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Wildlife Use for Economic Gain
the potential for wildlife to contribute to development in Namibia

by

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This series of Research Discussion Papers is intended to present preliminary, new, or topical information and ideas for discussion and debate. The contents are not necessarily the final views or firm positions of the Ministry of Environment and Tourism. Comments and feedback will be welcomed.

Preface

A programme of resource economics was established in the Ministry of Environment and Tourism in 1993. One objective of the programme is ongoing research on the values of wildlife, and how to increase and realise these values. Several research findings have already been published in Research Discussion Papers. This paper seeks to consolidate findings to date on the question of values of wildlife utilisation. It therefore draws heavily on previous papers, while adding new information and analysis.

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1. INTRODUCTION

Namibia has a rich and rare environmental endowment, such as the ancient welwitschia plant (Welwitchia mirabilis), around 700 species of endemic beetles, and elephants (Loxodonta africana) adapted to a desert conditions. Wetter parts of the country support the more typical African game, including the "big five." Spectacular scenery includes rolling sand dunes of the desert, the wilderness of Kaokoland, and lush rivers and floodplains of Caprivi. The network of protected areas includes the world famous Etosha National Park.

These environmental assets have long been important to conservationists from around the world, and increasingly to tourists. But not, in the past, to the majority of Namibians. However, there is now growing evidence that Namibia's environmental wealth can make a substantial contribution to the country's post-apartheid development through the principle of sustainable utilisation. In a newly independent nation, in which land, income and skills are still highly skewed, cattle is a cultural and economic mainstay for many, natural resources are at risk of degradation, and more equitable and diversified development are national goals, wildlife utilisation can bring profits, growth, equity and sustainability.

This paper outlines the current and potential economic contribution of Namibia's wildlife resources and highlights some of the steps that must still be taken if this development potential is to be realised. After providing essential background, the first half of the paper explores the contribution of wildlife and tourism to the national economy. The second half focuses on the contribution to local incomes and development in the poorer regions, the "communal areas." Throughout the paper values are given in Namibia dollars (N$), where N$1.00 = SA Rand 1 and at the end of 1995, N$3.65 = US$1.

2. BACKGROUND AND CONTEXT

Namibia is a country of 1.6 million people (National Planning Commission, 1994) and 824,000 square kilometres (Brown, 1994), located in the southwestern tip of Africa. It has the driest climate of any country south of the Sahel, and much of the country is desert or semi desert. Until 1990, it was occupied by South Africa. Consequences of apartheid rule still pervade, such as grossly unequal distribution of income and land. By far the largest economic sector in terms of contribution to Gross National Product (GNP) is mining. Another large component of the economy is marine fishing based on the productive, cold water upwellings of the Benguela current. But commercial livestock ranching (8% of GDP in 1994) and communal subsistence livestock (largely unmeasured) provide the livelihood of the vast majority, and form the main land use in the country. The harsh climate, unequal access to land and income, the tradition of livestock, and priorities of a newly independent nation affect all aspects of political economy in Namibia, and particularly wildlife utilisation. They require a little more explanation.

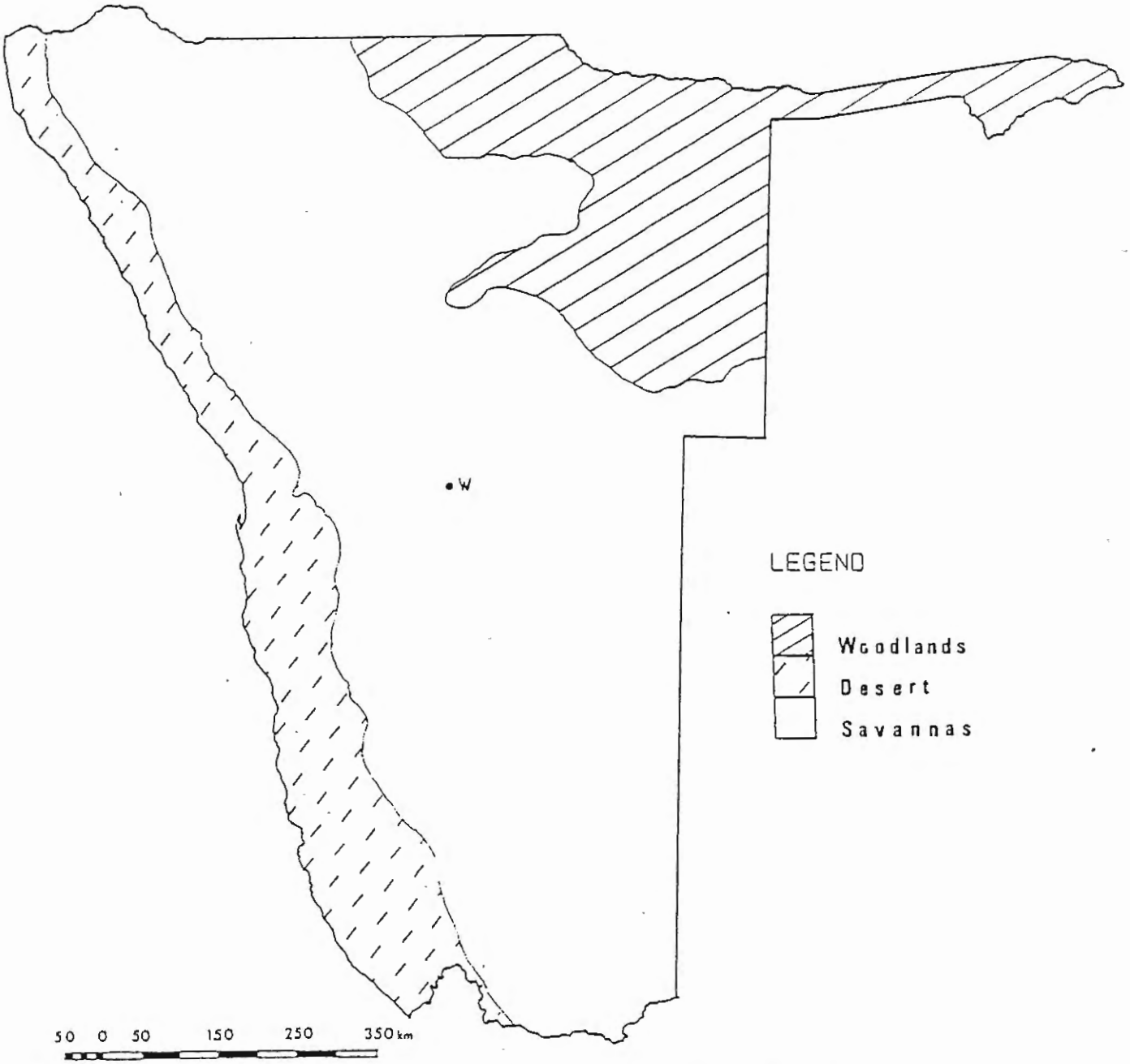

FIGURE 1. NATURAL VEGETATION BIOMES OF NAMIBIA

2.1 Ecology and vegetation

Namibia has a narrow western coastal plain, from which the land rises to an extensive interior plateau, 1,000 to 1,500 metres above sea level. Mean annual rainfall ranges throughout the country from less than 20 millimetres in the south west to 650 millimetres in the extreme north east corner, but fluctuates widely around the mean. There are no perennial rivers between the northern borders with Angola, Zambia and Botswana (comprising the Kunene, Okavango, Kwando-Chobe and Zambezi rivers) and the southern border with South Africa (the Orange River).

Corresponding primarily with rainfall, but also with soil characteristics, there are three major vegetation zones. Desert occupies the western coastal plain and the south. Savannah occupies the central and north central plateau, and woodland occupies the wetter north east (Figure 1). Wildlife communities also tend to correspond to these zones, with a few arid-adapted species found in the desert, a slightly more diverse plains game community in the central savanna, and a relatively rich fauna in the north east. The desert and savanna contain south west arid biome species, typified by gemsbok (Oryx gazella) and springbok (Antidorcas marsupialis), and the transitional zone between them contains a fairly high proportion of endemic species and sub-species, including Hartmanns mountain zebra (Equus zebra hartmannae). The north east contains a rich fauna with central African elements, including lechwe (Kobus leche) and sitatunga (Tragelaphus spekei) and the highest wildlife biomass. A good description of the distributions of the larger wildlife species in the country was made by Joubert and Mostert (1975). Apart from the leopard (Panthera pardus), which is widespread, the rest of the so-called "big five" wildlife species (elephant, black rhinoceros (Diceros bicornis), lion (Panthera leo) and buffalo (Syncerus caffer)) tend to be concentrated in the northern state lands, including both protected areas and communal land.

2.2 Land distribution and use

The country is divided into commercial farmland (43%, mainly in the savanna and semi-desert areas of the south and centre) and communal land (former "homelands", 40%, largely in the north), as shown in Figure 2. On both, livestock farming predominates as most of the country is too dry for arable farming, but in all other respects the differences are extreme. Commercial land is privately owned by approximately 4,600 mainly white farmers (less than 1% of the population). These private farms average over 7,000 hectares in size. Extensive livestock ranching is mostly of cattle in the centre/north and sheep in the arid south, for commercial sale and export. The majority of Namibians live in communal areas, where the land is state-owned and farmers have only usufruct rights. Crops are produced on small individually allocated plots of a few hectares in limited areas of the north where soils are suitable and water available, but grazing is in commonly managed or open access areas. For most communal farmers livestock serve many purposes, providing milk, draught power, meat, manure, a mark of status, a store of wealth, and other social functions. Veterinary barriers prevent movement of livestock and unprocessed livestock products from most northern communal areas to the south. Agricultural incomes are so low and variable that cash remittances and pensions are essential supplements for most families and 17% of rural households regard these as their main source of income (Central Statistical Office, 1995a).

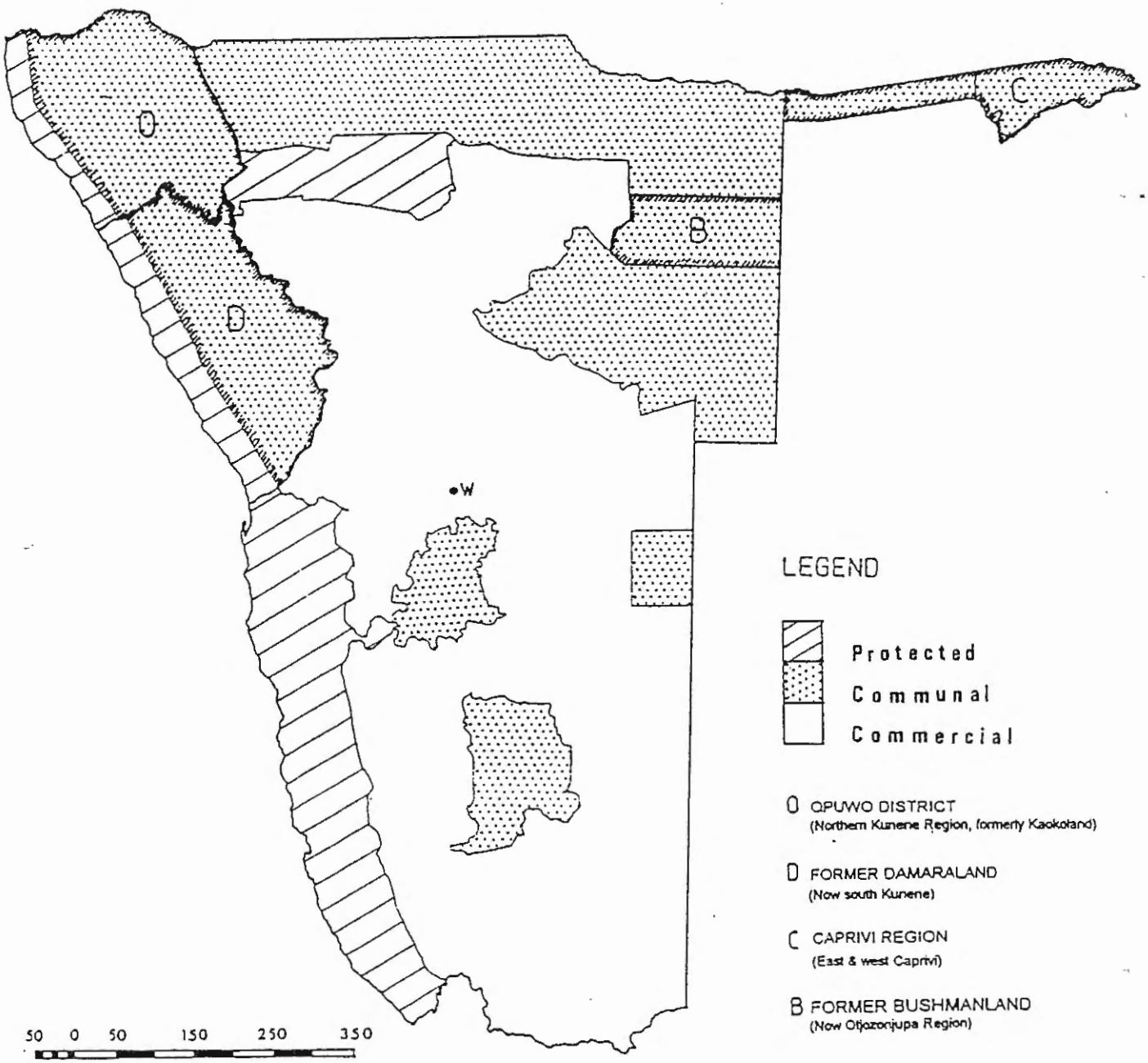

FIGURE 2. LAND TENURE IN NAMIBIA

Of the remaining state-owned land, some 13% is covered by 14 protected areas, and 2% is reserved for diamond mining (Brown 1994). The "land question" remains unresolved: there is pressure for redistribution, but much of the commercial farmland is unsuitable for uses other than livestock keeping, with between 10 and 25 hectares needed per large stock unit.

2.3 Economic problems and prospects

Gross Domestic Product was N$10,394 million in 1994 (US$2,927 million) (CSO, 1995c). However, this relatively high average per capita income (US$1,865) masks a sharply dualistic economy. Average annual per capita income among the top 10% of households is about N$17,500 compared to N$1,500 in the rest of the population. The top one percent have a total annual household income that exceeds the total income of the bottom 50% (Central Statistical Office, 1995b).

Only a third of the active population is employed in the formal sector (GRN, 1995). Unemployment is estimated at around 20% with a further 40% estimated to be under-employed (Central Statistical Office, 1995b). As the population is growing faster than the economy (GRN, 1995), and few formal sector jobs are found in the more populous north (Tapscott, 1992), the need for more labour-intensive and geographically-dispersed growth is urgent.

3. CURRENT AND POTENTIAL ECONOMIC VALUE OF WILDLIFE

3.1 Wildlife uses

Wildlife occurs in varying densities on nearly all land in Namibia. The legislative and policy framework which permits the use of wildlife for economic commercial gain, reflects the legacy of the apartheid era, in that private (commercial) land holders have custodial rights to manage and use wildlife on their land while those on communal lands do not. A new policy has been developed, and legislation passed, to make it possible for communal land holders to acquire common property rights over wildlife resources in their lands. The delegation of control over the wildlife resources from central government to local communities in communal land, is now possible through the development of wildlife and natural resource "conservancies"[1].

The use of wildlife in Namibia has involved non-consumptive tourism, consumptive tourism (recreational hunting and fishing), and consumptive use for meat, skins and other products (Joubert, 1974; Yaron *et al* 1994). Overall non-consumptive tourism, based on viewing wildlife and wilderness, dominates, but there are important differences between protected, commercial and communal areas. Wildlife viewing activities are centred around the protected areas, particularly Etosha National Park and Sossusvlei sand dunes. However, the fastest growth in tourism is now occurring outside the parks with a

[1] Conservancies currently occur on private land where farmers group together to manage and use their wildlife. The new policy is to extend this concept to communal land, giving communities common property, custodial rights over wildlife on their land.

mushrooming of guest farms and lodges on commercial land, and lodges and specialised tours in communal areas.

Consumptive uses of wildlife have tended to be concentrated on commercial farmland, where the majority utilise game for their own family, friends and workers (Yaron *et al*, 1993). Recreational hunting mainly of plains game (for biltong/sport rather than for trophies) is a common form of wildlife use on private farms. In addition, over 400 farms are registered as hunting farms to host trophy hunters. Offtake for commercial sale of venison is focused on springbok in the south and kudu and gemsbok in the north. Survey returns from commercial farmers to the Ministry of Environment and Tourism indicate that the 100,000 or so animals shot per year are used roughly equally for own use, hunting, and commercial sale (Yaron *et al, 1993*).

Consumptive wildlife uses in northern communal areas are mainly through government-controlled trophy hunting for "big five" species, such as elephant. Legal local hunting for feasts or annual culls occurs on a small scale.

Estimating the economic value of these wildlife uses is a matter of piecing a jigsaw together. Some pieces are missing or roughly hewn, but there is sufficient evidence to indicate that the economic benefits of wildlife on commercial land have grown rapidly in the last twenty years; that economic and local benefits on communal land have potential to multiply; and that the protected areas, by anchoring the tourism industry, are maintaining one of the most important sectors of the Namibian economy.

These jigsaw pieces are presented in the next section, which focuses on the *economic* contribution of wildlife enterprises. i.e the net contribution to national welfare measured as *net value added to national income.*[2] This is different from the estimates of *financial* benefit accruing to investors in a specific enterprise, or from estimates of local revenue earned by community members which is outlined below in section 4.

3.2 Value of wildlife on private land: 20 years of growth

On private land, the number of game species has increased by 44% over twenty years, while the total number of animals and biomass has increased by 80%, according to questionnaire surveys for 1972 and 1992 analysed by Barnes and de Jager (1995) (the source of figures in 3.2 except where otherwise stated). The economic contribution per large stock unit (LSU) equivalent of game averages over N$100/LSU on a typical farm where culling and hunting are supplements to livestock ranching. This average hides extremes, between those farmers that make no commercial use of naturally-occurring game, and those maximising use through a game lodge devoted to wildlife viewing (where net value added is nearly $600/LSU). Taking the average, indicates that the net economic contribution (in 1994 prices) of wildlife on private land was N$56 million in 1992

[2] Net value added to National Income, as defined by Gittinger (1982), was derived by subtracting economic costs (including costs of capital) from economic benefits for the activity. In the process financial values were converted to economic values, using shadow pricing criteria adopted by the Directorate of Environmental Affairs. The net economic contribution is also a measure of the return to land and government investment, because the opportunity cost of land and the economic costs of government expenditures were not deducted. These values were extracted or extrapolated from financial and economic cost-benefit models of resource use activities.

compared to N$31 million in 1972[3]. This is equivalent to an increase from N$85 to N$157 in net value added per square kilometre.

Although wildlife remains a supplement to, rather than substitute for, livestock on most private land, it is evident that wildlife use has grown faster. As a proportion of the economic value of all private rangeland use, the economic value of wildlife appears to have risen from 5% in 1972 to 11% in 1992.

It is interesting to note that this shift does not seem to be driven by profit maximisation on the part of farmers. The effects of sales tax, rental fees, market wages, and other factors that are paid by farmers but excluded or adapted in the economic model, is that financial profitability of wildlife use is lower than economic profitability. The investor's financial rate of return on investment is only around 4-6% per year for livestock, mixed livestock/wildlife, and pure wildlife. From the national economic perspective, pure wildlife ranching for tourism generates higher returns than mixed livestock/game farming, but not higher financial returns for the investor. What's more, on a mixed livestock/game farm, income earned per LSU of game is marginally lower than that per LSU of livestock (DEA unpublished data).

This suggests that part of the value of game to farmers lies in the diversification of risk, and aesthetic (non-use) benefits (which are not captured in the economic analysis). Diversification is particularly important when farming in such a variable environment with relatively low profits. The analysis also suggests that policies that are making economically-sound wildlife activities financially shaky need to be addressed. To some extent, the relative profitability of wildlife over livestock is likely to increase automatically, as trade agreements lower the price of livestock products, while expansion of up-market tourism may increase the returns per LSU of game.

As profitability of wildlife increases, there will be further incentives to boost wildlife populations. As density and diversity increase, the higher value-added uses of wildlife, such as game lodges and trophy hunting, are in turn likely to continue expanding. Conglomerations of farms into conservancies generate higher returns (both economically and financially) than individual farms and this trend is also likely to continue. Therefore a continued expansion of wildlife numbers, and an even faster increase in the total economic contribution of wildlife, is likely. The economic contribution of wildlife on private land to the Namibian economy could effectively double again in the next 10 to 20 years.

3.3 Value of wildlife on communal land: potential to multiply

In contrast to the commercial areas, the numbers of many wildlife species on communal land appear to have been in decline. Generally, where increases have occurred, they are in areas where community-based conservation initiatives are already in place and they involve larger species such as black rhinoceros and elephant. As wildlife on communal land has been classed as state property, there has been little opportunity for residents to benefit from its use and therefore little incentive to conserve wildlife. Furthermore, the

[3] assuming use of wildlife and therefore value per LSU was roughly constant in real terms.

wildlife that is present is generally not exploited to its full sustainable potential. In particular, tourism on communal land has developed in an *ad hoc* way, rather than planned to optimise economic benefits.

Barnes (1995) assessed the economic value of various activities that use wildlife and other non-agricultural natural resources in the four areas of communal land that generally have better wildlife populations and where community-based wildlife conservation projects are in progress: Caprivi region and "former Bushmanland" in the north east, and "former Damaraland" and Opuwo District in the north west. The study areas are shown in Figure 2. Associated protected areas were also included in the study. Together these four areas make up 43% of communal land surface. Given that livestock is a cultural and economic mainstay in most communal areas, the research focused on wildlife as an addition to agriculture, and assumed agricultural activities remained constant. The research gives a picture of the net economic contribution of different activities in 37 zones of the four study areas[4]. The aggregated results indicate the overall value of wildlife in these four communal areas, while analysis of the components help answer key questions, such as which areas and which activities have highest potential for greater economic benefits? The results, summarised in Table 1, show:

Current and potential economic contribution: In total, it is estimated that wildlife-utilisation in the four communal areas currently contributes around N$7.5 million to net national income, ranging from N$6 to N$215 per km^2. If existing resources are used to their sustainable potential, this could more than double to N$16.5 million. Even more, about 2.5 times current value, could be generated with a feasible increase in the resource base.

Comparison between areas: As Table 1 shows, Caprivi generates the highest *absolute* level of economic benefits. However, it is also the region where utilisation is already most developed, so the potential for *expansion* of economic use value ranges from 1.7 times current value in Caprivi, to eight times in "former Bushmanland" where commercial wildlife use in currently minimal.

Values of protected areas: Communal land adjacent to protected areas has significantly higher current and potential economic value from wildlife use than areas further away. Many of the use values measured in these buffer zones are dependent on the integrity of the associated protected areas. The research also shows that economic benefits generated *inside* the parks and protected areas are currently very low, but have potential for enormous (five and six-fold) increases. So optimal benefits require a change in wildlife utilisation inside protected areas, as well as on communal land.

Importance of non-consumptive tourism: Overall, and particularly in the dry, but scenic, north western parts non-consumptive tourism dominates the current and potential economic use values. The highest returns per square kilometre are derived from non-consumptive tourism. However, as these are only achievable at prime sites, there are large areas of Caprivi (with higher biological productivity and variable potential for

[4] In each zone, the number of current and potential enterprises was estimated, and multiplied by the estimated net economic contribution per enterprise. The definition and derivation of net value added to national income is as in the commercial area research above.

wildlife viewing) and Bushmanland (with less scenic attraction) where consumptive wildlife use will be the most viable option.

Table 1: The current and potential contribution to National Income of wildlife utilisation in four study areas in communal land with associated protected areas (see Figure 2) **(N$'000, 1994)**[1]

	Caprivi Region		Former Bushmanland[2]		Opuwo District		Former Damaraland[3]		TOTAL	
Extent (sq km)	18,800		17,877		61,585		58,105		156,367	
a) Current contribution:	N$	%	N$	%	N$	%	N$	%	N$	%
non-consumptive tourism[4]	2,181	*53*	77	*62*	1,467	*99*	1,466	*76*	**5,191**	*67*
consumptive tourism (hunting, angling)	1,969	*47*	0	*0*	0		439	*23*	**2,408**	*31*
small-scale hunting	9	*0.2*	48	*38*	15	*1*	24	*12*	**119**	*2*
Sub-total	4,159		125		1,482		1,929		**7,695**	
LESS wildlife damage	110		14		14		30		**168**	
TOTAL	**4,049**		**112**		**1,468**		**1,899**		**7528**	
Total per sq km (N$)	215		6		24		33		**48**	
b) Potential contribution:										
non-consumptive tourism	4,851	*69*	609	*58*	3,622	*10*	4,192	*86*	**13,274**	*80*
consumptive tourism	2,180	*31*	388	*37*	0	*0*	671	*14*	**3,239**	*20*
small-scale hunting	2	-	60	*6*	9	-	6	-	**77**	-
Sub-total	7,033		1,057		3,631		4,869		**16,590**	
LESS wildlife damage	55		17		14		30		**116**	
TOTAL	**6,978**		**1,040**		**3,617**		**4,839**		**16,474**	
Total per sq km (N$)	371		58		58		83		**105**	
c) Percentage increase current to potential	%		%		%		%		%	
non-consumptive tourism	122		690		147		186		**156**	
consumptive tourism	11		inf.		0		53		**35**	
small-scale hunting	-77		25		-66		-75		**-35**	
TOTAL net of wildlife damage[5]	**72**		**828**		**146**		**155**		**119**	

1 Adapted from Barnes (1995)

2 "Former Bushmanland" refers to Tsumkwe District, eastern Otjozondjupa region, north of latitude 22.

3 "Former Damaraland" refers to the whole of Khorixas District in Kunene region, the western communal land in Erongo region and the West Coast Tourist Recreation Area.

4 Craft production and marketing are included in non-consumptive tourism although some items are sold to hunters and local residents.

5 Damage caused by wildlife to communities, e.g. elephant damage to crops, predation of livestock.

The evidence indicates that there is considerable latent potential for increasing the contribution that wildlife makes to economic growth in Namibia. On private land, it seems that a policy environment, and an array of financial and economic forces, have already encouraged an expansion of wildlife use and this is set to continue. On communal land, economic benefits are so far much smaller but some areas have potential for several-fold increases. However, much needs to be done to create the right conditions for a similar expansion. For landholders in communal areas to invest land and resources in wildlife conservation, they need a return in benefits from wildlife. Ways in which this can be achieved is discussed in Section 4 below.

3.4 Wildlife in protected areas

The value of wildlife in National Parks and Game Reserves is not easy to assess. Here the resource, and its use for tourism, has remained under virtually exclusive control of the state. Some of the direct uses occur in the market economy, particularly tourism and the limited capture for live sale, but often not at market prices. Other direct uses, such as research, education, and aesthetic pleasure cannot be easily valued, while some of the most important values of national parks lie in their indirect benefits and non-use values: maintenance of essential ecological functions, and the existence and option value of bio-diversity they preserve. Within this, wildlife is just one component of the assets of a national park. The total annual subsidy for the running of the protected area network (i.e. total costs of running parks and reserves less receipts from tourists) of around N$30 million per year covers all these benefits (Patching 1996).

One benefit that is particularly important for this economic assessment is the role of parks as a crucial magnet for both wildlife and tourists. Internationally, the world-famous Etosha National Park and the dunes at Sossusvlei in Namib-Naukluft Park, attract tourists to Namibia, while the network of protected areas then provides focal points for both tourists and wildlife across the country. Without the protected areas, economic benefits generated from wildlife on communal and commercial land, and in the tourism industry more broadly, would be lost.

Regional magnet and motor

This function of parks as regional magnet and motor is already evident in the mushrooming of private game reserves on the southern border of Etosha and eastern border of the Namib-Naukluft Park. A further indication of these benefits comes from the research on the economic value of wildlife uses in communal land, as there is a marked difference between areas that are adjacent to protected areas and those that are further away. In the northwest study areas, the highest current and potential economic benefits per square kilometre are found in the areas adjacent to the Skeleton Coast Park and Etosha, where economic benefits in these areas could increase by around 300% and 400% (with and without expansion of the resource base), compared to increases of around 80% and 160% in areas further away.[5]

[5] Estimated *current* economic benefits average around N$41 per square kilometre in zones adjacent to protected areas, compared to N$22 for non-adjacent areas. The *potential* values are N$125 compared to N$39 per square kilometre, and with improved resource stocks, N$170 compared to N$57, in adjacent and non-adjacent areas respectively.

This shows that parks are adding value to neighbouring areas. To exploit this potential, multiple-use buffer zones, in which wildlife use dominates other uses, should be developed. Tourism facilities on the edge of protected areas are not only benefiting from their proximity to a tourism destination. In many cases, the maintenance of wildlife habitat and hence viable wildlife populations inside protected areas, also makes possible the dispersion of wildlife beyond the park borders into communal or commercial land. An indication of the value of this free-ranging asset can be gleaned from the financial analysis of a wildlife-viewing game lodge described above. The financial return on a game lodge is low because of the massive N$3.2 million investment it entails -- of which 38% is the cost of stocking up with wildlife. Therefore those lodges that enjoy some natural dispersion of wildlife onto their land from adjacent protected areas can achieve higher profitability. From the national economic point of view, this natural dispersion saves costs of capture and transport which are necessary for selling game to other areas or for other uses.

National magnet for tourism

By attracting tourists to Namibia over other holiday destinations, National Parks are providing the foundation for Namibia's tourism industry. The vast majority of overseas holiday tourists visit Etosha and Sossusvlei (rough indications for 1993/4 are: 40,000+ overseas holiday-makers in Namibia, 25-30,000 overseas visitors to Etosha and 20,000 to Sossusvlei)[6]. These tourists are clients for the tourism facilities in communal and commercial areas discussed above, and also for tour operators, car/plane hire companies, restaurants, taxis, airlines, souvenir sellers etc. Indeed it is estimated that tourists spend just as much again on these other items, as they do on accommodation and wildlife-viewing services (Hoff and Overgaard, 1993) It is therefore necessary to consider the overall value of tourism in the national economy when assessing the contribution of national parks.

Total expenditure by wildlife-focused tourists is estimated at over N$350 million in 1992 which indicates that contribution to net national income from wildlife-based tourism was almost N$200 million[7] (equivalent to around N$250 million per year in 1994 prices). This can be seen as the net economic benefit of the industry for which wildlife and scenery in National Parks and Reserves is the core resource.[8]

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6 assuming around 80% of overseas (non-African) tourists are here for leisure purposes, and that average nights per person spent in Etosha is 2.5 (Hoff and Overgaard 1993 and unpublished data). The percentage of African holiday tourists visiting Etosha is smaller, probably because they are on repeat visits, and visiting friends.

7 Total expenditure by international and domestic tourists was N$509 million in 1992. Estimates assume 60% of tourists are wildlife-focused (29% are business tourists and 10% visiting family and friends) and account for 70% of tourism expenditure (because they stay longer) (Hoff and Overgaard, 1993) and that net economic contribution is equivalent to 55% of turnover. Estimates are inflated to 1994 prices using the Windhoek Consumer Price Index (Ministry of Finance, 1994).

8 However, parks and reserves also have a negative effect on the tourism industry, in that subsidised prices of government accommodation affect the competitiveness of private tourism establishments outside parks. The resulting reduction in demand for and prices of private accommodation has not been quantified, although it may well diminish in the foreseeable future as commercialisation of government resorts will require cost-recovery and doubtless price increases.

3.5 Overall economic value of wildlife and tourism

Table 2 fits the pieces and estimates together to give a rough jigsaw picture of the economic value of direct uses of wildlife and tourism in Namibian. It must be remembered that other benefits of wildlife, indirect and non-use values, are not quantified. Although the figures are rough, it is clear that benefits are currently concentrated in commercial rather than communal land, and that the potential for non-consumptive tourism benefits to outweigh consumptive benefits, particularly on communal land was not yet realised in 1994. It is also noteworthy that the economic value of supporting services for the tourists that come to enjoy wildlife and wilderness is even greater than that of the direct wildlife-using enterprises on the ground. Given a potential doubling of tourism arrivals by 2000 according to the Tourism Development Plan (Government of the Republic of Namibia 1995, Hoff and Overgaard 1993), the devolution of rights over wildlife to conservancies in communal areas, and the ongoing expansion in wildlife and tourism on commercial land, a doubling of these estimated economic benefits is easily foreseeable. If the natural resource base is enhanced and tourism developed sustainably, greater increases are possible.

Table 2: Overview of estimated net economic contributions of wildlife-utilisation activities in parts[6] of Namibia, N$ 1994

	Non-consumptive Tourism	*Consumptive Uses*	*TOTAL*
Commercial land[1]	15-20 mn	32-37mn	52 mn
Northwest and northeast communal land[2]	5 mn[3]	3-4 mn[4]	8-9 mn
TOTAL	20-25 mn	35-41 mn	**60-61 mn**
Additional services for wildlife-viewing tourists			**190 mn**[5]

1 *source: Barnes and de Jager (1995) and DEA unpublished data.*

2 *accounting for 43% of all communal land, but most of the remainder has considerably lower wildlife potential. Source: Barnes 1995 supplemented by further estimates for trophy hunting on communal land (Barnes, 1996).*

3 *includes craft production and sales, as tourists are the primary market.*

4 *hunting and angling by tourists, plus local harvesting of wildlife and freshwater fish for subsistence or local sale.*

5 *The estimated economic contribution of wildlife-viewing tourists in 1992, inflated to 1994 prices (N$250 million), less N$60 million generated directly from enterprises on communal and commercial land.*

6 *Economic benefits of national parks are not estimated, although part of their value is captured in the last row.*

4. BENEFITS TO LOCAL RESIDENTS ON COMMUNAL LAND

The development process has as an important objective -- improved livelihoods and opportunities for the historically marginalised poor who make up the majority in communal areas. Wildlife utilisation boosts the economy but who benefits? How significant is it to the residents of communal areas? To those who suffer the costs of wildlife damage, who live in the areas visited by tourists, and who are expected to conserve wildlife? It is of crucial importance to find strategies through which wildlife use for economic gain benefits rural communities, for the sake of both development and conservation. Until recently, residents in communal areas had almost no rights to utilise wildlife and few opportunities to participate in the historically-white tourism sector, so financial benefits for local residents have been confined mainly to wages in private tourism enterprises. But new developments are changing this.

- communities are gaining rights to use wildlife and develop tourism through conservancies;
- communities and local residents are initiating their own tourism enterprises and entering partnerships with the private sector.
- prime areas for the most profitable, up-market eco-tourism developments fall within communal land.

The most fundamental requirement for ensuring that local communities can derive benefits from wildlife is appropriate property rights. Individual rights of tenure over wildlife are not feasible in communal areas because of the social structure, relatively high human densities, and large areas needed by most species. However, the new policy and pending legislation will permit development of conservancies, and thus common property control and management of the wildlife resources. This will include the right to prevent open access to the resources, to manage the resource for maximum gain, charge for access to wildlife, and the accrual of marketable assets in the form of wildlife stocks.

Research and analysis by Ashley and Garland (1994) and Ashley (1995), which builds on the work in four study areas of Barnes (1995), shows that there is potential for local net incomes[9] earned from wildlife to triple in the northwest and northeast communal areas, even without any increase in the resource base. However, the significance of this for rural development depends on many factors, including the type and distribution of benefits, and their scale compared to population density and alternative incomes, as the following sections show. In turn, implications for maximising the positive impact of wildlife use can be identified.

4.1 Different types and distribution of benefits from wildlife

Wages

Different enterprises will provide very different levels of financial and other benefits to residents of communal areas. As Table 3 shows, local wages from an up-market lodge can be up to N$80,000 per year and are the most substantial financial injection to the local economy.

[9] Net incomes here may be defined as take-home wages, royalty/profit sharing payments to communities, or net profits from community or individual resource use activities.

Table 3: Benefits and Costs to Local Residents of Selected Wildlife-based Enterprises on Communal Land

Enterprise / Benefits/ Costs	Private lodge, up-market tourism	Private lodge, voluntary revenue-share	Joint-venture lodge (private + community)	Community tourism enterprise	Hunting camp in govt. concession	Hunting camp in conservancy	Local wildlife cull by residents
Financial, N$ p.a.							
- local wages	50 - 80,000	50 - 80,000	50 - 80,000	500-1,000 per craft HH or 2 - 20,000+ per community	44,000	44,000+	x
- collective income	X	15-20,000[1]	40 - 80,000[2]		meat worth $6,000	100,000+/-[3] + meat	meat worth $50,000[4]
Social:							
- skill and institutional development	X	+ in revenue distribution	+ negotiation & distribution ? management	+ management & distribution	X	+ negotiation & distribution ? management	+ culling & distribution ? management
- local rights control ownership	X	+ control of revenue X no rights nor ownership	+ rights, control of revenue ? some control & ownership	+ (? if not privatised by an individual)	X	+ rights ? some control & ownership	X ?unless inside conservancy[5]
Costs to community (ex wildlife damage)	loss of land & resources	loss of land & resources	difficult; time & effort risk of failure	difficult; time and effort risk of failure	loss of land rights and resources	time and effort for negotiation	time and effort in hunting

1 For example, a N$5 bed-night levy for a lodge charging around N$200 per night or N$10 for a more exclusive but smaller lodge charging N$400 per night. Based on generalised enterprise models, these are estimated to be viable for a lodge operator, particularly if the levy boosts tourist appeal or wins reciprocal local benefits. e.g. Lianshulu Lodge distributed N$26,000 collected in 1994 and part of 1993.

2 For example, a N$25-bed night levy from an up-market camp, or 5-15% share of turnover (15-50% of profit). Viable for the operator if communities can offer some security on land/wildlife/tourism assets, such as in a conservancy, and/or the lodge attracts "ethical tourists."

3 Very variable depending on conservancy size. Assumes average conservancy is half the size of current hunting concessions, and all the concession fee is paid to conservancy rather than government

4 e.g. in Sesfontein area in 1993, three local hunts produced 42,000 kg of meat valued at $3.50 per kilo, giving an average value per area of N$50,000. Profits from sale of skins and costs of ammunition are not shown -- the profits potentially outweigh costs, enabling cash income to be generated in addition.

5 To date, local hunts are controlled and supervised by the Ministry of Environment and Tourism.

Wages outweigh what a community could earn from its own enterprise or from a voluntary bed-night levy, and might only be matched by a concession fee earned by a conservancy from a joint venture.

Locally-controlled and distributed income

In East Caprivi, there are several upmarket lodges injecting a few hundred thousand dollars of wages into the local economy, and there is one lodge, Lianshulu, paying a voluntary bed-night levy to its neighbours of around N$15,000 per year. But it is the bed-night levy that has focused attention on the benefits of wildlife conservation, that required conflicting communities to establish procedures for sharing the money, and that, for hundreds of households, provided their first ever cash benefit from wildlife -- N$35. In terms of the development impact of wildlife benefits, it is not just the amount of cash that matters, but how it is distributed and who decides.

The bulk of local income from wildlife will never be shared equally across rural households because it comes in the form of staff wages. Jobs in lodges and camps are bound to go to those most skilled or nearby, and their allocation is decided by an outsider. Earnings of local artisans (craft-makers or guides) will also depend on the distribution of skills. However, collective income can earned by a community from its own enterprise (e.g. campsites, craft centres), bed-night levies donated by private operators, meat from a hunt, or concession fees paid to conservancies (a few thousand dollars per year in the first three cases, tens of thousands of dollars in the latter, as shown in Table 3). This collective income is qualitatively different from wage income, because it can be locally controlled and more broadly distributed.

Apart from any moral preference for equity, there are important practical reasons to value the local control and broader distribution of benefits of wildlife on communal land. From a development perspective, impacts on living standards and poverty alleviation are likely to be greater if benefits reach the poorest households of all. In addition, the development of skills and institutions required to distribute revenue can boost other local developments.[10] From a conservation perspective, it is important that benefits reach all rural residents in wildlife areas of communal land, because if the majority remain committed exclusively to livestock, or even a minority to poaching, collective wildlife management breaks down. Apart from the financial benefits, participation in *management* of resources has proved immensely important in the success of community-based conservation projects in Namibia, and community control of revenue is one important part of participation. In the long term, this community commitment to conservation is essential if all the other national and local economic benefits discussed in this paper are to be achieved in communal areas.

Social benefits

Social benefits, such as development of skills and institutions, may be gained from tourism enterprises in other ways, apart from through control of money. In particular, enterprise skills are more likely to develop in community enterprises and joint ventures, and a sense of empowerment is more likely from enterprises controlled by communities. However, social

[10] There are also costs to local distribution of benefits in terms of time and effort needed to arrange distribution -- in Caprivi, preparations for the Lianshulu bed night levy distribution occurred over a year. Delays are common and there is a risk of mis-management is a risk.

costs also need to be taken into account. Joint ventures in particular require enormous time and effort (transaction costs).

This analysis has implications for the type of wildlife use promoted in communal areas, as it suggests that the "value" of community-controlled income from bed-night levies, hunting or tourism concessions, or community enterprises is higher than reflected in dollar terms (in economic terms it implies a weighting for these locally controlled earnings) and that other development benefits and costs need to be taken into account in any cost-benefit analysis. It is also important to look for a combination of enterprises and increase the up-stream and downstream linkages of any development. Many up-market wildlife-viewing lodges are linked more closely to Windhoek or Johannesburg than the local economy, but they could be the focus for a network of secondary enterprises ranging from firewood and laundry to cultural shows and home visits.

4.2 The scale of financial benefits at regional and household level

Regional current and potential benefits

Looking at the bigger picture, how much can wildlife-utilisation contribute to local incomes overall in Namibia's communal areas? Barnes' (1995) study shows that residents of the northwest and northeast communal areas[11] are currently earning around N$2.1 million from wildlife enterprises. Wages of local staff employed in wildlife-viewing lodges account for half of this, while production and sales of crafts account for a quarter. With expansion up to sustainable limits, no increase in the natural resource base, local income could triple to N$6.8 million per year.

Comparisons between regions and between different types of enterprises follow a similar pattern to the estimates of net economic contribution described above (see Figure 3). Caprivi, relatively well-endowed with natural resources and tourism infrastructure, enjoys the highest absolute level of current and potential income, while remote former Bushmanland has the lowest level of income but highest potential rate of increase (five-fold). Potential is also highest in areas adjacent to protected areas. Non-consumptive tourism again dominates the picture in the arid north-west, where carrying capacity is low but scenic quality high. This is in marked contrast to some other community-based conservation programmes, notably CAMPFIRE in Zimbabwe, where hunting provides the bulk of community benefits.

With a potential tripling of local staff wages from tourist camps and lodges to around N$3.5 million, wages still account for over half of potential local income. But the critical question is whether communities' revenue-shares, royalties and concession fees from tourism and hunting operators develop to a similar scale. Voluntary revenue-sharing by lodges on a broad scale could generate up to N$1 million in total for communities. But if conservancies are established with concessionary rights to virtually all prime sites outside protected areas, lease fees could total around N$3 million once normal turnover levels are achieved (DEA unpublished data).

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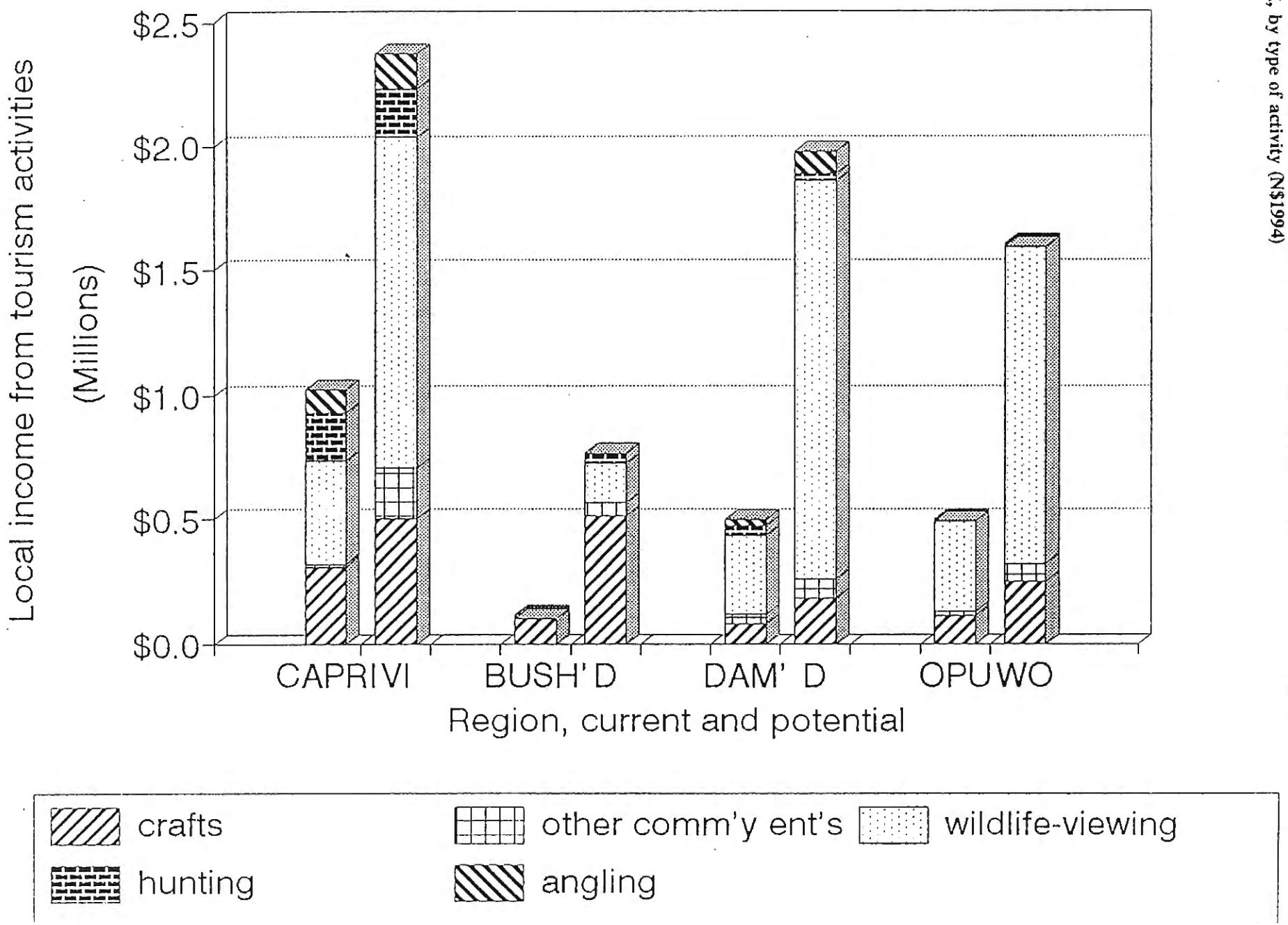
[11] All aggregate income estimates in this section are derived from Barnes 1995 and apply only to the four study areas: Caprivi Region, former Bushmanland, former Damaraland and Opuwo. More detailed analysis of returns to different activities, zones, per capita, and per hectare are from Ashley 1995 derived from Barnes 1995.

Figure 3: Current and potential local income from wildlife utilisation in four study areas in communal land, by type of activity (N$1994)



Earnings per household in high and low potential zones

Caprivians will not take heart that their region enjoys highest total earnings from wildlife and tourism, if the amount *per household* is insignificant. Indeed, potential wildlife income per resident is higher in "former Damaraland" where population density is considerably lower.[12] In zones with *medium wildlife potential*, average wildlife income per *household* could increase from one or two hundred dollars per year to around N$500 to N$1000 in Caprivi,[13] and to around N$1,000 to N$2,000 per year in former Damaraland. Increases would be somewhat greater if the resource base improves (of course in practice some will receive well above average and others below). It is estimated that average household income of subsistence farming households is around N$7,000 per year and in the poorest 20% of households around N$2,000 per year (Central Statistics Office, November 1995). On this basis, wildlife enterprises could make a substantial contribution to household incomes but not revolutionise them.

However, in zones with *high potential*, which are generally adjacent to protected areas, the order of magnitude is nearer N$10,000 per household per year or more making wildlife and tourism a very important development strategy. This illustrates the importance of prioritising developments in high potential areas.

4.3 Benefits versus costs of wildlife

Caprivi's elephants relish a midnight feast of green "mealies" (maize, corn-on-the-cob) still growing on the cob, about to be harvested. Kunene's elephants will follow the smell of water and dig up the pipes and pump if they find the ground dry. For lions and hyaena, goats and calves not herded in at night can be an easier catch than antelope. The residents of communal areas suffer these costs, and not surprisingly many see wildlife as nothing but trouble. What benefits must wildlife generate to be instead perceived as a route to development?

Four years research in one of the areas worst affected by wildlife damage, the east bank of the Kwando river in east Caprivi, found that between 1991 and 1994 the thirteen most affected villages lost an average of around N$1,000 worth of crops per village per year through elephant damage (O'Connell, 1995). Losses of livestock to predators cost about another N$2,000 per village, except for the four villages bordering Mamili National Park, where lion attacks are more common and losses higher. This means that for most communities, a very small enterprise, a one-fifth share of an annual bed-levy, or one employee in a lodge, would provide income on a comparable scale with direct losses.

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12 Within the region, the areas with highest potential tend to be least populated and vice versa, so there are vast differences in income per person across the zones, ranging from only N$2 per resident in the more populated and less scenic eastern end of the Ugab, to nearly N$5,000 per resident in the upper Uniab catchment with low population and high tourism capacity. Excluding these extremes, wildlife and tourism in most zones could generate N$100 - N$230 per person per year, with generally higher potential in areas adjacent to the Skeleton Coast Park and Etosha. The average for the entire region (i.e. if all the estimated local wildlife income was spread equally across the population – highly unlikely) is N$15 per resident per year now and N$60 in the potential scenario (with no increase in the resource base). Figures per household in the text assume average household size of ten.

13 In Caprivi region, the range goes from low potential income per capita of around N$30 in several of the zones up to N$100-300 in prime riverine areas. Across the whole Caprivi region, current wildlife-tourism income averages around N$15 per capita and potential income around N$35 per capita per year.

In fact, in the wildlife damage study area, it is estimated that workers in tourism lodges and craft-makers already earn around N$300,000 per year in total -- four times the estimated agricultural losses from wildlife of around N$70,000 per year since 1991 (Ashley and O'Connell, 1995). If wildlife uses increase to potential, total local income could be eight or ten times the costs of wildlife. However, residents of the area certainly do not *perceive* that benefits of wildlife are already four times greater than damage costs. This is doubtless because tourism income is likely be *distributed and perceived quite differently* from the damage costs of wildlife. However much is earned by neighbours with tourism jobs, it is still perfectly possible that losses for individual farming families exceed any benefit, unless collective-income is very large and equally shared. Furthermore, wages and other tourism income are less public and the link with wildlife not demonstrated and discussed. The link between lost crops and elephants is all too evident and vocally discussed the next morning.

This suggests that the benefits of wildlife are more likely to exceed the costs at the household level, in perception and in practice, under three conditions: if benefits of wildlife are broadly distributed between households and at least a share can be allocated by communities themselves in accordance with their perception of fairness; if links between tourism income and wildlife are emphasised; and if, in the aggregate, benefits exceed costs sufficiently that households getting below-average benefit get enough to match their agricultural losses. i.e. benefits need to be either massive or very evenly distributed, and well publicised. Otherwise, the majority are unlikely to invest in wildlife as a rural development strategy.

4.4 Wildlife as a complement to other land uses.

Livestock, crops, and a range of natural resources such as grass, wood and fruits provide the essentials of life for most rural households in communal areas, plus the means to earn some cash from local sale. In deciding whether to switch time, effort, and most importantly, land, to wildlife and tourism, households will compare the returns to these various activities and decide on an appropriate combination. The question is not whether wildlife can provide enough to become the *only* option, but to become a major addition to livelihoods and hence a viable constituent land use.

Comparisons with harvesting of other wild resources, such as thatching grass, palms, reeds, fish, fuelwood and timber are difficult because subsistence use is hard to value and quantify. But rough comparisons by Barnes (1995) in the four study areas show that local income from harvesting of non-agricultural resources currently exceeds income from wildlife in the northeast, whereas the reverse is true in the more arid northwest. However, wildlife income has greater potential for expansion, so in the future could be dominant in all four areas. This means that, while continuing subsistence use of wild resources, households' greater opportunities for *increasing* income come from wildlife and tourism.

A comparison with livestock agriculture is more important because, to some extent, wildlife/tourism is a competing use of land. Wildlife and livestock can and do share habitats, but some limited zoning of land is necessary to provide high quality core areas for tourists and wildlife, and reduce wildlife damage. The value of setting aside land will depend on the returns per hectare of competing activities.

A joint venture up-market lodge in a communal area could generate local income (wages plus revenue share) of N$150,000. If this income is attributed just to the 4 ha lodge site, the return to land is massive. If, more reasonably, it is attributed to land use of the whole concession area, say 14,000 hectares, the return per hectare is over N$10 per hectare - still good. However, the viability of the lodge may depend on maintaining wildlife over a much larger area of thousands of square kilometres. If the tourism income is averaged across the entire region, the return seems much less impressive. For example, potential tourism income averages out at N$1.2 per ha across Caprivi, N$0.33 per ha in former Damaraland.

This implies that at specific sites, particularly prime tourism sites, it can be well worth it for a community to substitute wildlife for agriculture. But on a broader scale, it will be a complement to agricultural income, not a substitute way of life. This complementarity depends on maintaining wildlife stocks across the larger area - i.e., maintaining multiple use zones where livestock and wildlife coexist. Therefore the priority is to identify:

- which sites would be better used for tourism than agriculture,
- the extent to which wildlife and agriculture can complement each other across large farming/residential areas, and ways to reduce the trade-offs,
- ways to ensure that wildlife *is* protected in the larger mixed-use area through sufficient incentives and opportunities.

At the same time the core conservation areas need to be maintained as they act as magnet and motor for tourism development opportunities in the communal areas.

Diversification of income and risk is a way of life for the poor, and wildlife adds another element to this survival strategy. Tourism enterprises cannot provide the basics of maize, meat, and milk, but can provide a little *cash income* that is so essential for school expenses, clothing, sugar, and other marketed goods. Furthermore, non-consumptive tourism is relatively independent of drought cycles (though subject to other fluctuations), so it can *dilute risk* and act as a drought buffer. A final and important indicator of wildlife's significance for rural development, is the potential for *increases* in local wildlife incomes which are probably greater than potential increases from agriculture. Barnes' estimates of potential to more than double in Caprivi and increase seven-fold in Bushmanland (even before any expansion of the resource base). For agriculture, the national target is 5% per year growth in subsistence agriculture (GRN, 1995) and further expansion is difficult to foresee given constraints of low rainfall, poor soils, and small or distant markets.

4.5 Overall contribution of wildlife enterprises to development in communal areas

While the economic value of wildlife and tourism on communal land is relatively small in the national perspective, it is clear that it can be highly significant for local development and improved living standards in some of the most marginalised areas of the country in the north west and north east communal areas. It can boost and diversify local incomes substantially in many areas, providing a complement to agriculture on a large scale and a highly-profitable alternative at prime sites. As residents get more involved in tourism, social benefits such as increased skills and institutional development are also likely. These economic and social benefits can, in turn, increase people's commitment and capacity for conservation so enable further growth of the industry and its benefits.

The development impact will depend on the type of wildlife-enterprises, as well as the scale, and particularly on the degree to which communities are involved and how they distribute benefits. There are likely to be trade-offs between maximising the incomes and speed of development (through private-sector operations) and increasing community participation and control (through local enterprises and initiatives). Conservancies, within which communities can lease out concessions to private operators are an ideal way of combining private sector money and expertise with local control, but such joint ventures will not happen overnight. For wildlife to be broadly perceived as a development option by local residents of communal areas, equitably-distributed collective income will be needed in addition to jobs for a minority, links between tourism income and wildlife must be emphasised, and the conflicts with livestock minimised.

Although tourism is developing rapidly in communal areas, the framework is not yet in place to maximise development impacts of wildlife use. There is a lack of tourism planning to ensure prime areas are neither under- nor over-utilised, no obligation on existing tourism or hunting operators to involve communities, conservancy rights are only just being legislated, and communities lack a range of skills and even basic information for operating wildlife enterprises. However, given the potential benefits that can be realised, action is being taken by the Namibian government, non-governmental organisations, and donors, to address these obstacles.

5. CONCLUSIONS

Namibia has good potential for expansion of sustainable wildlife use, which can contribute positively to national economic growth, and more than double its economic value over the next ten to 20 years. In some communal areas, local incomes from wildlife could increase several fold within that time. However, within the context of Namibia's dual economy, there remain stark differences in capacity to achieve this potential. In the commercial farming sector, most necessary conditions are in place to ensure growth of wildlife stocks and use, in particular appropriate property rights for commercial farmers. They are already diversifying from livestock and gradually moving to suitably profitable uses of wildlife. However, in the communal lands, where most of the people live, and where most are poor, much still needs to be done to ensure growth in wildlife stocks and use.

Namibia's most intrinsically valuable wildlife resources are found in or adjacent to the communal lands. Without the appropriate conditions, these will be lost - the space they occupy converted to agricultural uses and their stocks depleted. What is required are high tangible use values for wildlife, realisable by communal land residents, within appropriate property rights. The preceding discussion highlights certain strategic principles to achieve this. In order for communal areas residents to manage, benefit from, and invest in, wildlife, Namibia should:

- develop community rights,
- support conservancies and local enterprises,
- seek to develop wildlife and as a complement to agriculture and minimise trade-offs.
- make sure wildlife use rights include non-consumptive uses, given the high potential for tourism, as well as consumptive uses.

This will involve concerted efforts by communities, government, NGOs, and private sector. Getting enterprises going is just the beginning - how they are implemented and controlled and how benefits are shared will really determine the contribution to local development and conservation. But the evidence so far shows that the boost to the national economy and to development in marginalised communal areas, will make it a worthwhile investment.

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