Republic of Namibia

Ministry of Environment & Tourism

A STRATEGIC MANAGEMENT PLAN FOR
MUDUMU LANDSCAPE
2012 - 2015

ACKNOWLEDGEMENTS

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The plan was put together by Brian T.B. Jones of the Environment and Development Trust on behalf of the Landscape partners. It was compiled largely using existing work carried out by Mudumu Landscape partners and stakeholders, who also commented on an initial draft.

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LIST OF ABBREVIATIONS AND ACRONYMS

HWC	Human Wildlife Conflict
KAZA TFCA	Kavango/Zambezi Transfrontier Conservation Area
MET	Ministry of Environment and Tourism
MNC	Mudumu North Complex
MSC	Mudumu South Complex
PA	Protected Area
TA	Traditional Authority

CHAPTER 1 *INTRODUCTION*

This document sets out a Strategic Management Plan for the Mudumu Landscape, Caprivi Region, Namibia. The plan builds on a number of existing management plans that have been developed for different management units within the landscape. These include the management plans of conservancies, community forests, the Mudumu North Complex (MNC), the Mudumu South Complex (MSC), the Five-year Strategic Plan for the Mudumu Landscape Association, and the Kwando-Linyanti Integrated Tourism Development Plan. The Landscape Strategic Management Plan addresses key threats to biodiversity and addresses the human and social dimensions of conservation in an area where people are mostly poor and dependent upon the land and its natural resources for their livelihoods.

This Strategic management Plan for the Mudumu Landscape also strongly builds on the concept of collaborative or "co-management". Both the MNC and the MSC emerged from the need for co-management between the conservancies, community forests and park staff of the Mamili, Mudumu and Bwabwata national parks. A strong co-management ethic has been developed in these complexes which should form a solid foundation for the implementation of this Strategic Landscape Management Plan.

An important aim of the plan is to promote cooperation between different sectors and organisations in the sustainable development of the Landscape and in particular to involve the Caprivi Regional Council, the Ministry of lands and Resettlement and the Ministry of Agriculture, Water and Forestry.

The Mudumu Landscape (Fig.1) covers the area from the Mamili-Nkasa/Lupala National Park in the south to the border with Zambia in the north including part of the State Forest. The Sobbe and Dzoti conservancies form the eastern most management units. The Landscape also includes the eastern or Kwando core area of the Bwabwata National Park. The component land units of the Landscape are shown in Table A1 in Annexe 3.

CHAPTER 2 *REGIONAL AND INTERNATIONAL IMPORTANCE OF THE MUDUMU LANDSCAPE*

The Mudumu Landscape is an integral part of the Kavango-Zambezi (KAZA) Transfrontier Conservation Area (TFCA). KAZA is the world's largest TFCA covering over 280,000 km^2 of land across Zambia, Angola, Namibia, Botswana, and Zimbabwe. KAZA aims to improve management of shared resources, increase biodiversity, re-establish historical game migration routes and improve opportunities for tourism to benefit rural communities in this area. In many ways the Mudumu landscape can be considered a central focal point of KAZA (see Fig. 2) as it provides a corridor for the movement of wildlife (particularly elephant) from Botswana in the south through to Zambia and Angola in the north. The Landscape links Wildlife Management areas in Botswana and the Chobe National Park with protected areas in Namibia, community conserved areas in Namibia, the Luiana National Park in Angola and the Sioma-Ngwezi National Park in Zambia.

CHAPTER 3 *PURPOSE AND STRUCTURE OF THE STRATEGIC MANAGEMENT PLAN*

3.1 Purpose

The main purpose of this plan is to set out the Vision, Objectives and main Strategies for sustainable development in the Landscape based on the use of renewable natural resources. This plan does not address detailed management strategies and activities. These are already contained in the management plans and work plans of MET, the conservancies, community forests and the complexes. In addition the Strategic Management Plan of the Mudumu Landscape Association provides a framework for how the Association will contribute to achieving the Vision and Objectives of the Landscape.

This Landscape Strategic Plan therefore focuses on the key strategies required at the landscape level to enable and facilitate the more detailed management activities that take place at complex and conservancy/community forest level. There is thus a strong focus on issues such as coordination, collaboration, developing partnerships and securing support for the Vision and Objectives from key decision-makers at local and Caprivi regional levels. This plan also sets out some policy guidelines on key issues that are managed mainly at the Landscape level, and where strategically important, also provides some policy guidelines for certain activities at the complex and conservancy/community forest levels. However, it is not meant to replace the park, complex and conservancy/community forest management plans but helps to place each management unit's plans and activities within a broader framework that guides management efforts towards a common Vision.

3.2 Structure

The Strategic Management Plan sets out the agreed Vision and Objectives for the park and identifies a set of topics for which management guidelines are required. For each of these topics a background introduction is provided which outlines the reasons for developing a management approach for that particular topic. This background introduction provides the foundation for a Policy Statement, which outlines the broad management approach or philosophy for that topic, taking into account social and economic values as well as conservation values. Following on from the Policy Statement, a set of strategies are then outlined. These provide a more detailed description of the strategies to be used to implement the policy.

Threats to biodiversity in the landscape, the implications of climate change, and the biophysical, socio-economic, and institutional contexts are discussed in Annexes. The Five Year Activity Schedule for the Mudumu Landscape Association is included as Annex 5.

3.3 Duration of the Plan and Review Process

This Strategic Management Plan should be reviewed and revised periodically in order to assess whether the assumptions, circumstances and principles that shaped its original drafting are still valid. However, it would render the document ineffective if changes were made too frequently. This plan will be valid for a period of three years from December 2012 to November 2015. Prior to November 2015 the plan should be reviewed and if necessary a revised plan should be prepared ready to come into effect in December 2015. Thereafter it should be reviewed, and if necessary revised, every five years. If a strong need arises to amend the plan during the initial three-year period, the Landscape Association members should meet to discuss proposed amendments and adopt them where appropriate. The document should then be amended and redistributed as Version 2 of the plan.

Fig. 1. The Mudumu Landscape (source NAM-PLACE, MET)

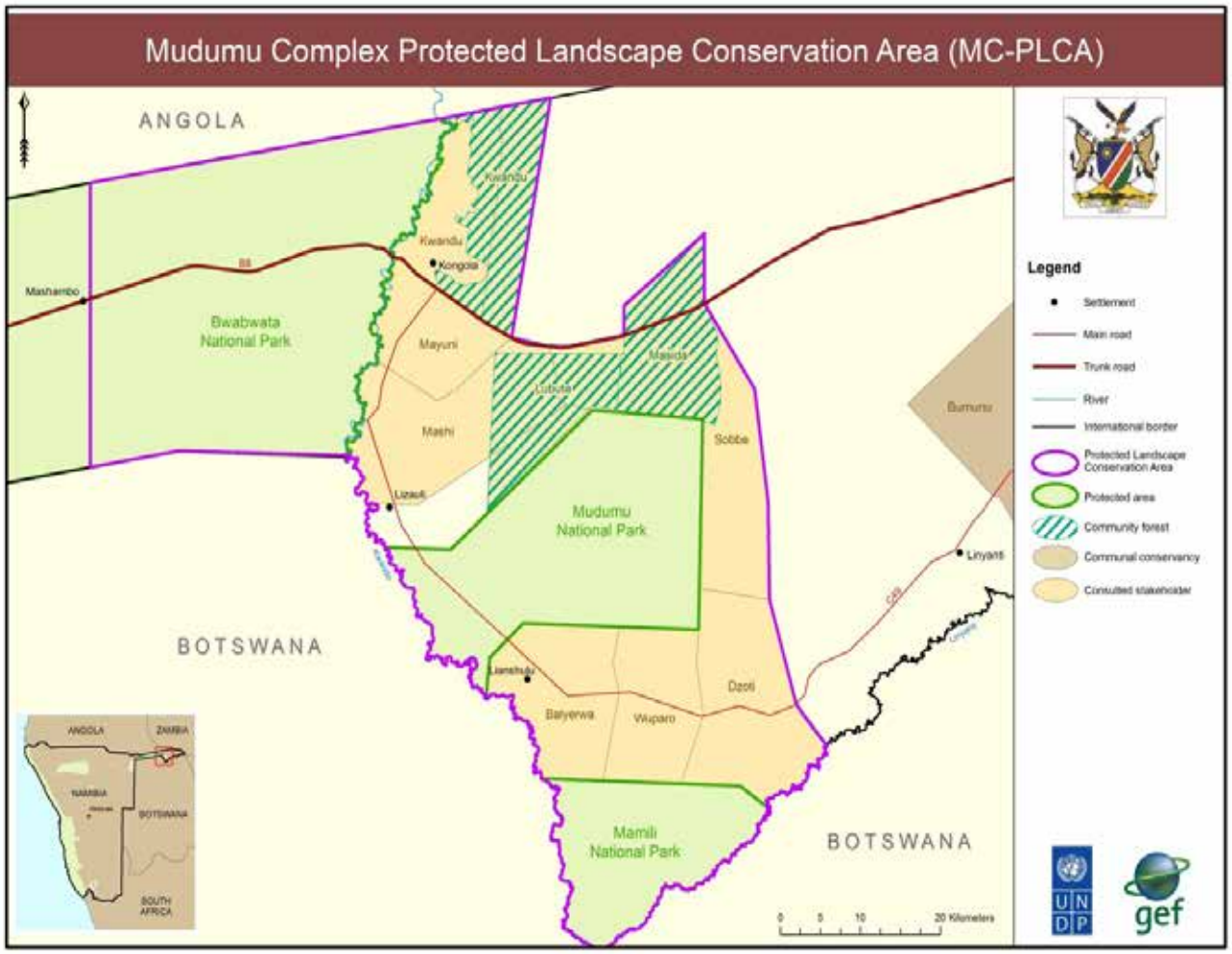
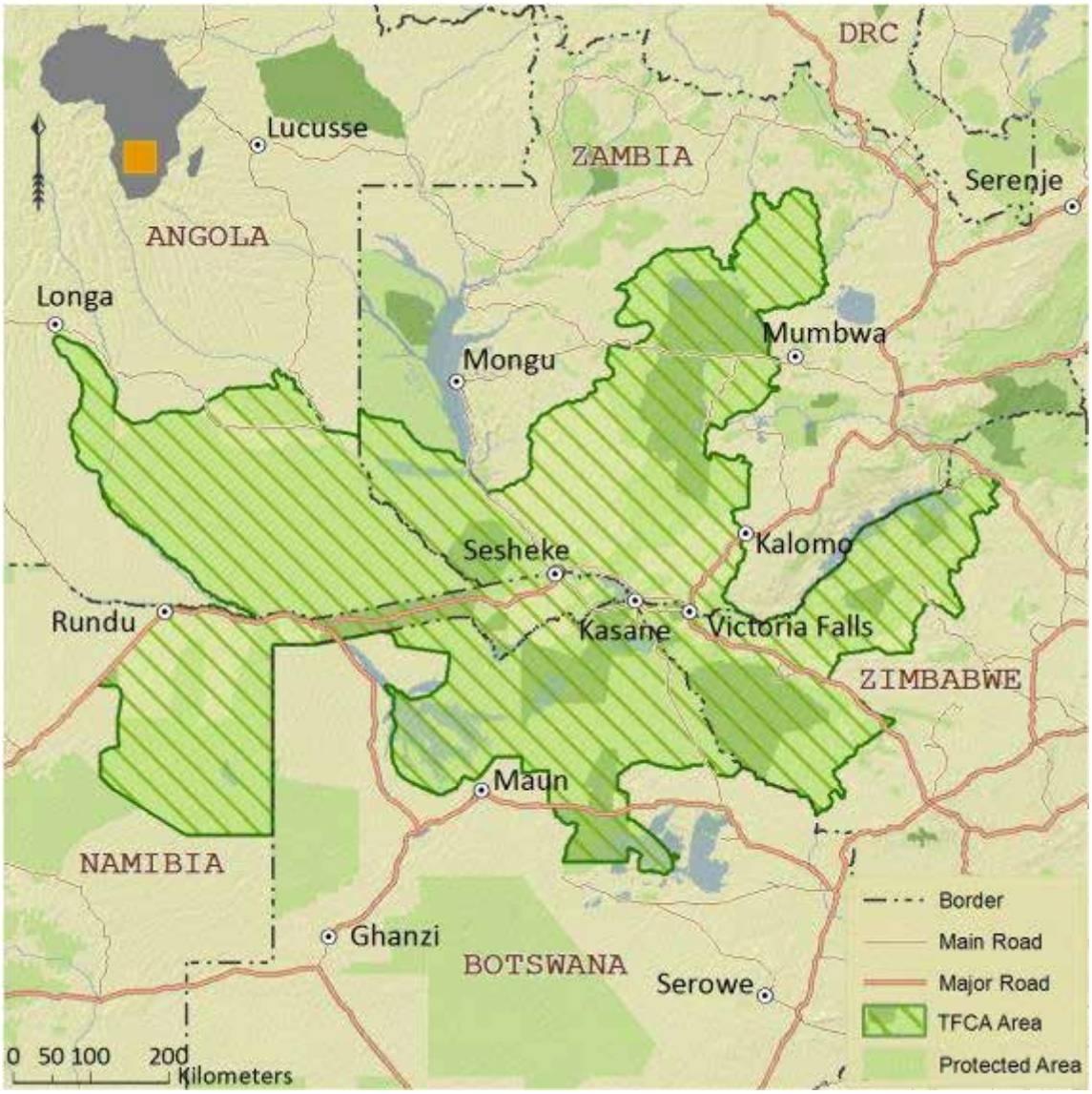


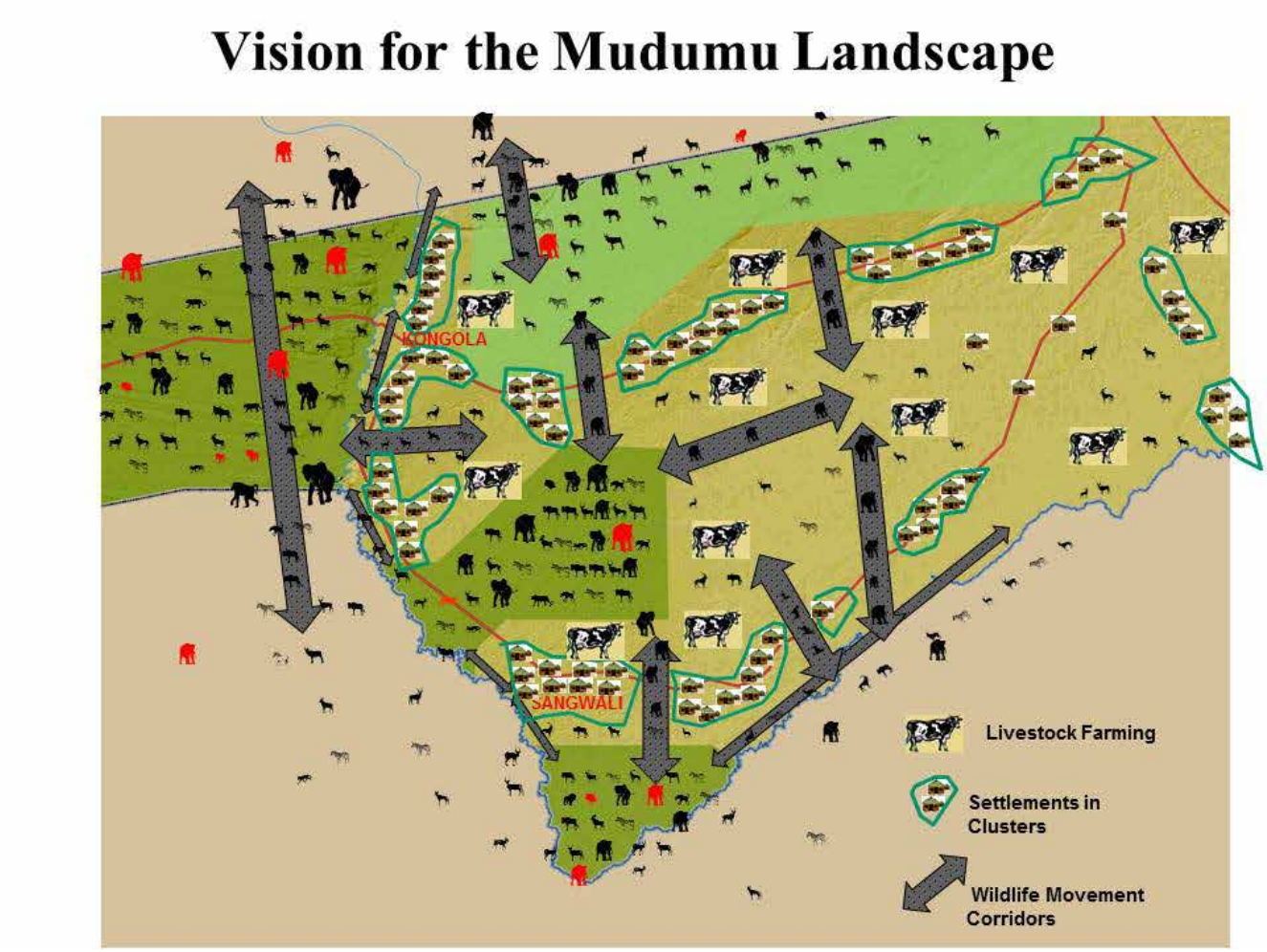
Fig. 2. The KAZA TFCA (Source: Peace Parks Foundation)



This map clearly indicates the extent to which Caprivi and the Mudumu Landscape are at the heart of the KAZA TFCA.

CHAPTER 4 *VISION*

Natural resources such as wildlife and forests are conserved and sustainably used in the Mudumu Landscape, and integrated with other sustainable livelihood options, for the benefit of the communities within the Landscape. In addition, the Landscape functions effectively as a critical heartland of the Kavango-Zambezi Transfrontier Conservation Area.



The above graphic sets out a conceptual vision for the Mudumu Landscape. It shows how people, wildlife and livestock could co-exist through appropriate planning and zonation for different land uses. If settlement and crop fields were to be clustered, this would open up corridors for wildlife moving between protected areas and across international boundaries.

1. To conserve, and where appropriate, rehabilitate important habitats and habitat diversity

CHAPTER 5 *STRATEGIC OBJECTIVES*

1. To maintain wildlife populations and to ensure that wildlife can move freely through the Landscape and across international borders without causing unacceptable levels of disruption to livelihoods
2. To integrate land use planning that is carried out at local, complex and landscape level in order to avoid conflicts between different land uses
3. To support economic development within the landscape through sustainable wildlife use, including tourism, and sustainable agricultural practices.
4. To develop, implement and maintain an efficient and functioning management system that integrates management at local, complex and landscape level and ensures that decision-making takes place at the most appropriate level for each resource or issue.

CHAPTER 6 *STRATEGIES*

The following are the Strategies for achieving the objectives of the management plan:

6.1 Collaborative Management

Background

As indicated in the Introduction, co-management has been a foundation for the development of the Mudumu North and Mudumu South Complexes. This is particularly important because the Mudumu Landscape is mainly an open system through which wildlife can move. Parks in the Landscape are unfenced and wildlife moves through the conservancies/community forests. In this respect wildlife is a resource shared between the parks and their neighbours. Joint management activities are therefore required to manage the shared resource. Further, the effectiveness of conservation also gains from scale: The greater the area under conservation management, the larger the benefit. For example, animals have larger areas over which they can move, a greater variety of attractions are available for tourists, and management costs are significantly lower. Benefits therefore increase exponentially.

Co-management between government and conservancies and community forests is possible in the landscape for two main reasons: First, conservancies/community forests have some form of legal management authority over wildlife and forest resources on their land. This means they have similar status to parks as management units. Second, parks and conservancies/community forests share similar goals. The vision statements and objectives of the park, conservancy/community forest, and complex management plans, as well as the Five-year Strategic Plan for the Landscape Association all contain the same key elements. They all emphasise the need for conservation of wildlife and wild habitats, and they all embrace sustainable utilisation of wildlife as a means to help drive rural development. The Mudumu complexes have to some extent managed to involve other stakeholders such as the Namibian Police, the Namibian Defence Force and various line ministries. There is a need to more strongly involve the Regional Council, the Ministry of Lands and Resettlement and the Ministry of Agriculture, Water and Forestry in co-management of the Landscape.

Policy

Management of the landscape will be a collaborative venture between the members of the Mudumu Landscape Association and between the members and other appropriate stakeholders. Co-management will be the primary means by which the objectives of this Integrated Strategic Management Plan will be achieved.

Strategic Management Approach

Co-management in the landscape involves the sharing of responsibility and accountability for achieving the objectives of this Landscape Strategic Management Plan. It involves joint planning, decision-making, monitoring and evaluation regarding conservation issues, economic development and social issues within the landscape.
In particular the following require cooperation and coordination through co-management:

- *game counts;*
- *game translocations;*
- *quota setting;*
- *land-use planning, zoning and corridor development;*

- » *engagement with regional planning forums and activities;*
- » *law enforcement;*
- » *fire management;*
- » *tourism planning and marketing;*
- » *migratory species such as elephant and buffalo;*
- » *human-wildlife conflict*
- » *planning for provision of benefits from sustainable wildlife use to local communities*
- » *adaptive wildlife management through decision-making based on the best available information, monitoring impacts, reviewing decisions and if necessary revising the decisions based on the new information.*

6.2 Land use Planning, Zoning and Corridors

Background

The essentially open and unfenced network of protected areas and community conserved areas within the Landscape provide the opportunity to promote connectivity between PAs through the development of wildlife corridors. A number of corridors exist in some places in the sense that there is little settlement and certain wildlife species use the corridors to access water or to move between PAs across community land or across international borders. However there is a need to formalise and secure existing corridors and identify and develop new ones. For wildlife corridors to be successful they need to be carefully planned. They will be most successful where there are limits on crop growing and settlement, as this will reduce disturbance of wildlife and reduce human wildlife conflict (HWC). This will require the full participation and consent of local land users. Land use planning and zoning is also important for ensuring that conflicts are avoided between competing forms of land use. It is necessary for example to ensure that conservancies and complexes have clearly defined tourism zones which enable the carrying out of wildlife-based tourism activities without disturbance that reduces the visitor experience.

Policy

Promote the establishment and maintenance of viable wildlife corridors within the landscape that are actively supported by local land users in partnership with government wildlife managers and other stakeholders such as NGOs.

Strategic Management Approach

Land Use Planning for Corridors requires more than simply drawing lines on a map and declaring the existence of a corridor. Corridors must be negotiated with the communities whose land has been identified for corridor development. Communities, as the land users, need to be fully engaged in corridor development. They need to agree to any zonation that is made and to any restrictions placed upon their current activities. The need for full and meaningful participation with local communities for corridor development requires a process of engagement that will take time to implement. Key components of this process include the following:

1. Carry out surveys to identify the individuals and households affected by zonation and corridor development. These individuals and households should be specifically targeted for close involvement in the process and for any benefits linked to corridor development.
2. The provision of economic incentives for communities to agree to restrictions on their activities in critical corridor areas. When designing incentives for establishing and maintaining corridors it will be important to ensure that benefits from different forms of wildlife use in corridors reach those individuals/households most affected. Additional tourism opportunities such as camp sites, provision of services such as guiding and food/firewood sales, etc., should as far as possible be targeted towards those individuals most affected by corridor development.
3. The promotion of agricultural activities that are compatible with conservation objectives. Examples include conservation farming or conservation tillage, the promotion of drought resistant crops and community-based livestock management.

4. HWC management and mitigation measures aimed at households affected by corridors.

6.3 Economic benefits based on sustainable use of wildlife

Background

Economic benefits based on the sustainable use of wildlife, including wildlife-based tourism, are important for providing incentives to local communities for tolerating wildlife on their land. Through conservancies/community forests these communities are able to earn income from various forms of hunting, through tourism development and the use of forest products. However in some conservancies income from wildlife is low and in most conservancies direct benefits to households are low. At the same time in some areas the costs of living with wildlife are high. There is a need to increase benefits from wildlife in order to ensure that the relatively high levels of tolerance for wildlife are maintained.

Policy

Economic benefits from tourism and natural resource based industries will be maximised as far as is possible within the bounds of business and environmental sustainability. Tourism and natural resource based industries should be used to create employment and business opportunities for local residents and to provide income for communities to use for local rural development.

Strategic Management Approach

Not all conservancies/community forests have the same tourism attractions or potential for wildlife. In order to maximise benefits to communities, business opportunities need to be developed with the conservancies/community forests but also within PAs. The following strategic approaches will be taken:

1. At the landscape level, coordinate the way in which benefits are provided and distributed to the different land units. Care will be taken that the area does not become saturated with the same types of tourism products all competing with each other for the same market. Care will be taken that wildlife utilisation quotas are set based on an overview of wildlife status in the landscape not just within each land unit.
2. At the complex and conservancy/community forest levels, identify new opportunities for new tourism and natural resource-based businesses, and assist communities to implement these.
3. Also at the complex and conservancy/community forest levels partners should cooperate to support the award and implementation of the proposed concessions to conservancies within PAs. Where concession opportunities in parks are limited, complexes should promote the joint application for concessions by more than one conservancy and should liaise closely with and advise the MET Concessions Unit regarding such applications.

6.4 Wildlife Management

Background

Wildlife numbers and the potential for sustainable utilisation are limited in conservancies and community/forests due to relatively high human populations in some areas of the Landscape. However, neighbouring PAs act as core areas from which wildlife can move out if conditions are favourable within conservancies/community forests.

Some species such as elephant and buffalo, and wildebeest move across relatively large areas and are not confined to PAs or to other individual land units. Management of these species as well as the benefits from utilisation, need to be shared.

Policy

Wildlife management in conservancies/community forests should aim at maintaining representative populations of species at socially acceptable levels.

Quota setting and sharing the benefits from these harvests should be based on the natural scale of the resource in question. This means that resources confined to a local scale should be managed at that local scale. Resources that range across a complex or the entire Landscape should be managed at the complex scale or landscape level respectively and benefits should be shared amongst relevant complex or Landscape members in proportion to their contribution to supporting these resources.

Strategic Management Approach

The principle of sharing quotas and benefits at different scales should be followed through comprehensive negotiations between partners in the complexes and across the Landscape. It is important that wildlife utilisation quotas should be set based on an overview of wildlife status in the landscape not just within each land unit.

1. Joint management activities will include game counts and monitoring of certain species, particularly re-introduced species. Provision of water for wildlife must be planned at least at a complex level so the cumulative impacts of artificial water points can be assessed.
2. Wildlife re-introductions should also be agreed and planned at the Landscape and Complex levels, based on the relative abundance of species in specific areas and availability of suitable habitat.
3. Efforts should be made to increase tolerance of predators by residents of conservancies and community forests, including targeted predator tourism, increased benefits from wildlife in general and Human/Wildlife conflict management and mitigation. However, management activities for predators should not aim at maximising populations outside PAs, but should aim to maintain populations at socially acceptable levels.

6.5 Human Wildlife Conflict Management

Background

Human Wildlife Conflict, if not addressed, presents one of the biggest challenges to the achievement of the Vision and Objectives of the Landscape. High human densities, increased clearing of land and uncontrolled human settlement along the river will inevitably lead to increased levels of HWC (and also undermine the tourist potential of the area). Conservancies/community forests have a number of existing strategies for addressing HWC.

Policy

At the Landscape and complex levels the most appropriate means of addressing HWC is through proper land use planning and zonation.

Strategic management Approach

In addition to the land use, planning, zoning and corridor development described above, there is also a need to promote the more coordinated development of villages and associated infrastructure. Partners should engage with local authorities and line ministries to promote more coordinated planning in order to avoid competing land uses that lead to increased HWC.
At the complex level continued coordination of HWC activities will be pursued, while conservancies/community forests will continue to apply management measures to reduce and mitigate HWC.

6.6 Law Enforcement

Background

Since the 1980s, poaching in the Landscape has been considerably reduced, assisted by changing community attitudes and the activities of conservancy game guards (GGs). This reduction in poaching was achieved through the development of improved relationships between MET and communities particularly following the establishment of conservancies. MET personnel were able to act on information provided by conservancy GGs and community members. However, periodically surges in poaching may be experienced similar to the increase in elephant poaching in the Landscape in 2011 and 2012.

Policy

Law enforcement in the complex should be a joint responsibility of all stakeholders and should aim at stopping or reducing poaching through deterrence as well as enforcement, based on good cooperation through shared information and activities.

Strategic management Approach

Successful law enforcement requires the continued cooperation of all stakeholders, particularly MET and the conservancies/ community forests. MET personnel have the legal backing to carry out arrests and use firearms if necessary. The strength of conservancy GGs lies in the information they gain and receive through their interaction with their communities. The partners in the Landscape will develop a practical, harmonised approach to the implementation of law enforcement within the context of this management plan, and relevant legislation and regulations.

The following strategic approaches will be taken to strengthen law enforcement:

1. Joint patrols will be undertaken by partners to demonstrate solidarity in controlling illegal resource use;
2. Communications between partners will be improved so that game guards and others can quickly provide information to MET staff who can swiftly launch legal investigations;
3. Close working relations will be developed and maintained with the Police and Namibian Defence Force in order to enforce laws;
4. The partners in the Landscape will immediately report incidents of illegal wildlife trade, including those emanating from neighbouring countries.
5. Cooperation will be developed with wildlife authorities and communities in neighbouring countries.
6. Landscape partners will identify capacity needs of GGs and MET personnel and initiate appropriate training and skills development.

6.7 Partnerships and awareness at strategic levels

Background

It is important that line ministries active in the Landscape and the Regional Council and its Rural Development Coordinating Committee (RDCC) and Regional Planners are aware of the activities and initiatives of the Landscape and do not undermine them through uncoordinated planning of other activities. There are already examples of multiple and conflicting land uses being planned for the same areas of land in Caprivi which also conflict with existing land uses. Spatial planning such as the establishment of wildlife corridors needs to be endorsed at regional level and incorporated into regional development planning.

Policy

To ensure that Caprivi regional decision-makers and planners fully understand the importance of conservation in the Landscape and its positive role in rural development and fully support Landscape land use planning and zoning.

Strategic Management Approach

The Landscape Association should pro-actively engage with the Ministry of Lands and Resettlement and the Ministry of Agriculture, Water and Forestry in appropriate forums. The Association should also engage with Regional Development Planners, and aim to become a member of the RDCC.

At complex level there should be engagement with Constituency Councillors and relevant TAs.

6.8 Infrastructure

Background

The provision and siting of appropriate infrastructure plays an important role in driving settlement patterns and land uses. Within the Landscape there are no clear settlement or village development plans compatible with the visions and objectives of the complexes or the Landscape. There is a shortage of town development infrastructure around Kongola for example, so there is little incentive for people to settle in one area and thus linear settlement is occurring along the existing roads. This is degrading the tourism potential of the area, leading to increased HWC and will eventually lead to increased costs to Government to provide social services (e.g. electricity, water, clinics, schools, etc). In addition there is a shortage of water away from the Kwando/Linyanti River and this acts as a major disincentive for people to move away from the floodplains to avoid HWC.

Further the provision of appropriate infrastructure such as water points can help direct wildlife movements and help build up wildlife numbers.

Policy

To promote the provision of the necessary infrastructure to support a vibrant Wildlife and Tourism industry in the Landscape.

Strategic Management Approach

The strategic management approach will be the following:

1. Develop water points away from the floodplains to facilitate the voluntary resettlement of people who wish to move away from the floodplains to avoid HWC
2. Actively seek out and engage with key stakeholders responsible for infrastructural development to streamline planning and development so that there is more consolidation of settlements, villages and crop farming.
3. Identify at Landscape and Complex levels the infrastructure needs for wildlife management and source funding to meet these requirements.

6.9 Fire Management

Background

Fires can quickly spread over large areas of the Landscape, making it difficult for individual units to develop their own

management regimes. While fire has moulded woodlands naturally over thousands of years, the high frequency of intense late season fires causes severe degradation, and many resources of direct value to people are lost. As a result fire is an issue that requires joint management across the Landscape.

Policy

Fire is a natural part of the woodland ecosystem and should not be completely suppressed, but should be managed through joint early burning programmes in order to avoid intense and destructive fires.

Strategic Management Approach

Partners will cooperate to develop joint early burning programmes at complex level so that conservancies/community forests and PAs can synchronise burning within their land units. Appropriate training and provision of appropriate equipment should be part of the joint fire management programme.

6.10 Tourism planning and management

Background

Tourism planning is required in the landscape to ensure that a) quality tourism products can be assured, and b) to ensure that tourism does not exceed its carrying capacity. An Integrated Tourism Development Plan for the Kwando/Linyanti Area was drafted in 2003. Since then many changes have taken place in the landscape. There are new conservancies and new tourism developments. Detailed tourism planning has been carried out for the three national parks in the landscape which make specific recommendations for tourism concessions to be awarded to neighbouring conservancies. The 2003 plan therefore needs to be reviewed and revised.

Tourism planning for the landscape needs to take into account the different tourism assets and development opportunities within each conservancy. Not all conservancies have similar assets. Some have prime river frontage overlooking wildlife areas or national parks, and while others have river frontage, wildlife is not so abundant in these areas. Sobbe is landlocked and does not have prime tourist attractions. Tourism planning needs to find ways of directing tourists to conservancies with less spectacular attractions and developing other means for these conservancies to gain tourism income.

Tourism can also be linked to the development of wildlife corridors. It is important to ensure that households that move out of corridors or agree to change their land uses in corridors are directly compensated. Where corridors can be used for game viewing, one means of compensation would be to direct income from such tourism directly to affected households.

Policy

Tourism in the Landscape should be sustainable, mixed income, low impact, nature and activity based and should contribute significantly to the economy of the area. In accordance with the National CBNRM Policy, tourism businesses should be, where possible, owned by appropriate community institutions. Where this is not the case, tourism businesses should ensure that agreements are made with conservancies to ensure that local communities benefit in accordance with the National Tourism Policy.

Strategic Management Approach

1. In the short-term attention should be given to the following:

    a. Update and align conservancy tourism plans with MET park tourism plans;

b. Revise and review the Kwando/Linyanti Area Integrated Tourism Development Plan. The revised plan should take into account new developments and establish a new tourism carrying capacity for the landscape. The revised plan should also take into account tourism zoning and planning that has already been carried out in parks, conservancies and complexes, and should follow the landscape tourism policy set out above. The revised plan should be informed by the Strategic Environmental Assessment (SEA) for Tourism that was due to be carried out soon after the drafting of this Landscape Strategic Management Plan.

2. In the medium to long term, attention should be given to the implementation of tourism plans and the recommendations of the SEA . The following approaches should be taken:

a. At Landscape level
   - *i Increase awareness of the importance of tourism and tourism zones among key regional policy makers and decision-makers;*
   - *ii Promote the use of the revised Landscape Integrated Tourism Plan by the Regional Council and line ministries in their own spatial and development planning and by the Communal Land Board in its approval of lease applications;*
   - *iii Market the Landscape for tourism investment in terms of the revised Landscape Integrated Tourism Plan;*
   - *iv Support the provision of tourist information and marketing materials that promote the Landscape.*

b. At Complex level
   - *i Increase awareness of the importance of tourism and tourism zones among key decision-makers such as Constituency Councillors and officials, and Traditional Authorities;*
   - *ii Promote the use of the revised Landscape Integrated Tourism Plan and complex level tourism zoning by Constituency Councillors and officials, and Traditional Authorities particularly when they consider lease applications for agricultural and tourism developments;*
   - *iii Promote tourism development in appropriate wildlife corridors.*

c. At Conservancy/Community forest level
   - *i Increase awareness of the importance of tourism and tourism zones among residents, Sub-Khutas and Silalo and Village Indunas.*
   - *ii Promote the use of the revised Landscape Integrated Tourism Plan, complex level and conservancy tourism zoning by conservancy committees and by local Traditional Authority representatives when they consider applications for land allocation.*
   - *iii Secure beneficial agreements with all tourism operators (lodges and campsites) that have yet to enter into contracts with conservancies;*
   - *iv Ensure that tourism zones are maintained and complied with, particularly around lodges/campsites.*

6.11 Sustainable Agriculture

Background

Crop growing and livestock farming are the main land uses apart from conservation and tourism within the Landscape and play important roles in sustaining livelihoods. Successful conservation cannot be achieved in isolation from other land uses and economic activities. Sustainable agriculture and range management practises should be integrated with wildlife and tourism management. Improved agro-ecological skills of local communities are critical in the implementation of effective Land Use Planning for the maintenance of wildlife corridors. Examples include conservation farming or conservation tillage which requires less land and water due to increased efficiency leading to higher yields. If, for example, farmers are expected to

move their crop fields and households away from the river, they will need support in developing new fields in the interior. This provides the opportunity to help farmers develop more sustainable methods of farming that also help to reduce HWC. It will also be crucial to ensure that HWC management measures are in place at new crop lands.

Policy

To promote conservation farming and community-based livestock/range management and integrate these activities as part of developing sustainable rural livelihoods in the Landscape.

Strategic Management Approach

At the Landscape and Complex levels, engage with appropriate stakeholders and potential partners, such as farmers' unions, line ministries and NGOs, in order to promote the integration of sustainable farming activities with conservation. (See Annex 4 for further information regarding conservation farming and community-based rangeland and livestock management).

Source funding to support these activities.

6.12 Waste management

Background

The disposal of waste is often problematic in remote areas, and the volume of waste will grow as the tourism developments increase. The proper treatment and discharge of wastewater is especially critical where developments are close to wetlands and boreholes.

Policy

Waste management should be based on the principle of "reduce, re-use and recycle" and waste disposal should be carried out in the most environmentally sustainable way possible.

Strategic Management Approach

The following strategic management approach will be taken to deal with waste management in the Landscape:

1. In the long term, parks and tourism establishments should aim to remove all waste from informal sites to officially approved waste management sites, although biodegradable waste may be composted where appropriate and environmentally feasible.
2. Tourism providers and employers of staff living in the Parks are responsible for the removal of their own household waste, or that generated by tourists and staff, to approved waste disposal sites.
3. Waste storage facilities must be properly enclosed to prevent access by wildlife and pollution by wind-blown litter. These facilities may hold waste for a maximum of 28 days; shorter periods will apply if high volumes accumulate and health issues arise.
4. Where practical, waste must be sorted for recycling.
5. Transport of waste to storage or approved dumpsites must be in properly constructed vehicles or containers to ensure that no littering occurs.
6. All new and existing developments must develop an Environmental Management Plan for waste management.

CHAPTER 7 *MANDATES OF DIFFERENT MANAGEMENT LEVELS*

The Mudumu Landscape comprises different management units and levels. PAs and conservancies/community forest form the basic local level management units. These units have legal management rights over the resources within their boundaries. The next level is that of the complexes where land units have agreed to cooperate voluntarily over issues that require co-management. The final level is that of the Landscape, where local units and the complexes have combined to coordinate across an even larger area of land.

In such a system there is potential for conflict and misunderstanding of mandates and roles and responsibilities. The following principles should guide relationships between the various land units and collaborative institutions within the Landscape.

1. If a resource or issue can be managed at the local level then it should be managed at that level.
2. Within the complexes the main units of implementation are the PAs and the conservancies/community forests. The complex committees and working groups serve as platforms for coordination and cooperation on issues agreed on by the implementation units.
3. Within the Landscape, the main implementation units are the complexes. The Landscape Association and its committee serve as platforms for coordination and cooperation, and should not be involved in the day to day management activities within the landscape.
4. Landscape level institutions must remain accountable downwards to the complexes and the management units that comprise the complexes.
5. In the same way the complex level institutions must remain accountable downwards to their member management units - the protected areas, conservancies and community forests.

At the Landscape level coordination and co-management should be pursued without dictating to or in any way interfering with the activities or land tenure rights of any participating member.

ANNEX 1: *THREATS TO BIODIVERSITY AND SUSTAINABLE DEVELOPMENT IN THE LANDSCAPE*

Threats to biodiversity and sustainable development have been identified as follows (based on VERSACON/IECN 2009):

Unplanned human settlement and development; ribbon development of settlements and crop fields along roads and the Kwando/Linyanti River blocks wildlife movements and reduces land available for eco-tourism and maintaining wild habitat.

Uncoordinated planning and decision-making: although conservancies and complexes carry out land use planning and zoning, these plans are not always followed by other institutions that carry out planning or take decisions about land use. This situation leads to overlapping forms of land use and could potentially result in key wildlife corridors or tourism zones being targeted for other types of land use.

Shifting agriculture; land clearing as part of a system of shifting agriculture can lead to local deforestation and loss of habit for many species.

Uncontrolled fires; fires may occur naturally but uncontrolled frequent fires late in the year pose a threat to livestock, valuable wildlife and important plant species.

Poaching; has drastically reduced over the years partly due to the initiation of conservancies and joint wildlife monitoring and anti-poaching patrols between conservancies and MET. However, poaching remains a potential threat and stakeholders need to be ready to deal with sudden surges in poaching such as the increase in elephant poaching during 2011 and 2012.

Unsustainable natural resource use; Uncontrolled use of natural resources could lead to localised over extraction of wood, grass and reeds for building material and fuel leading to deforestation and patching of forests. Over exploitation of certain plant species for medicinal purposes may cause a loss of valuable biodiversity.

Human wildlife conflict; HWC has led to loss of wildlife and even lives. Elephants and hippos have been the main cause of crop damage, while hyena, leopard and crocodiles threaten livestock. Conservancies have helped to build local tolerance of wildlife, and they have established initiatives to effectively reduce these conflicts. However, this tolerance might diminish if households affected by HWC are not adequately compensated.

ANNEX 2: *IMPLICATIONS OF CLIMATE CHANGE*

Climate Change is expected to bring a number of negative impacts to Namibia in general and the Caprivi Region in particular. However, there is also potential for the implementation of the Mudumu Protected Landscape Conservation Area to assist in the adaptation to Climate Change and in the mitigation of its effects.

According to Mfune ***et al*** (2009) Climate Change will adversely affect the ability of physical and biological systems to sustain human development including socio-economic development. Climate change will constrain the ability of the vulnerable, mainly the poor in many developing countries, to cope with adverse impacts of climate change because they have low capacity to respond (i.e. to develop mitigation measures or adapt). In southern Africa, the combined effect of expected increases in temperature and increased drying will adversely affect most ecosystems and agriculture and livestock production. Arid and semi-arid countries such as Namibia, the driest country south of Sahara, are expected to be most affected.

According to a vulnerability and adaptation assessment carried out by Dirkx ***et al*** (2008), it is predicted with a high degree of certainty that Namibia will become hotter throughout the year with a predicted increase in temperatures of between 1°C and 3,5°C in summer and 1°C to 4°C in winter in the period 2046 - 2065.

However the same study suggests it is more difficult to predict future rainfall trends because of the existing highly variable climate. According to Dirkx ***et al*** (2008) it is not obvious whether Namibian rainfall will be reduced, although intensity is likely to be increased. They suggest stronger variability is likely to remain the key aspect of the Namibia's climate in the future. Further, they project significant changes in vegetation structure and function in several areas of Namibia due to Climate Change. For example the dominant vegetation type termed Grassy Savanna is projected to lose its spatial dominance to Desert and Arid Shrubland vegetation types, with projected increases in bush encroachment for the north-eastern parts of the country. Vegetation is projected to suffer some reduction in cover and reduced Net Primary Productivity (NPP) throughout much of the country (Dirkx et al 2008). Mfune ***et al*** (2009) suggest that bush encroachment will reduce grazing rangeland for livestock and grazing and browsing for wildlife.

Poverty, lack of income and lack of employment opportunities greatly worsen the vulnerability of households to impacts of climate (Dirkx ***et al.,*** 2008). This is because these factors influence the resilience of households to cope with impacts of climate change.

According to another study by Reid ***et al*** (2007) extreme events such as drought are likely to become more frequent and more intense. They suggest the impacts will fall hardest on the poor. Work opportunities will decrease and wages decline. Even under the best-case scenarios generated, they predict subsistence farming will be sharply reduced. In the worst-case scenario for agriculture, labour intensive livestock farming would be hit hard, and while high-value irrigated crop production could thrive, job creation in this area would be minimal. Thus, even under the best-case scenario, a quarter of the population would need to find new livelihoods.

One of the main strategies suggested for coping with Climate Change is Adaptation. Dirkx ***et al*** (2008) suggest that diversification of agricultural activities, improved management practices and spatial planning are important aspects of Adaptation. Several existing activities with the Mudumu North and Mudumu South Complexes contribute to these aspects of Adaptation. These include diversification of livelihoods through wildlife use and tourism, improved agricultural management practises through the introduction of conservation farming and community-based livestock management, and conservancy and complex level land use planning and zoning.

With regard to wildlife, Kaeslin et al (2012) suggest that there will be a number of consequences of Climate Change. These include ecosystem changes; changes in species distribution, abundance and interactions; increased human wildlife conflicts; more frequent wildfires; and the emergence and increased spread of disease pathogens, geographically and across species boundaries, due to climate, landscape and ecosystem changes.

Kaelin et al (2012) also consider a number of responses to climate change:

- ***Maintaining current ecosystems***: including through a strong and effective network of protected areas.
- ***Adaptive management:*** including translocation of species.
- ***Restoration of ecosystems:*** including, inland waters, forests, savannahs and grasslands.
- ***Landscape approaches.***

They suggest that as land use and Climate Change both contribute to major environmental changes "the best way to adapt to different climatic conditions and mitigate their effects is through a preventative approach and by integrating the environmental effects of changing climate into land use planning. Such approaches are particularly useful in addressing events that affect ecosystems on a large scale..." Kaelin et al (2012:69).

Scaling up the existing complex approach to the landscape level can therefore play an important role in climate change adaptation and mitigation both for people and wildlife. The landscape conservation approach aims to strengthen protected areas and provide connectivity through links to neighbouring community conserved areas, aims to provide adaptive management at scale and provides a foundation for maintaining or restoring ecosystems. Land use planning and zoning are an integral part of the landscape conservation approach.

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ANNEX 3: *BACKGROUND INFORMATION*

1. Biophysical Context

The Caprivi Region is mainly flat with the highest area around 1 000m above sea-level in the west and the lowest (near Impalila Island in the east) around 900m (Mendelsohn and Roberts . The area is covered by thick deposits of Kalahari sands with very little of the underlying geology exposed, except for some sections of river courses and at Impalila Island. These extensive Kalahari sands and the rivers with their associated floodplains, channels and deposits are the two main features which shape the landscape. Of the six main land types in the region, five are found in the Mudumu landscape:

- Open water (the deeper channels of the Kwando/Linyanti River)
- Floodplains associated with the river
- Riverine woodlands
- Mopane woodlands (particularly in and around the Mudumu National Park)
- Kalahari woodlands on sandy plains.

The landscape falls into the tree and shrub savanna biome encompassing North-Eastern Kalahari Woodlands, Riverine woodland, Caprivi Mopane Woodland and Caprivi Floodplains (VERSACON/IECN 2009).
A variety of soils occur in Caprivi. These range from the heaviest soils with a high clay content in areas regularly flooded to pure sands. In between is a variety of intermediate soils consisting of different proportions of sand, clay, and organic material. These intermediate soils are often the best suited for crop production because they retain water to some extent and have fairly high levels of nutrients. Large areas of the northern part of the Mudumu North complex consist of sandy soils while much of the rest of the landscape consists of clay-loam soils.

Caprivi has the highest rainfall of all regions in Namibia (averaging around 700mm at Katima Mulilo. However, as in the rest of the country rainfall is highly variable. Highest temperatures occur from September to October when average daily maximums range from between 32 and 35 degrees Celsius. Average daily minimum temperatures vary between around 20 degrees in summer and about 5 degrees Celsius in winter. Frost is unusual. About 2.5m of water evaporate in an average year which is over four times the normal precipitation.

The Caprivi Region is important for Namibia in terms of biodiversity because of its species richness. Species Diversity increases from the south of Namibia to the North east (Caprivi Region) along the rainfall gradient (GRN 2006). By contrast the highest areas of endemism are found in a zone running along and to the west of the Namib escarpment (Barnard 1998).

Within the Mudumu Landscape the varied habitats of the Kwando/Linyanti River support relatively high species diversity. The river's catchment is in eastern Angola and by the time it enters Namibia it flows across a very small gradient and spreads out across a broad floodplain characterised by many channels and marshlands (VERSACON/IECN 2009. The floodplains are rich with nutrients that have accumulated over the years, becoming a main attraction for wildlife and livestock due to the abundant pasture and grasslands. The Kwando River/Linyanti flows into the Linyanti swamps that dominate most of the Nkasa-Wapara (formerly Mamili) National Park and in high flood years flows from there into Lake Liambezi and ultimately links with the Chobe River.

The floodplains form important spawning and nursery grounds for a variety of fish (Koekemoer 2003). The areas where water flows from the floodplain into the main channel are popular feeding grounds for predatory fish due to the fry or juvenile fish leaving the floodplains to migrate or start life in the mainstream. There are more than 80 species of fish recorded in Caprivi

many of which are found in the Kwando/Linyanti system.

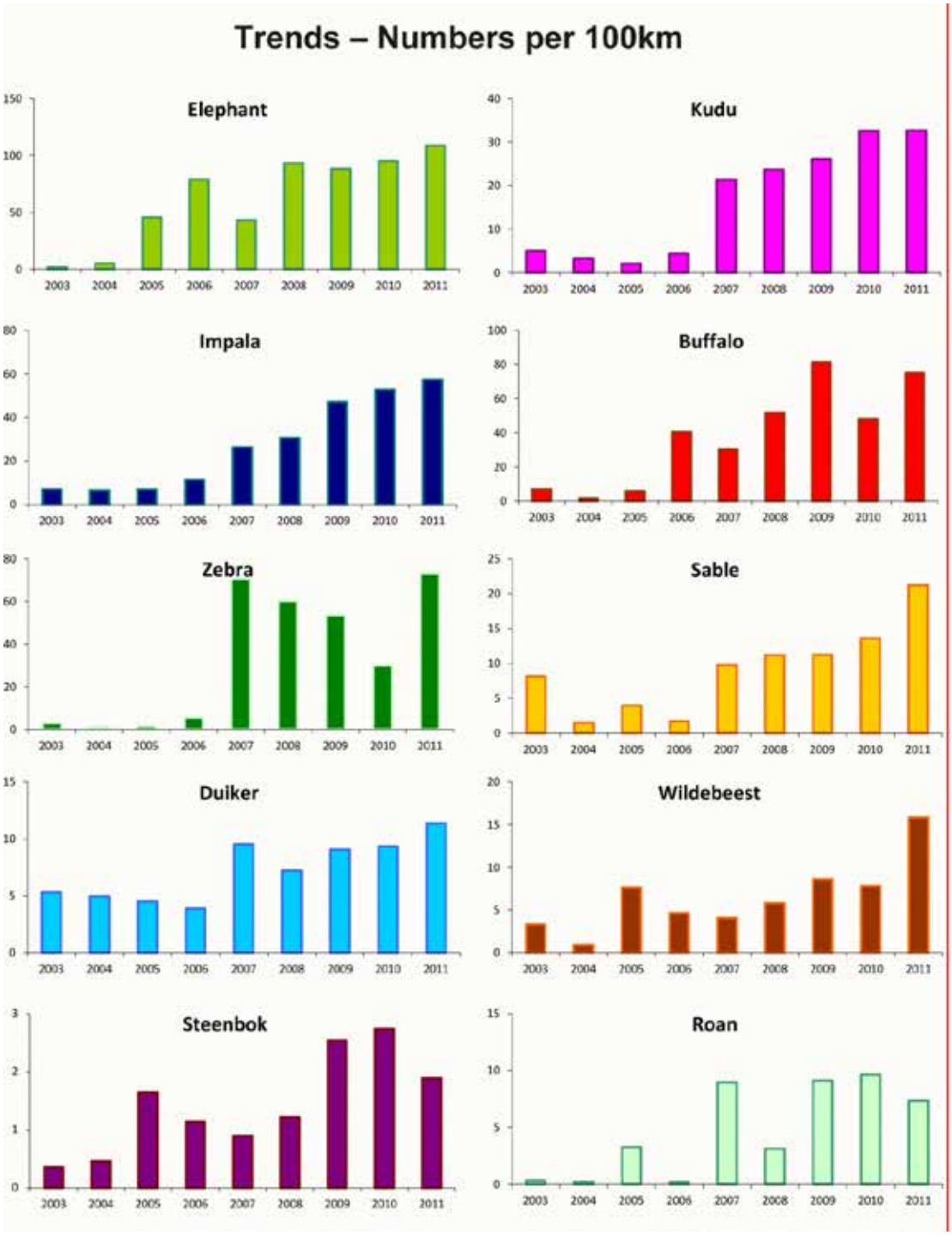
The landscape has a large population of elephants that dominate the carrying capacity of wildlife in the area. Combined estimates for Bwabwata East and Mudumu National Park suggest a population of around 9 000 (WWF/NACSO 2012a). While elephants are a great tourist attraction, exceeding carrying capacities is detrimental to the natural environment on which numerous other species rely on.

The numbers of most wildlife populations are either stable or increasing (NACSO 2012). The MET, has reintroduced species including kudu, blue wildebeest, giraffe, sable, eland and impala since 2005 (NACSO 2012). A list of the main mammal species is provided below.

Common trees in the landscape include Mopane (***Colophospermum mopane***), Camelthorn (***Acacia eriolioba***) ***Combretum Collinum,*** sand combretum (***Combretum engleri***), ***Combretum herorense***, ***Combretum mossambicense***, ***Combretum zeyheri***, leadwood, (C***ombretum imberbe***), Silverleaf Terminalia (***Terminalia sericea***), Zambezi teak (***Baikiaea plurijuga***), African teak (***Pterocarpus angolensis***), Kalahari apple leaf (***Philenoptera nelsii***), apple leaf (***Philenoptera violacea***), bird plum (***Berchemia discolor***), blue sourplum (***Ximenia americana***), large sourplum (***Ximenia caffra***), sycamore fig (***Ficus sycomorus***), wild medlar (***Vangueria infausta***), African wattle (***Peltophorum africanum***) and Jackal berry (***Diospyros mespiliformis***), African mangosteen (***Garcinia livingstonei***).

Over 450 bird species occur in the MNC (NNF 2009). A list of Red Data species expected to occur in the landscape is provided below.

The following graphs show population trends in Caprivi for selected game species (NACSO 2012):



Main mammal species found in the landscape:

Elephant
Hippopotamus
Giraffe
Buffalo Eland
Zebra (Burchell's)
Roan
Sable
Wildebeest (Blue)
Kudu
Tsessebe
Sitatunga
Lechwe (Red)
Bushpig
Warthog
Impala
Reedbuck
Bushbuck
Duiker (Common)
Steenbok
Oribi
Lion
Spotted Hyaena
Cheetah
Leopard
Caracal
Civet
Serval
Side-striped jackal
Black-backed jackal
Bat-eared fox
Baboon
Vervet

Other species:
Crocodile
Ostrich

Red data bird species expected to occur in the landscape (source: Namibia's Red Data book on birds)

Species	Namibian status	Global status
Bittern	Critically Endangered	-
Black-cheeked Lovebird	Critically Endangered	Vulnerable
Pel's Fishing Owl	Critically Endangered	-
Wattled Crane	Critically Endangered	Vulnerable
African Finfoot	Endangered	-
African Marsh-Harrier	Endangered	-
Bateleur	Endangered	-
Black Stork	Endangered	-
Booted Eagle	Endangered	-
Great Crested Grebe	Endangered	-
Martial Eagle	Endangered	-
Rock Pratincole	Endangered	-
Rufous-bellied Heron	Endangered	-
Saddle-billed Stork	Endangered	-
Slaty Egret	Endangered	Vulnerable
Southern Ground	Hornbill Endangered	-
Tawny Eagle	Endangered	-
Yellow-billed Oxpecker	Endangered	-
African Fish-Eagle	Vulnerable	-
African Skimmer	Vulnerable	Near Threatened
Greater Flamingo	Vulnerable	-
Great White Pelican	Vulnerable	-
Lappet-faced Vulture	Vulnerable	Vulnerable
White-headed Vulture	Vulnerable	-
Black-winged Pratincole	Near Threatened	-
Lesser Kestrel	Near Threatened	Vulnerable
Marabou Stork	Near Threatened	-
Peregrine Falcon	Near Threatened	-
Pallid Harrier	Near Threatened	Near Threatened
White-backed Vulture	Near Threatened	-

2. Socio-economic Context

Agriculture provides the majority of people with most of their income and food. Residents combine cattle farming with crop cultivation (mostly pearl millet, sorghum and maize). Fish provide an important additional source of protein for many residents. Most farms are small and do not provide large surpluses, but there is also a growing trend of more wealthy individuals farming commercially on larger areas of land (Mendelsohn and Roberts 1998).

Poverty and human development

Of Namibia's 13 regions, Caprivi is one of the poorest. It has the third lowest Human Development Index according to UNDP assessments (Table A1) and has the fourth lowest Human Poverty Index (Table A2).

Table A1. HDI Namibia 2001-2004 and 1991-1994

Human Development Index		
	2001-2004	1991-1994
Namibia	0.557	0.607
Caprivi	0.421	0.441
Erongo	0.705	0.690
Hardap	0.572	0.637
Karas	0.664	0.666
Kavango	0.410	0.480
Khomas	0.732	0.784
Kunene	0.504	0.509
Ohangwena	0.403	0.524
Omaheke	0.627	0.528
Omusati	0.476	0.595
Oshana	0.548	0.602
Oshikoto	0.490	0.555
Otjozondupa	0.638	0.567

Source: adapted from UNDP (2007)

Table A2. HPI Namibia 2001-2004 and 1991-1994

Human Poverty Index (%)		
	2001-2004	1991-1994
Namibia	33	29
Caprivi	43	38
Erongo	18	20
Hardap	30	20
Karas	21	20
Kavango	45	52
Khomas	19	9
Kunene	38	39
Ohangwena	42	31

Omaheke	34	43
Omusati	45	29
Oshana	37	33
Oshikoto	45	27
Otjozondupa	23	35

Source: Adapted from UNDP (2007)

According to analysis by the Namibian Central Bureau of Statistics (CBS) in the National Planning Commission the highest incidence of poverty by region in Namibia is in the Kavango Region at 56.5% while Caprivi ranks seventh at 28.6%. However, when holding constant all other characteristics that are thought to influence income and consumption levels e.g. education levels, age, number of children in the household etc., a household in Caprivi is likely to be poorer than a household living in any other region of the country (CBS 2008).

Long (2004) also found that in Caprivi although not everyone is poor, poverty is more widespread than for the country as a whole. Rural people living in Caprivi have little access to jobs and cash and depend mostly on cropping, livestock, piecework, wages, pensions and the use of a variety of natural resources. Wealthier people tend to be those with larger cattle holdings and are less reliant on pensions and natural resources (Long 2004).

Turpie et al. (2000) found that rural households in Caprivi see crop production for domestic consumption as important for livelihoods. Other activities ranked important by communities include natural resource utilisation (especially thatching grass and reeds) and livestock production through grazing of natural rangeland. For cash income among rural households in Caprivi, pensions, crop sales and sale of natural resources were considered important. While cattle are not so important in terms of cash income, they are very important in providing meat and milk for consumption and for crop production, providing draught power and enabling larger areas of crops to be cultivated (Mendelsohn et al. 2006). Cattle also offer a degree of security as accumulated wealth, and are an important indicator of livelihood security.

Natural Resource use

Natural resource harvesting is important for local livelihoods. Resources are used to supplement food, for construction, and for cash income through limited sale. Reeds and thatching grass are the main items sold. For some households, wildlife such as duiker, warthog, impala and springhares provides an additional source of food security and are occasionally sold (Long 2004). A broad range of wild plant resources is used for various purposes and some have potential for commercial exploitation. According to Murphy and Mulonga (2002), wild plant species harvested for food includes, wild fruits, wild vegetables, wild melons and bulbs. Wild fruits such as the Brown Ivory (***Berchemia discolor***) is commonly sold and harvested in the Caprivi region. Other fruits include blue sourplum (***Ximenia americana***), large sourplum (***Ximenia caffra***), sycamore fig (***Ficus sycomorus***), wild medlar (***Vangueria infausta***) and African mangosteen (***Garcinia livingstonei***).

Reeds and Mopane (***Colophospermum mopane)*** and Silverleaf terminalia (***Terminalia sericea***) poles are used for construction of houses and courtyard fences. Other sources of income generation include selling thatch grass, poles and reed mats. Plants such as sour plums and blue water lily (***Nymphaea nouchali***) are used for food and Silverleaf terminalia for medicinal purposes. According to Murphy and Mulonga (2002) water lily are most commonly harvested in the Mayuni conservancy and sometimes sold for income. Extracts from the bark of bird plum trees (***Berchemia discolor***) locally known as muzinzila are used as dye in making baskets. Baskets are usually made from grass and palm leaves. Other plants that are harvested include the devil's claw, and Kalahari melon seeds as a source of oil.

Fish are a main source of protein in Caprivi, and are widely caught in rivers including the Kwando/Linyanti. Fishing is mainly done by the local and small scale fishermen using different fishing methods targeting multi-species of fish. Commonly caught fish include catfish (***Barbus spp.***), greenhead tilapia (***Oreochromis macrochir***), redbreast tilapia (***Tilapia rendalli***), tiger fish

(*Hydrocynus vittatus*), and nembwe (*Serranchromus robustus*). A fish market is well established in the main town of Caprivi Region Katima Mulilo with large quantities of fish being sold all year, and its peak is when floods recede (Murphy and Mulonga 2002).

3. Institutional Context for Land and Natural Resource Management

Conservancy, complex and landscape institutions

One set of institutional arrangements for land and natural resource management in the landscape is based on the main land management units. At the most local level are the conservancies, community forests and protected areas. These are the following:

Table A1. Land management units in the Mudumu Protected Landscape Conservation Area

Conservancies:	Community Forests:	Protected Areas:
Kwandu (MNC)	Kwandu* (MNC)	Bwabwata NP East (MNC)
Mayuni (MNC)	Lubuta** (MNC)	Mudumu NP (MNC/MSC)
Mashi (MNC)	Masida *** (MNC)	State Forest (MNC)
Sobbe (MNC)	Several other community forests are being formed within the complex.	Nkasa-Wapara (formerly Mamili) NP (MSC)
Balyerwa (MSC)		
Wuparo MSC)		
Dzoti (MSC)		

** Overlaps partially with the Kwandu Conservancy*
*** Overlaps partially with the Mashi and Sobbe conservancies*
**** Overlaps partially with Sobbe Conservancy and the State Forest Reserve*
N.B. the Kyaramacan Association is also a management partner with MET in the Bwabwata National Park

The next important level of land management comprises the two complexes, Mudumu North and Mudumu South the components of which are indicated in the table above.

The third level is that of the landscape. The Mudumu Landscape Association has been formed to coordinate activities which need to be coordinated and driven at a landscape level. This association has adopted a constitution which states that the association shall consist of land users, custodians and authorised administrators and managers, representing organizations and individuals, both civil society and government, which are actively involved in the custodianship, management and administration of land within the designated Mudumu Landscape, whose boundaries may change from time to time, as new members join or members leave the Association. The founder members were the MET, the conservancies and community forests which are part of the MNC and the MSC, a number of tour operators, the Likwama Farmers' Union,the Ministry of Lands and Resettlement, the Ministry of Agriculture, Water and Forestry, the Ministry of Fisheries, the Caprivi Regional Council, the Mashi Traditional Authority, the Mayeyi Traditional Authority, the Mafwe Traditional authority, Integrated Rural Development and Nature Conservation (IRDNC), the Namibia Nature Foundation (NNF), and the KAZA TFCA.

This brings together a much wider variety of core members than are members of the complexes, and provides a good platform for coordination at the landscape level.

Multiple and overlapping authorities and institutions

In addition to the stakeholders mentioned above there is a much broader array of institutions involved in land and natural resource and management in the landscape (Jones and Barnes 2009). The main land users are households who use the forest for grazing, clearing land for crops, gathering thatching grass, gathering wild fruits (particularly to see them through the end of the dry season), cutting poles for construction, and gathering firewood. Wealthier individuals may gather some of these resources to sell commercially. Some areas of land have been illegally fenced by wealthy individuals for their own use. In some areas of the Caprivi Region, land has been allocated to individuals under leasehold under a scheme administered by the Ministry of Lands and Resettlement (MLR) to promote small-scale commercial farming on communal land.

The mandates of the various institutions involved in regulation, management or use of the wildlife and forests are often overlapping. Table A2 indicates the various mandates of the different institutions in the Caprivi Region relevant for the landscape and potential conflicts between them.

The result of the current institutional framework is that land use is developed in an uncoordinated way and sectoral plans are developed and implemented in isolation. A good example of this is seen in the central area east of the Mudumu National Park where some community forests overlap partially with conservancies or have been formed within conservancies. Furthermore, small-scale commercial livestock farms (which would be fenced) had been allocated by traditional authorities to individual farmers in existing and emerging conservancies and community forests without taking into account the planned land uses within the conservancies and community forests. At the same time there were private sector plans for the development of a crop-growing scheme on the same areas of land, with the permission of the traditional authorities.

One of the main aims of the Mudumu Landscape Association is to provide better coordination across the landscape to avoid the situation described above.

Table A2: Overlapping authorities over natural resources and land, wildlife and forest resources in the Caprivi Region.
Source: Jones and Barnes (2009)

Resource/ activity	Line ministries	Regional government	Traditional authority	Water user associations/water point committees	Community forest	Conservancy
Land	Overall control by MLR*. Titling, registration and leases allocated through CLBs. TA decides on allocation of customary title for residential and crop-growing land, endorsed by Land Board. Land Board allocates leases, endorsed by TA – potential for allocating leases that conflict with other land uses.	Specific powers regarding development planning include land-use planning; development coordination function impacts land use. Potential for promoting development that conflicts with other land uses.	Allocation of residential and grazing land, endorsement of leases.	Management and maintenance of water points/right to exclude non-members. Control of water = control of land?	Forest Act provides broad management rights over the forest. Community forest boundaries gazetted, potentially strengthening land rights. Forest management plan determines uses and zones.	Conservancy boundaries gazetted, potentially strengthening land rights. Land-use planning and zoning of exclusive wildlife and tourism areas.
Wildlife	Overall control by MET. Devolved limited authority to conservancies. Retains control over certain species. Manages three protected areas.	No specific powers. Governor 'endorses' conservancies.	Traditional control over certain species in the past. Vague legal duty to ensure sustainable use of natural resources. Often driving force for conservancies. Important stakeholder.	No specific powers. Control of water = control of wildlife management? Important stakeholder: potential conflict between needs of members and wildlife.	Forest Act provides that hunting must be done in accordance with the Community Forest Management Plan and that no permit for hunting in terms of wildlife legislation may be issued that is contrary to the management plan.	Devolved use and management rights.
Tourism	Overall control by MET. Devolved some authority to conservancies. Provides concessions in parks to neighbouring conservancies.	No specific powers. Governor 'endorses' conservancy application.	'Endorses' tourism leases.	No specific powers. Important stakeholder: potential conflict between needs of members and wildlife.	No specific powers unless also obtains conservancy rights.	Rights to commercial tourism activities.
Water	Overall control by MAWF. Rights and responsibilities over water points devolved.	Planned regional water management agency, to be responsible for coordination and planning.	No specific powers except duty to ensure sustainable resource management.	Management and maintenance of water points/right to exclude non-members.	No specific powers.	No specific powers. Important stakeholder: wildlife needs water.

Table A2: Overlapping authorities over natural resources and land and forest resources in the Caprivi Region, (continued).

Resource/ activity	Line ministries	Regional government	Traditional authority	Water user associations/water point committees	Community forest	Conservancy
Grazing	MAWF advises TA on grazing allocation.	No specific powers.	Allocates grazing and 'emergency' grazing. Permission to outsiders for access to grazing land.	No specific powers. Important stakeholder: control of water points = control of grazing?	Authority over grazing in the community forest under Forest Act.	No specific powers. Important stakeholder: wildlife uses grazing; zoned wildlife areas may contain attractive grazing areas.
Forest management	Overall control by MAWF. DoF** manages Caprivi State Forest Reserve.	No specific powers, land-use/development planning functions can impact community forests.	Village indunas have traditional management authority over local forests.	No specific powers (see above).	Devolved authority over forest management and the natural resources in the forest area.	Manages forest resources indirectly through zoning areas for wildlife and tourism and maintaining wildlife habitat.
Land-use planning	MLR has overall control of land and ultimate responsibility for land-use planning.	Responsible for development planning with large land-use planning component.	No specific role or powers. Important stakeholder through land allocation powers.	No role or specific powers. Important stakeholder through control of water points.	Develops forest management plans.	Develops own management/land-use plan including zoning areas for wildlife and tourism.
Development planning	MRLGH&RD*** community development. Line ministries carry out planning for own projects.	Responsible for development planning and establishing constituency and village development committees.	No specific roles or powers. Important stakeholder because of land allocation.	No specific roles or powers. Important stakeholder through control of water points.	No specific roles or powers. Important stakeholder because of own local planning for forest use.	No specific roles or powers. Important stakeholder because of use of benefits for development, projects and own planning for tourism and wildlife.

** Ministry of Lands and Resettlement*
*** Directorate of Forestry*
**** Ministry of Regional and Local Government and Housing and Rural Development*

ANNEX 4: *CONSERVATION FARMING AND COMMUNITY-BASED RANGELAND AND LIVESTOCK MANAGEMENT*

Conservation farming

The approach known as "conservation farming" is being introduced to some conservancies in the Landscape Caprivi in order to increase yields and avoid the need for shifting cultivation. The method used in Caprivi involves digging small holes in the ground at set intervals, mixing in manure and planting in these depressions. Each subsequent year, the same hole is used and the soil improved (Mpoyi Rural Development Consultants, 2009). The rest of the ground is not disturbed (no ploughing) and weeds are not burned, but laid over the ground around the emerging crop as mulch and ground cover, reducing surface temperature and moisture loss. This is a form of "minimum tillage". Conservation farming is being linked to wildlife management in Caprivi where areas of land have been set aside for wildlife or where wildlife corridors have been established by conservancies. The idea is that the reduction in the need for land for shifting cultivation through increased yields on the same piece of land will reduce the pressure on wildlife habitat in conservancies.

Conservation farming has also been successfully introduced in neighbouring areas of Zambia at a larger scale than currently in Caprivi. The Community-Centred Conservation and Development (CCCD) project of WWF Zambia is supporting more than 700 farmers in conservation agriculture (CA) and many CA plots can be seen while travelling in the area. According to the District Agriculture Coordinator (DACO) for the Sesheke District maize yields from CA have risen to 3-5 tonnes per ha compared to 1-2 tonnes from conventional agricultural techniques. In the past Kapau village was largely dependent upon government food aid, but now is growing enough food to last from one growing season to the next harvest.

Apparently the local school always used to close in the last term of the year because the children were too hungry, but now there is sufficient food and the school stays open. Through CA farmers are able to produce a surplus which is sold to the government by the project which then buys seed for the farmers. During the last growing season the farmers raised US$4 000 from 300 bags of maize as a contribution to buying new seed. This means that about 75% of the 500 farmers for the 2010/2011 season bought their own seed in the 2011/2012 season. A female farmer from Kapau told us her maize yield had increased from 400 kg (8 bags) of maize under conventional agriculture to 1150 kg (23 bags) under CA.

The project also supported the establishment of a nursery at Sesheke which will provide seed and cuttings for drought resistant crops to farmers and the project will assist with the distribution of seed and cuttings to farmers through the extension agents.

Community-based rangeland and livestock management

This approach has also been introduced to some areas within the Landscape. A primary focus of community-based rangeland and livestock management is improving grazing production through aiming for a higher perennial grass mix and soil with more organic matter on the soil surface as well as in the soil itself (Nott undated). In order to achieve this, livestock owners within conservancies are being assisted to apply sound rangeland management principles, which include:

- During the growing season perennial plants must be given sufficient time to recover from being grazed/ browsed before being grazed once more. The time required for a plant to recover is clearly dependent on the amount and effectiveness of rainfall events within and between seasons;
- During the non-growing season soil cover should be increased through herding or the concentration of animals in an area for short periods of time;
- Animal numbers should be adjusted (upward or downward) depending on the amount of feed available to animals. This again depends on the amount of effective rainfall within and between seasons.

- Livestock should be combined in larger herds so they can be herded according to a planned grazing system
- Low stress livestock handling methods should be used.

The use of herding has benefits for reducing HWC in the Landscape as herders can protect the livestock and ensure they do not enter the protected areas or conservancy tourism zones around lodges.

ANNEX 5: *FIVE-YEAR ACTIVITY PLAN FOR THE MUDUMU LANDSCAPE ASSOCIATION*

Mudumu Landscape 5 Year Strategic Activity Schedule

		Financial ($) and Technial Support (T)												Time Line			
Strategy / Activities	Indicative Budget (N$)	NAMPLACE	GPTF	EIF	KAZA	MCA	SAREP	Complex	Conservancy	Forestry	MET	WWF	Column1	Start (M/Y)	End (M/Y)	Responsible Person from the Assocation	**Progress** (1= Some progress and 2 = Activity completed)
Strategy 1: Promote wise use of land and natural resources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
1.1 Develop a map detailing the overall vision for land use in the landscape												$&T		Aug-12	Sep-12	Stuart-Hill and Diggle	1
1.2 Access and package information necessary for land-use planning and make sure stakeholders use this information		$&T															0
1.3 Proactively raise awareness on the wise use of land and natural resources with all key stakeholders																	0
1.4 Actively engage with the Caprivi Integrated Land-use Planning Process being planned by the MLR																	0
1.4.1 Road construction																	
1.4.2 Green Scheme																	
1.4.3 Integrated land use planning																	
Strategy 2: Increase and manage wildlife populations	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0

2.1 Motivate and seek funding for more game translocations																	
2.2 Support the fee movement of wildlife through the establishment of core wildlife/ tourism areas and corridors																	
2.2.1 Assist in the identification of these areas																	
2.2.2 Support clear identification of these areas																	
2.3 Develop and source funding for wildlife water points in strategic places (e.g. reduce pressure on river fronts on the BNP and MNP)																	0
2.4 Source funding for Anti-poaching efforts of the Association members																	
2.5 Source technical and funding support for the Game Monitoring Units' in the two Complexes, including annual game counts																	
2.6 Source funding for fire management																	0
Strategy 3 Encourage smart partnerships between stakeholders	-		-	-	-	-		-		-	-		-		-		
3.1 Identify and participation on other forums / committee in the region																	
3.1.1 RDCC																	
3.1.2 Project / NGO coordination forum																	

3.1.3 KAZA																	
3.2 Increase participation from line ministries																	
3.2.1 Seek influential chairperson																	
3.2.2 Find high level champion																	
3.2.2 Involve the line ministries in meetings of the Association																	
3.3 Develop a communication /information strategy for the Association																	
3.3 1 Develop an information hub																	
3.3.2 Develop a website for the Landscape																	
3.3.3 Develop a Profile of the Landscape																	
3.3.4 Have a high level opening of an Association meeting																	
3.4 Use training centre establishments in the region																	
Strategy 4: Promote investment and unlock the value of wildlife and natural resources	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
4.1 Update and align the conservancy tourism plan(s) with MET / BMM plans																	
4.2 Finance and Implement the prioritised infrastructure plan	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.2.1 Signposts for the corridors																	
4.2.2 Sangwali Bridge																	

4.2.3 etc																	
4.3 Outsource the marketing of the Landscape for attracting investment																	
4.4 Encourage and support community based tourism and SME's																	
4.4.1 Support marketing of community based tourism and NR products																	
4.4.2 Support SMEs at Trade Fairs																	
4.4.3 Source funding for SME training																	
4.4.4 Source funding for tourism skill training																	
4.5 Work with MLR to try and speed up the leasehold process																	
Total Budget	-	-	-	-	-	-	-	-	-	-	-		-				

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NAMPLACE

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