

# Conservancies: Integrating Wildlife Land-Use Options into the Livelihood, Development and Conservation Strategies of Namibian Communities<sup>1</sup>

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## Introduction

This paper presents information on the Namibia Conservancy Programme and highlights the conservation and development impacts that Namibia's incentive-based conservation policies are producing in communal areas and how conservancies may enhance the viability of Namibia's park system. A case study on the Nyae Nyae Conservancy is used 1) to provide documentation on the contributions of wildlife and tourism to the livelihoods of one of Namibia's most marginalized people – the Ju/'hoansi San; and 2) to demonstrate the tremendous untapped wildlife potential that remains to be harnessed by conservancies. Lastly, this paper identifies some of the challenges facing the conservancy programme and discusses the need for government decisionmakers to recognize the long-term competitive advantages of wildlife and tourism as legitimate land uses for Namibia's arid and semi-arid environment. In this regard, it will be essential to address restrictive veterinary regulations that place wildlife production at a competitive disadvantage to a highly subsidized commercial and subsistence livestock industry.

## Background

Namibia is a large country (823,988km<sup>2</sup>) located in southwestern Africa, where it is bordered by Angola and Zambia to the north, Botswana to the east, South Africa to the south, and the Atlantic Ocean in the west. Namibia acquired its independence from South Africa in 1990, but in a short period of time has put in place a remarkably innovative and effective community conservation movement.

The population of 1,826,854 (Census Office 2002) is largely rural, with more than 65% living on communally owned lands, which is one of three predominant land-tenure regimes. Roughly 6,100 private farms (Barnard 1998) occupy 44% of Namibia, communal lands encompass an additional 42%, and a network of 21 protected areas covers the remaining 14%.

The climate ranges from hyperarid in the west, where portions of the Namib Desert receive average rainfalls of less than 25mm/year, to subhumid in the Caprivi Region, which

averages precipitation of 600–700mm/year (Barnard 1998). Rainfall distribution provides a foundation for three main vegetation zones (i.e., deserts, savannas, and woodlands), which in turn, have been classified into 14 distinct vegetation types (Geiss 1971).

Traditionally, Namibian communal-area residents have depended heavily on subsistence crop and livestock agriculture to support daily livelihood needs. However, there is growing recognition of the unsuitability of much of Namibia for arable crop or sustainable livestock production, and the Namibia Ministry of Environment and Tourism (MET) has initiated a national conservancy movement that seeks to promote and integrate (where appropriate) wildlife production and tourism development efforts into the welfare and livelihoods of many communal-area residents.

Although impressive returns are being realized, the financial viability of most registered and emerging conservancies are marginalised due to their location within Namibia's designated veterinary restriction zone, where diseases such as foot and mouth disease (FMD), contagious bovine pleural pneumonia (CBPP), corridor disease, bovine tuberculosis, and malignant catarrhal fever still remain health threats and potential compromises to Namibia's livestock export markets. The resultant veterinary restrictions make it difficult for such conservancies to fully capitalize on the presence of recovering populations of high-value wildlife species such as roan antelope, sable, and disease-free buffalo, as well as burgeoning populations of common plains game species (i.e., springbok, oryx, eland, etc.) that have viable market values within Namibia or the broader southern Africa region.

Unless innovative mechanisms are found to mitigate the risks of infectious diseases and/or their associated regulatory controls, the wildlife industry in communal-area conservancies cannot reach its potential and will remain at a competitive disadvantage to a livestock industry that has been highly subsidized through years of government support and artificially inspired international export markets. Alternatively, should mechanisms to mitigate risk be found, it is predictable that the integration of wildlife and tourism activities into the livelihoods of rural Namibian residents will continue, and will in the process be promoted as legitimate,

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competitive land uses comparable with or advantageous to agriculture in Namibia's semi-arid and arid ecosystems.

## Conservation policy setting

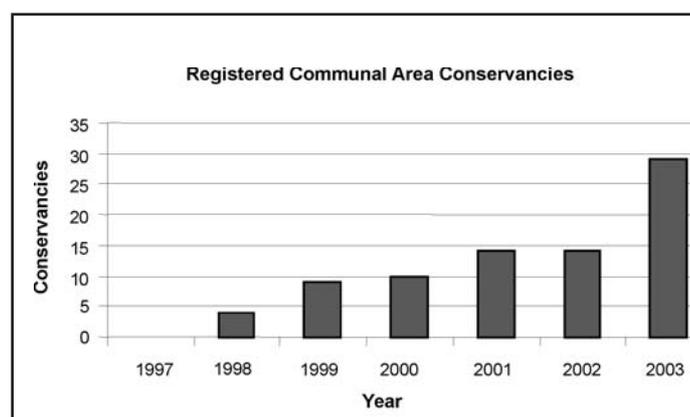
Namibia is renowned for its vast wilderness settings and rich wildlife populations. However, prior to 1970, national wildlife populations were declining. It was not until 1968, when freehold farmers were given limited rights of proprietorship over wildlife, that farmers acquired incentives to manage their wildlife for economic gain. These rights were reinforced through the passage of the Nature Conservation Ordinance of 1975, and since then wildlife numbers on commercial farmlands have increased by more than 80% (Barnes and de Jager 1996).

In contrast to the freehold situation, wildlife population trends on most of Namibia's communal lands continued to decline until the mid-1990s. In an effort to emulate a similar recovery of wildlife populations on Namibia's communal lands, MET approved a policy entitled "Wildlife Management, Utilisation and Tourism in Communal Areas" (MET 1995) that was aimed at creating equitable rights to wildlife between freehold and communal-area residents. Shortly thereafter, the Government of Namibia passed legislation that established the legal rights of communal-area residents to benefit from wildlife once they had registered as a communal-area conservancy (Government of Republic of Namibia 1996).

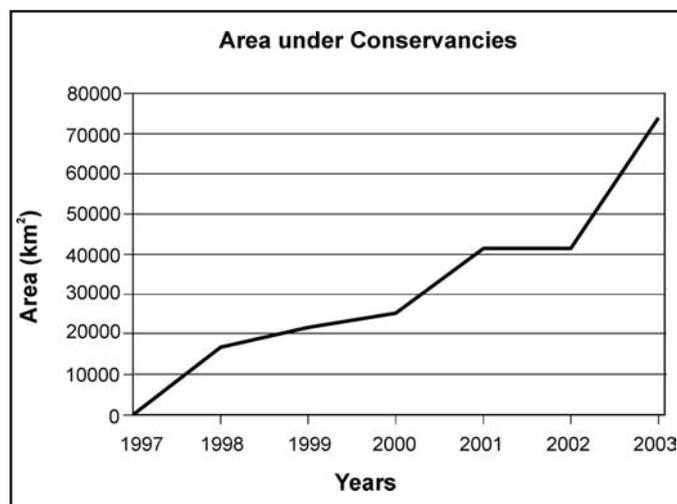
## Impacts of communal conservancy legislation

The passage and implementation of the communal conservancy legislation has stimulated a conservation movement that is unprecedented in Namibia, and perhaps elsewhere in Africa also. Since registration of the first four conservancies in 1998, the number of registered conservancies has grown to 29 (Fig. 1).

**Fig. 1. Cumulative number of communal area conservancies by year since 1997**



**Fig. 2. Cumulative area (km<sup>2</sup>) registered under communal conservancies by year since 1997**



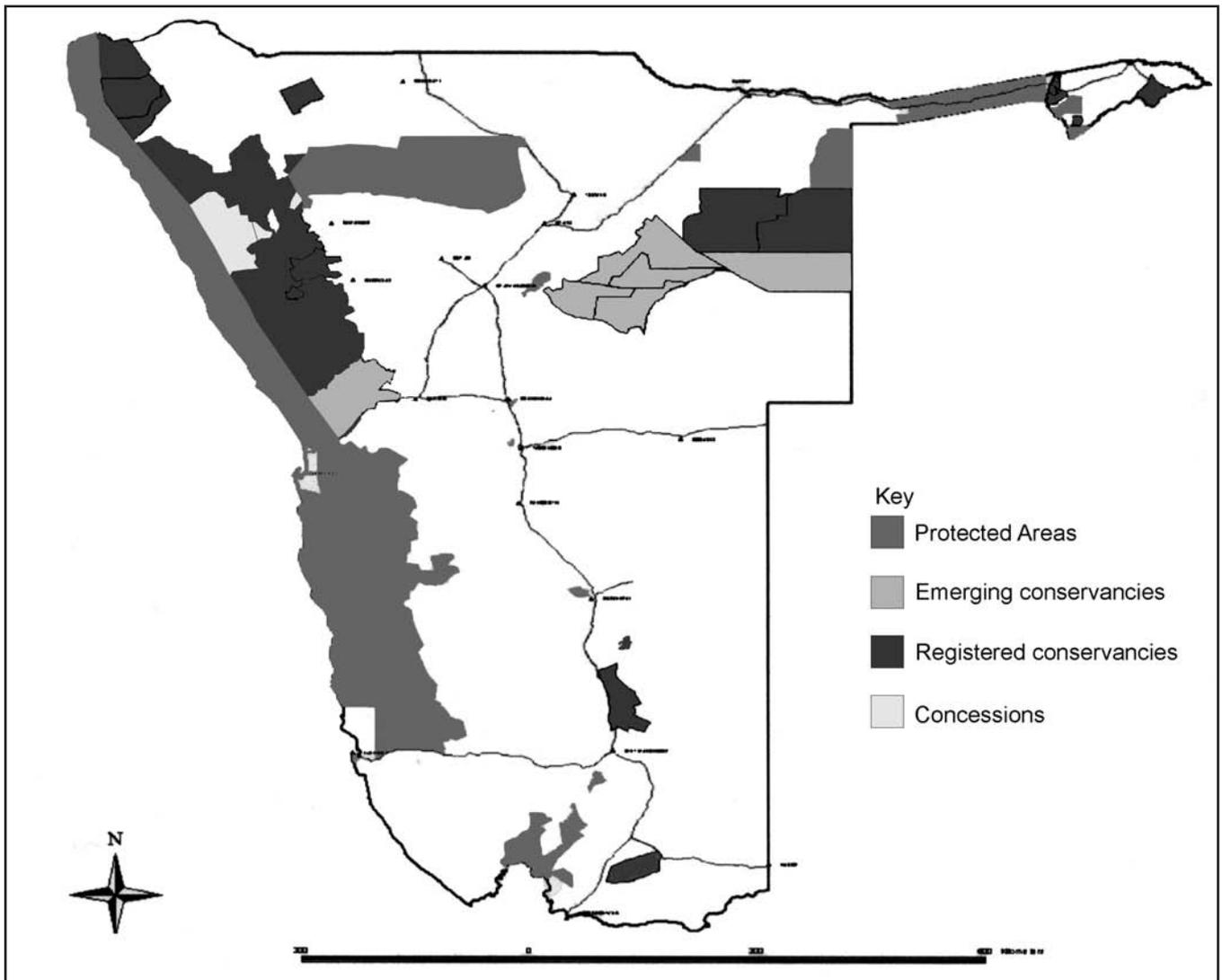
The communal conservancies are highly complementary to Namibia's 114,080km<sup>2</sup> protected area network. The registered conservancies encompass an additional 70,052km<sup>2</sup> (Fig. 2), and it is significant that 17 of these 29 conservancies are located immediately adjacent to national protected areas or in strategic wildlife movement corridors between such protected areas (Fig. 3).

These 17 conservancies place an additional 47,515km<sup>2</sup> of land adjacent to protected areas under compatible conservation management, thereby bolstering the protected network system by 42%. The increased conservation land base provides opportunity for wildlife to move seasonally between parks and communal areas, with the additional land base being of particular significance in times of drought or when poorly distributed rainfall force wildlife to move out of protected areas in search of forage or water.

The conservancy legislation has catalysed a fundamental shift in the attitudes of community members towards wildlife. Before this empowering legislation was passed, wildlife was deeply resented because only the State gained from the presence of wild animals that competed with livestock for grazing and water, preyed on livestock, and routinely damaged crops and infrastructure. Given the hardships wildlife imposed on communities, there was little community support for these "State assets," and wildlife was routinely and widely poached.

In contrast, following five years of conservancies receiving tangible benefits (income, employment, meat, etc.) from wildlife, there are now a documented 38,000 registered conservancy members (representing more than 150,000 communal-area residents) engaged in conservation activities in communal conservancies (DFID WILD Project 2003). Thus, the mindset and attitude of many of Namibia's communal-area residents have drastically shifted, whereby wildlife is now viewed as a community asset instead of a community liability.

**Fig. 3. Registered and emerging communal conservancies in Namibia**



Source: NACSO Natural Resource Working Group

The positive community attitude has had a marked impact on the recovery of wildlife populations. Northwest Namibia provides a striking example. In the early 1980s, following two decades of heavy poaching and a major drought, wildlife populations in this rugged, 50,000km<sup>2</sup> remote corner of Namibia were at a historical low, with populations of such species as springbok, oryx, and Hartmann's zebra being estimated at less than 1,000 animals each (Gibson 2001).

Shortly thereafter, Namibia's fledgling Community-Based Natural Resource Management (CBNRM) Programme was introduced in the form of Community Game Guards through the NGO Integrated Rural Development and Nature Conservation (IRDNC). This community initiative, which eventually led to the conservancy programme, was highly successful in reducing poaching by enhancing community stewardship over its remnant wildlife resources.

As a consequence, wildlife populations slowly began to recover, paving the way for today's burgeoning populations

that are believed to include more than 100,000 springbok, 35,000 oryx, and 14,000 Hartmann's zebra.

The trends (Fig. 4) of these populations have been documented over the past four years by annual road counts that entail annual analyses of the number of animals observed per 100km over more than 6,000km of transect routes.

The recovering wildlife populations are now being translated into tangible benefits for conservancies and their members in the form of cash returns to conservancies/enterprises, employment, and in-kind benefits such as meat from game (trophy animals or own-use harvesting). Since passage of the 1996 conservancy legislation, the Namibia National CBNRM Programme has noted a rapid increase in the flow of benefits to conservancies and their members (WWF-LIFE Programme 2002). Benefits to Namibia's CBNRM participants have almost doubled during three of the last four years (Fig. 5), with documented benefits in 2002 exceeding N \$11,100,000 (US \$1,100,000).

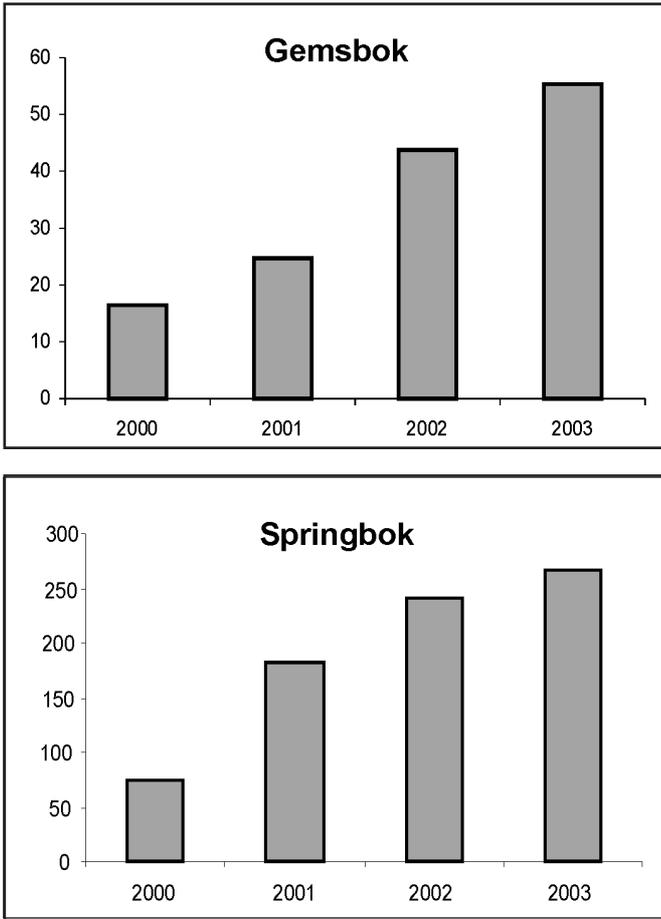
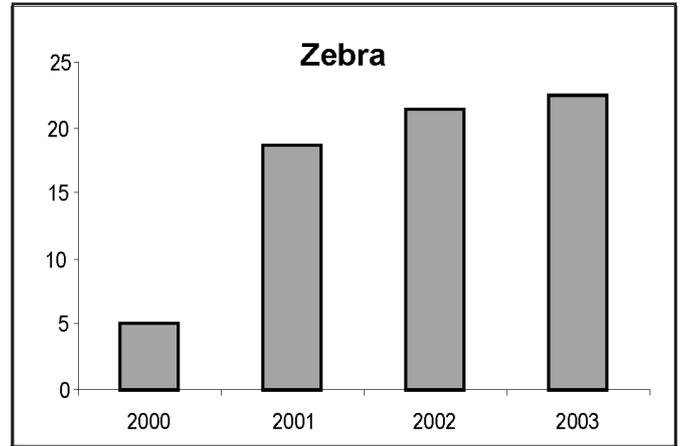
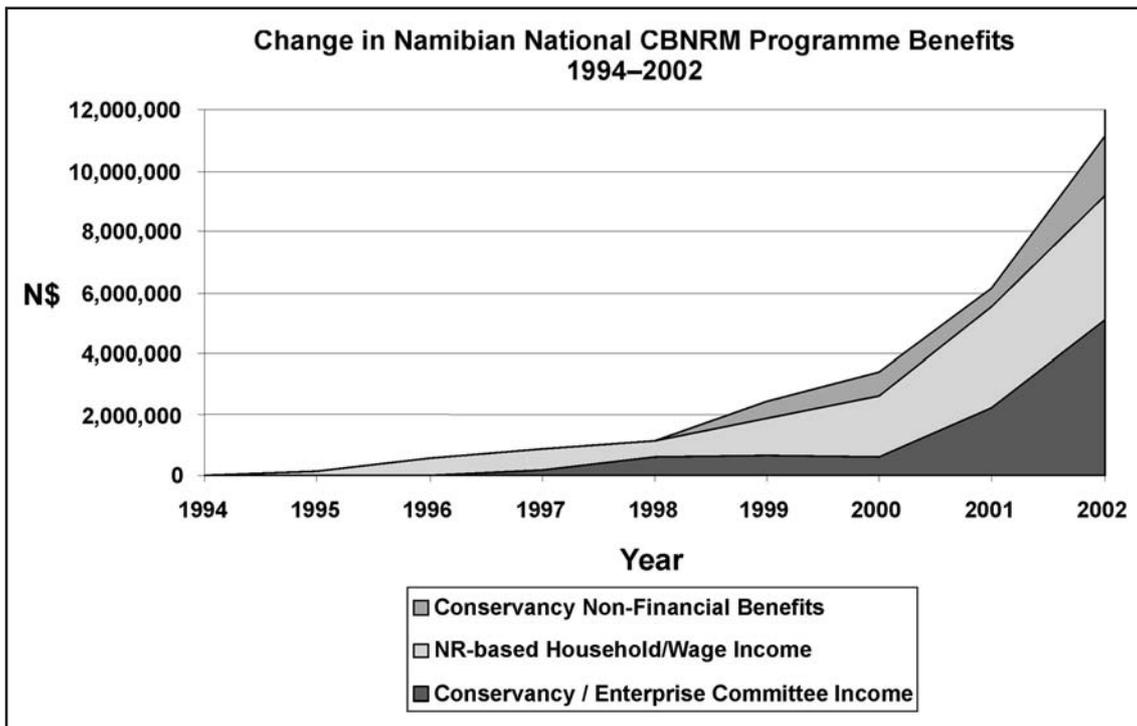


Fig. 4. Population trends for gemsbok, springbok, and Hartmann's zebra in NW Namibia from 2000 through 2003 based on animals observed per 100km driven



Source: MET/WWF/NACSO 2003

Fig. 5. Benefits generated by the Namibia National CBNRM Programme 1994–2002 (N\$10 = approximately US \$1 during October 2002)



## Conservancies and their implications for traditional land uses

The communal conservancy programme has sparked a grass-roots movement by rural communities to integrate wildlife production activities into their livelihood strategies. In many instances, large tracts of conservancy lands have been zoned exclusively for wildlife production and tourism. A number of studies (Ashley *et al.* 1994, Ashley and LaFranchi 1997, DFID WILD Project 2003, Diggle 2003) have found that wildlife and tourism enterprises have substantial potential to complement and bolster the livelihoods of rural Namibian communities. Barnes and Humavindu (2003) recently assessed the Goddwana Canon Nature Reserve to compare tourism economic returns to those generated by livestock production activities on neighboring farms. The study documented three significant findings in favor of wildlife and tourism:

- 1) greater revenues generated per hectare than agriculture,
- 2) higher levels of employment than agriculture on neighbouring farms, and
- 3) the wildlife/tourism activities are significantly more ecologically friendly and sustainable for the area's arid ecosystem.

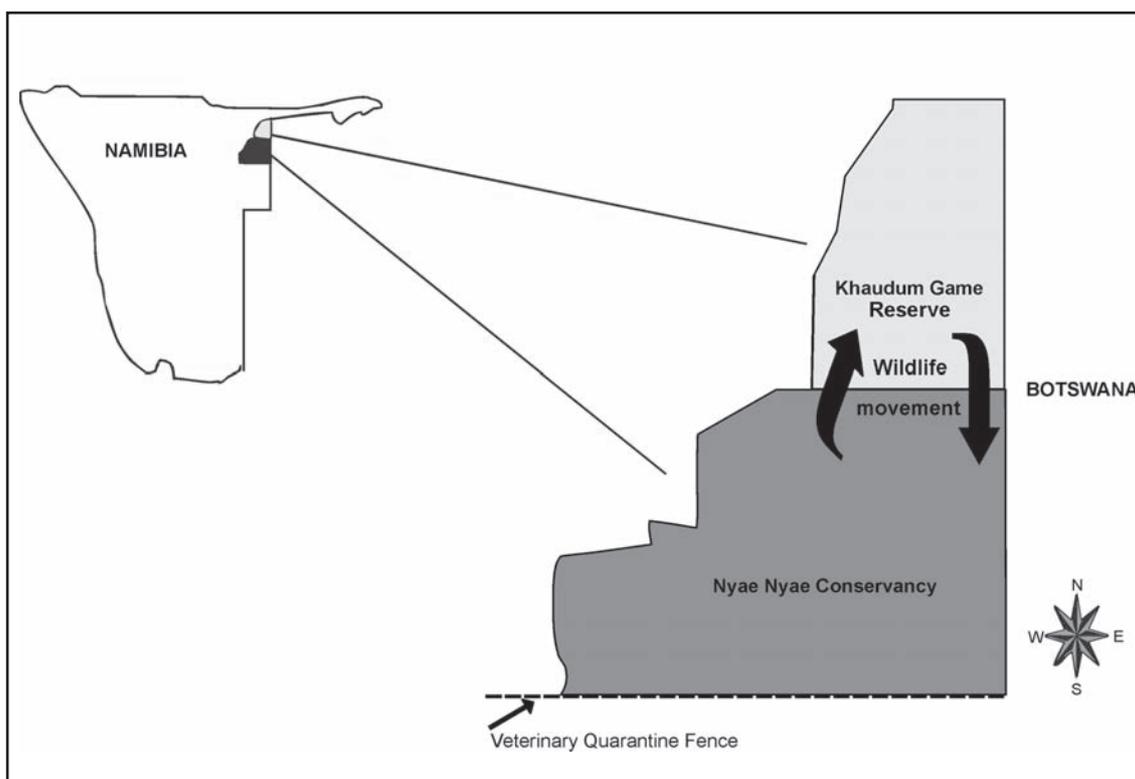
Although the viability of CBNRM in Namibia has been well documented, the communal conservancy movement is not being driven by studies. In contrast, the driving force is its benefactors – the rural community members who are reaping

the direct economic, social, and environmental benefits of integrating wildlife into their livelihood planning and management practices. Thus far, the success of the conservancy movement is such that nearly one of every 12 Namibians is resident to a registered or emerging communal conservancy, and conservancy development is widely promoted in the latest Namibia National Development Plan (Government of Republic of Namibia 2002).

## Nyae-Nyae Conservancy and Khaudum Game Reserve – a case study

The potential for conservancies and neighboring protected areas to effectively produce, co-manage, and market their joint natural resources has only begun to be tapped. An illustrative example is the Nyae Nyae Conservancy, Namibia's first communal conservancy, registered February 16, 1998 (Government of the Republic of Namibia 1998), and the adjoining Khaudum Game Reserve (GR). This area is located in northeastern Namibia, where it borders with Botswana to the east (fenced), communal lands to the west and north, and to the south, a veterinary quarantine "Red Line" fence established by the Ministry of Agriculture, Water, and Rural Development (MAWRD) to prevent movement of potential disease-harboring animals (wildlife and livestock) into Namibia's recognized livestock export zone (Fig. 6).

Fig. 6. Map of Khaudum Game Reserve and Nyae Nyae Conservancy



Nyae Nyae is the second largest conservancy in Namibia and encompasses approximately 9,030km<sup>2</sup> of Kalahari woodlands. Combined with Khaudum Game Reserve's 3,842km<sup>2</sup>, this joint reserve/conservancy incorporates almost 13,000km<sup>2</sup> of wilderness wildlife habitat. The area receives approximately 400–450mm of rainfall per year, and it is estimated that more than 2,000 elephants move freely between Khaudum GR, the Nyae Nyae Conservancy, and neighboring communal lands. The area is home to Namibia's largest population of roan antelope, and also provides habitat for other common game species such as blue wildebeest, oryx, kudu, red hartebeest, eland, tsessebe, springbok, giraffe, duiker, and steenbok. Predators include a sparse population of lion and cheetah, but healthy numbers of leopard, spotted hyaena, and wild dogs. The Nyae Nyae Conservancy also contains a potentially very valuable herd of 74 disease-free buffalo that has been confined to a small 2,400ha compound due to veterinary health restrictions.

The Nyae Nyae Conservancy was founded by one of Namibia's most marginalized ethnic groups, the Ju/'hoansi San (formerly known as Bushman). The conservancy, excluding the district settlement of Tsumkwe, has 770 adult members, which represent a total population of approximately 1,800–2,000 San people (Berger *et al.* 2003).

The Ju/'hoansi San are a society in transition. Historically, the Ju/'hoansi were a skilled, hunter-gatherer society that moved seasonally over vast distances between Botswana and Namibia. However, the area now inhabited by the Ju/'hoansi is roughly one-tenth of the 90,000km<sup>2</sup> that an estimated 1,200 Ju/'hoansi occupied as recently as 1950 (Nyae Nyae Development Foundation 2002). This reduction in landbase, combined with the loss of traditional hunter-gatherer skills in the younger generation of Ju/'hoansi, is increasingly forcing the Ju/'hoansi to adapt to western societal norms. However, the remoteness of the area and the challenges of developing an effective, culturally adaptive educational system for the San have contributed to the Ju/'hoansi's extremely low levels of literacy and employment. Furthermore, efforts to introduce the traditional hunter-gatherer Ju/'hoansi to sedentary agricultural activities (i.e., livestock and crop production) have had limited success (Berger *et al.* 2003). These activities are further constrained by conflicts with local predators and expanding elephant populations.

Since 1993, the Living In a Finite Environment (LIFE) Project has assisted the Nyae Nyae Development Foundation to support the Ju/'hoansi San through a grant to bolster the Nyae Nyae Conservancy's ability to sustainably manage and benefit from its natural resources. A key aspect of this grant has been to assist the Ju/'hoansi to rebuild their wildlife populations from historical low levels in the early to mid-1990s back to numbers that can contribute to the Ju/'hoansi's welfare through benefits generated from trophy hunting, tourism, sustainable game-meat harvesting, and potentially, game farming of high-value species such as roan antelope or buffalo.

The LIFE Project is jointly funded by the United States Agency for International Development (USAID), MET, and the World Wildlife Fund (WWF), and administered by the

WWF on behalf of the Namibia National CBNRM Programme. LIFE Project support to the Ju/'hoansi has come in a number of forms, including assistance in mobilizing the Ju/'hoansi into a conservancy; conservancy land-use zoning around different land uses (i.e., wildlife, integrated livestock, village areas, etc.); development and maintenance of game watering points; reintroduction of game to bolster the recovery rate and financial viability of the conservancy; support to the valuable disease-free buffalo herd; marketing and negotiation of trophy hunting concessions; and capacity building of the Nyae Nyae Conservancy committee to manage the above activities.

## **Programmatic impacts on the Nyae Nyae Conservancy and Khaudum GR wildlife populations**

Previous game censuses (Table 1) of the combined Nyae Nyae Conservancy and Khaudum GR vary considerably (Stander 1995, Craig 1999). Nonetheless, it is clear that the estimated game populations are extremely low for such a vast area.

Over the past four years, the LIFE Project has worked closely with the Nyae Nyae Conservancy, MET, and private sector partners to bolster the existing game populations through a series of game translocations. From 1999 through September 2003, a total of 2,070 game animals, composed of 541 red hartebeest, 274 oryx, 86 blue wildebeest, 633 springbok, 233 eland, and 303 kudu were introduced to the Nyae Nyae Conservancy (Table 2).

The purposes of these introductions are manifold: to increase the Nyae Nyae game populations, thereby allowing a larger and more diverse off-take of trophy animals; to increase the density of game in key areas of the conservancy, and in the general Nyae Nyae/Khaudum ecosystem, so that tourism becomes a more attractive and viable development option; and to increase the number of meat-producing species of game so that sustainable harvesting of game can begin to supplement the protein diets of the Ju/'hoansi residents of the conservancy. An additional intent is to increase the number of "buffer" species of game in the area (i.e., springbok, kudu, and oryx) so that predation pressure on more valuable species such as roan antelope and eland is reduced, thereby promoting the recovery of these species as well.

The decline of wildlife populations in the Nyae Nyae/Khaudum area during the 1980–1995 period is believed to be the result of a number of interacting factors. The earlier construction of veterinary fences along the eastern and southern boundaries of this area (i.e., Botswana/Namibia border and Namibia veterinary quarantine fence, respectively) has fragmented the historical migration routes of wildlife across the broader Kalahari ecosystem (*see* Martin – this volume). Concomitantly, the situation has been exacerbated by the settlement of the Ju/'hoansi people on waterpoints in the 1980s and the arising conflict between people and wildlife over access to water. Lastly, uncontrolled hunting has taken a toll on such species as giraffe.

**Table 1. Estimated populations of the Nyae Nyae Conservancy and Khaudum GR based on MET aerial censuses in 1995 (Stander) and 1999 (Craig)**

Species	1995 MET Census		1998 MET Census	
	Nyae Nyae	Khaudum GR	Nyae Nyae	Khaudum GR
Buffalo ( <i>Syncerus caffer</i> )	30	–	33	0
Eland ( <i>Taurotragus oryx</i> )	0	0	12	0
Elephant ( <i>Loxodonta africana</i> )	302	783	552	2224
Oryx ( <i>Oryx gazella</i> )	110	152	429	59
Giraffe ( <i>Giraffa camelopardalis</i> )	6	223	47	259
Red hartebeest ( <i>Alcephalus busephalus</i> )	31	4	18	0
Kudu ( <i>Tragelaphus strepsiceros</i> )	249	133	283	157
Ostrich ( <i>Struthio camelus</i> )	190	26	311	29
Roan ( <i>Hippotragus equinus</i> )	123	75	0	66
Springbok ( <i>Antidorcas marsupialis</i> )	0	–	0	0
Warthog ( <i>Phacochoerus aethiopicus</i> )	0	0	160	0
Blue wildebeest ( <i>Connochaetes taurinus</i> )	164	51	204	145

**Table 2. Estimated game populations for potential meat-producing animals in the Nyae Nyae Conservancy, based on the MET 1998 game census, game introductions to Nyae Nyae Conservancy 1999–2003, and extrapolated growth rates by species**

Species	1998 MET Game Census	Game introductions					Total animals introduced	Est. annual growth (%)	Total estimated animals 2003
		1999	2000	2001	2002	2003			
Red hartebeest	18	42	43	230	226	0	541	15	727
Oryx	429	48	81	48	97	0	274	15	1171
Blue wildebeest	204	33	0	0	53	0	86	15	518
Springbok	0	89	92	0	209	243	633	20	823
Eland	12	0	83	0	0	150	233	15	268
Kudu	283	0	215	0	88	0	303	15	947
Elephant	558	-	-	-	-	-	-	7	733
<b>Total</b>	<b>1,504</b>	<b>212</b>	<b>514</b>	<b>278</b>	<b>673</b>	<b>393</b>	<b>2,070</b>		<b>5,187</b>

As a consequence of the above factors, it was necessary to coincide the game introduction effort with a complementary joint MET/Conservancy water development programme to establish and maintain wildlife water points in the Nyae Nyae Conservancy. Consequently, there are now 14 dedicated game water points in the conservancy, which is a sharp contrast to the less than five that were operational in the mid-1990s. Similarly, extensive efforts to create awareness and build capacity have been instigated to involve the Ju/'hoansi people in the management of the Conservancy's wildlife and to keep game water points free of settlement.

The combined efforts of the game translocations and water development programme have begun to generate substantial returns to the Nyae Nyae Conservancy. Although not confirmed by an additional aerial census, wildlife populations in the broader Nyae Nyae Conservancy/Khaudum GR have increased noticeably since 1998 (Alberts, personal communication 2003). Further, the frequent observation of introduced (ear-tagged) game in the Khaudum GR demonstrates the interconnectivity of Nyae Nyae and the Khaudum, and the value of the Nyae Nyae game introductions to the Reserve as well. An extrapolation of the population growth rates of the

estimated 1998 game populations, combined with the introduced game, at conservative annual recruitment estimates (ranging from 7% to 20% per year by species), reflects what is believed to be a robustly recovering game population (Table 2).

### Impacts of the recovering wildlife populations on the livelihoods of the Nyae Nyae conservancy members

The Ju/'hoansi San are one of Namibia's most poverty-stricken and marginalized communities. A recent survey (Wiessner 2003) of 32 (of 33) Nyae Nyae settlements found income from non-conservancy sources to be based on 46 community members receiving monthly government pension payments and 70 people being formally employed. The total estimated annual income from non-conservancy sources was N\$995,244 for 2003, or roughly N\$498 per capita for the 2,000 residents of the Nyae Nyae Conservancy.

The development of the Nyae Nyae Conservancy has had considerable positive impact on the livelihoods of conservancy members. The conservancy has generated an additional 27 jobs, while conservancy members have received increased income from tourism, handicraft and devil's claw sales, and the conservancy's benefits distribution of trophy-hunting revenues back to the conservancy's 770 members (Honeb 2003). The additional 2003 conservancy-fostered

income increased total estimated income to the conservancy members to more than N\$2,000,000, or an estimated per capita income of N\$1,039 (Table 3). Further, the above figures do not include the livelihood benefits derived from game meat consumed by conservancy members, or the support the conservancy provides towards maintenance of village and wildlife water points and small agricultural development activities.

The recovering wildlife populations are promoting an upward spiraling return to the Nyae Nyae Conservancy. Increased game populations have been translated into a much larger and diverse trophy-hunting quota from the MET. In 1998, the Nyae Nyae Conservancy received an initial, small trophy-hunting quota of 10 animals, composed of five different species. In contrast, the latest quota (2002/2003) reflects the MET's recognition of the recovering wildlife populations and includes 53 animals from 12 species.

The increased quota has had a significant impact on the trophy-hunting income. Nyae Nyae's first concession period (1998–1999) generated US \$17,850/year, while the concession fee increased to US \$42,900/year during the second concession period (2000–2001). In contrast, the revised 2002–2003 quota has resulted in payments of US\$92,050 (N\$845,697). As game numbers increase, increased quotas will continue to feed the upward income spiral.

**Table 3. Cash incomes of Ju/'hoansi residents of the Nyae Nyae Conservancy 2002–2003**

Source	Wiessner Data			Wiessner and NNC Records		
	No. pensioners	No. jobs	Income	No. pensioners	No. jobs	Income
Pensions	46		138,000	46		138,000
Government		47	709,764		47	709,764
Mining		12	60,480		12	60,480
Church/lodge/clinic		11	87,000		11	87,000
Handicrafts sales			240,000–300,000			240,000–300,000
Tourism			60,000			60,000
Devil's claw sales			10,000			10,000
Conservancy/hunter		12	82,200		27	235,428
Conservancy Cash Benefits Distribution						477,672*
<b>Total</b>	<b>46</b>	<b>82</b>	<b>1,387,444–1,447,444</b>	<b>46</b>	<b>97</b>	<b>2,018,344–2,078,344</b>

\*The benefits distribution of N\$477,672 was premised on accumulated trophy-hunting revenues from the 2000, 2001 and 2002 hunting seasons and does not reflect an annually viable sum of money available for distribution. Based on the hunting revenues received in 2002 of N\$845,697, an amount of N\$414 per member, or a total of N\$318,828 was allocated to the benefits distribution. This sum was added to funds available from 2000 (N\$82,940) and 2001 (N\$75,904) to arrive at the total distribution of N\$477,672.

**Table 4. Estimated stocking rate in Large Stock Unit (LSU) equivalents (Bothma 1996) for potential meat-producing wildlife species in the Nyae Nyae Conservancy 2003, 2007 and 2015**

Species	LSU equivalent	Estimated LSUs 2003	Estimated LSUs 2007	Estimated LSUs 2015	Estimated no. animals 2015
Red hartebeest	0.37	269	438	807	2,182
Oryx	0.56	656	1,068	1,968	3,514
Blue wildebeest	0.50	259	443	815	1,629
Springbok	0.15	123	257	553	3,685
Eland	1.08	289	465	861	797
Kudu	0.54	511	833	1,534	2,841
Elephant	2.78	2,177	2,850	4,896	1,761
<b>Total</b>		<b>4,284</b>	<b>6,354</b>	<b>11,434</b>	<b>16,409</b>

## Potential for increased generation of wildlife-related benefits in the Nyae Nyae Conservancy

An analysis of Nyae Nyae's potential for exploitable wildlife and tourism opportunities indicates that annual benefits can still increase several fold. The keys to this process are the continued growth of the Nyae Nyae wildlife populations, government recognition of the validity of wildlife and tourism as the predominant land use in the Nyae Nyae Conservancy, and development of mechanisms that allow Nyae Nyae to produce and sell high-value roan and buffalo populations to markets found within the disease-free commercial production areas of Namibia and/or South Africa.

The present wildlife stocking rate of the Nyae Nyae Conservancy is only a fraction of its potential carrying capacity. The climate and habitat of Nyae Nyae lend themselves to a conservative stocking rate of 20ha per Large Stock Unit (LSU). An extrapolation of this stocking rate against the conservancy's 903,000ha therefore indicates a conservative carrying capacity of 45,150 LSUs for the conservancy. Based on the extrapolated growth rates of the introduced and previously resident populations (1998 census), the seven most significant potential meat-producing species of wildlife found in the Nyae Nyae Conservancy would currently include 5,187 animals (Table 2). This is the equivalent of 4,284 LSUs (Table 4), or less than 10% of the Nyae Nyae Conservancy's estimated carrying capacity.

### Game meat harvesting

Continued expansion of the Nyae Nyae game populations (based on 2% annual off-take rates for trophy hunting through 2007; and thereafter from 2007 to 2015 through a combination of trophy hunting at 2% and meat harvesting at 6.5% per year off-take) would still yield growing populations of approximately 11.5% per year for springbok and 6.5% for other plains game species (Fig. 7). At these growth rates, it is estimated that there would be approximately 14,648 plains

game animals in Nyae Nyae by 2015. Similarly, if elephant populations maintained growth rates of 7% per year, approximately 1,761 elephants would be resident in the conservancy by 2015. Cumulatively, these six species of plains game and elephant would equate to 11,434 LSUs, or still only 25% of the conservancy's estimated carrying capacity (Table 4).

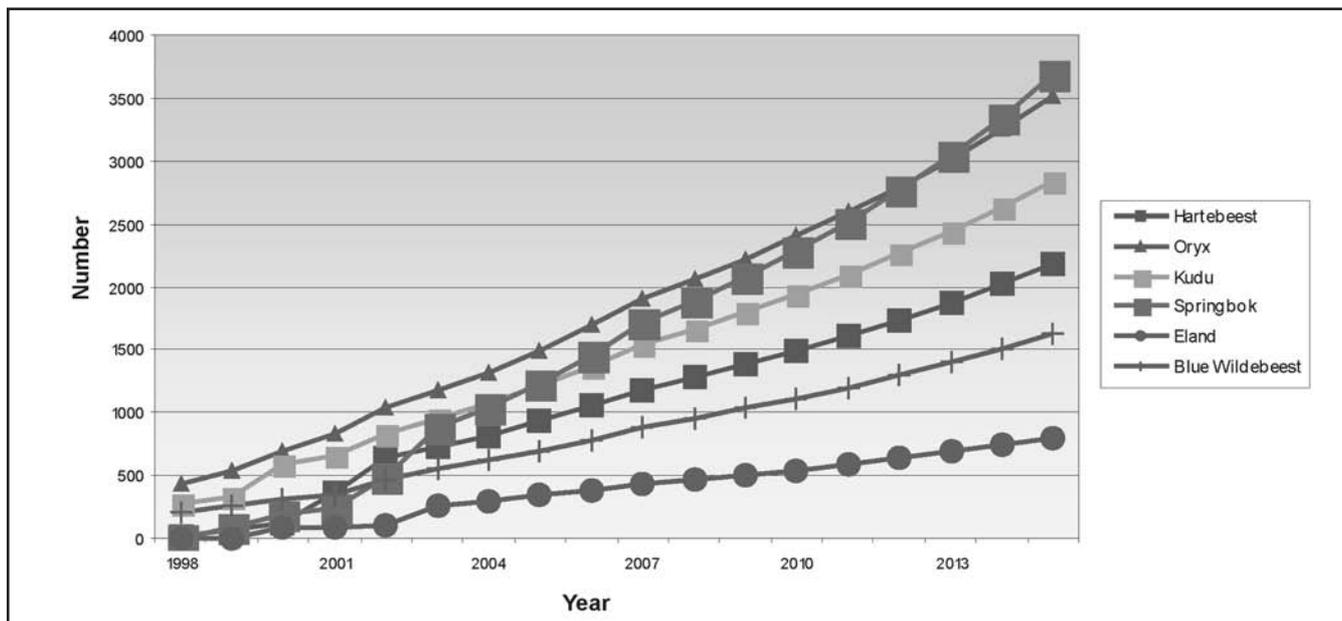
The livelihood benefits of harvesting the plains game for meat would be significant. At the above rates, 66 tons of meat could be harvested in 2007, and 117 tons by 2015 (Fig. 8). At a 3% growth rate, the Ju/'hoansi population of Nyae Nyae is projected to grow to 2251 in 2007 and to 2851 by 2015, which would translate into potential allocations of 29kg of meat per year per capita in the Nyae Nyae Conservancy by 2007 and 41kg by 2015. At today's market value of N\$8/kg for venison, the present-day value of this meat benefit would be N\$528,000 in 2007 and N\$936,000 by 2015.

### Sales of live wildlife

*Plains Game:* A potential alternative to harvesting the plains game for in-kind meat benefits would be to sell live game for cash payments. There is a vibrant and viable market for the sale of common plains game in both Namibia and the southern Africa region. However, the Nyae Nyae Conservancy's location in Namibia's FMD Buffer Zone presently makes it difficult to capitalize on the income these species are capable of generating. Table 5 provides an analysis of the value of these species through live capture versus harvesting for meat. While the live sale income is slightly more than the in-kind cash value of harvested game, the associated costs (i.e., feed, disease tests, death loss, etc.) of quarantining these animals for a 3-week period, plus capture and translocation costs, makes live sales a less attractive option to the Nyae Nyae Conservancy.

*High-Value Game Species:* Another more attractive option for income generation revolves around Nyae Nyae's high-value game species. Since 1991, the returns from sales of live animals in South Africa's game industry have risen from approximately R10,000,000 to R88,000,000 in 2001, and

**Fig. 7. Extrapolated population growth rates for Nyae Nyae plains game (meat-producing) species, based on sustainable off-takes of 2% for trophy hunting through 2015 and 6.5% for meat harvesting from 2007 to 2015**



**Table 5. Present-day values and potential numbers (based on 6.5% off-take) of plains game that could be sold from the Nyae Nyae Conservancy in 2007 and 2015 as an alternative to meat harvesting**

Species	Present-day value (N \$)	2007		2015	
		Projected no. animals for sale	Total value (N \$)	Projected no. animals for sale	Total value (N \$)
Red hartebeest	1,700	50	85,000	94	159,800
Oryx	1,700	80	136,000	151	256,700
Blue wildebeest	2,200	35	77,000	68	149,600
Springbok	1,000	106	106,000	241	241,000
Eland	4,000	16	64,000	33	132,000
Kudu	1,600	65	104,000	122	195,200
<b>Total estimated income*</b>			<b>572,000</b>		<b>1,134,300</b>

\*The income projected from live sales of game reflects the total value of animals at present-day auction prices in Namibia, but does not portray the actual income the conservancy would make by selling these animals. Actual profit would be considerably less, as the costs of capture, transport, etc. of these animals would need to be subtracted from the total gross income.

during this timeframe, values for roan antelope have increased by 178% and values for disease-free buffalo by 72% (Boonzaaier 2001). During 2002, the average regional selling prices for roan antelope ranged from N\$155,000–N\$170,000, while disease-free buffalo had an average value of N\$126,000 (van Rooyen 2003).

The Nyae Nyae Conservancy and Khaudum GR area contains Namibia’s largest concentration of roan antelope, while the Nyae Nyae Conservancy also is home to a small herd of buffalo. Both of these populations, under proper management, could yield lucrative returns to the Nyae Nyae Conservancy. But, as with the sale of the plains game, the conservancy’s location in Namibia’s FMD Buffer Zone presently prevents exploitation of this lucrative opportunity. Further compounding the matter is the fact that no buffalo are allowed below the Namibia Quarantine Red Line, thus preventing introduction of buffalo into Namibia’s commercial farmlands where a strong demand for this species has been voiced by the hunting and game-production industry.

In 1996, under instructions from the MAWRD Veterinary Department, the MET moved Nyae Nyae’s free-roaming buffalo population of 30 animals into a controlled 2,400ha camp. Shortly thereafter, the buffalo were tested for FMD, theileriosis (corridor disease), bovine tuberculosis, brucellosis, and lung sickness (CBPP). One animal tested seropositive for FMD, and it was removed from the herd and destroyed. Subsequently, the herd was again tested and found to be disease free. By September 2002, the herd had grown to 68 animals, and it was decided to reconfirm their disease-free status. Results of tests for FMD, theileriosis, and brucellosis were once again negative, reaffirming the disease-free status of the Nyae Nyae herd (Reuter 2002).

Over the past year, the Nyae Nyae buffalo herd has grown to 74 animals, but the herd is rapidly approaching the camp’s carrying capacity, and costly supplemental feed now has to be provided to maintain the herd’s condition. Thus, the need to enlarge the camp or construct a new one is imperative so the herd can continue to grow under optimal conditions. This could be a prohibitively expensive undertaking given the current veterinary restrictions against the introduction of buffalo onto Namibia’s commercial lands and/or the transport of these buffalo across Namibia’s unrestricted veterinary zones. However if these restrictions were relaxed, the commercial development of the Nyae Nyae Conservancy disease-free buffalo herd would become highly lucrative. Furthermore,

the development of such a production facility could be done in such a manner that some of Nyae Nyae’s roan antelope could be moved into the facility and managed for live sales as well.

According to Martin (2002), buffalo populations in 400–500mm rainfall belts can be expected to grow at rates between 2.71% and 4.13% under free-ranging conditions where predation and poaching have strong influences on herd productivity. In contrast, Stuart-Hill (1998) developed a simple population growth model for the Nyae Nyae buffalo herd that projected herd growth rates at 15.5% per year. It is interesting to note that the Nyae Nyae herd growth rate has almost identically mirrored the Stuart-Hill model that predicted a population of 76 by 2003. Thus, it would appear the Nyae Nyae herd could potentially be managed for a growth rate of 15% per year under appropriate conditions.

For purposes of projecting possible income from the live sales of Nyae Nyae buffalo and roan antelope, it is assumed that both species will reproduce at 15% per year. A management objective for buffalo could be to build the herd to 100 animals and then to begin the sale of live animals at 6% per year. This off-take level would allow maintenance of a steady growth rate of 9% per year, which could be maintained until the herd reaches a population of 150. From this point, the objective could be to sell 9% of the annual growth and maintain herd growth at 6%. Given the anticipated low starting population of the roan herd, the objective should be to not sell animals until the herd reached 50 in number. At this threshold point, the sale of live animals could start at 6% per year, while the annual herd growth rate could be maintained at 9% for the foreseeable future.

Population projections for buffalo are based on the present number of 74 buffalo and a proposed breeding herd of 40 roan antelope to be established in 2005. Based on these assumptions, the Conservancy could generate N\$1,362,000 from live-game sales in 2007 (N\$882,000 from the sale of seven buffalo and N\$480,000 from the sale of three roan). By 2015, this figure could increase to a total of N\$3,228,000 per year from the sale of 18 buffalo and 6 roan (Table 6). Perhaps even more significant is the accumulated asset value the Conservancy would acquire through this process. By 2015, the buffalo herd would have grown to 195 animals, while the roan would have increased to a herd of 99 animals. The asset value of these animals (at present-day values) would be an impressive N\$40,410,000.

**Table 6. Projected annual income from live sales of buffalo and roan antelope for the Nyae Nyae Conservancy for 2005, 2007, and 2015**

Species	Present-day value (N \$)	2005		2007		2015	
		No. to be sold	Total value (N \$)	No. to be sold	Total value (N \$)	No. to be sold	Total value (N \$)
Buffalo	126,000	6	756,000	7	882,000	18	2,268,000
Roan antelope	160,000	0	0	3	480,000	6	960,000
<b>Total per year</b>		<b>6</b>	<b>756,000</b>	<b>10</b>	<b>1,362,000</b>	<b>24</b>	<b>3,228,000</b>

In addition to capitalizing on the production and sale of the buffalo and roan in Nyae Nyae, the Conservancy could also potentially consider reestablishing a white rhino population and introducing sable from nearby West Caprivi. These species would also contribute substantial financial returns to the Conservancy from live sales. Further, the presence of all four of these species in a 10,000ha high-value game production center would prove highly attractive to an up-market lodge operation in the Nyae Nyae Conservancy.

### Expansion of trophy-hunting operations

As the game populations increase, the annual trophy quota can be expanded. Table 7 reflects a projection of the potential increased quotas and associated trophy-hunting revenues that Nyae Nyae could achieve in 2007 and 2015. These projections are based on a number of factors, including 2% and 1.5% harvest rates for plains game species and elephant, respectively; annual growth rates of 20% for springbok, 15% for the remaining plains game species, and 7% for elephant; and meat harvesting of plains game at a rate of 6.5% of the respective populations from 2007 on. The projections also assume game water points are expanded and the area remains predominantly managed for wildlife. In addition, as game numbers increase, the volume of trophies available for harvesting will far exceed the capacity of one concessionaire.

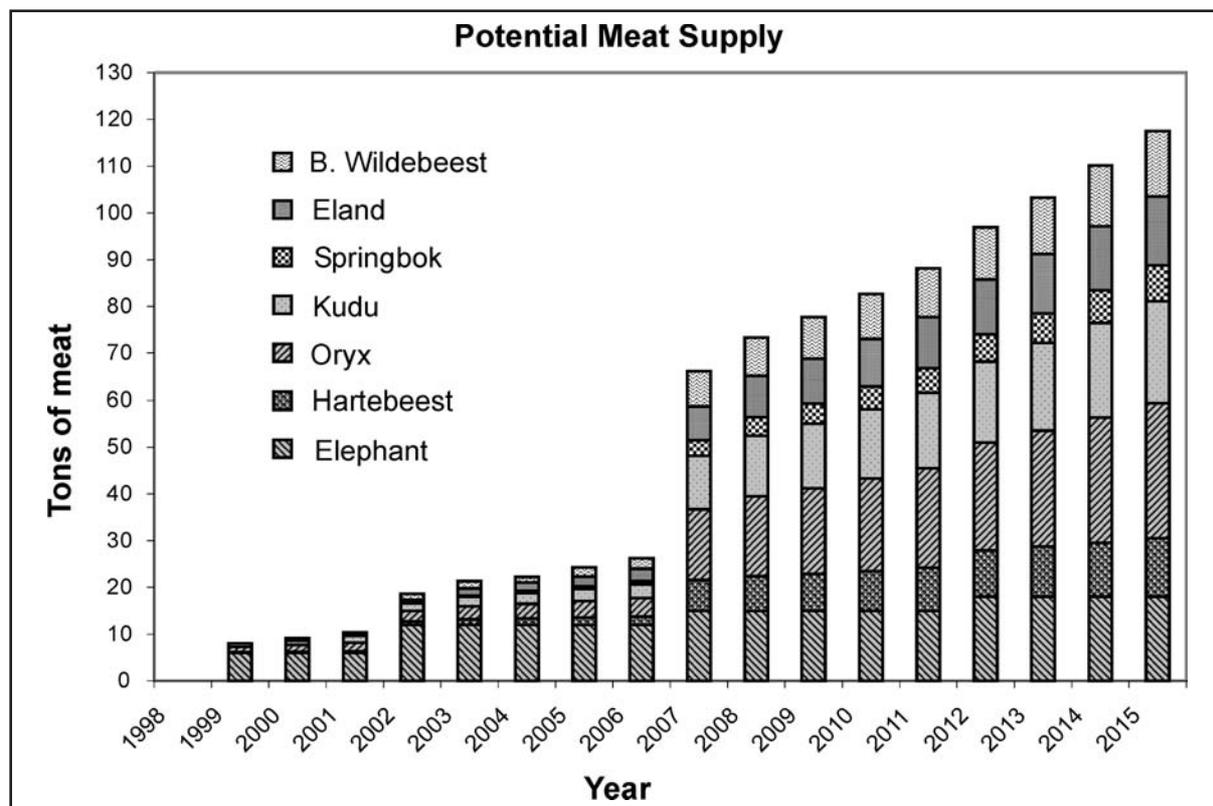
Hence, it is projected that the Nyae Nyae Conservancy will be partitioned into two hunting concessions in 2007 and five by 2015, and the Conservancy would then receive additional conservation support fees from each concessionaire similar to those paid by the current concessionaire. Lastly, no increased quotas or fees have been factored in for leopard, hyaena, duiker, steenbok, or roan antelope, as these species have not been built into the model. But income from these species would most certainly increase as well.

Based on the above calculations, the 2007 trophy-hunting operation has the potential to generate US\$206,950/year (N\$1,655,600), and by 2015, a total of US\$588,950 (N\$4,711,600) could be reaped. In addition, the creation of four additional hunting concessions would produce approximately six more jobs per concession, with the employment value being roughly N\$35,000/year per concession or an additional N\$175,000/year. These increased cash revenues would prove instrumental in promoting further recovery and management of the conservancy's natural resources and would significantly contribute to the livelihoods of conservancy members through dividends or development activities. Finally, the meat from the trophy animals would complement the potential game-meat harvests of 66 tons in 2007 and 117 tons in 2015 (Fig. 8).

**Table 7. Current number and value of Nyae Nyae Conservancy trophy animals versus projected numbers and values in 2007 and 2015 based on current concession values of each species**

Species on quota	2003		2007		2015	
	Quota no.	Value (US \$)	Quota no.	Value (US \$)	Quota no.	Value (US \$)
Elephant	4	60,000	7	105,000	26	390,000
Kudu	8	6,400	27	21,600	53	42,400
Oryx	8	5,600	34	23,800	65	45,500
Leopard	3	3,000		3,000		3,000
Hyaena	2	600		600		600
Blue wildebeest	5	2,500	18	9,000	33	16,500
Red hartebeest	8	4,000	21	10,500	40	20,000
Springbok	3	750	29	7,250	67	16,750
Eland	3	3,000	9	9,000	16	16,000
Duiker	4	600		600		600
Steenbok	4	600		600		600
Roan antelope	1	2,000		2,000		2,000
Concession Conservation Support Payments	1	7,000	2	14,000	5	35,000
<b>Totals</b>	<b>53</b>	<b>\$92,050</b>	<b>145</b>	<b>\$206,950</b>	<b>300</b>	<b>\$588,950</b>
<b>N \$ Equivalent (at N \$8 to US \$1)</b>		N\$736,400		N\$1,655,600		N\$4,711,600
Employment income (No. concessions)	(1)	N\$35,000	(2)	N\$70,000	(5)	N\$175,000

**Fig. 8. Projected tons of meat that could be harvested from Nyae Nyae Conservancy plains game and trophy elephants**



### Joint-venture tourism lodges

The growing wildlife populations, combined with the recent opening of a border gate between Botswana and Namibia on the eastern boundaries of the conservancy, have also sparked interest from the private sector with regards to establishment of an up-market tourism lodge in the conservancy. To date, the remoteness of the Nyae Nyae Conservancy and Khaudum GR has prevented meaningful tourism development. However, a new border gate will conceivably allow development of a popular southern Africa tourism route between the Okavango Delta and the Etosha NP, with stopovers in the Nyae Nyae/Khaudum complex, making tourism a viable activity. The development of a private sector/conservancy joint-venture up-market 16-bed lodge, similar to the Damaraland Camp in Torra Conservancy, would generate approximately N\$300,000/year in revenues for the conservancy, and an additional N\$250,000/year in employment benefits through the creation of 13–15 more full-time jobs. Furthermore, as the area becomes better known and marketed, it can be hypothesized that a second lodge would also become viable by 2010, and a third by 2015. Should this scenario unfold, the tourism benefits returns to the conservancy and members would add an estimated N\$900,000/year in cash and N\$750,000/year in employment benefits back to the conservancy by 2015.

### Synergetic benefits of cooperative management of the Nyae Nyae Conservancy with Khaudum GR

The optimal development of the Nyae Nyae Conservancy and adjoining Khaudum GR will require coordinated and synergetic management between the two areas. Such management will increase the elasticity of both areas, thereby allowing game to move freely between the park and the conservancy as climatic conditions dictate. Under this scenario, the risks of typical “boom and bust” production cycles so prevalent in arid and semi-arid habitats will be substantially reduced by minimizing the chances of extensive, long-term overgrazing of either area. Further, the larger management unit provides scope for Khaudum’s elephant population to expand, thereby alleviating anticipated threats that dense populations of elephants pose to such high-value species as roan antelope.

### Summary of potential Nyae Nyae Conservancy development opportunities

Table 8 highlights the benefits currently being generated by the Nyae Nyae Conservancy versus those that are potentially achievable in 2007 and 2015. As portrayed, wildlife and tourism-related benefits generated in the Nyae Nyae Conservancy could feasibly increase from the N\$1,270,574 in 2002 by 360% in 2007 and by 930% in 2015.

The above figures translate to the equivalent of pro-rated per capita benefits for the Ju/’hoansi people of N\$635 in

**Table 8. Actual income and benefits generated by the Nyae Nyae Conservancy in 2002 versus projected income and benefits if increased game populations facilitate expansion of the trophy-hunting operation and introduction of game harvesting, tourism lodges, and high-value game production operations**

Source of income/benefit	Actual (2002) versus projected value of income and/or benefit (\$ N)					
	2002		2007		2015	
	Cash	Employment/ in-kind	Cash	Employment/ in-kind	Cash	Employment/ in-kind
Hunting concession payment	845,697		1,655,600		4,711,600	
Wages from professional hunter(s)		36,101		70,000		175,000
Handicrafts sales*		264,334		406,711		810,396
Value of game meat consumed		124,442		528,000		936,000
Joint venture tourism lodge revenues			300,000		900,000	
Joint venture tourism employment benefits				250,000		750,000
Live game sales			1,362,000		3,528,000	
<b>Annual subtotal</b>	<b>845,697</b>	<b>424,877</b>	<b>3,317,600</b>	<b>1,254,711</b>	<b>9,139,600</b>	<b>2,671,396</b>
<b>Annual total</b>	<b>1,270,574</b>		<b>4,572,311</b>		<b>11,810,996</b>	
<b>Per capita benefit</b>	<b>635</b>		<b>2,031</b>		<b>4,144</b>	

\*Handicraft sales have been increasing at a rate of 9% per year, which is in line with the current annual tourism visitation increases in Namibia.

2002, N\$2,031 in 2007, and N\$4,144 in 2015 (assuming the present-day conservancy population of 2000 people grows at an annual rate of 3%). It should be further clarified that these figures represent present-day values and do not take into consideration inflationary increases, potential increases in market values of the products being offered, nor the long-term trend of the devaluation of the Namibian dollar against the US dollar or euro, which will be the currency used for most of the tourism-related products.

### Summary of Nyae Nyae Conservancy/ Khaudum GR Case Study

Thus far, the Nyae Nyae Conservancy has made a promising start towards improving the livelihoods of its highly marginalized Ju/'hoansi people. The 1996 conservancy legislation granted communities the rights to benefit from wildlife, and this Act provided the Ju/'hoansi community members incentive to become more involved in the management of their wildlife resources. As a result, wildlife populations in the Nyae Nyae Conservancy are increasing, which results in increased cash and in-kind benefits to conservancy members. Although Conservancy cash and in-kind benefits amounted to a substantial N\$1,270,574 in 2002, it is believed the Nyae Nyae Conservancy's wildlife resources have the potential to generate almost 10 times this level of return by 2015. In addition, there is scope for even greater returns, as these projections are premised on a wildlife stocking rate of only

25% of the Nyae Nyae Conservancy's estimated carrying capacity.

Should the Ju/'hoansi continue to develop their wildlife resources, it is likely that wildlife and tourism activities will become the primary source of their welfare. However, there are a number of conditions that must be met to optimise the development of the Nyae Nyae Conservancy's resources:

- First and foremost, there is a need for the Government of Namibia to give greater recognition of the validity of wildlife and tourism as legitimate land uses, and in the process, demonstrate a willingness to zone and manage extensive portions of Namibia's arid landscapes for this purpose. In the case of Nyae Nyae, there is strong pressure from neighbouring Herero herdsmen to move large herds of cattle into the Conservancy. Should this happen, uncontrolled grazing and escalating cattle numbers will ultimately lead to degradation of Nyae Nyae's pristine wildlife habitat, thereby spreading a debilitating desertification process northwards from heavily overgrazed rangelands to the south of Nyae Nyae.
- There is a crucial need to change the mindset and paradigm of government decisionmakers. There is often a perception that land not being used for livestock or crop production is land unproductively used. In the case of Namibia's fragile arid and semi-arid landscapes, this is a particular fallacy, as overgrazing by livestock is especially damaging to low-rainfall grazing

regimes and efforts to produce crops, more often than not, lead to failure. Although conservancies are beginning to demonstrate the viability of wildlife and tourism as competitive land uses, the agricultural sector continues to be strongly subsidised at the expense of wildlife and tourism development opportunities. Namibia's agricultural sector is receiving 320% more financial support than the MET (Kangueehi 2003), even though tourism generates equal or greater economic returns to the Namibian economy than does agriculture.

- Integration of wildlife and agricultural production activities into the daily livelihood strategies of rural community members needs to be improved. The rigid veterinary restriction on the movement of wildlife (especially the disallowance of buffalo) from north of Namibia's Red Line into its commercial areas is a prime example of a highly subsidised agricultural initiative that undermines the ability of communities to optimise their financial and economic returns from ecologically more appropriate wildlife production approaches. Both South Africa and Zimbabwe have found means of legitimately promoting wildlife production systems, and it is hoped that Namibia will soon follow suit.
- The integration and harmonization of wildlife and agricultural activities at village community levels needs to be enhanced. In the case of Nyae Nyae, introducing small horticultural production activities is possible, but will require introducing measures to mitigate the conflict being created by expanding Nyae Nyae and Khaudum elephant populations. Although arable agricultural production has limited potential in Nyae Nyae, there is a need for the Ju/'hoansi to introduce appropriate technology (i.e., drip irrigation systems) to allow small-scale gardens to be developed at the village level to supplement their nutritional needs.
- There is a strong need for the Government and the Ju/'hoansi to coordinate and jointly plan and manage the Nyae Nyae Conservancy and Khaudum GR as a contiguous landscape. The development of wildlife watering points in the conservancy and Khaudum GR and introduction of game into Nyae Nyae are examples of solid initiatives that have benefited both the Conservancy and the Reserve. However, both initiatives have been underfunded and weakly coordinated, and the synergy that is possible by co-planning and co-management between the Conservancy and Reserve needs to be strengthened.

- The transitional nature of Ju/'hoansi society and culture places the Ju/'hoansi people at a competitive disadvantage to other ethnic groups in Namibia. Given current low literacy levels and the disadvantaged position of the Ju/'hoansi people, long-term donor commitment and effective coordination of donor inputs are needed if the capacity of the Ju/'hoansi people is to be appropriately developed in the coming years.

## Conclusion

The Namibia conservancy movement, although still young, has made extensive progress since registration of the first conservancies in 1998. The presence of 17 of the registered conservancies adjacent to protected areas is increasing the viability of Namibia's protected area network, while the 29 registered conservancies cumulatively increase land under conservation management in Namibia by more than 70,000km<sup>2</sup>. Some conservancies, such as the Nyae Nyae Conservancy, are now contributing significant benefits to their members, and conservancies are becoming embedded into the livelihoods of rural community members.

Although the benefits from conservancies have doubled in three of the past four years, most communal conservancies remain financially marginalized due to their presence in Namibia's FMD Buffer Zone and their resultant inability to realise the full value of their burgeoning wildlife populations. This situation is further compounded by a paradigm that guides many government policymakers to believe that wildlife and tourism enterprises are not productive land uses. As a consequence, Namibia's subsistence and commercial agricultural sector receives a budget that is more than 320% higher than the national conservation budget, even though tourism contributes equal or greater amounts to Namibia's Gross Domestic Product.

Optimal development of Namibia's promising wildlife resources will require policy adjustments that recognise the validity of wildlife and tourism as competitive land uses with agriculture and promote the effective integration of wildlife/tourism enterprises. In particular, there is a need to constructively address rigid veterinary restrictions that prevent conservancies from capitalizing on the presence of their high-value game species such as roan and sable antelope and disease-free buffalo.

Implementing the above adjustments will help promote economically competitive and more environmentally appropriate forms of *wildlife-based* land use in Namibia's arid and semi-arid landscapes.

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