

5. SUSTAINABLE RESOURCE BASE

5.1 FRESHWATER AND ASSOCIATED RESOURCES

Namibia suffers from extreme water scarcity. The only permanently flowing rivers lie near to, or form part of, the country international boundaries. The lack of readily available freshwater in the interior of the country remains the most important limiting factor for development.

Broad overview of Namibia's water resources and consumption

- Water in Namibia is scarce due to low and highly variable rainfall and high rates of evaporation.
- Although perennial rivers have the greatest potential as water resources, they are located far from the areas of highest demand. Sustainable management of perennial rivers in Namibia is difficult because several countries share them.
- All rivers that originate within Namibia's borders are ephemeral. The water table associated with these rivers is high and their banks characteristically support vegetation that provides important resources for people and wildlife living in the arid areas of Namibia.
- Storage dams on Namibia's ephemeral rivers are subject to high losses through evaporation. Although necessary for water supply to farms and towns, the impoundment of ephemeral river flow can have serious environmental and social implications, since it causes a lowering of the water table and reduces downstream underground aquifer recharge.
- Due to shortages in surface water, Namibia relies heavily on groundwater reserves. These reserves are subject to low recharge rates from rainfall and periodic ephemeral floods. Despite this, groundwater is vital for farmers and most towns throughout western and central Namibia.
- Approximately 50 % of Namibia's total population live in the proximity of the northern perennial and seasonal rivers, and are involved with fishing activities; 90% of these people derive some income from the sale of fish. Fish numbers in the Okavango River have declined dramatically since 1984. The major cause for declining freshwater fish populations in Namibia is over-fishing.
- With Namibia's limited freshwater resources, it is generally accepted that aquaculture does not have large potential as a major economic activity. Current aquaculture projects in the northern rural areas have met with many problems, most of which will be difficult to overcome without causing environmental degradation, and are similar to those experienced in other areas of sub-Saharan Africa.
- Although agriculture accounts for over 70% of the water used in Namibia, it contributes little more than 10% to GDP. The value added to the water used for agricultural activities in Namibia (especially irrigation) is very low (an estimated N\$7.2/m³) when compared to that used for manufacturing (N\$272/m³) or tourism and other service sectors (N\$574/m³).

Future water demand, freshwater depletion and degradation

Over the next 30 years, water demand in Namibia will increase rapidly in some areas (in particular all expanding urban areas, many of which are located far from easily accessible sources of water) and only moderately in others. The current

problem of distributing the available water to where it will most be needed, will be exacerbated and, due to full exploitation of developed resources, expensive new water sources (for example, desalination plants and new dams) will need to be developed. Water demand for irrigation, currently the main water consumer, is expected to increase considerably.

Namibia is extremely vulnerable to the effects of water pollution – mainly because of the country's limited supply of surface water and high dependency on groundwater sources. Once it has been contaminated, groundwater is almost impossible to clean up. In the absence of strictly implemented local and transboundary policies, pollution from pesticides, excess fertilisers and other substances is likely to increase in the decades to come.

Freshwater depletion and degradation threatens human and livestock health, and socio-economic development. It reduces livelihood options and exacerbates rural poverty. In addition, increasing costs of supply are inevitable, since expensive new infrastructure needs to be developed. As water in some areas becomes scarce and expensive, development options become increasingly limited. Cost recovery of the capital spent on developing expensive new water resource infrastructure is likely to become more and more difficult – especially as the number of teenage headed households are set to increase drastically over the next few decades, as a direct result of the growing HIV/AIDS epidemic.

Efforts to reduce freshwater depletion and to enhance the value of water

It is recognised that the enforcement of Integrated Water Resource Management and Water Demand Management strategies are essential if our goals regarding social well-being, economic development and environmental health are to be realised. To date, efforts to reduce the threats to water resources in Namibia have been extensive and include:

- Adopting a stricter economic approach to water pricing to encourage all sectors to use water as efficiently as possible.
- Water conservation initiatives including efforts to reduce evaporative losses from dams the development of water re-use and reclamation strategies and the development of alternative water sources.
- Using water in the most economically viable and ecologically sound manner. Tools such as Natural Resource Accounting and Strategic Environmental Assessment are being adopted. Ultimately these tools will help guide policies regarding future water use, and will prevent impact on freshwater ecosystems and the resources and services that they provide.
- Improving catchment, river and aquifer management through the establishment of several agreements between Namibia and her neighbours regarding shared river basins. In addition, rural communities are becoming increasingly responsible for their own water points through the establishment of water point committees.

Sub-Vision

Namibia's freshwater resources are kept free of pollution and are used to ensure social well-being, support economic development, and to maintain natural habitats.

Freshwater and Associated Resources

Things to do

- Adopt a new Water Act in place of the outdated Water Act of 1956.
- Vigorously implement water demand management approaches and develop mechanisms to encourage more efficient water use.
- Promote high value-added economic uses for water.
- Improve catchment, river and aquifer management.
- Implement Integrated Pest Management for disease control (malaria, sleeping sickness) and crop pest control wherever viable, to reduce contamination of Namibia's limited water supplies.
- Ensure the strict implementation of the relevant national legislation.

Where we want to be (2030)

- Water allocated and used efficiently.
- Irrigation of only high value and strategic crops on suitable soils.
- Equitable access to potable water.
- Clean, unpolluted water.
- Productive and healthy natural wetlands with rich biodiversity.
- Appropriate tenure over wetland resources.
- Optimal and strategic economic development options.

Current situation

- Much improved access to potable water.
- Improved water demand management.
- Increased demand.
- Increasing costs of supply.
- Increasing threats of water pollution.
- Inadequate education and knowledge regarding the importance of natural wetland systems.
- Insufficient focus on conserving wetlands and recognizing essential ecological services in water legislation.

Things to avoid

- Subsidies for water which encourage wastage and misuse.
- Devegetation and overgrazing of livestock within catchment areas, along floodplains and along the banks of rivers. This increases sediment transportation in downstream areas and is directly responsible for an increase in flood severity during periods of high rainfall, dam siltation, reduced rates of aquifer recharge and reduced water quality.
- Over-fishing and the use of unsustainable methods for catching fish (such as the use of mosquito nets that remove immature fish as well as adults from the population).
- Inappropriate development near to natural wetlands, causing a loss of valuable resources and essential services

Worst-case scenario

- Water used for low value purposes.
- Severe water depletion and extremely high costs of supply.
- Polluted and degraded water.
- Loss of natural wetlands and freshwater biodiversity.
- Reduced livelihood, economic development options and poverty.
- Increasing health problems.
- Potential conflict with neighbours over shared resources.

Targets for Freshwater and Associated Resources

While high rainfall variability and the accompanying threat of drought are the most critical constraints facing Namibia's water resources, water demand continues to rise. As a consequence, water scarcity has become a problem for all areas that are placed geographically far from the perennial water sources. The DWA has estimated that the country's developed water sources are able to supply a total of 600mm³ per annum. Based on projections for future water demand (estimated to grow at 2.2% per annum), these developed sources are likely to be fully exploited by 2016. Even if stricter Water Demand Management practices are enforced, the central areas of Namibia (in particular the high growth points in the Khomas Region) are expected to experience full use of currently developed sources by 2012.

Over the next 30 years, water demand in Namibia will increase rapidly in some areas (in particular, all expanding urban areas) and only moderately in others. The current problem of distributing the available water to where it will be most needed, will be exacerbated and, due to full exploitation of developed resources, expensive new water sources (for example desalination plants, new dams, long pipelines and water from foreign countries) will need to be developed.

The proportion of water used for high value uses, e.g. tourism (N\$ 574/ m³), other service sectors and high value crops (e.g. grapes and dates), should increase relative to the proportion used for low value uses, e.g. irrigation of low value crops (N\$7.2/ m³), (e.g. maize).

- By 2030, equitable access to water should be supported by water pricing that reflects the cost of water supply with subsidies being fully transparent and mainly restricted to lifeline amounts for low income users.
- Greater dissemination and use of Namibia's Natural Resource Accounting programme to inform policies and future development.
- The proportion of water reused and recycled is increased.
- The proportion of water derived from alternative water sources, e.g. desalination, has increased.
- Number of basin management committees that are established and functioning, has increased.
- Number of Water Point Committees that are established and functioning, has increased.

Objective

To achieve equitable access to potable water and freshwater resources by all.

Strategies

- Formulating and implementing new water policies which focus on Water Demand Management principles, appropriate pricing, and water efficient technology and which recognise the fact that the natural environment is a user of water and that natural water sources and wetlands are important providers of vital processes and services.
- Promoting sustainable, equitable and efficient water use; and moving away from strategies of expanding Namibia's water supply to meet projected water demand.
- Developing appropriate technologies for the promotion of freshwater fishing.
- Vigorously implementing water demand management approaches and develop



mechanisms to encourage more efficient water use through:

- Educating people about the need to conserve water
- Recovering water supply costs in urban and rural areas. The adoption of stricter economic approaches to water pricing using block tariffs for all domestic, agricultural and industrial users, will help to ensure that excessive consumers subsidise lower volume (and lower income) users
- Improving awareness on water conservation options
- Promoting more efficient end-use technology (e.g. improved irrigation technology)
- Discouraging domestic production of unsuitable cash crops in favour of imports by charging for “free” water
- Encouraging the active participation of users and beneficiaries in regulating water access and management in rural areas through the further establishment of the rural water point committees
- Making full use of tools such as Natural Resource Accounting and Strategic Environmental Assessment to ensure that water is used in the most economically viable and ecologically sound manner – particularly in the agricultural, manufacturing and tourism sectors
- Promoting high value-added economic uses for water (e.g. nature centered low-impact tourism and high value crops such as dates and grapes) and the importation of water-intensive goods (e.g. maize).
- Improving catchment, river and aquifer management through the strict implementation of agreements between Namibia and her neighbours, regarding shared river basins.
- Implementing Integrated Pest Management for disease control (malaria, sleeping sickness) and crop pest control wherever viable, to reduce contamination of Namibia’s limited water supplies
- Abolishing all economically unsound subsidies that encourage water wastage and the large-scale use of pesticides and fertilisers that can cause water pollution.
- Improving water source monitoring techniques and ensure that all wastewater is disposed of safely.
- Ensuring the strict implementation of the relevant national legislation.
- Develop and enforce legislation to protect natural wetlands (the creation of a Wetlands Policy), and the resources and services they provide, from damaging human impacts.
- Promoting the joint management of river basins, through information exchange and joint research, harmonization of policies, and coordinated policy implementation.

5.2 Production Systems and Natural Resources

This section covers six interlinked and significant components of Namibia’s ecological support base and economic potential, namely:

- the issue of tenure - peoples’ rights, responsibilities and authority over land and natural resources;
- achieving sustainability in the land and agricultural sectors, and the need for diversified livelihoods;
- promoting sustainability of the forestry sector - timber and non-timber forest products;

- sustaining the coastal and marine fisheries and ecosystems;
- wildlife and tourism - optimising Namibia's comparative advantage; and
- minerals, prospecting and mining - harvesting the earth's bounty with minimal impacts.

These interlinked issues are illustrated in Figure 5.1.

Whilst an appropriate and consistent policy environment is at the heart of Vision 2030, effective institutional arrangements are critical for implementation. In order to achieve a sustainable future, Namibians need to work together and government must facilitate and embrace the contributions of civil society. In summary, three elements are essential for success: a common vision, a clear and consistent strategy, and a concerted team effort.

Ultimately actions that can effectively reverse unwelcome trends and reduce threats to Namibia's natural resource capital, should be focused on the following broad areas

- Filling in the gaps in our knowledge regarding natural resources
- Tackling the root causes of the key issues that threaten sustainable development through the adoption of integrated political, technical and economic measures
- Improving public access to environmental information
- Educating all Namibians with respect to environmental and development issues, and the *total economic value* of Namibia's natural resources
- Capitalising on Namibia's comparative advantages, promoting diversification, "off land" economic opportunities and value-adding to natural resources
- Maintaining and promoting freedom of the press – in order to keep the public well informed regarding the facts associated with environmental and developmental issues
- Making policy formulation processes accessible to all stakeholders and providing more opportunities for NGOs and community groups to participate in decision-making.

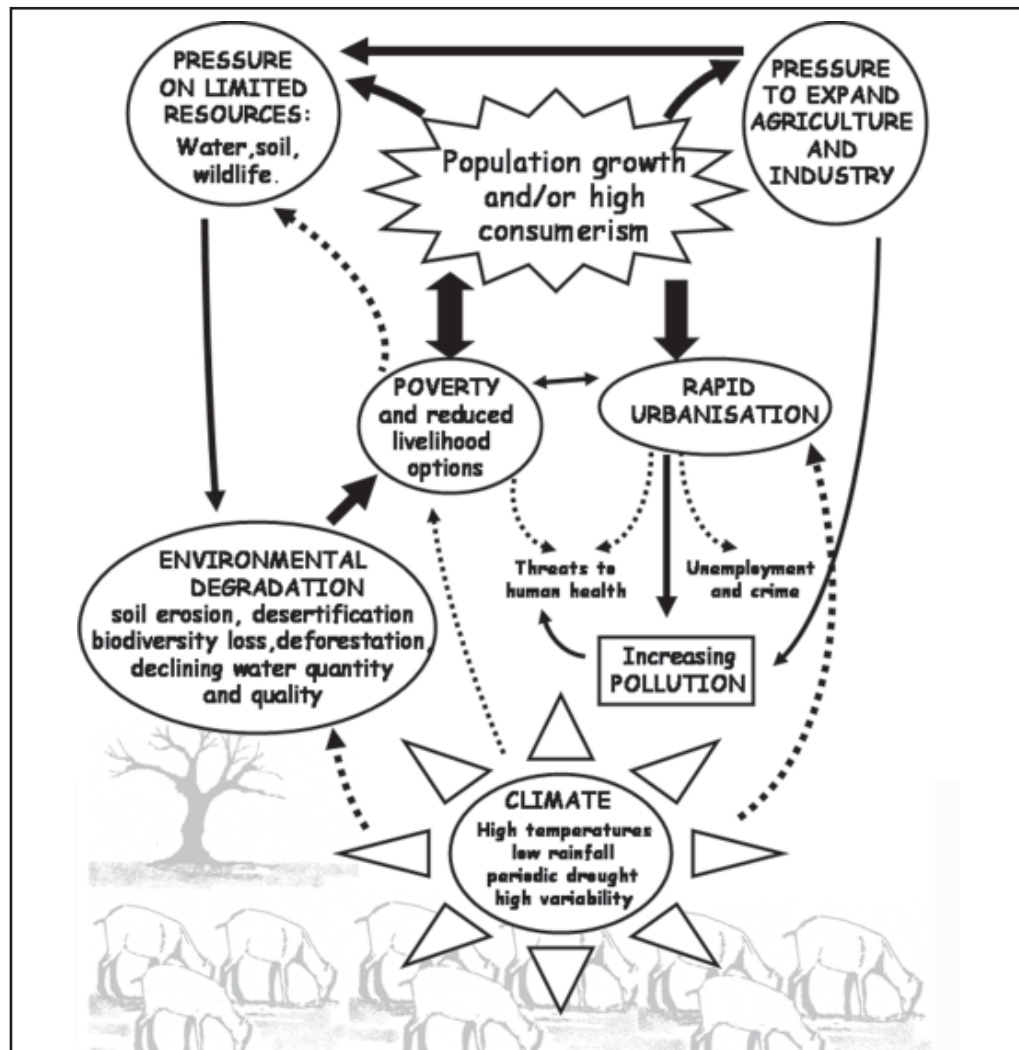


Figure 5.1: Some of the interlinked issues that threaten sustainable development in Namibia

5.2.1 Land and Agricultural Production

Low land capability - a severe constraint to sustainable agriculture

In Namibia surface water is scarce, availability of grazing is variable and livestock-carrying capacity is low. These natural environmental constraints severely limit the development of rain-fed cultivation and commodity-farming throughout most of the country. Despite these constraints, a large percentage of the land is used for agricultural purposes, and many thousands of families still “live off the land” for their livelihoods. Considering the low capability of the land for husbandry, it is not surprising that Namibia’s agricultural sector is subject to uncertain output, regular crop failure and a drain on state finances, through heavy subsidies and drought relief.

Land distribution and ownership

- Between 60% and 70% of Namibia’s population practice subsistence agro-pastoralism on communal land, which is state owned, and constitutes approximately 41% of the total land area.
- Less than 10% of the people live in the freehold farming areas. This privately owned land constitutes approximately 44% of the total land area. 1.5 % of the total land area is comprised of exclusive diamond concession areas. 13.5 % has been proclaimed as nature conservation areas.

- On average freehold agriculture contributes less than 4 % to the GDP (including meat processing) and 27% of exports. Since the 1970's, many freehold livestock farmers have moved towards mixed game/livestock farming. This diversification helps to create a valuable buffer against drought.
- Agriculture in the communal areas is vital for the livelihood of most rural households. Distant markets limit the development of farming in the communal areas, and agricultural incomes are low and variable. Veterinary fences that prevent the spread of contagious livestock diseases have limited the export marketing opportunities of communal farmers.
- Not all farmers in Namibia can be defined as “serious”. There are many absentee farmers who own freehold land, and illegal fencing of prime areas of supposedly communal land by wealthy individuals has become common.

Land degradation – threatening future agricultural output

Land degradation reduces the production potential of the land. It occurs when there is a decline in plant cover or when one type of vegetation is replaced with other, often less productive, species. Namibia's arid savannah systems, and dry woodland areas that have reverted to savannah-type systems as a result of extensive deforestation, are the most susceptible to land degradation.

The environmental manifestations of land degradation in Namibia - soil erosion, bush encroachment and soil salination - are causes of economic loss and escalating poverty, through declining agricultural production and a loss of food security. This leads to human migration, rapid urbanisation and an increased need for the government to import food.

Land degradation in Namibia is usually attributed to overgrazing, land clearing for crop farming or inappropriate cultivation techniques. Ultimately, however, desertification occurs as a result of incorrect policies, incentives and regulations that encourage inappropriate land management practices. The lack of tenure, the inequitable access to land and a lack of integrated planning are all important factors contributing to land degradation in Namibia.

Trends in agricultural growth, rural household food security

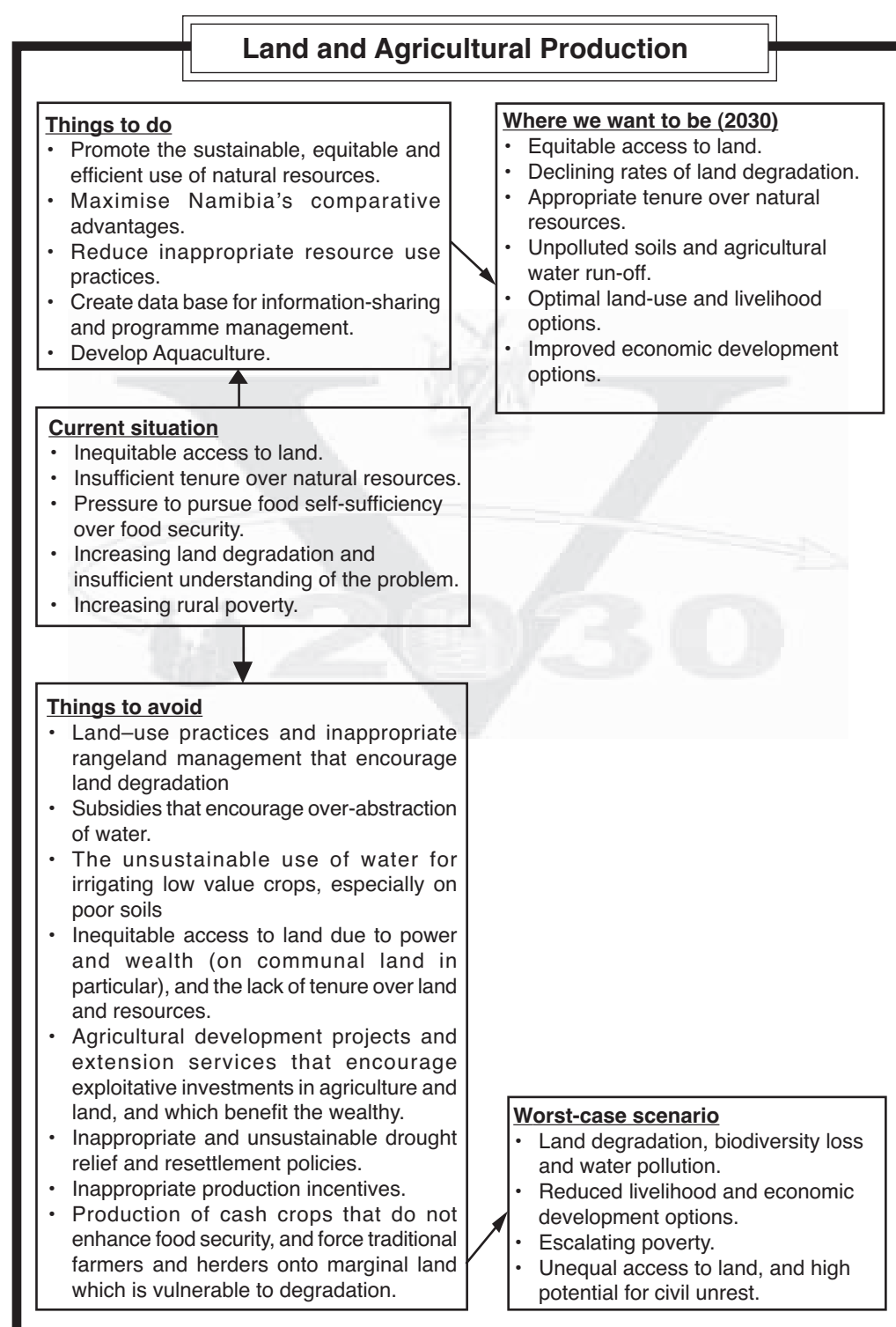
Although Namibian producers currently supply all of the nation's red meat requirements, the country has suffered a grain deficit since 1964. Through its National Agriculture Policy, government aims to expand irrigation activities up to five-fold but makes no mention of strategies needed to reduce environmental impacts associated with soil salinisation, pesticide run-off and control over the use of potentially polluting fertilisers that are likely to accompany irrigation expansion. Increasing pollution from these substances could threaten Namibia's future meat exports to European markets. In addition this policy does not reject the use of subsidies for any products that may enhance agricultural production. While it is generally accepted that there is no potential to intensify veld grazing without increasing land degradation in the country, the National Agricultural Policy also proposes the expansion of livestock production onto under-utilised land north of the Veterinary Cordon Fence.

Although 94% of rural households identify agriculture as their main activity, it has begun to make a declining contribution to communal farmers' household income. In most years, households are unable to produce enough grain for the family's requirements.

It is expected that national consumption of fish will increase significantly as a result of improved availability of marine fish in inland areas, increased production from freshwater aquaculture facilities and greater production of freshwater fisheries.

Sub-Vision

Land is used appropriately and equitably, significantly contributing towards food security at household and national levels, and supporting the sustainable and equitable growth of Namibia's economy, whilst maintaining & improving land capability.



Objective

To ensure that all Namibians have equitable access to land and other natural resources, and that these resources are sustainably and efficiently used, while maximizing Namibia's comparative advantages.

Strategies

- Creating economically and ecologically rational land-use plans to ensure that land is used optimally and not just for direct-use activities like agriculture.
- Placing emphasis on manufacturing, service provision and other secondary or tertiary activities which hold the greatest promise for economic growth, income generation, and poverty reduction, to promote diversification away from the agricultural sector.
- Mainstreaming HIV/AIDS in agricultural development programmes.
- Encouraging local value-adding through domestic processing of meat products. Improve awareness of market requirements for agricultural produce and monitor market responses to Namibian products.
- Implementing land redistribution policies that promote equity among the people of Namibia.
- Implementing agricultural and resettlement policies aimed at “serious” farmers and the rural poor
- Implementing policies that discourage the use of wood fuel and help combat climate change.
- Focusing on food security and not food self-sufficiency. Although new irrigation projects, which aim for self-sufficiency, will create jobs, they require enormous subsidies and are capable of accelerating land degradation through pollution, soil salination and high water demands. Thus crops whose production is intensive in the use of scarce natural resources (in particular water), should be imported.
- Improving the quality of education and environmental education.
- Ensuring that all new projects programmes and policies do not proceed without a thorough Environmental Assessment (EA).
- Improving political will and good governance.
- Extending the Affirmative Action programme being implemented by the Agribank (usually available to individuals who qualify because of their ownership of sufficient stock) to groups, consortiums, companies, etc. so that people can reach the target by two or more people working together.
- Securing tenure over all natural resources to be assigned to communities, and a major capacity-building programme to be undertaken in order to develop community institutions capable of allocating land rights and managing natural resources sustainably.
- Rehabilitating degraded land and water bodies.
- Providing incentives for family planning and education services combined with appropriate and diversified land-use options.
- Recognising the interdependence between agriculture and other issues, and in particular, water management and biodiversity conservation.
- Providing appropriate, effective, decentralised and integrated support services (extension, research, education, credit, marketing, etc.).
- Providing incentives for people to protect themselves against present and future extreme events, e.g. incentives to ...
- Encourage rapid destocking and marketing of livestock to reduce pressure on rangelands during times of drought.

- Developing effective and sustainable uses of land and natural resources which do not threaten their future productivity, by:
 - Adopting more adaptive and responsive agricultural methods e.g replacing a monoculture of food and cash crops with viable intercropping systems, crop rotation or agro forestry.
 - Ensuring that irrigated land is well drained, practicing night-time irrigation and leaving land fallow for part of the year in order to reduce the chances of soil salinisation.
 - Adopting integrated pest management (IPM) in an attempt to reverse the trend of rising pesticide use, which threatens human health and Namibia's comparative advantages in the global fish and meat markets.
 - Maintaining the genetic integrity of *Sanga* cattle and other indigenous livestock and crop gene pools.
 - Encouraging research, development and testing of new CO₂ responsive heat and drought resistant crop cultivars (in preparation for future climates that could become hotter and drier). Identify cost-effective, flexible and adaptable management approaches and national disaster response strategies to the potential impacts of Climate Change, that could affect the livelihoods of Namibia's rural poor.

5.2.2 Forestry

Forest ecosystems play multiple roles – at global and local levels. They provide life-sustaining environmental services through the provision of oxygen, the absorption of carbon dioxide and the stabilising of climate systems, and are sources of economically valuable products.

Namibia's natural physical and climatological conditions allow for almost 80% of the land to support trees and shrubs, incorporating vegetation types that range from a variety of wooded savannahs (in the central part of the country) to dry woodlands (which predominate in the north central and north eastern regions). The savannahs are characterised by various species of thorn trees, shrubs and grasses while the woodlands are dominated by several hardwood tree species and a wide variety of fruit trees.

The woodland ecosystems enhance the livelihoods of the majority of Namibians directly through the supply of fuel, construction materials, wild foods, medicines, and browse and grazing for livestock. In addition they support a wealth of biodiversity and game, which are the mainstay of the tourism sector. In addition to these direct-use values,

Namibia's woodland and savannah ecosystems play a vital role in maintaining environmental health through soil stabilisation and climate control. Namibia has limited, but valuable, hardwood timber resources. Value addition, also at community level, should be promoted as an alternative to increasing the volume of raw timber production. Manufacturing should be diversified away from curio carvings to high value items that are suitable for export.

Uncontrolled and unplanned fires pose the greatest threat to forests and woodlands other than unsustainable harvesting, and also affect grazing land severely. The management of fires requires a cross-sectoral approach and community involvement.

Government is responsible for developing appropriate policies, legislation and strategies aimed at sustainable forest management, data collection and analysis, resource monitoring, research, education and extension. In addition, it incorporates aspects of control over resource utilisation, the promotion of trade, and conservation of forested land for national and global benefits.

Unsustainable deforestation of natural woodland has occurred in many parts of the country and is most severe in those areas that have the highest population density, including the north-central and north-eastern regions and on the outskirts of Namibia’s rapidly expanding urban areas. The consequences of unsustainable deforestation include increased rainfall run-off and soil erosion, declining soil fertility, changes in the local water cycle, a loss of biodiversity and increased rates of global warming.

The results of the 2001 population census reveals that wood is the primary energy source for cooking for about 62% of households in Namibia. In Caprivi 89% of all households use wood for cooking (see Figure 5.2) and 80% of all dwellings are made from wood. However, most deforestation in the north central area and north-eastern areas of Namibia have resulted from land clearing for agriculture.

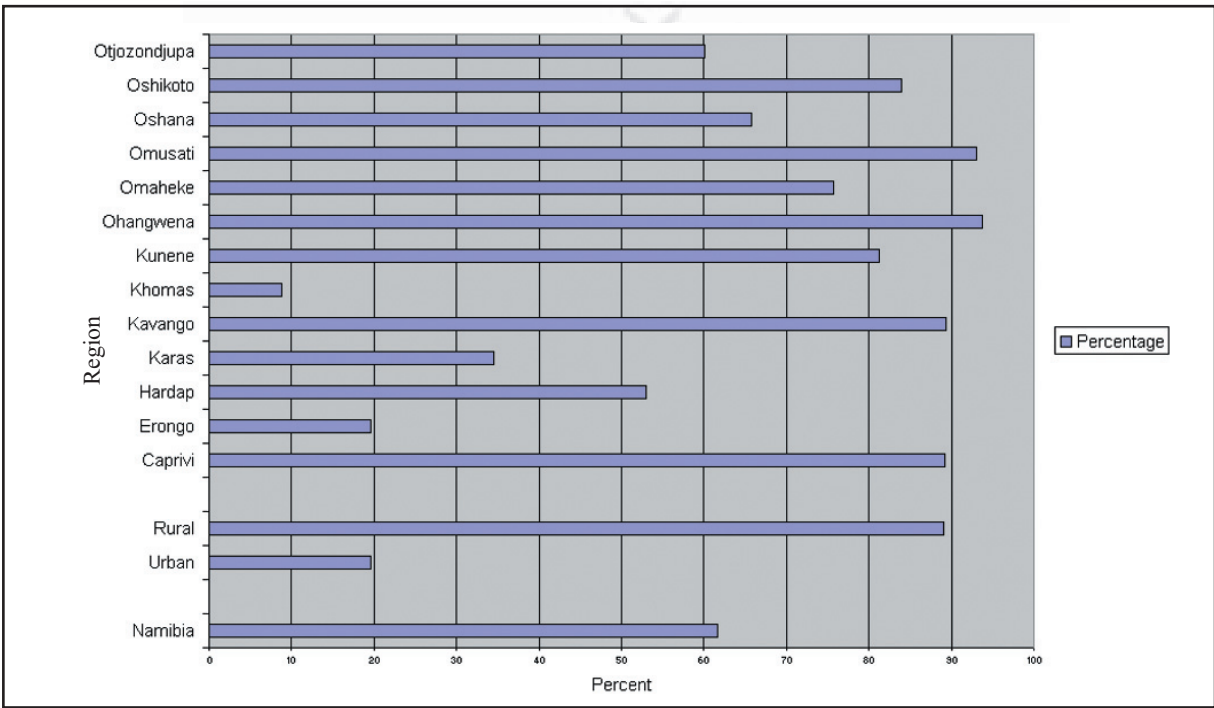


Figure 5.2: Percentage of Households Relying on Wood for Cooking (2001)

Riparian (Riverine) forests along the northern perennial rivers have been particularly badly deforested owing to human and cattle population pressure. This has led to destabilisation of river banks, soil erosion, reduced water quality, threats to biodiversity (invertebrates, mammals and bird species), and a noticeable reduction in available resources. Approximately 70% of the riverine vegetation has been lost along the Kavango River.

Developing woodlots and establishing forest plantations can help to alleviate some of the impacts of deforestation - but only partially. Although they reduce the rate of global warming and can provide some economic benefits, planted forests tend

to favour fast growing, exotic soft wood tree species. These are unable to support native birds, insects, mammals and other wildlife adapted to the natural vegetation of an area. In addition, exotic tree species can cause dramatic changes to the nature of the soil and can drain it of vital nutrients.

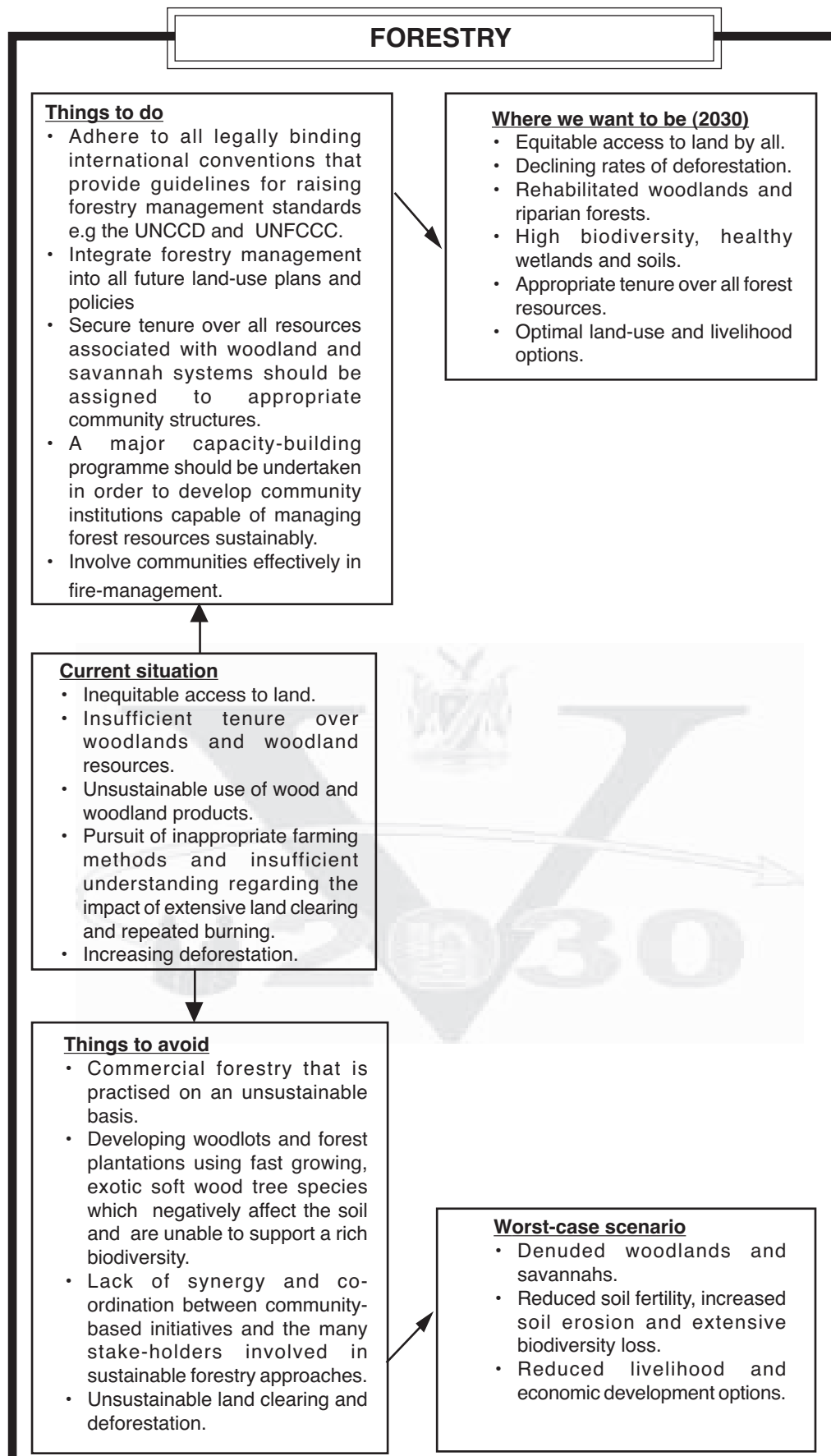
Alien invasive trees (including *Prosopis* sp. and *Nicotiana glauca*) are prevalent throughout the westward flowing ephemeral river systems. These exotic trees spread rapidly, do not support as much biodiversity and compete aggressively with indigenous species for water and space.

Government currently has inadequately qualified staff; community forest reserves still do not have management plans; a lack of knowledge regarding sound forest management; the destructive effects of over-harvesting; and repeated burning continue to undermine the good intentions of decentralisation. There is limited co-ordination between and support from land management ministries.

Sub-Vision

Namibia's diverse natural woodlands, savannahs and the many resources they provide, are managed in a participatory and sustainable manner to help support rural livelihoods, enhance socio-economic development, and ensure environmental stability.





Objective

To ensure equitable access to, and appropriate tenure over land, woodland and forest resources, as well as their sustainable utilisation.

Strategies

- Encouraging co-ordination between community-based initiatives and within the GRN and NGOs involved.
- Improving knowledge regarding the complex ecological processes involved in woodland ecosystems, in order to develop and implement appropriate management practices.
- Establishing education programmes focused on the all-encompassing value of natural forests and the consequences of deforestation. In particular focus on public awareness regarding the damaging effects of over-harvesting and fires.
- Enhancing professional competence and training within the forestry sector and develop incentives to retain qualified and motivated forestry officers.
- Protecting existing natural woodlands and increase their productivity by declaring Forest Reserves or Managed Areas (especially on uninhabited land that still supports healthy natural vegetation).
- Extending the Protected Areas Network to incorporate as many natural wetlands and river systems (and their accompanying vegetation) as soon as possible.
- Encouraging the rehabilitation of forest and vegetation cover in the catchment areas of the Chobe, Kwando, Okavango Rivers and on the ephemeral river systems which have suffered deforestation.
- Promoting appropriate land-use practices and habitat protection practices to all areas that are at risk of deforestation.
- Using bush encroachment species to manufacture charcoal, wood chips and other wood-based products. These products must be made easily available for the local population, thus relieving deforestation pressure in the most population-dense areas of the country.
- Supporting only those afforestation programmes that use appropriate indigenous species and/or harmless exotic species.
- Combating deforestation by encouraging the development of affordable and appropriate technology e.g. wood efficient stoves.
- Developing and maintain nurseries for indigenous tree species. Use these plants to rehabilitate degraded woodland and savannah ecosystems, and to encourage homeowners to plant indigenous rather than exotic species in their gardens.
- Providing incentives for sustainable forest management and education services, combined with appropriate and diversified land-use options.
- Promote the use of alternative fencing and construction materials, as well as sources of household energy.

5.2.3 Wildlife and Tourism

Tourism is an important employment generator in Namibia, particularly in the rural areas where most tourism activities occur. In addition Tourism contributes to Namibia's national economy through the provision of many diverse services including accommodation, restaurants, transport, entertainment and financial services. Currently there are limited data available in Namibia to analyse the 'multiplier' economic impact of tourism. Consequently the full contribution of this sector to the national economy is underestimated. In addition to its contributions to the national economy, Namibia's tourism industry is capable of:-

- Contributing to wildlife conservation and biodiversity protection;

- Contributing to poverty alleviation, particularly in rural areas, through direct and indirect employment; and
- Improving the earning ability of rural women and enhancing traditional Namibian culture by stimulating trade in basketry, pottery and other traditional crafts.

Land–use for tourism in parts of Namibia, outside protected areas, has extremely high economic potential. Through the CBNRM program, communities in communal areas invest in wildlife and benefit from the resulting tourism development opportunities.

Since Independence, tourism has grown rapidly from 254,978 international tourist arrivals in 1993 to 757,201 in 2002, representing a growth rate of almost 200 percent. It is also predicted that within a few years tourism will become the leading economic sector in our country. According to the World Tourism Organization (WTO²), the number of international tourist arrivals world-wide grew by 2.7% in 2002 after a decrease of 0.5% in 2001. In contrast, Namibia experienced a healthy tourist increase of 12.9% for 2002, indicating a competitive advantage. WTO² forecasts indicate that by 2010, Africa's share of international tourists will have more than doubled, taking 1995 as the base year. Globally, tourism accounts for one in every 12 jobs. According to a visitor survey conducted in Namibia by the Ministry of Environment and Tourism at the end of 2002, tourist expenditure in Namibia for that year amounted to approximately N\$4 billion.

Almost all tourists visiting the country expect a wildlife-centred experience – either through game-viewing, bird-watching, hiking, sport fishing or trophy-hunting. Namibia's biggest attraction is undoubtedly its sparsely populated, spectacular arid scenery and wide-open spaces. In today's over-crowded, rapidly developing world, natural environments are disappearing fast. Consequently, the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities that must be regarded as valuable natural assets. Preserving these assets is fundamental to developing tourism as a sustainable economic sector and helping Namibia to maintain a comparative advantage within the global market.

A total of 29 conservancies have been registered on State land by 2003, amounting to about 7, 405, 200 ha or nine percent of Namibia's total land mass. Approximately 40,000 people, usually above the age of 18, are currently signed up as registered conservancy members. However, the number of beneficiaries triples once people below the age of 18 are added. These registered conservancies are distributed across the Caprivi, Kunene, Erongo, Otjozondjupa, Omusati, Hardap and Karas regions, while additional ones are emerging in the Kavango, Oshikoto and Omaheke regions. A systematic approach towards the registration of communal conservancies is needed to halt the uncoordinated mushrooming of these conservancies.

Recovering wildlife populations on land outside State-owned parks, present economic opportunities. Conflicts between people and wildlife might increase, especially species that damage crops and predate on livestock. Innovative ways are needed to address such conflicts, principally by creating and facilitating opportunities for generating economic value out of such wildlife rather than the payment of compensation.



Community-based tourism (CBT) offers significant potential for economic development in rural areas. The benefits of CBT result from the employment of community members and cash income from tourism enterprises (which increased from N\$0.73 million in 1998 to N\$12.02 million in 2003). Tourists visiting CBT enterprises increased from 30,000 in 1999 to over 70,000 in 2002 and are projected to grow to more than 90,000 by 2004.

There is a growing interest among tourists not just in both marine and inland sport-fishing, but also to visit the seal colonies and to watch whales and other marine cetaceans.

Like all other economic activities, tourism uses resources, produces wastes and creates environmental, social and cultural costs and benefits in the process. Rapid growth in tourism aiming at short-term economic benefits, can easily result in more negative than positive impact - including the degeneration of traditions and cultural values, and environmental damage to tourist sites and natural settings.

Namibia's tourism sector operates in extremely arid and ecologically sensitive areas. Thus, it is essential that attention is paid to all potential environmental and social impacts that can result from tourism activities. These are summarised as follows:-

- Scarring of landscapes and damage to wildlife habitats through off-road driving and careless behaviour;
- The unsustainable use of scarce resources (e.g. water and wood);
- Pollutants from sewerage, domestic waste, chemical cleaners and litter;
- Intrusions on local cultures and values; and
- Economic distortions.

In many parts of the world tourism products have been ruined in a very short period of time as a result of *ad hoc* planning. To avoid a similar situation, a sustainable Tourism Master Plan was developed. This Master Plan seeks to increase high quality tourism activities with low impact on the environment. It implies an increase in the volume of high spending tourists who stay longer and travel to most parts of the country. Tourism products and benefits would be spread throughout the country to relieve pressure on some of the key attractions such as Etosha National Park, the coastal regions, Namib Desert and the eco-tourism products of the Northwestern regions. Cultural tourism will become a prominent product since it does not disrupt economic activities or invade the personal space of local people.

Tourism is already playing a very important role in economic development. However, its full potential has neither been explored nor exploited.

Sub-Vision

The integrity of Namibia's natural habitats and wildlife populations are maintained, whilst significantly supporting national socio-economic development through sustainable, low-impact, consumptive and non-consumptive tourism.

WILDLIFE AND TOURISM

Things to do

- Provide tourists with information on ecological and cultural values within the country of destination.
- Take effective steps to reduce the volume of waste associated with travel and tourism activities.
- Design tourist enterprises using low impact designs, materials and technologies, so as not to damage the environmental or cultural assets that tourists seek to experience and that sustain the local community. In other words, to maintain a *sense of place*.
- Distance publicly from any illegal, abusive or exploitative forms of tourism.
- Meet and preferably exceeding relevant national labour standards.
- Extend conservancies to new areas.
- Update State-owned park management and development, and diversify tourism development while placing strong emphasis on high value-low impact tourism.
- Promote the training of persons engaged in or entering the tourism industry, to ensure that they are adequately trained to provide quality services.
- Improve and accelerate income generation on conservancies to lessen dependence on Government and other providers of support.

Current situation

- Excellent progress made on CBNRM initiatives and private tourism enterprises.
- Sustainable Tourism Master Plan was developed and is ready for implementation.
- State-owned park management systems and tourism facilities need to be upgraded to reflect the modern standards of tourism and park management.

Things to avoid

- Poor tourism planning and a lack of a clear vision for the tourism industry.
- Declining standards of park management and land management in prime tourism areas
- Uncontrolled low quality mass tourism
- Tourists who negatively affect the experience and enjoyment of other tourists
- Anything that threatens Namibia's unique *sense of place*
- Uncontrolled water use and waste generation.
- Political instability, crime and regional problems that might threaten the tourism industry.
- Inadequately trained staff, poor service and poorly maintained facilities
- "Leakage" of tourism-generated foreign exchange.

Where we want to be (2030)

- Well managed parks and nature reserves.
- Well maintained camps in National Parks with excellent services.
- Strong partnerships between government and private sector.
- CBNRM extended into all viable rural areas to improve livelihoods.
- Protection of Namibia's unique tourism product-focus on low impact, high quality nature centred tourism.
- Strategic approach to tourism planning.
- Discerning tourists.
- Equity participation and distribution of benefits to enhance socio-economic empowerment of the previously disadvantaged communities.
- A multifold increase in contribution to our GDP, and will remain one of the key leading economic sectors in our country. Enterprise development on communal land (e.g. community-owned lodges, tourism information centres, tourism related infrastructure, high quality craft products, improved tour guiding systems).
- An efficient system of registering, licensing tourism enterprises and maintaining high quality standards, will be in place and funded by the collection of levies.
- Tourism and wildlife increasingly contributing to economic growth for sustainable development of Namibia.
- Ownership and management of the tourism and wildlife industry are representative of all Namibians.
- Namibia, as a tourist destination, offers a high quality experience, with high economic value to the country and low negative impacts on the environment and society.
- Healthy, diverse and productive wildlife populations of economically important species on land outside State-owned parks, integrated into economic activities on farmland, and making a significant contribution to the national economy.
- Modern and sustainably managed State-owned parks with diversified and regionally competitive tourism.
- Conservancy system that is self-sufficient through income-generation and dependency on Government only for technical advice and assistance.

Worst-case scenario

- Poor land-use planning and zoning result in prime tourism areas that have low direct-use value and/or ecologically sensitive (e.g. biodiversity hotspots) used for other activities (e.g. inappropriate agriculture).
- Loss of Namibia's unique tourist product and a "sense of place" due to mass.
- Poor service and maintenance of facilities.
- Over-utilization of wildlife due to uncontrolled offtake.

Targets for Community Based Natural Resources Management

Table 5.1 sets out the expected future growth and development of the CBNRM programme under two different scenarios. In the first, the programme remains focused largely on wildlife and tourism. In the second, the programme provides for a holistic, integrated approach to renewable natural resources, with conservancies being empowered to manage and hold group tenure over also their rangeland, woodland, water, freshwater fish and the land itself. Both scenarios show excellent results and returns, but the integrated and holistic approach offers far greater opportunities, and the basis for a truly innovative, empowering and appropriate form of sustainable rural development. The financial benefits to conservancies, from just the wildlife and tourism components of CBNRM, projected to 2030 and calculated on conservative figures, is shown in the chart below.

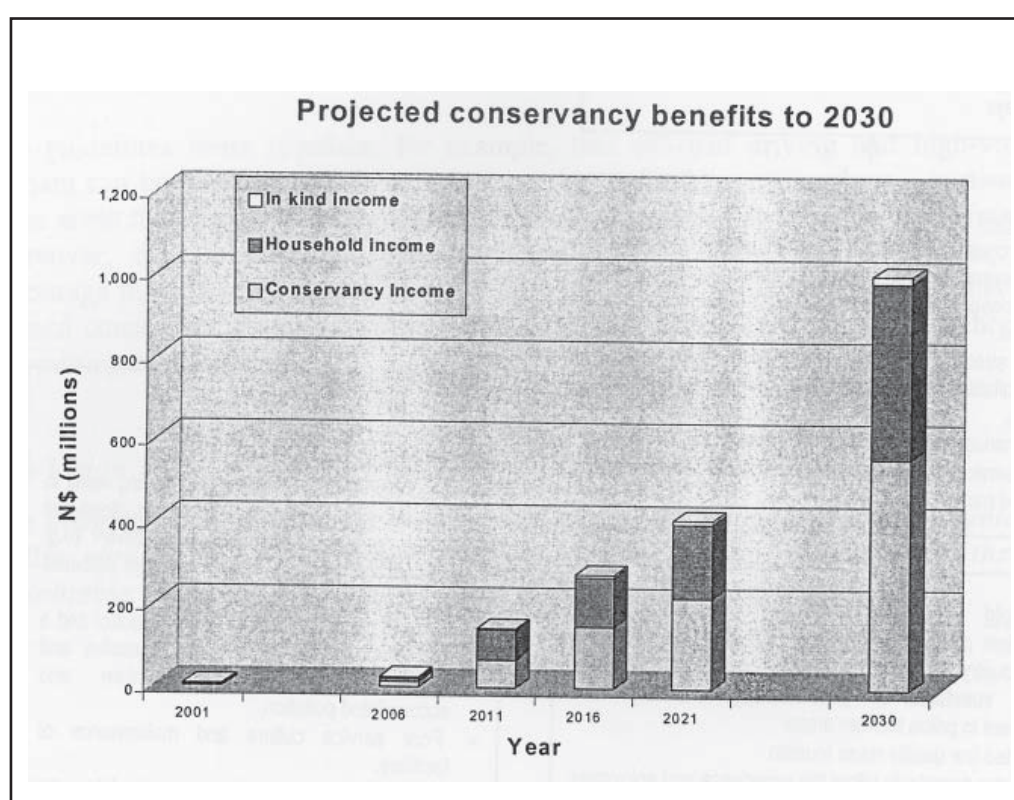


Figure 5.3: Projected Conservancy Benefits 2030

Table 5.1 Targets for Communal Area Conservancies

KEY INDICATORS	2003 Current Situation	2030 Scenario No. 1: Conservancy legislation primarily supports development of wildlife & tourism resources	2030 Scenario No. 2: Conservancy legislation expanded to allow management of other common resources (i.e. rangelands, community forests, water, etc.)
Number of registered conservancies	A total of 29 communal area conservancies have been registered as of December, 2001, while an additional 33 are at various stages of formation.	It is estimated that approximately 65 communal area conservancies could be registered for the specific purposes of developing and managing wildlife and tourism resources.	Should the GRN recognise conservancies as a common property management mechanism for other communal resources (i.e. rangelands, community forests, water, fresh water fisheries, etc.), then it is estimated that more than 160 conservancies could form on communal lands.
Number of hectares of land & natural resources managed through communal conservancies	7,405,200 hectares	It is estimated that 15,000,000 hectares of communal area would be suitable for management of wildlife & tourism resources. This is equivalent to 18.2% of Namibia's land mass (or 44% of communal lands).	It is estimated that a total of 24,000,000 hectares would be suitable for a conservancy common property management mechanism if rangelands & community forests were managed by conservancies. This is equivalent to 29.2% of Namibia's land mass (or 71% of communal lands).
Number of people benefiting from conservancies	40,000 are presently benefiting in registered conservancies, while more than 75,000 people are currently participating in the communal area conservancy movement.	Given a conservative population growth rate of 2.0% per annum (taking into consideration the impact of HIV-AIDS) and expansion of the conservancy movement to other parts of the country, it is estimated that over 250,000 communal area residents would benefit from conservancies by 2030 under the current legislation.	Given the same projected growth rate and, should the legislation be expanded to include other common property resources, then it is conceivable that more than 900,000 communal area residents could benefit from better managed natural resources by 2030.
Expansion of conservancy programme and wildlife habitats	Currently, conservancies are predominantly forming in parts of the Hardap, Karas, Kunene, Erongo, Caprivi, Omusati and Otjozondjupa regions.	Given the sparse settlement patterns and potential wildlife habitat, conservancies should cover many portions of the Oshikoto, Ohangwena, Kavango, Oshana, and Omaheke regions as well. As a consequence, wildlife (as an income generator and drawcard for tourism) will be more widely dispersed and supported throughout all of these regions.	Conservancies would be established in all regions under this scenario.

Links and partnerships between communal conservancies and commercial game farmers.	Very limited contact, with freehold conservancies now covering some 4 million ha and expressing an interest in closer collaboration	Close links and cooperation, resulting in sharing of expertise, translocation of wildlife, partnerships around trophy-hunting, capture and live sale, cropping and tourism; linked marketing, joint training, etc.	Expansion of natural resource management and enterprises to all natural resources. Close cooperation around agriculture, marketing, tourism, wildlife and forestry management, significant sharing of skills and opportunities, etc.
Income & benefits being generated in communal areas through tourism activities.	Presently, it is estimated that tourism enterprises in communal areas are generating approximately N\$58,233,000 in gross revenues, of which only N\$4,732,885 are documented as returning to community members.	Given the anticipated growth of the tourism industry (which is very conservatively calculated in the attached Annex), the anticipated increased in the number of joint ventures & community tourism enterprises, it is estimated that employment and cash benefits from tourism will exceed N\$3,978,450,000 by year 2030, of which more than N\$795,691,000 will be directly benefiting communities.	In addition to the massive benefits reflected in the previous column, the subsistence benefits to community members from better managed resources, will be reflected in improved livelihoods and reduced support costs to the GRN in managing its national resource base and the people dependent upon it.
Income & benefits generated from trophy & subsistence hunting and live game sales.	Presently, hunting concessions in communal areas are generating in excess of N\$3,217,000 of hunting fees. It is estimated that total revenues generated from hunting operations in these concessions generated more than N\$9,000,000 of which N\$1,350,362 was returned to conservancies in 2001. However, there is immense scope for increasing the number of concessions and the current off-take rate (which in nearly all instances is less than 3% of the huntable game populations.	Should conservancy game populations continue to expand, then it is possible to project increases of 20% per annum in returns for trophy hunting (i.e. through increased supply and exchange rate savings) and other subsistence uses of wildlife, bring the annual projected returns by 2030 to N\$844,893,255, of which conservancies and their members would directly receive N\$340,212,802 in benefits.	Should the veterinary red line be moved further northwards and eastwards, thereby allowing the conservancies in the Kunene and Otjozondjupa to sell live game, then estimated additional benefits of N\$62,000,000 could be realised by conservancies by the sale of live game by 2030.

Objective

To advance sustainable management of wildlife and tourism for the social and economic well-being of the people of Namibia.

Strategies

- Improving and accelerating income-generation on conservancies to lessen dependency on Government and other providers of support.
- Facilitating opportunities for people to derive economic value from wildlife species that impact on farming and livelihoods.
- Updating State-owned park management and tourism development, while placing strong emphasis on high-value, low-impact tourism.
- Providing adequate training for persons involved in the tourism industry, to ensure quality services.
- Developing and enforcing appropriate environmental and tourism legislation.

5.2.4 Fisheries and Marine Resources

Namibia's entire coastal zone falls within the Namib Desert and is characterised by low rainfall and limited freshwater resources. The inshore marine environment provides valuable migration and nursery habitats for many marine organisms.

Namibia's marine ecosystem is dominated by the Benguela Current, and supports vast populations of commercially exploitable fish species, some of which are shared with Angola and South Africa. The climatic conditions that determine prevailing winds, ocean currents, water temperature and fish stock distribution vary with temporary changes in the earth's atmosphere. As a result, the maximum sustainable yields of fish stocks fluctuate from one season to the next.

The marine fisheries sector is an important foreign exchange earner, and a significant employment generator for Namibia. Prior to Independence, the country's fishing industry was subject to open access and, as a result of poor management, overexploitation of some of the most productive fisheries occurred. After Independence, Namibia took firm control of the country's territorial waters and the marine fisheries sector grew rapidly - largely as a result of an increase in fish processing which adds value to landed fish. Since 1990, considerable improvements have been made regarding the monitoring and regulation of Namibia's fish stocks and the country's post Independence marine fisheries management policies have been commended internationally for their effectiveness and efficiency.

In order to prepare a long term vision for Namibia's natural resources, it is useful to look at the lessons learnt from global trends. At least 70% of the world's commercially important marine stocks are reported to be either in a state of depletion, in the process of collapsing or slowly recovering. Furthermore, many marine ecosystems throughout the world have begun to display signs of irreversible damage. The causes and consequences of declining fisheries and marine environment degradation are summarised as follows:

- Variable environmental conditions, which are difficult to predict and could increase in response to atmospheric changes linked to global warming.

- Poor management and overexploitation of fish stocks.
- Coastal degradation is currently limited in Namibia. However it is likely to increase with growing coastal development over the next 30 years. Human activities responsible for coastal degradation include: The draining and clearing of lagoons and estuaries; upstream dams, deforestation and agricultural and urban pollution, which have had a detrimental effect on water quality entering the river mouths, reducing their potential as a fish-nursery area; marine pollution, caused when seagoing vessels accidentally or purposefully deposit sewerage, oil and other wastes into the ocean.
- Fishermen inadvertently kill and waste large numbers of marine species when they target one economically valuable species.

An increase in exports of high value fish products to overseas markets is likely. In addition, more efficient trade and improved export markets for marine products to landlocked countries within the SADC region, are expected. Mariculture and low impact nature centred tourism are two areas where there is great potential for expansion.

Currently, there is limited aquaculture in Namibia, but it is a sector with great potential. Aquaculture can contribute towards sustained food security, income and employment for many Namibians.

Commercial marine aquaculture is limited to oysters, mussels and seaweed production in Lüderitz harbour and in salt-ponds around Walvis Bay and Swakopmund. Commercial freshwater aquaculture of tilapias and cat fishes is undertaken in the Hardap Dam. There are also small-scale operations raising fingerlings for sale to small scale aquaculture ventures at Ongwediva Rural Development Centre, Omahenene and Katima Mulilo. It is anticipated that culture-based fisheries will develop to complement and enhance the production of freshwater fish.

Sub-Vision

Namibia's marine species and habitats significantly contribute to the economy without threatening biodiversity or the functioning of natural ecosystems, in a dynamic external environment.

Fisheries And Marine Resources

Things to do

- Encourage local value-adding through domestic processing of fish products.
- Create marine reserves especially in areas suspected to be important for fish breeding,
- Improve access to knowledge regarding the marine environment.
- Ensure that data collection is standardised, stored adequately, and made easily available to technicians, managers and the public.
- Secure regional cooperation that enables access to and joint management of shared fisheries resources, including information exchange and joint research; harmonization of policies; coordinated policy implementation.
- Develop human capacity for the industry.
- Ensure that access to marine stocks continues to be regulated by quota allotments and strict fishing rights.
- Develop marine and freshwater aquaculture.

Where we want to be (2030)

- Sustainable yields reached and managed effectively to prevent overexploitation.
- Improved understanding of the dynamics of the Benguela system.
- Strict pollution control leading to increased exportation of high value fish and increased mariculture opportunities.
- Marine reserves and an increase in high earning, low-impact nature centred tourism activities.
- Intensive commercial marine and freshwater aquaculture.

Current situation

- Good monitoring and regulation of fish stocks by Government.
- Improved value-adding.
- Limited but increasing marine pollution.
- Limited understanding of Benguela ecosystem dynamics.
- Limited aquaculture.

Things to avoid

- Subsidising the fishing industry, creating tax breaks and market interventions that could encourage unsustainable fishing practices.
- The targeting of by-catch species and any activities that threaten marine biodiversity or cause pollution.
- All impact resulting from increased numbers of visitors to the coast (including litter, sewerage, water demand, traffic and noise).
- Avoid any new developments that do not have an acceptable Environmental Management Plan. Such developments could be harmful to human health and/or the environment, and threaten sustainable development.

Worst-case scenario

- Increasing pollution, coastal degradation and biodiversity loss.
- Industry becomes too powerful and exerts pressure on Government to allocate TACs that are unsustainable.
- Overexploited and declining fish stocks
- Reduced economic development and employment options.

Targets for Marine Resources

One optimistic scenario for fish harvesting predicts good recovery of fish stocks to maximum sustainable yields by 2016. On the basis of this scenario, the fisheries sector could experience a growth rate of 6-9% between 1998 and 2017.

Once maximum sustainable yields are reached, no further growth in harvesting can be expected, but if managed properly, and concerted efforts are made to ensure the value adding of harvested fish, this sector could remain a high earner on a sustainable basis beyond 2030.

The industry foresees an increase in exports of high value fish products to overseas markets. In addition, the opening of the Trans-Caprivi and Trans-Kalahari highways are expected to result in more efficient trade and improved export markets for marine products to landlocked country's within the SADC region.

In addition, there is considerable potential for expanding mariculture and diversifying the marine resources sector. In particular, nature centred tourism activities (for example, low impact whale/seal watching and visits to the offshore islands for bird-watching) provide ideal opportunities for economic growth.

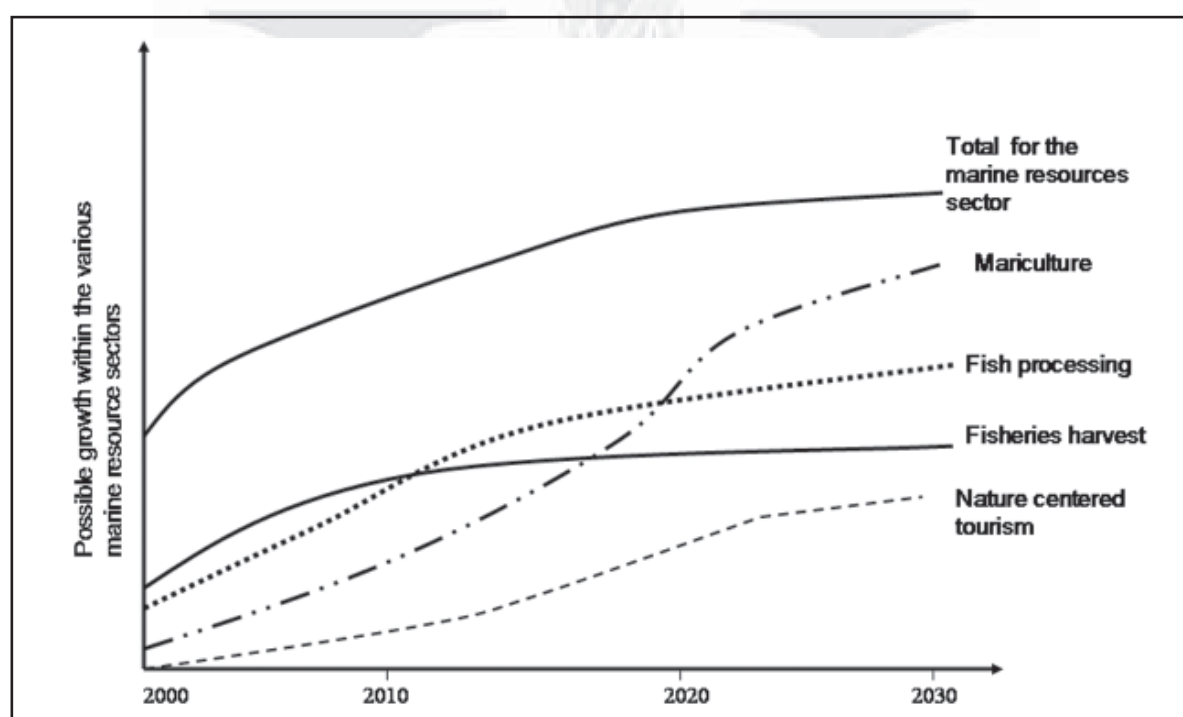


Figure 5.4: Possible Growth Within the Marine Resource Sectors (2000-2030)

It is important to note that Namibia's post Independence marine fisheries management policies have been commended internationally for their effectiveness and efficiency.

Objective

To achieve increasing and sustainable yields of fisheries and marine resources for the development of the economy and the benefit of the people of Namibia.

Strategies

- Setting TACs at conservative levels in order to promote the sustainability of resources and to enhance the recovery of depleted stocks.
- Adopting and implementing all the policies and programmes in support of sustainability and equity.
- Utilizing the services of expert consultants to assist Government fisheries scientists in setting their estimates for TACs.
- Developing new ways of adding value to Namibia's marine products.
- Improving awareness of market requirements for marine produce, and monitor market responses to Namibian products.
- Adopting and implementing a well researched ICZMP in an attempt to limit unnecessary coastal degradation, without restricting coastal development. This ICZMP aims to reduce conflict of interests in resource utilisation and ensures co-ordination and co-operation between the many stakeholders involved with coastal development, including sectors involved with fishing, urban development, tourism, offshore oil and shipping.
- Planning with care any future coastal developments (including those pertaining to tourism, town expansion and industry), and using of tools such as Environmental Impact Assessment, in order to avoid threats to communities and damage to natural areas and marine life.
- Developing strategies that create incentives for fishing companies to adopt more sustainable fishing practices (e.g. the introduction of by-catch fees).
- Enforcing regulations set by MARPOL which counteract all forms of marine pollution.
- Ensuring that all port authorities provide facilities for the retrieval and correct disposal of oily ballast water and other waste matter that accumulates on board ships.
- Continuing research, involving outside researchers, into the functioning of the marine environment and marine biodiversity.
- Establishing and maintaining mechanisms that secure financial resources that can feed directly into the marine fisheries sector and will boost the funds available for the maintenance and improvement of Namibia's marine capital (e.g. the Fisheries Investment Fund).
- Encouraging entrepreneurial drive and redirect investment so that environmentally friendly economic and livelihood options are opened up for the poor - e.g. promote small scale mariculture enterprise development.
- Identifying cost-effective, flexible and adaptable management approaches and national disaster response strategies to the potential impact of sea-level rise and other impact linked to climate change, that could affect the marine resource sector. Once identified, such impact must be incorporated into Namibia's national development plans.

5.2.5 Non-renewable Resources

Namibia is endowed with a rich variety of mineral resources. Diamonds remain the country's premier mining commodity, although uranium, gold, copper, salt, zinc, lead and fluorspar. semi-precious stones, industrial minerals and dimension stone are also produced. Mining related activities, other than formal mines include mining claims, NEPLs, EPLs, and formal mines. Currently there are only 15 active mines in Namibia.

Virtually all mining output is exported. In 1998, minerals represented approximately 36% of Namibia's merchandise exports, but contribution to GDP has fallen from approximately 28% in the 1980's, to current levels of between 12%-14%. In addition to its national importance, mining has stimulated significant infrastructure development, and has been responsible for supporting a variety of community initiatives, conservation projects, training and skills-development programmes and various other social causes in Namibia.

Despite rising costs, uncertain prices and variable labour relations, mining is likely to maintain its significant contribution towards Namibia's socio-economic development over the next three decades. The small-scale mining sector is expected to grow in relative terms and there is the possibility for the development of "mining tourism", where operating mines provide tourism experiences, such as going underground or searching for diamonds. In the case of the Swakopmund salt mine, the idea of mining-linked tourism can be developed further – to embrace a nature centred experience, as this mine is also a registered private nature reserve and one of the best localities in Namibia for observing shorebirds.

If poorly planned or badly managed, mining can result in a great variety of impacts which threaten human health and environmental integrity. However, with modern Environmental Assessment applied during planning and the implementation of EMP during the operational phase, mines in Namibia are increasingly better planned, and negative impacts can usually be mitigated and localised. Moreover, mines are under increasing pressure to obtain ISO certificates which would enhance their chances of selling their commodities to Western markets. Despite these recent improvements, a century of mining with little or no planning to reduce environmental damage, has impacted heavily upon large areas in Namibia, especially in the Namib Desert. There are currently approximately 40 abandoned, unrehabilitated mines in Namibia, of which 40% are in nature reserves.

Sub-Vision

Namibia's mineral resources are strategically exploited and optimally beneficated, providing equitable opportunities for all Namibians to participate in the industry, while ensuring that environmental impacts are minimised, and investments resulting from mining are made to develop other, sustainable industries and human capital for long-term national development.

NON-RENEWABLE RESOURCES

Things to do

- Develop land-use plans that identify the most economically viable land-use options for Namibia's thirteen regions, and which set clear guidelines for zoning (i.e. setting aside specific areas where mining should be restricted).
- Enact the Environmental Management Bill and ensure that all mining activities are preceded by an EA study, and that EMPs are developed and implemented.
- Affected communities must be informed about the potential environmental impacts of mining activities in their area.

Where we want to be (2030)

- Mining well planned, resulting in minimal, if any, impacts on human health and the environment.
- All mines fully rehabilitated after closure.
- Investments resulting from mining are used to develop other sustainable industries and human capital for long term national development.
- Strong small-scale mining sector.

Current situation

- Mining contributes significantly towards Namibia's socio-economic development.
- Mining companies have stimulated infrastructure development and supported a variety of community initiatives, training and skills-development programmes.
- Currently there are approximately 40 abandoned, unrehabilitated mines in Namibia, of which 40% are in nature reserves.
- Mines are increasingly better planned and mining management shows improved awareness of environment and human health issues.

Things to avoid

- Inappropriate prospecting and mining activities, especially for low value minerals within protected areas and areas of high ecological sensitivity and/or tourism potential.
- Abandonment of prospecting sites and mines without appropriate rehabilitation.

Worst-case scenario

- Poorly managed mining activities result in a variety of hazardous impacts that threaten human health and environmental integrity.
- No mine rehabilitation.
- Mines established in ecologically sensitive areas in absence of zoning.
- No investment made to support other sustainable economic activities.

Objective

To exploit Namibia's non-renewable resources optimally and equitably for the benefit of all.

Strategies

- Setting targets in the EMP to be met by management, and indicators that track progress towards a more sustainable mine. It is the responsibility of the mine managers to ensure that every staff member understands the goals of the EMP
- Enacting and implementing Namibia's Pollution Control Bill.
- Ensuring that hazardous waste is handled and disposed of in the safest way possible, and that
- Ensuring that mines hold the ultimate responsibility for cleaning up their own polluting wastes. This will encourage a reduction in the amount of waste that is produced.
- Ensuring that mines obtain ISO 14001 certificate, because this will enhance their chances of selling their commodities to Western markets in future decades.

5.2.6 Biodiversity

Namibia's biodiversity and wildlife resources

Biodiversity may be defined as the variety and variability among living organisms and the natural environments in which they occur. Namibia's biodiversity includes innumerable species of wild plants and animals, which inhabit the country's six major biomes. Only a small number (possibly as little as 20%) of Namibia's wildlife species have been described to date. Of the 13 637 species that have been described, almost 19 % are endemic or unique to Namibia. This high prevalence of endemic species is most pronounced in the Namib Desert and pro-Namib transition zone.

The critical importance of Namibia's wildlife resources

Despite the fact that only some species are directly useful to humans as sources of food, fibre, medicine or tourism, all species, even those that are too small to see, are of ecological importance. Natural ecosystems provide vital genetic material (an invaluable resource that is regularly required to enhance domestic crop and livestock species), as well as the indirect benefits associated with certain ecosystem functions. These include the provision of life sustaining air, water and productive soils.

Biodiversity loss

Although it may not always be obvious, no environmental crisis will have a more lasting impact on future generations than the widespread loss of biodiversity. Each time a species is lost, our ecosystems become less complex. As ecosystems lose complexity, outbreaks of pests and disease become prevalent and essential ecological functions become disrupted. Ultimately, the loss of wild species increases vulnerability to drought, floods and other extreme events like global climate change. In turn, these impacts threaten food supplies, sources of wood and medicines, and the ability of rural communities to sustain themselves. Direct causes of biodiversity loss include:

- The loss, fragmentation and conversion of natural habitats (due to deforestation, land degradation, urban development, etc). Most severely

threatened habitats are riparian forests along the banks of the perennial rivers, wetlands, woodland and savanna biomes.

- The unsustainable harvesting of wild plants and animals and wildlife products
- Air, soil and water pollution
- The introduction of alien invasive organisms that threaten the survival of indigenous species
- Water management schemes and the regulation of perennial river flow by dams.

Human population pressure, poverty, the lack of secure and exclusive tenure and insufficient intersectoral policy co-ordination are the most important indirect causes of biodiversity loss in Namibia. It can be assumed that those areas in Namibia that have the highest human population and livestock densities, and which have been subjected to extensive land clearing, are those that have suffered the highest losses in biodiversity.

Many wetland sites are parts of larger systems, usually with significant components in unprotected areas or in other countries. This means that transboundary and multisectoral approaches are usually needed for their effective management. Other transboundary biodiversity conservation challenges exist. For example, the extensive wildlife herds that migrate seasonally between northern Botswana, north-eastern Namibia, Zimbabwe and parts of Zambia and Angola must be considered as valuable shared resources – together with certain ecosystems (particularly those associated with rivers). The successful conservation of this entire area within SADC, and the ultimate survival of its tourism industry, will depend to some extent on the establishment of a cross-boundary conservation zone, linking unspoiled habitats and some of the established parks in these five countries.

The importance of wildlife harvesting to subsistence economies

Currently about 67% of Namibia's population live in rural areas. At a national level it is estimated that 33% of total household consumption in rural areas comes from wild foods. The most important wild products that are harvested include: firewood, wood for construction and woodcarvings; thatching grasses; medicinal products and veld foods (from nuts, fruits, leaves, roots and bark, meat from game animals and fish).

There is no conflict between using natural resources and the notion of conservation, provided that resources are used sustainably and equitably.

Contribution of protected areas to wildlife conservation and biodiversity protection

Namibia's national parks and reserves remain the principal means of maintaining essential ecological functions and conserving biodiversity and scenic areas. The wildlife resources within the parks are used for tourism, capture for resale, research and education. Despite this, Namibia's parks and reserves face many challenges including:

- Lack of linkages to local, regional, and national planning and management systems, which sometimes leads to inappropriate development within protected areas
- Increasing pressure for protected areas to be used for emergency grazing or reallocation due to land reform
- Communities generally see parks as land that only benefits government and foreign visitors

- Parks are extremely expensive to run and maintain. Only a small percentage of the funds generated by Namibia's National Parks are put back into park management.

It is now generally accepted that to make conservation efforts sustainable, they must contribute in some meaningful way towards rural development. Conservancies and CBNRM initiatives have had much success in this regard since 1996.

Conservation outside protected area: Conservancies and CBNRM initiatives

Namibia's conservancy programme meets most of Namibia's National Development objectives – it has created employment, provides economic and managerial empowerment, enhanced rural development, helps to alleviate poverty and, at the same time, has contributed to biodiversity conservation.

Conservancies offer opportunities for communities in remote communal areas to generate cash revenues and employment. At present, conservancies have legal rights over a narrow resource base that includes wildlife and tourism. However, eventually conservancies could become common property management bodies responsible for managing all natural resources, including land, rangelands, forests, fresh water fisheries, and water. To date, 29 communal conservancies have been registered and an additional 33 are under development. The registered conservancies encompass approximately 4 million hectares of prime wildlife habitat, while the emerging conservancies cover an additional estimated 5-7 million hectares. Currently, more than 30,000 people benefit directly from improved resource management in registered conservancies, and an additional 60,000 – 80,000 will soon fall under the conservancy umbrella.

Conservancies receive the majority of their income from the tourism industry. The comparative advantages of this industry over other subsistence uses of natural resources (e.g. livestock grazing) is immense. Most tourists are willing to pay for high quality, low impact nature-centred experiences with foreign exchange. In addition, anticipated growth in the world tourism industry is high. Provided it looks after its unique tourism product, Namibia is likely to be the chosen destination for many affluent tourists seeking a nature centred experience, in the decades to come.

A direct result of devolving rights and responsibilities to communities over wildlife has been a dramatic increase in wildlife numbers outside of protected areas. This in turn has led to community empowerment and local management of the resource.

Despite these successes, certain policy constraints threaten the conservancy programme's long-term potential. In summary,

- Wildlife tourism is not yet recognised as a valid land-use option that can replace other direct land-uses (like agriculture) in certain areas.
- Supportive legislation to assist conservancies with integrated resource management plans has not yet been developed.
- NGO's and the private sector are vital partners in the CBNRM programme. Private sector investment incentives in communal conservancies must be developed.

Projections to the year 2030

By 2030 approximately 65 communal area conservancies covering approximately 15,000,000 hectares (44%) of communal land, could be registered for the specific purposes of developing and managing wildlife and tourism resources. It is estimated that over 250,000 communal area residents could benefit from these conservancies. However, if group tenure within conservancies is extended to rangeland, woodland, water, freshwater fish and the land itself, many more opportunities and benefits will arise. This will, however, demand strong partnerships and significant sharing of skills and opportunities between agricultural, marketing, tourism, wildlife and forestry management personnel from the GRN, private sector and NGOs. Under this scenario, projections to 2030 may be summarised as follows:

- Approximately 160 conservancies could be established on communal lands, covering an estimated 24,000,000 hectares (equivalent of 29.2% of Namibia's land mass or 71% of communal land)
- More than 900,000 communal area residents could benefit from better managed natural resources under this scenario
- There will be improved livelihoods and reduced support costs to the GRN in managing its national resource base and the people dependent upon it
- Should conservancy game populations continue to expand, then it is possible to project increases of 20% per annum in returns for trophy-hunting (i.e. through increased supply and exchange rate savings) and other subsistence uses of wildlife, bring the annual projected returns by 2030 to N\$844,893,255, of which conservancies would directly receive N\$340,212,802 in benefits.

Sub-Vision

The integrity of vital ecological processes, natural habitats and wild species throughout Namibia is maintained whilst significantly supporting national socio-economic development through sustainable low-impact, high quality consumptive and non-consumptive uses, as well as providing diversity for rural and urban livelihoods.

Biodiversity

Things to do

- Combat poverty and population growth.
- Recognise that wildlife tourism on communal land is a valid land-use option with high potential to combat poverty, stimulate rural development and conserve biodiversity.
- Create incentives for landowners and managers to diversify into wildlife and tourism in more efficient and cost effective ways.
- Continue to extend conservancies into all viable areas on communal land.
- Encourage and develop private sector investment incentives in communal conservancies. NGOs and the private sector are vital partners in the CBNRM programme.
- Enforce legislation regarding the illegal export of indigenous species and the import and/or propagation of alien invasive species.
- Ensure that all important Namibian ecological diversity are represented in State-owned parks;
- Strengthen management and biodiversity conservation-value of State-owned parks by improving management planning and the financial resources for implementation;
- Update the management and tourism infrastructure in parks to maintain Namibia's competitiveness as a tourism destination

Where we want to be (2030)

- Diminished rates of biodiversity loss.
- Rehabilitated and productive riparian forests, woodland and savannah biomes.
- CBNRM extended into all viable rural areas.
- Equitable access to and appropriate tenure over all natural resources through CBNRM initiatives.
- Strong partnerships and significant sharing of skills and opportunities between GRN, private sector and conservancy stakeholders.
- Extended and well managed protected areas network to include biodiversity "hotspots" and trans-boundary areas.
- Improved land-uses and optimal livelihoods achieved.
- Vibrant, productive rural areas.

Current situation

- Habitat loss due to human population pressure, poverty, the lack of secure and exclusive tenure and insufficient inter-sectoral policy co-ordination.
- Insufficient understanding of the importance of Biodiversity to human and economic health.
- Inadequate network of protected areas and poor management of parks.
- Excellent progress made on conservation efforts outside of protected areas as a result of CBNRM initiatives.

Things to avoid

- Sectoralism, which results in limited co-ordination between the various sectors that deal with natural resources.
- No land-use planning and zoning off of certain areas for different economic activities.
- Deforestation, and other unsuitable land management practices that cause land degradation, to continue.
- Inadequate protection of natural wetlands and riverine systems and their accompanying flora and fauna;
- Over-exploitation of freshwater fish, riverine vegetation and all other natural resources.
- Failure to protect Namibia's threatened and endangered species.
- Preventing NGOs and the private sector continuing their support of the CBNRM programmes.
- Inadequate and/or inconsistent implementation of Namibia's Environmental Management Bill, Waste Management and Pollution Control Bill and other legislation that aims to ensure sustainable development with minimal costs to human health and the natural environment.

Worst-case scenario

- Rapid rates of biodiversity loss resulting in outbreaks of pests and threats to human health.
- Increased vulnerability to drought, environmental change and loss of productivity.
- Threats to food supply, sources of medicines and wood.
- Reduced livelihood options and increasing rural poverty.
- Decline in Namibia's tourism potential.

Objective

To achieve diminished rates of biodiversity loss and ensure equitable access of all Namibians to and appropriate tenure over all natural resources.

Strategies

a) Improving the policy environment regarding land-use management by:

- Developing economically and ecologically viable land-use plans that identify the most suitable land-use options for Namibia's thirteen regions, and which set clear guidelines for zoning (i.e. setting aside specific areas for low impact, high quality tourism and others for direct use activities like agriculture and mining).
- Implementing the Environmental Management Act. This will help to reduce threats to human health, ecosystems and resources from poorly planned development activities.
- Developing supportive legislation to assist conservancies with integrated resource management plans.
- Including representative parts of all important Namibian biodiversity in State-owned parks;
- Strengthening management and biodiversity conservation value of State-owned parks by improving management planning and the financial resources for implementation;
- Updating the management and tourism infrastructure in parks to maintain Namibia's competitiveness as a tourism destination.

b) Introducing as many economic instruments as possible, which can be used to help finance sustainable development options and/or discourage environmentally unfriendly practices that threaten human health and limit long-term economic prosperity. These include:

- Introducing tax reforms and environmental taxes by taxing environmentally unfriendly or pollution-generating imports and inappropriate land use practices;
- Reducing subsidies that encourage environmentally unsound practices (for example the use of pesticides, water and coal which threaten biodiversity and environmental health in general);
- Establishing and maintaining the EIF to help ensure that at least some of the revenue generated from tourism activities in state owned parks, will be used to help conserve the environmental resource base;
- Providing loans, grants or subsidies that will encourage sustainable, environmentally friendly practices (for example, the use of solar and other renewable energy resources; Integrated Pest Management practices, instead of highly polluting pesticides); and
- Implementing strict "polluter pays" principles through the Waste Management and Pollution Control Bill.

c) Improving the knowledge base regarding natural resources and biodiversity in Namibia through:

- Training and improved finances for relevant research and monitoring; and
- Recognizing and utilizing local (indigenous) knowledge held by rural communities about their environment.

d) Developing and implementing initiatives aimed at the transboundary management of north-eastern Namibia and the Namib Desert.

e) Combating deforestation and loss of habitat through land degradation, by providing rural communities with electricity and/or renewable energy sources.

5.3 THE URBAN ENVIRONMENT

Urban environments play a vital role in the provision of employment, shelter, services and as centres of education. They hold promise for sustainable development because of their ability to support a large number of people, while limiting their *per capita* impact on the natural environment. However, the rapid amassing of people in towns and cities can have tremendous impact and managing the urban environment sustainably has become a major global challenge. An important part of meeting this challenge is *planning*. The locality of a town, and the way in which it is built and managed, will ultimately affect the quality of life of its residents.

In Namibia, rapidly growing informal settlements on the outskirts of towns are generally associated with localised deforestation, increasing waste management problems, increasing crime, poverty, limited access to adequate sanitation and isolated incidents associated with the spread of communicable, waterborne diseases. There is also the growing problem of unemployment. Unemployment in Namibia's urban areas is currently estimated at 31.5 %; about 37% of women and 27% of men in the labour force are unemployed.

Rapid urbanisation in Namibia has occurred largely as a result of high rates of population growth, drought, a decline in the ability of the land to support growing populations and the perception that there is an easier and better life in towns and cities. Namibia's current rates of urbanisation are high and 75% of the country's population could be living in towns and cities by 2030.

Local Authorities in the larger towns are autonomous in most aspects of their management. However, skills and expertise are concentrated in the Windhoek and Walvis Bay municipalities, whilst smaller municipalities have to rely on external consultants and/or the Ministry of Regional, Local Government and Housing for their human resources.

While Environmental Assessment has been seen as a means of reducing unnecessary impact upon human health, the land and resources, legislation has yet to be passed and this planning tool is inconsistently implemented during urban developments.

Thus far, only two local authorities in Namibia (the Windhoek and Walvis Bay municipalities) have introduced Local Agenda 21 initiatives. There is insufficient public awareness of Agenda 21 and environmental issues in general. Environmental issues appear to be a relatively low priority on personal and political agendas in Namibia, in both rural and urban environments.

Since Independence, the formation of parastatal organisations for electricity and water supply has provided the opportunity to improve service provision and efficiency. The establishment of Namibia's Water and Sanitation Committee in 1990 has led to an improvement in access to potable water and sanitation facilities. At Independence less than 50% of the rural population had adequate access to a reliable source of safe water. The 2001 census report shows that about 98 % of

urban and 80% of rural households have access to safe water. The report also shows that over 70% of the households in the urban areas use flush toilets, compared to less than 10% in rural areas.

Despite these notable improvements, declining water quality is a problem even in many improved water supply systems. Although the spread of waterborne diseases in Namibia's growing squatter areas is low, problems periodically emerge even in the dry, desert towns. For example, during May 2001 an outbreak of diarrhoea in the squatter area outside Swakopmund caused 25 people to be hospitalised during the east wind period.

While equitable access to health facilities and health education has improved considerably since the early 1990's, medical services are still affected by a shortage of adequately trained medical doctors. Health services are expected to deteriorate as the health care system becomes over-burdened with HIV/AIDS patients, and there is a brain-drain of well-qualified doctors and nurses.

Although local authorities in some of the major towns (in particular Walvis Bay and Windhoek) and the private sector have made efforts to improve waste management, there has been inadequate commitment to provide incentives for improved waste management and pollution control – particularly the reduction, recycling and re-use of waste materials and the adequate handling and disposal of hazardous wastes. Illegal dumping in green spaces and dry river beds has developed into an immense problem in all urban areas.

Regardless of Namibia's problems relating to waste management, some exciting zero emission (ZERI) projects have been proposed by NGOs and the private sector. The UNAM Integrated Bio-system project provides an excellent example.

There has been improved access to urban land and incentives to invest in and develop land through the systematic proclamation of smaller towns and the adoption of the National Housing Policy. The self-help *Build Together Programme* (BTP) provides low interest rate loans to individuals. This programme has helped many families in peri-urban areas to build their own homes. Despite these efforts, the BTP has managed to redress only less than 3% of Namibia's housing backlog per annum – a figure which, due to population growth and the increasing number of informal settlements in urban areas, has begun to decline.

There has been good progress in road development. In particular, there has been a dramatic upgrading of roads and infrastructure in formerly neglected parts of Namibia.

Despite Namibia's trends regarding increasing crime and domestic violence, services to protect civilians, provide support to victims of violent crime or shelter for the growing numbers of AIDS orphans, remain inadequate. Namibia's Police Force suffers from limited resources, and the small numbers of victim shelters that exist are inadequate and mostly run by volunteers and NGOs, with a shortage of funds and little or no support from the authorities.

Sub-Vision

Despite high growth rates, Namibia's urban areas will provide equitable access to safety, shelter, essential services and innovative employment opportunities within an efficiently managed, clean and aesthetically pleasing environment.

The Urban Environment

Things to do

- Maintain population growth at sustainable levels
- Slow down rates of urban migration aim for economically sound and environmentally safe sustainable rural development options (e.g. CBNRM initiatives)
- Practice responsible architecture – design buildings around the environment, not bulldoze through it.
- Develop Youth Clubs run by trained adults, in all areas, and create recreation centres.
- Make Windhoek and all of Namibia's large towns "Cyclist friendly". This will reduce traffic congestion and contribute to mitigating the effects of Global Warming.
- Identify and implement cost-effective, flexible and adaptable management approaches and national disaster response strategies to the potential impact of sea-level rise for each coastal settlement.
- Reduce the spread of HIV/AIDS.

Where we want to be (2030)

- Healthy, self-sufficient rural populations and reduced rates of rural-to-urban migration.
- Well planned, well managed, clean, safe and aesthetically pleasing urban areas.
- Recreation facilities (parks, monuments, museums, etc) available in cities.
- Equitable access to land and essential services.
- Opportunities for innovative and sustainable employment.
- Pro-active, citizens with high levels of civic pride, involved in decision-making.

Current situation

- High rates of urbanisation, unemployment and increasing urban crime.
- Improved provision of essential facilities and services (shelter, water, sanitation, roads and health) to all urban areas since Independence.
- Poor knowledge of Local Agenda 21 initiatives.
- Insufficient sharing of knowledge and experience between the larger more established local authorities and smaller ones.
- High incidence of peri-urban deforestation and illegal dumping.
- Poor hazardous waste-control and limited efforts at reducing and recycling wastes.
- Inadequate services to protect civilians, provide support to victims of violent crime or shelter for the growing numbers of AIDS orphans.

Things to avoid

- No effort to enhance sustainable rural development and land-use options.
- A lack of planning which paves the way for environmental degradation, overburdening of existing infrastructure, a lack of access to suitable land, adequate shelter and essential services.
- Urbanisation spilling over in an ad hoc manner into:
 - Sensitive coastal areas, causing the destruction of valuable ecosystems and their resources.
 - Reclaimed wetlands
 - Areas that could be used for agricultural purposes.
- No effort to develop Local Agenda 21 initiatives
- Discouraging decentralisation and public participation
- Limited waste management and hazardous waste control especially in green spaces and informal urban areas.
- Uncontrolled crime
- Negligent governance, which ignores vital issues pertaining to sustainability; decentralisation; efficiency; accountability; public participation; and security.
- A loss of green spaces in urban areas, noise pollution and aesthetically unpleasant sights and smells which can erode civic pride, lower morale and result in a loss of well-being amongst urban residents.

Worst-case scenario

- Aesthetically unpleasing, uncontrolled urban sprawl and informal areas.
- Increasing poverty and uncontrolled crime.
- Health hazards associated with poor waste management and limited access to adequate water supplies and sanitation services.
- Citizens with low morale, limited civic pride and minimal involvement in decision-making.

Objective

To achieve integrated urban and rural development in which there are opportunities for innovative and sustainable employment, with well planned, well managed, clean, safe and aesthetically pleasing urban areas.

Strategies

- a) Incorporating a clear urban development plan into the national development plans, to reduce the need for land conversion, improve infrastructure for water supply, provide opportunities for water and energy savings and to make recycling of waste and water more cost effective.
- b) Implementing HIV/AIDS reduction policies, plans and programmes.
- c) Improving urban environmental management by:
 - Developing more effective waste collection systems through public/private partnerships (especially those that encourage to use of informal labour).
 - Implementing strict legislation for the treatment of hazardous wastes
 - Adopting sustainable energy policies that are cost effective and environmentally friendly.
- d) Harmonising objectives and policies and ensure close coordination of actions between GRN and the private sector on issues to do with pollution control, child welfare and crime prevention.
- e) Improving urban governance through:
 - Drafting Local Agenda 21 Action Plans for each Urban Settlement – thus aiming for social, economic and environmental sustainability.
 - Decentralising responsibilities and resources to the lowest appropriate level;
 - Developing effective partnerships with and among all actors of civil society (particularly the private and community sectors);
 - Making local authorities accountable to their citizens, improving access to Government information;
 - Encouraging public participation in all decisions regarding urban development;
 - Striving to create and maintain safe public spaces (e.g. involve citizens in crime prevention or developing a public awareness campaign to encourage gender awareness and tolerance of diversity).
- f) Developing suitable and caring shelters for victims of violent crime, domestic violence, street children and the growing number of AIDS orphans.
- g) Encouraging town-to-town co-operation and exchange of experiences, and lessons learnt.