
Roan antelope	5%	11.00%	440	120	28	62	1 680 000	3 696 000
Sable antelope	5%	12.22%	256	60	16	39	711 000	1 737 684
Springbok	0%	20.34%	17811	1121	0	228	-	277 417
Tsessebe	0%	12.22%	0	15	0	2	-	32 903
Warthog	0%	17.93%	148	61	0	11	-	9 378
Waterbuck	0%	12.22%	0	0	0	0	-	-
Wildebeest, blue	0%	10.56%	18098	0	0	0	-	-
Zebra, Burchell's	3%	10.73%	764	3210	96	344	144 450	516 650
Zebra, Hartmann's	3%	10.00%	77489	8914	2592	8640	9 072 315	30 241 050
							12 232 765	**42 334 502**

6.7.3 Harvesting of plant resources and bioprospecting

This is a potential additional source of income. Some of the succulents that grow in the southern areas of the country, especially in the succulent karoo, offer potential income to the MET. There is a strong demand for many of these species and many are illegally harvested. This market has not been tested and the practicality and administration involved may not be worth the risk of opening the market. It does however offer a potential market which may need to be explored further.

In addition, bioprospecting permits are increasingly generating revenues in protected areas around the world. The potential for Namibia's protected areas is unlikely to be huge, but might be worth investigating further.

6.8 Payments for ecosystem services

Financing the conservation of protected areas could potentially benefit from the recognition of the ecosystem services generated and the establishment of markets for these services where appropriate or feasible. This is currently a major area of activity and research around the world, with major initiatives also underway in South Africa, as governments and conservation agencies seek more innovative ways of financing conservation. Analysis of successful cases where such payments do occur and do make a difference to conservation efforts are, however, limited to a few basic services, primarily water supply and carbon sequestration (Savy & Turpie 2004). Namibia's protected areas do not protect any major catchment areas that generate sufficient value to be captured by the protected area system. Neither is there a strong case for carbon trading, since protected areas do not meet the stringent ecological and social requirements to be eligible for such trading. It is thus probably not worthwhile pursuing this route.

6.9 Conclusions: a financing plan for protected areas

Various possibilities for increasing the financing of Namibia's protected areas have been discussed in the preceding sections. The actual amounts of revenues that can be raised are easier to estimate in some cases than in others, though in all cases, assumptions have had to be made due to a lack of primary research data. Nevertheless, the preceding sections give an idea of the level of financing that could be achieved, and this is summarised in Table 6.18.

Table 6.18. Potential sources of funding apart from government

Source	Current income	Potential income
Donor funding	< N$2.5 million	Related to fundraising effort and attractiveness of pa system
Visitor fees	N$16 million	N$20 – 25 million
Tourism royalties	<0.5 million	N$16 million
Hunting concessions	N$3.9 million	N$4 – 6.5 million
Live game sales	< N$0.5 million*	N$ 12 - 15 million -
Harvesting of plant material and bioprospecting	None	Unknown value, probably not large
Payments for ecosystem services	None	Unlikely to be viable
Known total	**N$19 million**	**N$52 – 63 million**

* estimated medium-term average based on a single auction

In summary, the financing plan should concentrate on conventional measures of financing, mainly seeking donor funding, increasing visitor fees, generating royalties from tourism services offered in parks, and generating income from hunting concessions and the sale of live animals.

Attracting donor funding will be a critical component of the plan, especially for covering some of the initial outlay required, but it is difficult to estimate how much is potentially available. The amount of donor funding that could be raised will be dependent on the effort dedicated to fundraising (i.e. Involving fundraising costs), and will also be contingent on donors being convinced of the long-term benefits to parks and/or economic upliftment.

Apart from donor funding, these activities could generate an estimated N$52 – N$63 million, compared to the roughly N$19 million that is currently generated. This would go a long way towards covering the desired recurrent costs of the protected area system of about N$105 million.

Not all of these financing mechanisms are equally easy to implement. The best return for effort will be obtained from increasing park fees. Preliminary analysis suggests that the net income derived from park fees could be similar irrespective of whether a wild card arrangement is introduced. Although visitors could be persuaded to part with significantly more money with the introduction of a wild card system, the transaction costs involved mean that most of the extra revenue may simply accrue to the company administering the card. The actual outcome would depends on the business relationship that would be negotiated with the company, and the degree to which MET could take on the administrative aspects such as sales. Irrespective of the type of payment vehicles offered, it is important that MET invests in an improved system of visitor data collection in order to monitor the use and demand for parks.

Income from consumptive use of wildlife is probably relatively easy to access, but is limited by potential conflict with wildlife viewing activities and ethical considerations. The latter considerations must take precedent since they are far more lucrative, both from a financial and economic perspective. Thus it is safer to be conservative in the amount of revenue targeted from these sources. The establishment of quotas and concessions will involve certain set-up costs, such as research, administration of auction or tendering processes, and monitoring. However, since these processes are not new to the DPWM, it is not anticipated that these costs would be very high.

Tourism concessions potentially provide the greatest new source of finance for the protected area system. Nevertheless, this will also take the longest to realise, especially in view of the financial problems associated with the NWR. Generating this revenue will also involve considerable costs in terms of research into carrying capacities, careful identification of concessions, administration of a tender process, monitoring and fee collection. Potential concessionaires need to be attracted by appropriate infrastructure as well as an efficient system of management, marketing, and a sense of security with regard to the continued good management of the natural resource base upon which income depends. Most of the infrastructure requirements such as roads and water points are covered in the capital requirements already envisaged to improve the overall management of parks (see previous chapter), but there may be additional capital costs needed to attract targeted types of concessionaires.

It is important to accept that some parks will be more inclined to make a profit while others may always make a loss. Furthermore, profitable parks will probably always have to subsidise other parks, as it is unlikely that the parks system will ever reach financial break-even. Nevertheless, the onus is on government to continue its investment in making up this shortfall as part of its obligations to the international community and to future generations. The government should not see this financing plan as a means of reducing its input into park costs. On the contrary, the earlier economic analyses have provided plenty of justification as to why their input should actually increase.

7. THE WAY FORWARD

This study was entirely a desk-top analysis conducted using available existing data, and was conducted over a relatively short period of time. Thus several assumptions have had to be made where there are data gaps, and ideally, these assumptions need to be verified before final decisions are taken on details of implementation. In addition, further consideration is needed as to how to ensure the contribution of the project to poverty alleviation in Namibia.

7.1 Research requirements

7.1.1 Current protected area tourism use patterns

A good understanding of the trip characteristics of domestic, regional and foreign tourists that visit protected areas is a vital prerequisite for (a) accurately estimating the total number of tourists visiting parks, (b) accurately estimating the economic impact of protected area tourism, (c) estimating the potential income from visitor fees and (d) estimating the potential response to the introduction of novel payment systems such as the WILD Card.

However, little or nothing is known of how many parks visitors visit, or how many days they spend visiting protected areas during their stay, and other characteristics of their trips. There is also no information on the relative proportions of individuals, couples and family groups using parks. Information is particularly lacking for domestic users. The lack of these statistics has seriously hampered this investigation, making it particularly difficult to estimate the actual number of visitors involved as a whole, and resulting in a wide ranging estimate of economic impact. A better understanding of the park use patterns by different types of visitors would be particularly helpful in improving the accuracy of estimates made in this study.

7.1.2 Protected area demand characteristics

Visitor surveys conducted in Namibia have never directly addressed the questions as to the importance of natural resources, and of protected areas in particular, in the decisions that visitors make in coming to the country, or in how long they stay in the country. It would be particularly valuable to establish the way in which different attributes (e.g. of biodiversity or park facilities) of the overall protected area system influence the demand for protected area tourism as a whole, and then how changes in park quality (affecting those attributes) might affect overall demand, visitation rates, length of stay and willingness to pay. These research questions need to be applied to domestic as well as international tourists. The outputs of such research would lead to a much better understanding of how the improvement of protected areas might influence overall tourism demand, and thus what the returns to these investments would be. This is very difficult to estimate at present.

7.1.3 Further evaluation of the introduction of a wild-card system

An important consideration that has been discussed in this study is whether the introduction of a Wild Card system would lead to improved financing. While estimates have been made of potential revenues that could be generated from this system, based on the situation in South Africa, it is not possible to be conclusive as to the magnitude of these revenues without receiving some input from the company that would administer the system. Since this would be a business arrangement, all things are negotiable, and the contract conditions may not necessarily be the same as in South Africa. it would be necessary to receive a firm proposal from the company in order to further evaluate the viability of this system.

7.1.4 Development of financial planning and monitoring systems

Current financial planning tends to be guided by previous years' budgets rather than a strategic assessment of needs. There is a strong need for the development of financial planning tools for protected areas that will allow for the strategic analysis of options and more efficient planning. Related to this and preceding research requirements, a monitoring system needs to be designed and implemented in which park entry data and other relevant statistics are usefully recorded so that they can be readily accessed.

7.2 Socio-economic considerations

Financing the parks may not always be wholly compatible with broader social and development goals. The financing plan should ensure that the project does not impact negatively on social equity, and it should make a positive contribution to poverty alleviation. This will impact on financing goals to some extent, but will help to ensure the maximisation of overall economic benefits. The following recommendations are made in this regard:

7.2.1 Park pricing strategies

The problem with trying to maximise the capture of consumer surplus by charging higher park entry fees is that it runs the risk of excluding poorer Namibians from the protected area system. This problem could be avoided by keeping fees for Namibians very low. This strategy enhances the economic value of the parks (in that more Namibians will benefit), but may compromise the financing aspect. The park pricing strategy thus needs to make allowance for poorer Namibians, but in such a way that income to the parks is not too heavily compromised. The best way to do this would be to keep prices for Namibians close to market rates, but to offer waivers for poorer Namibians. Thus:

- Prices for Namibians should be relatively close to the current mean WTP in order to capture a fair amount of rent from wealthier visitors, but slightly lower, in order to encourage access to a wider sector of society
- Fees for certain groups, such as school groups, should be made voluntary so that more affluent users are able to make a contribution but poorer users would not need to pay

7.2.2 Tourism concessions

Tourism concessions are recognised as one of the most important potential sources of income for the protected area system. Nevertheless, it is important that the implementation of tourism concessions also contributes to the development and poverty reduction in Namibia's poorer rural areas.

While it is recognised that there is capacity for tourism development within parks, such development may compete with opportunities outside parks. While competition is low at present, it can be expected to intensify if more upmarket developments are introduced into parks in the concession process. Tourism lodge concessions within parks should not be so numerous as to take up all the spare market capacity. Allowance should be made for increases in tourism developments outside parks, particularly providing entrepreneurial opportunities for communal land areas.

Concessions within protected areas should have conditions which make it mandatory for the concessionaires to contribute to local economic development. This includes the employment of local labour, providing training opportunities for local employees, and encouraging small and medium sized enterprise development by trading with neighbouring communities. Although not a major source of finance for parks, tourism concessions should also include smaller enterprises such as guided trails and tours which can be taken up by members of surrounding communities. Local communities should be encouraged to participate in tourism opportunities in and around the parks.

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APPENDIX 1.

GENERALISED LODGE ENTERPRISE MODEL.

FINANCIAL/ECONOMIC MODEL - LODGE ON COMMUNAL LAND

ASSUMPTIONS*

Production System:	18	bed, up-market lodge offering all inclusive, guided, wildlife viewing.										
Site:	High quality, unfenced area with river/floodplain frontage and mixed population of northeastern woodland species.											
Game Density:	100%	3.32	LSU Equivalents/Sq. Km. or,				30.100133	Hectares per LSU Equivalent				
Carrying Capacity:	100%	0.125	Tourist Beds/Sq. Km. or,				800	Ha. per Tourist Bed				
Concession Size:	14400	Hectares or,	144	Square Kilometres								
Tourist Category:	Overseas	95%	Regional	4%		Resident	1%		Citizen	0%		
	Adults	100%	Children	0%								
Occupancy Rate:	100%	53.0%	Average Length of Stay:			4	Days					
Daily Tariffs (N$):	100%	Overseas	950	Regional	760	Resident	380	Citizen	380			
		Children	75%	of Adult Price								
Capital Item Prices:	100%	(Variation from Normal for Sensitivity Analysis)										
Capital Sources:	100%	Loan =	25%	Equity =	75%	and:	100%	Foreign	25%	Domestic	75%	
Interest Rates:	Rate for Capital Loans:		10%		Rate for Working Capital Loans:			15%				
Working Capital as Proportion of Annual Operating Costs:				15%								
Park Entry Fees:	100%	Fee per Tourist Night/Day: N$		0.00								
Land Rental and Resource Royalty (N$):		100%	Rental:	5.00	per Ha.	100%	Royalty:	12%	of Turnover			
Manpower Needs:	100%		Managers	2	Skilled Labour	2	Unskilled Labour	5				
	100%		Management:		Foreign	20%	Citizen	80%				
Wage rates (N$ per year):	100%		Managers	200000	Skilled Labour	45000	Unskilled Labour	18000				
Shadow Wage Adjustment:		100%	Managers	1.00	Skilled Labour	1.00	100%	Unskilled Labour	0.35			
Foreign Exchange Premium:		100%	6%		Adjustment Factor =		1.06					
Tax Adjustments:	100%	General Sales Tax:	11%		Import Taxes: from SACU:		0%	to SACU:	n/a			
Discount Rates:	100%		Financial Discount Rate:		8%		Economic Discount Rate:		8%			
Opportunity Cost of Capital:		100%	8%									

Static models depict enterprise at full production. Static financial model includes interest, amortisation government fees, royalties and land rentals. Static economic model takes foreign inflows and outflows into account, excludes other interest and transfers and values enterprise in economic prices before land and government costs

Dynamic models presented over 5 and 10 years, to measure IRR and NPV. Financial dynamic model, at constant prices, excludes interest and depreciation, and includes asset residual values.

TABLE Ta1: CAPITAL REQUIREMENTS

ITEM	QUANT.	PRICE N$	FINAN. COST	LIFE Years	AMORT. + INT.	DEPREC-IATION	ECON. DEPR.	FOREX ADJ.	TAX ADJ.	ECON. COST
FIXED CAPITAL										
DOMESTIC ITEMS										
Houses Manager	1	40000	40000	40	4698	1000	890	1.00	0.89	35600
Houses Labour	4	30000	120000	40	14095	3000	2670	1.00	0.89	120000
Storerooms	1	20000	20000	40	2349	500	445	1.00	0.89	17800
Tourist Lodges	1	1520000	1520000	40	178539	38000	33820	1.00	0.89	1352800
Borehole	1	25000	25000	40	2936	625	556	1.00	0.89	22250
Reservoir (Whole Water System)	0	5540	0	40	0	0	0	1.00	0.89	0
Reticulation/Pans	1	12000	12000	40	1410	300	267	1.00	0.89	10680
Firebreaks	1	2500	2500	40	294	63	56	1.00	0.89	2225
Hiking Trails	0	0	0	40	0	0	0	1.00	0.89	0
Power/Road to Site	0	0	0	40	0	0	0	1.00	0.89	0
CONTINGENCIES @ 5%			86975	40	10216	2174	1935	1.00	0.89	77408
SUBTOTAL DOMESTIC ITEMS			1826475							1638763
TRADABLE ITEMS										
Boma	0	0	0	20	0	0	0	1.06	0.89	0
Hiker Camps	0	0	0	15	0	0	0	1.06	0.89	0
Pump/Windmill	0	0	0	15	0	0	0	1.06	0.89	0
Fencing Perimeter	0	0	0	15	0	0	0	1.06	0.89	0
Fencing Internal	0	0	0	15	0	0	0	1.06	0.89	0
CONTINGENCIES @ 5%			0	15	0	0	0	1.06	0.89	0
SUBTOTAL TRADABLES			0							0
SUBTOTAL- FIXED CAPITAL			1826475							1638763
MOVABLE CAPITAL										
TRADABLE ITEMS										
Land Cruisers/Trucks/Vans	5	200000	1000000	5	263797	200000	188680	1.06	0.89	943400
Tools/Office Equipment	5	5000	25000	4	7887	6250	5896	1.06	0.89	23585
Lodge Equipment	3	220000	660000	6	151541	110000	103774	1.06	0.89	622644
Bicycles	5	4000	20000	6	4592	3333	3145	1.06	0.89	18868
CONTINGENCIES @ 10%			170500	6	39148	28417	26808	1.06	0.89	160850
SUBTOTAL TRADABLES			1875500							1769347
DOMESTIC ITEMS										
Capture: Small Antelope	0	0	0	20	0			1.00	0.89	0
: Large Antelope	0	0	0	20	0			1.00	0.89	0
: Ostrich	0	0	0	20	0			1.00	0.89	0
: Other Animals	0	0	0	20	0			1.00	0.89	0
Horses and Donkeys	0	0	0	20	0			1.00	0.89	0
CONTINGENCIES @ 10%			0	20	0			1.00	0.89	0
SUBTOTAL- DOMESTIC ITEMS			0							0
SUBTOTAL- MOVABLE CAPITAL			1875500							1769347
WORKING CAPITAL			LOAN	INTEREST						
VARIABLE			123230	18484				1.06	1.00	130624
OVERHEAD			207840	31176				1.06	1.00	220310
SUBTOTAL- WORKING CAPITAL			331070	49660						350934
TOTALS			4033045	49660	681502	393662	368942			3759044

TABLE Ta3: SALES AT FULL PRODUCTION

ITEM	VISITOR DAYS	@ RATE	(N$/Day)	FINANCIAL VALUE	FOREX ADJ.	TAX ADJ.	ECON. VALUE
Overseas Adults	3308	@	950 N$/Day =	3142595	1.06	1.00	3331151
Regional Adults	139	@	760 N$/Day =	105856	1.06	1.00	112207
Resident Adults	35	@	380 N$/Day =	13232	1.06	1.00	14026
Citizen Adults	0	@	380 N$/Day =	0	1.00	1.00	0
Overseas Children	0	@	713 N$/Day =	0	1.06	1.00	0
Regional Children	0	@	570 N$/Day =	0	1.06	1.00	0
Resident Children	0	@	285 N$/Day =	0	1.06	1.00	0
Citizen Children	0	@	285 N$/Day =	0	1.00	1.00	0
Excursions/activities				39460	1.06	1.00	41828
Food sales (additional)				13280	1.06	2.00	28154
Sundries				1340	1.06	3.00	4261
Gratuities				55150	1.06	1.00	58459
Bar				88900	1.06	1.00	94234
Crafts/Curios				92130	1.06	1.00	97658
TOTALS	3482		GROSS INCOME	3551943			3781977

TABLE Ta4: VARIABLE EXPENDITURE AT FULL PRODUCTION

ITEM	FINANCIAL VALUES N$/LSU	N$/HA.	VALUE	FOREX ADJ.	TAX ADJ.	ECONOMIC VALUES N$/LSU	N$/HA.	VALUE
TRADABLE ITEMS								
Marketing Costs: Advertising	148.49	4.93	71039	1.06	0.89	140.09	4.65	67018
: Agents Fees	371.23	12.33	177597	1.06	0.89	393.50	13.07	188253
Lodge Running Costs : Accomodation	145.57	4.84	69642	1.06	0.89	137.33	4.56	65700
: Transport	40.18	1.33	19221	1.06	0.89	37.90	1.26	18133
: Optional Activ.	0.00	0.00	0	1.06	0.89	0.00	0.00	0
: Bar	96.81	3.22	46312	1.06	0.89	91.33	3.03	43691
: Crafts/Curios	60.41	2.01	28901	1.06	0.89	56.99	1.89	27266
Fodder and Supplements	0.00	0.00	0	1.06	0.89	0.00	0.00	0
Offtake Costs: Ammunition	0.00	0.00	0	1.06	0.89	0.00	0.00	0
: Supplies and Packaging	0.00	0.00	0	1.06	0.89	0.00	0.00	0
: Transport	0.00	0.00	0	1.06	0.89	0.00	0.00	0
: Live Game Distribution	0.00	0.00	0	1.06	0.89	0.00	0.00	0
: Biltong Distribution	0.00	0.00	0	1.06	0.89	0.00	0.00	0
Fuels, Oils and Miscellaneous Costs	37.85	1.26	18107	1.06	0.89	35.71	1.19	17082
SUBTOTAL TRADABLES	900.54	29.92	430819			892.85	29.66	427143
DOMESTIC ITEMS								
Veterinary and Medicine Costs	0.00	0.00	0	1.00	0.89	0.00	0.00	0
Licence Fees: Park Entrance Fees	0.00	0.00	0	1.00	1.00	0.00	0.00	0
: Hunting Licences	0.00	0.00	0	1.00	1.00	0.00	0.00	0
Sales Tax	816.70	27.13	390714	1.00	1.00	0.00	0.00	0
SUBTOTAL DOMESTIC ITEMS	816.70	27.13	390714			0.00	0.00	0
TOTAL VARIABLE EXPENDITURE	1717.24	57.05	821533			892.85	29.66	427143

TABLE Ta5: OPERATING OVERHEAD EXPENDITURE AT FULL PRODUCTION

ITEM	FINANCIAL VALUES N$/LSU	N$/HA.	VALUE	FOREX ADJ.	TAX ADJ.	ECONOMIC VALUES N$/LSU	N$/HA.	VALUE
DOMESTIC ITEMS								
Salaries and Wages: Unskilled Labour	188.13	6.25	90000	1.00	1.00	188.13	6.25	31500
: Skilled Labour	188.13	6.25	90000	1.00	1.00	188.13	6.25	80100
: Managers	836.11	27.78	400000	1.00	1.00	836.11	27.78	400000
Administration	658.44	21.88	315000	1.00	0.89	658.44	21.88	280350
Maintenance and Repairs	854.09	28.38	408600	1.00	0.89	854.09	28.38	363654
Insurance	167.22	5.56	80000	1.00	0.89	167.22	5.56	71200
Travelling	4.18	0.14	2000	1.00	0.89	4.18	0.14	1780
TOTAL OPERATING OVERHEAD EXPENDIT	2896.30	96.22	1385600			2896.30	96.22	1228584

TABLE Ta6: STATIC FINANCIAL MODEL (AT FULL PRODUCTION)

ITEM	UNITS	TOTAL
Concession Extent	Hectares	14400
Concession Stock	Large Stock Units (LSU)	478
Total Capital Requirement	N$	4033045

	N$/LSU	N$/HECTARE	N$
GROSS INCOME	7424.58	246.66	3551943
VARIABLE COSTS	1717.24	57.05	821533
GROSS MARGIN	5707.34	189.61	2730410
OVERHEAD COSTS			
Overhead Operating Costs	2896.30	96.22	1385600
Loan Amortisation and Interest	356.13	11.83	170376
Provisions for Capital Replacement	617.15	20.50	295246
Interest on Variable Working Capital	38.64	1.28	18484
Interest on Overhead Working Capital	65.17	2.17	31176
Land Rental	150.50	5.00	72001
Resource Royalty	890.95	29.60	426233
TOTAL OVERHEAD COSTS	5014.84	166.61	2399117
NET CASH INCOME	692.50	23.01	331293
NET CASH INCOME/N$100 TOTAL CAPITAL INVESTMENT	8.21		
"TOTAL BENEFITS"*/N$100 TOTAL CAPITAL INVESTMENT	44.64		
"TOTAL BENEFITS"*/HECTARE	125.02		

* "Total Benefits" = all of Net Cash Income, Salaries and Wages, Licences and Duties, Rental and Royalties.

TABLE Ta7: STATIC ECONOMIC MODEL (AT FULL PRODUCTION)

ITEM	UNITS		TOTAL
Concession Extent	Hectares		14400
Concession Stock	Large Stock Units (LSU)		478
Total Capital Requirement	N$		3759044
Economic Depreciation Cost	N$		368942
Foreign Financing (Prorated)	N$		104320
Foreign Amortisation	N$		26080
Foreign Capital Replacement Provision	N$		78240
Foreign Interest Cost	N$		89438
Domestic Interest Cost	N$		268313
ECONOMIC BENEFITS	N$/LSU	N$/HECTARE	N$
Gross Income	7905.42	262.64	3781977
ECONOMIC COSTS			
DOMESTIC COMPONENT			
Shadow Unskilled Citizen Wages	65.84	2.19	31500
Other Citizen Wages	836.32	27.78	400100
Opportunity Cost of Capital	628.60	20.88	300723
Other Domestic Economic Costs	1498.70	49.79	716984
SUBTOTAL DOMESTIC COMPONENT	3029.47	100.65	1449307
TRADABLE COMPONENT			
Foreign Remuneration	167.22	5.56	80000
Foreign Services	506.91	16.84	242507
Foreign Interest	186.95	6.21	89438
Foreign Lease Payments	0.00	0.00	0
Foreign Rentals	0.00	0.00	0
Foreign Net Income	183.51	6.10	87793
Other Tradable Economic Costs	385.94	12.82	184635
SUBTOTAL TRADABLE COMPONENT	1430.54	47.53	684373
TOTAL ECONOMIC COSTS	4460.01	148.17	2133681
NET ECONOMIC BENEFIT (Gross Value Added)	3445.41	114.47	1648296
NET VALUE ADDED (Excluding Depreciation)	2674.22	88.84	1279354
DOMESTIC RESOURCE COST RATIO =	0.55		
NET VALUE ADDED/N$100 TOTAL CAPITAL COST =	34.03		
CAPITAL COST/EMPLOYMENT OPPORTUNITY CREATED =	417672		
NUMBER OF EMPLOYMENT OPPORTUNITIES/1000 HA.	0.63		

TABLE Ta9: CAPITAL PHASING, DEPRECIATION SCHEDULE AND CALCULATION OF RESIDUAL VALUE

ITEM	LIFE (Yrs)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
DEPRECIABLE ASSETS												
"Forty Year" Items	40											
Total Expenditure		1826475										
Phased Expenditure		1095885	730590	0	0	0	0	0	0	0	0	0
Depreciation		27397	45662	45662	45662	45662	45662	45662	45662	45662	45662	45662
Residual value		1095885	1799078	1753416	1707754	1662092	1616430	1570769	1525107	1479445	1433783	1388121
"Twenty Year" Items	20											
Total Expenditure		0										
Phased Expenditure		0	0	0	0	0	0	0	0	0	0	0
Depreciation		0	0	0	0	0	0	0	0	0	0	0
Residual value		0	0	0	0	0	0	0	0	0	0	0
"Fifteen Year" Items	15											
Total Expenditure		0										
Phased Expenditure		0	0	0	0	0	0	0	0	0	0	0
Depreciation		0	0	0	0	0	0	0	0	0	0	0
Residual value		0	0	0	0	0	0	0	0	0	0	0
"Six Year" Items	6						6					
Total Expenditure		875500						875500				
Phased Expenditure		612850	262650	0	0	0	0	612850	262650	0	0	0
Depreciation		102142	145917	145917	145917	145917	145917	145917	145917	145917	145917	145917
Residual value		612850	773358	627442	481525	335608	189692	656625	773358	627442	481525	335608
"Four Year" Items	4											
Total Expenditure		1000000				1000000				1000000		
Phased Expenditure		1000000	0	0	0	1000000	0	0	0	1000000	0	0
Depreciation		250000	250000	250000	250000	250000	250000	250000	250000	250000	250000	250000
Residual value		1000000	750000	500000	250000	1000000	750000	500000	250000	1000000	750000	500000
NON DEPRECIABLE ASSETS												
Stock	-											
Phased Expenditure		0	0	0	0	0	0	0	0	0	0	0
Residual value		0	0	0	0	0	0	0	0	0	0	0
Working Capital	-											
Phased Expenditure		331070	0	0	0	0	0	0	0	0	0	0
TOTAL PHASED CAPITAL EXPENDITURE												
Domestic Component		1095885	730590	0	0	0	0	0	0	0	0	0
Tradable Component		1612850	262650	0	0	1000000	0	612850	262650	1000000	0	0
Total Financial Value		2708735	993240	0	0	1000000	0	612850	262650	1000000	0	0
Total Economic Value		2496900	898009	0	0	943400	0	578163	247784	943400	0	0
TOTAL ASSET RESIDUAL VALUE												
Domestic Component		1095885	1799078	1753416	1707754	1662092	1616430	1570769	1525107	1479445	1433783	1388121
Tradable Component		1612850	1523358	1127442	731525	1335608	939692	1156625	1023358	1627442	1231525	835608
Financial Value		2708735	3322436	2880858	2439279	2997701	2556122	2727394	2548465	3106886	2665308	2223729
Economic Value		2496900	3038316	2624169	2210022	2739275	2325128	2489144	2322781	2852034	2437887	2023741

TABLE Ta10: LOAN FINANCING SCHEDULE

ITEM	PERIOD (Yrs)	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
LONG TERM LOANS												
TWENTY YEAR LOAN	20											
Total Expenditure		456619										
Loan Disbursements		273971	182648	0	0	0	0	0	0	0	0	0
Loan Payments		32181	53634	53634	53634	53634	53634	53634	53634	53634	53634	53634
Amortisation		13699	22831	22831	22831	22831	22831	22831	22831	22831	22831	22831
Interest Payments		18482	30803	30803	30803	30803	30803	30803	30803	30803	30803	30803
Loans Outstanding		273971	442920	420089	397258	374427	351596	328766	305935	283104	260273	237442
FIFTEEN YEAR LOAN	15											
Total Expenditure		0										
Loan Disbursements		0	0	0	0	0	0	0	0	0	0	0
Loan Payments		0	0	0	0	0	0	0	0	0	0	0
Amortisation		0	0	0	0	0	0	0	0	0	0	0
Interest Payments		0	0	0	0	0	0	0	0	0	0	0
Loans Outstanding		0	0	0	0	0	0	0	0	0	0	0
SIX YEAR LOAN	6						6					
Total Expenditure		218875						218875				
Loan Disbursements		153213	65663	0	0	0	0	153213	65663	0	0	0
Loan Payments		35179	50255	50255	50255	50255	50255	50255	50255	50255	50255	50255
Amortisation		25535	36479	36479	36479	36479	36479	36479	36479	36479	36479	36479
Interest Payments		9643	13776	13776	13776	13776	13776	13776	13776	13776	13776	13776
Loans Outstanding		153213	193340	156860	120381	83902	47423	164156	193340	156860	120381	83902
FOUR YEAR LOAN	4											
Total Expenditure		250000				250000				250000		
Loan Disbursements		250000	0	0	0	250000	0	0	0	250000	0	0
Loan Payments		78868	78868	78868	78868	78868	78868	78868	78868	78868	78868	78868
Amortisation		62500	62500	62500	62500	62500	62500	62500	62500	62500	62500	62500
Interest Payments		16368	16368	16368	16368	16368	16368	16368	16368	16368	16368	16368
Loans Outstanding		250000	187500	125000	62500	250000	187500	125000	62500	250000	187500	125000
SHORT TERM LOANS												
Working Capital	1											
Overdraft		331070	331070	331070	331070	331070	331070	331070	331070	331070	331070	331070
Interest Payments		49660	49660	49660	49660	49660	49660	49660	49660	49660	49660	49660
TOTAL LONG TERM LOAN DISBURSMENTS												
Domestic Component		507888	186233	0	0	187500	0	114909	49247	187500	0	0
Foreign Component *		179454	65802	0	0	66250	0	40601	17401	66250	0	0
TOTAL LONG TERM LOAN AMORTISATION												
Domestic Component		76300	91358	91358	91358	91358	91358	91358	91358	91358	91358	91358
Foreign Component *		26960	32280	32280	32280	32280	32280	32280	32280	32280	32280	32280
TOTAL INTEREST PAYMENTS												
Domestic Component		70615	82956	82956	82956	82956	82956	82956	82956	82956	82956	82956
Foreign Component *		24951	29311	29311	29311	29311	29311	29311	29311	29311	29311	29311
TOTAL LOANS OUTSTANDING												
Domestic Component		507888	617820	526462	435105	531247	439890	463441	421331	517473	426115	334758
Foreign Component *		179454	218296	186017	153737	187707	155428	163749	148870	182840	150561	118281

* Economic Values

TABLE Ta11: FINANCIAL ANALYSIS - 5 YEARS (N$, 1994)

ITEM	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
EXPENDITURE						
Capital Expenditure	2708735	993240	0	0	1000000	0
Variable Expenditure	82153	492920	821533	821533	821533	821533
Overhead Expenditure	1883835	1883835	1883835	1883835	1883835	1883835
TOTAL EXPENDITURE	4674723	3369995	2705368	2705368	3705368	2705368
INCOME						
Gross Income	0	1775972	3196749	3551943	3551943	3551943
Asset Residual Value	0	0	0	0	0	2556122
TOTAL INCOME	0	1775972	3196749	3551943	3551943	6108065
NET BENEFIT/COST	-4674723	-1594023	491381	846575	-153425	3402697

FINANCIAL RATE OF RETURN (FRR) OVER 5 YEARS = -7.29%
NET PRESENT VALUE (NPV) @ 8.00% = -2642875 Per Hectare = -183.53

TABLE Ta12: FINANCIAL ANALYSIS - 7 YEARS (N$, 1994)

ITEM	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
EXPENDITURE								
Capital Expenditure	2708735	993240	0	0	1000000	0	612850	262650
Variable Expenditure	82153	492920	821533	821533	821533	821533	821533	821533
Overhead Expenditure	1883835	1883835	1883835	1883835	1883835	1883835	1883835	1883835
TOTAL EXPENDITURE	4674723	3369995	2705368	2705368	3705368	2705368	3318218	2968018
INCOME								
Gross Income	0	1775972	3196749	3551943	3551943	3551943	3551943	3551943
Asset Residual Value	0	0	0	0	0	0	0	2548465
TOTAL INCOME	0	1775972	3196749	3551943	3551943	3551943	3551943	6100408
NET BENEFIT/COST	-4674723	-1594023	491381	846575	-153425	846575	233725	3132390

FINANCIAL RATE OF RETURN (FRR) OVER 7 YEARS = -2.72%
NET PRESENT VALUE (NPV) @ 8.00% = -2424956 Per Hectare = -168.40

TABLE Ta13: FINANCIAL ANALYSIS - 10 YEARS (N$, 1994)

ITEM	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
EXPENDITURE											
Capital Expenditure	2708735	993240	0	0	1000000	0	612850	262650	1000000	0	0
Variable Expenditure	82153	492920	821533	821533	821533	821533	821533	821533	821533	821533	821533
Overhead Expenditure	1883835	1883835	1883835	1883835	1883835	1883835	1883835	1883835	1883835	1883835	1883835
TOTAL EXPENDITURE	4674723	3369995	2705368	2705368	3705368	2705368	3318218	2968018	3705368	2705368	2705368
INCOME											
Gross Income	0	1775972	3196749	3551943	3551943	3551943	3551943	3551943	3551943	3551943	3551943
Asset Residual Value	0	0	0	0	0	0	0	0	0	0	2223729
TOTAL INCOME	0	1775972	3196749	3551943	3551943	3551943	3551943	3551943	3551943	3551943	5775672
NET BENEFIT/COST	-4674723	-1594023	491381	846575	-153425	846575	233725	583925	-153425	846575	3070305

FINANCIAL RATE OF RETURN (FRR) OVER 10 YEARS = 0.74%
NET PRESENT VALUE (NPV) @ 8.00% = -2169634 Per Hectare = -150.67

TABLE Ta14: ECONOMIC ANALYSIS - 5 YEARS (N$,1994)

ITEM	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
ECONOMIC COSTS						
Capital Expenditure	2496900	898009	0	0	943400	0
Unskilled Wages	31500	31500	31500	31500	31500	31500
Other Domestic Costs	893667	1117084	1117084	1117084	1117084	1117084
Tradable Costs	48106	288638	481063	481063	481063	481063
Foreign Amortisation	26960	32280	32280	32280	32280	32280
Foreign Profits	0	6145	70234	87793	87793	87793
Foreign Loans Outst.	0	0	0	0	0	155428
TOTAL COSTS	3497133	2373656	1732161	1749719	2693119	1905147
ECONOMIC BENEFITS						
Gross Income	0	1890989	3403780	3781977	3781977	3781977
Asset Residual Value	0	0	0	0	0	2325128
Foreign Financing	179454	65802	0	0	66250	0
TOTAL BENEFITS	179454	1956791	3403780	3781977	3848227	6107105
NET BENEFIT/COST	-3317680	-416865	1671619	2032258	1155108	4201959

ECONOMIC RATE OF RETURN (ERR) OVER 5 YEARS	=	27.99%		
NET PRESENT VALUE (NPV) @ 8.00%	=	2825529	Per Hectare =	196.22

TABLE Ta15: ECONOMIC ANALYSIS - 10 YEARS (N$, 1994)

ITEM	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
ECONOMIC COSTS											
Capital Expenditure	2496900	898009	0	0	943400	0	578163	247784	943400	0	0
Unskilled Wages	31500	31500	31500	31500	31500	31500	31500	31500	31500	31500	31500
Other Domestic Costs	893667	1117084	1117084	1117084	1117084	1117084	1117084	1117084	1117084	1117084	1117084
Tradable Costs	48106	288638	481063	481063	481063	481063	481063	481063	481063	481063	481063
Foreign Amortisation	26960	32280	32280	32280	32280	32280	32280	32280	32280	32280	32280
Foreign Profits	0	6145	70234	87793	87793	87793	87793	87793	87793	87793	87793
Foreign Loans Outst.	0	0	0	0	0	0	0	0	0	0	118281
TOTAL COSTS	3497133	2373656	1732161	1749719	2693119	1749719	2327882	1997503	2693119	1749719	1868000
ECONOMIC BENEFITS											
Gross Income	0	1890989	3403780	3781977	3781977	3781977	3781977	3781977	3781977	3781977	3781977
Asset Residual Value	0	0	0	0	0	0	0	0	0	0	2023741
Foreign Financing	179454	65802	0	0	66250	0	40601	17401	66250	0	0
TOTAL BENEFITS	179454	1956791	3403780	3781977	3848227	3781977	3822579	3799378	3848227	3781977	5805718
NET BENEFIT/COST	-3317680	-416865	1671619	2032258	1155108	2032258	1494697	1801875	1155108	2032258	3937718

ECONOMIC RATE OF RETURN (ERR) OVER 10 YEARS	=	33.43%		
NET PRESENT VALUE (NPV) @ 8.00%	=	6511878	Per Hectare =	452.21

TABLE Ta16: SUMMARY OF RESULTS

ITEM	UNITS	TOTAL
Concession Extent	Hectares	14400
Concession Stock	Large Stock Units (LSU)	478
Annual Visitor Days (VD)	Number	3482

ITEM	% of TCI	N$/VD	N$/LSU	N$/HECTARE	N$
Total Financial Capital (TCI)	-	1158.22	8430.22	280.07	4033045
Financial Gross Income	88.07%	1020.06	7424.58	246.66	3551943
Variable Financial Costs	-	235.93	1717.24	57.05	821533
Fixed Financial Costs	-	688.99	5014.84	166.61	2399117
Net Cash Income	8.21%	95.14	692.50	23.01	331293
Land Rental	-	20.68	150.50	5.00	72001
Resource Royalty	-	122.41	890.95	29.60	426233
FRR (@ 10 Years)	-	-	-	-	0.74%
FNPV (@ 8%, @ 10 Years)	-	-	-	-150.67	-2169634
Total Economic Capital	-	1079.53	7857.48	261.04	3759044
Economic Gross Income	100.61%	1086.12	7905.42	262.64	3781977
Economic Costs	56.76%	612.76	4460.01	148.17	2133681
Net Economic Benefit	43.85%	473.36	3445.41	114.47	1648296
Net Value Added	34.03%	367.41	2674.22	88.84	1279354
ERR (@ 10 Years)	-	-	-	-	33.43%
ENPV (@ 8%, @ 10 Years)	-	-	-	452.21	6511878
Economic Capital Cost/Job	-	-	-	-	417672
Domestic Resource Cost Ratio	-	-	-	-	0.55

Policy Analysis Matrix	: Effects of Policy / Market Imperfections	: on Output	-230034
		: on Tradable Inputs	253554
		: on Domestic Factors	-971581
	: Net Effects of Policy / Market Imperfections	: on Annual Net Income	-948061
		: on Net Present Value (10 Years)	-8681511

APPENDIX 2. SAM input data on ratios for intermediate costs incurred by different types of accommodation establishments, according to the Social Accounting Matrix product account classification. Compiled from data provided by A. Cartwright 2004 (DEA, unpublished data).

	INTERMEDIATE INPUTS	Tourist lodge	Tented Camp	Rest Camp	Camp -site	Self-catering	Hunting camp	Guest farm
1	Commercial cereal crops	-	-	-	-	-	-	-
2	Other commercial crops	0.0016	0.0016	0.0036	0.0036	0.0036	0.0132	0.0048
3	Commercial livestock	-	-	-	-	-	-	-
4	Food for own consumption (crafts)	0.0160	0.0160	0.0058	-	0.0058	-	-
5	Fishing	-	-	-	-	-	-	-
6	Fish Factories	-	-	-	-	-	-	-
7	Mining	-	-	-	-	-	-	-
8	Meat & meat products	0.0028	0.0028	0.0145	0.0164	0.0145	0.0132	0.0129
9	Prepared, preserved fish	0.0014	0.0014	0.0005	-	0.0005	-	-
10	Grain mill products	0.0069	0.0069	0.0025	-	0.0025	-	0.0361
11	Other food products	0.0469	0.0469	0.0717	0.0667	0.0717	0.0397	0.0242
12	Textiles, clothes, footwear	0.0022	0.0022	0.0013	0.0006	0.0013	0.0007	0.0015
13	Light manuf. goods	0.0571	0.0571	0.0617	0.0500	0.0617	0.0360	0.0665
14	Petroleum products	0.0191	0.0191	0.0572	0.0612	0.0572	0.0299	0.0224
15	Heavy manuf. goods	0.0275	0.0275	0.0163	0.0078	0.0163	0.0072	0.0627
16	Electricity	-	-	-	-	-	-	-
17	Water	-	-	0.0036	0.0044	0.0036	-	-
18	Construction	-	-	-	-	-	-	-
19	Trade services, repair services	0.0227	0.0227	0.0082	-	0.0082	-	0.0199
20	Hotel and restaurant	0.0011	0.0011	0.0004	-	0.0004	0.0143	0.0071
21	Transport services	0.0222	0.0222	0.0199	0.0146	0.0199	0.0205	0.0324
22	Communication	0.0031	0.0031	0.0089	0.0095	0.0089	0.0169	0.0154
23	Finance & insurance	0.0183	0.0183	0.0077	0.0014	0.0077	0.0165	0.0090
24	Real estate, own	-	-	-	-	-	-	-
25	Real estate, business services	0.3069	0.3069	0.1163	0.0073	0.1163	0.0941	0.0866
26	Other services	-	-	-	-	-	0.0052	0.0094
27	Government services	0.0016	0.0016	0.0006	-	0.0006	0.0034	0.0024
	Subtotal	0.5573	0.5573	0.4005	0.2436	0.4005	0.3107	0.4133
VALUE ADDED								
	Labour skilled	0.0643	0.0643	0.1545	0.2559	0.1545	0.1703	0.0532
	Labour unskilled	0.0680	0.0680	0.1426	0.2061	0.1426	0.0411	0.0584
	Mixed income, commercial agriculture	-	-	-	-	-	-	0.3993* (0.4312)
	GOS excluding rents/royalties	0.3025* (0.3050)	0.2372	0.3024	0.2931* (0.2940)	0.3024	0.3240	-
	Rent and royalties to communal lands	.0078* (0.0053)	0.0731	-	0.0013* (0.0005)	-	0.1539	-
	Royalties to DPWM for hunting							0.0758* (0.0440)
Total Turnover		**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**	**1.0000**

Note: input structure for Hotels is provided in the Basic SAM
*Figures are for Lower Bound Scenario. Figures in parentheses are used for Upper Bound Scenario.

APPENDIX 3. Current staffing and human resources costs of the DPWM

DIRECTOR	**180,000**
Subdivision Head Quarter Coordination Services	**375,945**
2 x Warden 2SP	166,590
1 x Clerk 2SP	83,295
1 x Clerk 2B3	56,886
1 x Clerk 1C2	32,565
1 x Clerical Assistant 1B3	22,710
1 x Messenger 1A2	13,899
DIVISION PARKS	**14,216,002**
1 x Deputy Director: Conservation	162,610
Subdivision Etosha	**5,423,952**
1 x Warden	97,716
2 x Warden	166,590
7 x Warden	441,399
3 x Clerk 1C2	93,690
30 x Ranger 1C1	976,950
1 x Clerical Assistant 1B3	22,710
2 x Operator driver 1B2	43,818
18 x Watchman 1B1	379,188
30 x Scout 1B1	631,980
80 x Workhand 1B1	1,685,280
20 x Labourer 1A1	300,360
Section Skeleton Coast	*584,271*
1 x Warden 2SP	83,295
1 x Warden 2C1	63,057
4 x Ranger 1C1	130,260
1 x Operator driver 1B2	21,909
9 x Watchman 1B1	189,594
1 x Labourer 1B1	21,066
5 x Labourer 1A1	75,090
Subdivision North East Parks	**4,436,364**
1 x Warden 3A2	97,716
Section Caprivi Parks	*1,756,584*
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
6 x Ranger 1C1	195,390
1 x Operator driver 1B2	21,909
2 x Labourer 1B1	42,132
10 x Watchman 1B1	210,660
44 x Workhand 1B1	926,904
10 x Labourer 1A1	150,180
Section Kavango Parks	*2,582,064*
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
11 x Ranger 1C1	358,215
2 x Operator driver 1B2	43,818
2 x Labourer 1B1	42,132
12 x Watchman 1B1	252,792
6 x Scout 1B1	126,396
60 x Workhand 1B1	1,263,960
19 x Labourer 1A1	285,342
Subdivision Central/Namib Naukluft	**2,392,077**
1 x Warden 3A2	97,716
2 x Warden 2SP	166,590
Section Central Parks	*616,266*
1 x Warden 2C1	63,057
2 x Ranger 1C1	65,130
1 x Operator driver 1B2	21,909
7 x Watchman 1B1	147,462
8 x Workhand 1B1	168,528
10 x Labourer 1A1	150,180
Section Waterberg Plateau Park	*935,277*
1 x Warden 2C1	63,057
6 x Ranger 1C1	195,390
1 x Implement Operator 1B1	21,066
1 x Labourer 1B1	21,066
1 x Scout 1B1	21,066
22 x Workhand 1B1	463,452
10 x Labourer 1A1	150,180
Section Namib Naukluft Park	*576,228*
2 x Warden 2C1	126,114
8 x Ranger 1C1	260,520
2 x Labourer 1B1	42,132
4 x Implement operator 1B1	84,264
3 x Scout 1B1	63,198
Subdivision Southern Parks	**1,800,999**
1 x Warden 3A2	97,716
Section Southern Namib Parks	*695,508*
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
4 x Ranger 1C1	130,260
1 x Operator driver 1B2	21,909
3 x Scout 1B1	63,198
3 x Watchman 1B1	63,198
7 x Workhand 1B1	147,462
4 x Labourer 1A1	60,072
Section South Parks	*1,007,775*
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
5 x Ranger 1C1	162,825
1 x Operator driver 1B2	21,909
1 x Labourer 1B1	21,066
3 x Scout 1B1	63,198
6 x Watchman 1B1	126,396
12 x Workhand 1B1	252,792
10 x Labourer 1A1	150,180

DIVISION WILDLIFE MANAGEMENT	**8,258,638**
1 x Deputy Director: Conservation 4A1	162,610
Subdivision North West Regional Services	**2,144,778**
1 x Warden 3A2	97,716
Section Khorixas and Outjo Reg Services	*1,645,017*
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
1 x Clerk 1C2	31,230
10 x Ranger 1C1	325,650
1 x Clerical Assistant 1B3	22,710
4 x Scout 1B1	84,264
39 x Workhand 1B1	821,574
10 x Labourer 1A1	150,180
Section Opuwo Regional Services	*402,045*
1 x Warden 2C1	63,057
2 x Ranger 1C1	65,130
2 x Scout 1B1	42,132
11 x Workhand 1B1	231,726
Subdivision North Central Regional Services	**804,189**
1 x Warden 3A2	97,716
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
1 x Clerk 1C2	31,230
4 x Ranger 1C1	130,260
1 x Clerical Assistant 1B3	22,710
4 x Scout 1B1	84,264
8 x Workhand 1B1	168,528
4 x Labourer 1A1	60,072
Subdivision North East Regional Services	**1,349,610**
1 x Warden 3A2	97,716
Section Kavango Regional Services	*876,618*
1 x Warden 2SP	83,295
1 x Warden 2C1	63,057
10 x Ranger 1C1	325,650
1 x Clerical assistant 1B3	22,710
2 x Labourer 1B1	42,132
3 x Scout 1B1	63,198
6 x Workhand 1B1	126,396
10 x Labourer 1A1	150,180
Section Caprivi Regional Services	*375,276*
1 x Warden 2C1	63,057
7 x Ranger 1C1	227,955
4 x Scout 1B1	84,264
Subdivision Central Regional Services	**966,192**
1 x Warden 3A2	97,716
Section Central North Regional Services	*379,272*
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
3 x Ranger 1C1	97,695
2 x Scout 1B1	42,132
2 x Labourer 1A1	30,036
Section Central South Regional Services	*489,204*
1 x Warden 2SP	83,295
1 x Warden 2C1	63,057
1 x Clerk 1C2	31,230
8 x Ranger 1C1	260,520
1 x Clerical assistant 1B3	21,066
2 x Scout 1B1	30,036
Subdivision Erongo Regional Services	**593,529**
1 x Warden 3A2	97,716
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
1 x Clerk 1C2	31,230
4 x Ranger 1C1	130,260
1 x Clerical assistant 1B3	22,710
2 x Scout 1B1	42,132
4 x Labourer 1A1	60,072
Subdivision South Regional Services	**1,049,199**
1 x Warden 3A2	97,716
1 x Warden 2SP	83,295
2 x Warden 2C1	126,114
1 x Clerk 1C2	31,230
9 x Ranger 1C1	293,085
1 x Clerical assistant 1B3	22,710
1 x Operator driver 1B2	21,909
7 x Watchman 1B1	147,462
2 x Scout 1B1	42,132
8 x Workhand 1B1	168,528
10 x Labourer 1A1	15,018
Subdivision EE and Information	**774,663**
1 x Warden 3A2	97,716
2 x Warden 2SP	166,590
1 x Artist 2C1	63,057
6 x Warden 2C1	378,342
1 x Clerk 1C2	31,230
1 x Clerical Assistant 1B3	22,710
1 x Labourer 1A1	15,018
Subdivision CBNRM	**413,868**
1 x Warden 3A2	97,716
2 x Warden 2SP	166,590
14 x Warden 2C1	63,057
1 x Clerk 1C2	31,230
15x Ranger 1C1	32,565
1 x Clerical Assistant 1B3	22,710

APPENDIX 4. Details of accommodation (number of beds or campsites) offered by Namibia Wildlife Resorts in protected areas.

Park	Resort	4x4	Camp sites*	Econ Bungalow	Econ Dormitory	Econ Flat	Econ Hut	Econ Room	Guided Hiking Trail	Hiking Trail	Lux Bungalow	Lux Flat	Lux Hut	Lux Suite	Std Bungalow	Std Chalet	Std Flat	Std Hut	Std Room	Unguided Hiking Trail	Grand Total
Ai-Ais	Ai-Ais		100				40										112				952
	FR Canyon		0							40											40
	Hobas		10																		80
Daan Viljoen	D Viljoen		30				40			48				8							776
Etosha	Halali		40	40							40			8					78		486
	Namutoni		25			8		30				12		4		80	4		60		398
	Okaukuejo		26	16				40			80			8	21	80			40		493
Gross Barmen	Gross Barmen		40	46										16	59						481
Hardap	Hardap		20	60	12									12	85						369
Khaudum	Khaudum		3				12														36
	Sikereti		3				12														36
Namib-Naukluft	Namib Park		99																		792
	Naukleft	64	7							48											168
	Sesriem		24																		192
West Coast	Jakkalsputz		230																		1840
	Mile 108		170																		1360
	Mile 14		213																		1704
	Mile 72		240																		1920
Popa	Popa Falls		10										8					32			120
Skeleton Coast	Terrace Bay		0					40						8							48
	Torra Bay		60																		480
	Ugab River Trail		0							8											8
Von Bach	Von Bach		10				44														124
Waterberg	Waterberg		40						8		50			16	60				68	30	552
Total		**64**	**1400**	**162**	**12**	**8**	**148**	**110**	**8**	**1664**	**170**	**12**	**8**	**80**	**225**	**160**	**116**	**32**	**246**	**30**	**13455**

*8 berths per site