

NAMIBIAN NATIONAL ISSUES REPORT ON LAND USE, LAND-USE CHANGE AND FORESTRY (LULUCF) (ADAPTATION)



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Contents

Introduction.....	5
Description of the LULUCF sector.....	7
Proposed adaptation options for the LULUCF sector.....	10
Key issues in assessing investment and financial flows to address climate change adaptation in the LULUCF sector	17
Proposed approach/recommendation for conducting the assessment of investment and financial flows to address climate change adaptation in the LULUCF sector	20
References.....	25
Annex 1: Detailed overview of Namibian sectors considered as part of LULUCF.....	27

List of Acronyms

AAP	Africa Adaptation Programme
BCLME	Benguela Current Large Marine Ecosystem
CBA	Community Based Organisation
CBNRM	Community Based Natural Resource Management
CC	Climate Change
CCA	Climate Change Adaptation
CPP for ISLM	Country Pilot Partnership for Integrated Sustainable Land Management
DEA	Directorate of Environmental Affairs
DoF	Directorate of Forestry
DoP	Directorate of Planning
DoT	Directorate of Tourism
DPW	Directorate of Parks and Wildlife
DWA	Department of Water Affairs
EWS	Early Warning System
FENATA	Federation of Namibian Tourism Associations
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GRN	Government of the Republic of Namibia
GTZ	The German Agency for Technical Cooperation
I&FF	Investment and Financial Flows
IAS	Invasive Alien Species IAS
IIED	International Institute for Environment and Development
IPCC	Intergovernmental Panel on Climate Change
ISLM	Integrated Sustainable Land Management
LULUCF	Land Use, Land Use Change and Forestry
MAWF	Ministry of Agriculture, Water and Forestry
MET	Ministry of Environment and Tourism
MME	Ministry of Mines and Energy
MMRF	Ministry of Marine Resources and Fisheries
MTEF	Medium Term Expenditure Framework
NACOBTA	Namibian Community-based Tourism Association
NACOM	Namibia Coast Conservation and Management
NACSO	Namibia Association of CBNRM Support Organisations
NAU	Namibia's Agricultural Union
NCCC	National Climate Change Committee
NCSA	National Capacity Self Assessment
NDP	National Development Plan
NGOs	Non-Governmental Organizations
NNFU	Namibian National Farmers Union
NPC	National Planning Commission

NR	Natural Resources
NRA	Natural Resource Accounts
NTB	Namibia Tourism Board
ODA	Official Development Assistance
OPM	Office of the Prime Minister
PESILUP	Promoting Environmental Sustainability through Improved Land Use Planning project
SAM	Social Accounting Matrix
SGP	Small Grant Programme
PAs	Protected Areas
NTFPs	non-timber forest products
PLCAs	Protected Landscape Conservation Areas
SNC	Second National Communication
SP	Strategic Plan
SPA	Strategic Priority for Adaptation
UNAM	University of Namibia
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

Introduction

Why LULUCF is a key sector for the country?

According to the UNFCCC guidance, the Land Use, Land Use Change and Forestry (LULUCF) sector includes six broad land use categories: (1) Forestland, (2) Cropland, (3) Grassland, (4) Wetlands, (5) Settlements, and (6) Other land. In Namibia, the National Climate Change Committee (NCCC) decided that in our country context it is important to tackle Climate Change (CC) and Climate Change Adaptation (CCA) in all these land use categories, also taking into consideration that land use change, including the conversion from one land use type to another but also in terms of degradation is a pressing environmental issue that needs to be addressed. Consequently it is understood that the LULUCF sector encompasses key production systems, which in Namibia's terrestrial context would primarily be: (1) Agriculture, including both, crops and livestock, (2) Forestry, (3) Fisheries (inland), (4) Tourism, (5) Wildlife and (6) the underlying Ecosystem Services, and which are practiced in the various land use categories in and integrated manner.

Further, in terms of degradation a wide ranging number of underlying issues needs to be considered in the CC and CCA context, as the CC Risk and expected impacts of CC will exacerbate already pressing environmental problems. Key degradation issues, varying amongst different eco-regions in Namibia include: deforestation, bush-encroachment, soil degradation through nutrient and organic matter loss, as well as through erosion, vegetation changes, including through Invasive Alien Species (IAS), fire, and very importantly water degradation both in terms of availability and quality.

Broadly speaking the climate change risk for Namibia includes a warming of up to 2⁰C over the coming 50 years, and an overall more variable and extreme climate with regional reductions of rainfall. All production sectors will be affected by such changes, and impacts on agricultural production (drier climates, more variable seasons, more frequent and prolonged dry spells and droughts), water availability (negative recharge rates of ground water; seasonally increased run-off from areas that are expected to receive more rainfall, i.e. Angola's central highlands), health (heat impacts, water stress, and spread of certain diseases such as malaria), and infrastructure (esp. through flooding damage), are to be expected. Major changes in vegetation structure and biodiversity are expected¹, with endemic species changing their distribution and by 2050 up to 47% could be vulnerable.² In terms of water it needs to be highlighted that the country is already heading towards a situation of absolute water scarcity by 2020 assuming no climate change.³ Any increase in temperature is associated with an increase in the evaporation rate, thus the Namibian water balance is anticipated to become drier.

¹ Midgley et al, 2005.

² Thuiller et al, 2006.

³ Based on GRN, 2002.

In Namibia positive and negative land use changes are naturally taking place. Being the already and naturally most arid country south of the Sahara, land uses are generally already adapted to highly variable and arid climatic conditions, even through certain policy and cultural barriers may have led to the entrenchment of inappropriate land use systems. An example would be that through the apartheid policies of the 20th century white settlers were encouraged through incentives to establish farms in extremely marginal areas, not fit of agriculture (incl. ranching), and black population groups were restricted to specifically demarcated tribal and communally managed lands. Such policies have impacted on the land use systems we find today, as well as land management. On the other hand, since Independence of Namibia in 1990, Namibia has pursued one of the most progressive wildlife and natural resources management approaches worldwide, which has led to a shift from livestock to game farming, with benefits accruing to both traditional commercial farmers and those living in communal areas. From an adaptation point of view, indigenous wildlife is extremely well adapted to the prevailing variable and arid climate, and, given that natural migration over large areas in line with the seasonal rainfall is permitted, is probably the most appropriate and environmentally sound land use for Namibia. Considering that Namibia's booming tourism sector is primarily based on nature and wildlife tourism, this is also one of the economically most attractive land uses (see Tourism Satellite Accounts⁴).

In summary, Namibia is following an approach of integrated land management/integrated ecosystem management. UNFCCC/IPCC rules and methodologies fail to take these and other Namibian realities and circumstances into account (also, in terms of carbon stocks, not accounting for underground carbon sequestration through root systems). Namibia feels that exactly because Namibia's approach to land use goes beyond the conventional categories and we can help to make the Bali Roadmap more holistic, and more integrated especially on biodiversity and land degradation concerns.

⁴ Based on NTB, 2008.

Description of the LULUCF sector

At this stage, Namibia has not formally established a baseline in terms of the six by the Convention pre-given land use categories named above, and they are not considered particularly applicable to the Namibian land use system. Without a baseline, changes in extent of specific land use categories are also not directly measurable. One reason why the categories are not clearly established is that Namibia has not updated its national Greenhouse Gas (GHG) emission inventory since the early 1990s, as Namibia is generally considered a net carbon sink, and so does not have to fulfil certain reporting obligations. In future, however, it may be useful to consider the more formal demarcation of the LULUCF sector, in a Namibia-adapted manner.

For the purpose of this issues paper, ANNEX 1 contains an overview of land uses and tenure in Namibia, and then in depth considerations on status and trends of forests and woodlands, land clearance for crop production, and stocking intensities, identifying areas that are over stocked. The farming risk in Namibia is mapped out, while finally the extent of wildlife based or mixed livestock and wildlife areas are shown. This overview provides an indicative view of the status and trends in the LULUCF sector, as already introduced in Section 1 of this paper.

In a nutshell, for Namibia the LULUCF sector needs to integrate all key production systems, namely (1) Agriculture, including crops and livestock, (2) Forestry, (3) Fisheries (inland), (4) Tourism, (5) Wildlife, and (6) underlying Ecosystem Services.

An initial economic impact assessment of climate change for Namibia⁵ established the current status of elements of the above indicated six LULUCF sector components, as well as the expected negative impacts of climate change on these production sectors in terms of GDP.

Agriculture is currently the livelihood basis for 70 % of Namibia's population, with a majority of Namibians depending on subsistence agriculture for survival (NPC, 2007). About 40% of all of Namibia's exports is based on agricultural products (NPC, 2007). It is asserted that the sector component has growth potential, although it is clear that government policy directs investments into the development of other sectors, which would potentially be less vulnerable e.g. to climatic change. Overall Namibia's agricultural potential is categorised as marginal at best, and livestock farming is the dominant land use. Irrigation is costly and water is considered an extremely limited resource, with absolute water scarcity expected for the year 2020 (GRN, 2002), without factoring in future climate change impacts. Limited information is available on the current contribution of inland fisheries to GDP, and most of the fisheries industry relates to marine fisheries. Aquaculture is a developing inland fisheries industry, still in its infancy. Although Namibia only has limited forests, forestry and non-timber products do

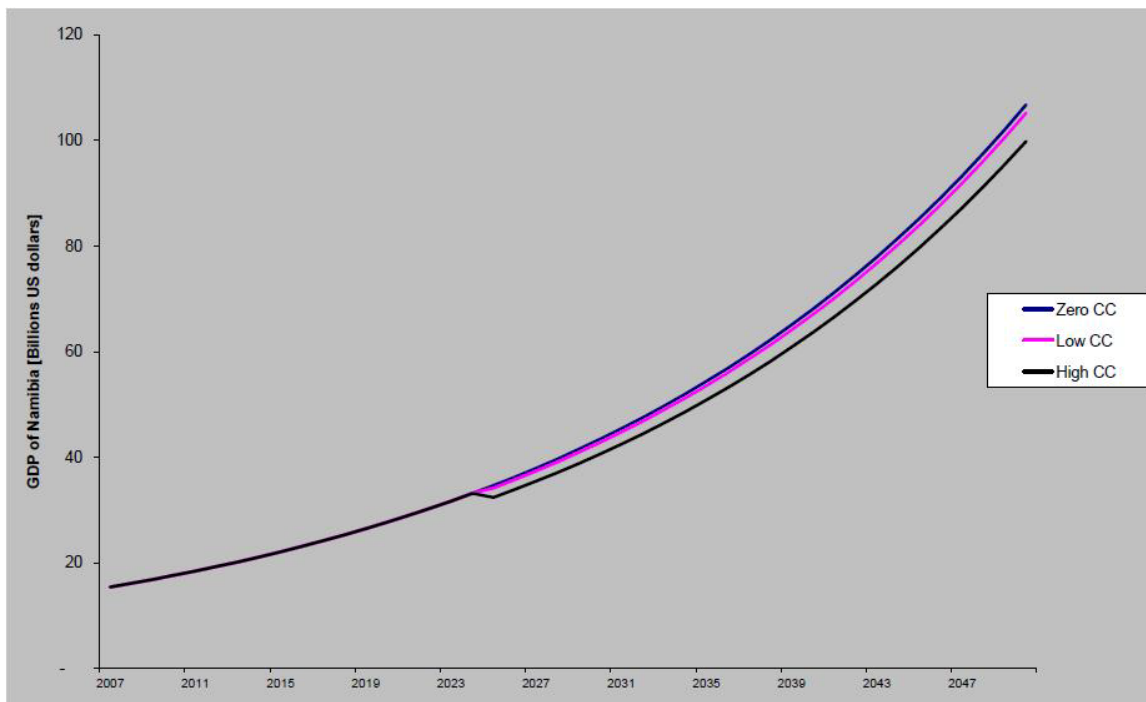
⁵ Reid et al., 2007.

make significant contributions to the economy⁶ and estimate the direct contribution to Namibia’s annual national income (not necessarily reflected in the traditional GDP measures) to be up to 1 N\$ billion, which would be up to 3% of GDP.⁷ Tourism, which includes wildlife to major extent (e.g. trophy hunting, park fees), is a key economic activity in Namibia, and the Tourism Satellite Accounts established the magnitude of the contributions as 2.3 % of GDP, and up to an additional 6.3 % through various indirect values. Overall the figures provided are only indicative, as only use values, and not non-use values are included in the traditional measure of GDP.

Overall the research by Reid suggests that over 20 years, annual losses to the Namibia economy could be up to 6 % of GDP due to the impact that climate change will have on its natural resources alone.

Projected Namibian GDP under three climate change impact scenarios, 2007-2050:

Figure 1: Projected Namibian GDP under three climate change impact scenarios, 2007-2050, suggesting that annually up to 6% of GDP could be lost. From Reid et al., 2007



Source: Hannah Reid, Linda Sahlén, James MacGregor, Jesper Stage (2007): The economic impact of climate change in Namibia. How climate change will affect the contribution of Namibia’s natural resources to its economy. IIED Discussion Paper 07-02, London.

Broken down by sector components, this would be broken down as indicated in Table 1.

⁶ Based on Annex 1.

⁷ Reid et al. (2007).

Table 1: Possible climate change effects on GDP per sector component (from Reid et al., 2007).

Values	Current GDP contribution (%)	Changes expected due to climate change (%)	Effect on GDP (millions N \$)	Confidence in range of change
Use values:				
Cereal production	0.5	Decrease (10-20%)	-16 to -32	Low to medium
Crop production	1	Decrease (10-20%)	-32 to -65	Low to medium
Livestock production	4	Decrease (20-30%)	-264 to -660	Medium
Traditional agriculture	1.5	Decrease (40-80%)	-197 to -395	Medium to high
Fishing	6	Increase (30)/Decrease (50)	0 to -990	Low
Tourism	2.3	Increase/Decrease		Low
Forests	+*	Unchanged	-0	Low
Non-use value	+*	Decrease	-	Low
Total value			-509 to -2142	

Source: Hannah Reid, James MacGregor, Linda Sahlén and Jesper Stage (2007): Sustainable Development Opinion. Counting the cost of climate change in Namibia, London.

*Not included in the traditional national accounts

Proposed Adaptation Options for the LULUCF sector

Adaptation context

It is useful to distinguish autonomous adaptation versus policy driven adaptation, and to realise that adaptation is different from mitigation because: (i) it will in most cases provide local benefits, and (ii) these benefits will typically be realised without long lag times. As such, many actions will be taken ‘naturally’ by private actors such as individuals, households and businesses in response to actual or expected climate change, without the active intervention of policy. This is known as ‘autonomous’ adaptation.

In contrast, policy-driven adaptation can be defined as the result of a deliberate policy decision. Autonomous adaptation is undertaken in the main by the private sector (and in unmanaged natural ecosystems), while policy-driven adaptation is associated with public agencies - either in that they set policies to encourage and inform adaptation or they take direct action themselves, such as public investment. There are likely to be exceptions to this broad-brush rule, but it is useful in identifying the role of policy. The extent to which society can rely on autonomous adaptation to reduce the costs of climate change essentially defines the need for further policy. Costs may be lower in some cases if action is planned and coordinated, such as a single water-harvesting reservoir for a whole river catchment rather than only relying on individual household water harvesting. There are some primary barriers to autonomous adaptation, including lack of information and knowledge, financial constraints, and “inappropriate” markets.

Different approaches and strategies for adaptation will have to be implemented by different stakeholders, including the individual, the private sector and government.

The Stern Review (2006) of the Economics of Climate Change is a landmark document published by the British Government. Among other things, it lays out potential policy responses to adaptation in Part V of the report. As these provide general guidance for adaptation options for Namibia, they are reproduced in the following section.

Adaptation options in general terms

Development itself is recognised as the most effective way to promote adaptation to climate change, because development increases resilience and reduces vulnerabilities. Beyond that broad development focus, fully integrating climate change will require ensuring that adaptation concerns are reflected across many aspects of government policy. Some of the required measures for strengthening adaptation include:

- **Ensuring access to high-quality information about the impacts of climate change and carrying out vulnerability assessments.** Early warning systems

and information distribution systems help to anticipate and prevent disasters.

- **Increasing the resilience of livelihoods and infrastructure** using existing knowledge and coping strategies.
- **Improving governance**, including a transparent and accountable policy and decision-making process and an active civil society.
- **Empowering communities** so that they participate in assessments and feed their knowledge into the process at crucial points.
- **Integrating climate change impacts** in issues in all national, sub-national and sectoral planning processes and macro-economic projections. The national budget process is key here.
- **Encouraging a core ministry** with a broad mandate, such as finance, economics or planning, to be fully involved in mainstreaming adaptation.⁸

Progress in Namibia – CCA responses already underway

Namibia is already implementing a great deal of CCA related policy responses, and before brainstorming in more detail potential LULUCF relevant options, some of the key achievements and ongoing activities are briefly cited.

- Namibia has established a designated National Climate Change Committee, housed at MET.
- Within DEA a special Climate Change Programme has been running since the early 1990s, with a CC Coordinator and ad hoc additional staff.
- CCA has been included as one of the environment sector priorities under NDP 3; although CCA is not yet fully mainstreamed into NDP 3, the NDP 3 CCA programme should aim to achieve this for the next 5 year planning period.
- The MET Strategic Plan (SP) spells out priority CCA activities, aimed, amongst other things, at providing opportunity for supporting a national framework of action on CCA and CCA mainstreaming.
- Namibia has completed reporting requirements under the UNFCCC and since last year is conducting relevant background studies for the completion of Namibia's Second National Communication (SNC).
- Namibia has received funding for several pilot projects on CCA from UNDP/GEF:
 - SPA: A pilot project in Omusati region that aims at developing and promoting coping mechanism amongst small scale farmers e.g. through the improvement and promotion of indigenous and drought resistant crops and livestock breeds; the establishment and improvement of Early Warning Systems, linking local, regional, national and super-national modern and traditional systems; the generation and dissemination of

⁸ Source: Adapted from Sperling (2003) in Stern Review: *The Economics of Climate Change* (2006), <http://www.kickasstorrents.com/the-stern-review-on-the-economics-of-climate-change-t874364.html>

CCA relevant information amongst key stakeholder groups in Omusati region.

- CBA: Community-based Adaptation fund under the Small Grants Programme (SGP), which provides small grants to local communities for testing CCA innovations.
- Namibia further receives CCA support through UNDP, through a workshop on national CC awareness raising and capacity development workshop, and a four years programme of up to US\$ 4 Mio that would support the Government in establishing a national framework to successfully deal with CCA in the future, sponsored by the Government of Japan.
- The GTZ is currently undertaking a scoping study that identifies how the German support to the NR sector in Namibia can mainstream CCA considerations throughout the existing support programme and which CCA priorities of the Government should be supported.
- A number of NR sector programmes, such as the BCLME, NACOMA and various water sector research programmes have undertaken CC risk assessments (e.g. Cuvelai Drainage project); various researchers and development partners, including IIED and the Tyndall Centre, have carried out research on CC in Namibia, including on adaptation as well as costing of the impacts. No studies that would assess the cost of adaptation versus the benefits thereof have been conducted to date, according to my knowledge.
- Numerous other projects and government policies promote the overall adaptation policy options outlined above i.e. on improving governance, and empowering communities.

Some specific adaptation options relating to the Namibian LULUCF sector

Mainstreaming CCA in national policy

- Although the NDP 3 environment sector submission includes a designated section on CCA, and environment was supposed to be mainstreamed throughout NDP3, it is critical to support actions that guarantee that CCA will be mainstreamed through all sectors during the next 5 year national planning period.
- Similarly, the MET SP should be checked for CCA mainstreaming opportunities, as well as the SPs of other Ministries.
- A CCA policy review should be conducted that identifies which national policy instruments should better mainstream CCA and develop proposals for such mainstreaming.
- Priority policy issues should be flagged, such as for example how Namibia deals with drought and drought relief; the implementation and potential improvement in view of CCA of the drought policy should be considered as a matter of urgency.

- Current drought relief practices need to be reviewed in terms of their CCA value. For example, the hand out of drought relief should be reviewed in favour for food-for-work or other incentive systems that empower people to adapt instead of creating dependency.
- I&F flows need to be critically assessed and long-term financing and investment strategies to be developed.

Land use planning and promotion of climate compatible land uses and associated production systems

- Land use options that are better adapted to the already extremely variable and arid climate that characterises Namibia should be promoted; already, through autonomous adaptation, a shift from livestock to wildlife-based production systems is taking place.
- It needs to be ensured that land use planning not only promotes land uses that are better adapted to today's climate but also withstand further changes.
- A national land suitability overview should be made available, taking future CC into consideration. The PESILUP project under the CPP for ISLM intends to undertake an assessment of environmentally sustainable land use options in Namibia – this could further be improved by taking CCA into consideration. Such information would be critical to underpin land use planning and decision making in Namibia in the future.
- It is important to empower local level land and resource users to conduct land use planning on the implementation level and to link such planning to higher tier, i.e. regional and national plans. Information flows need to be multi-way.
- The Namibian-promoted integrated ecosystem management approach that combines a facet of land uses and management options in a “land use category” is a well adapted coping strategy.

Prevention of land degradation and rehabilitation

- Land degradation is a major threat to Namibia, hugely undermining adaptive capacities. Any investment into SLM will also have CCA benefits.
- In relation to the forestry sector key adaptation activities would include: combating deforestation and promotion of reforestation and afforestation, and improved forestry management.
- Country Pilot Partnership for Integrated Sustainable Land Management (CPP for ISLM) is a national umbrella programme addressing inter-sectoral action on land management. This programme provides a huge opportunity for Namibia to go ahead with CC proofing SLM in Namibia and all affected/related sectors.

Examples of land and resource management options⁹

- *Crop, forage and tree species/varieties*: farmers need to flexibly adapt their crops from season to season to ensure that the seeding material used and planting times are well adjusted to the weather expected this specific season. Access to the right planting material, reliable weather and early warning information is critical. Already farmers in northern Namibia, where rainfed crop farming is more common, prefer to farm on a mosaic of soils and plant a variety of plants that might fare better under unpredictable climates.
- *Livestock, game and fish species/breeds*: farmers in Namibia can similarly select breeds and species that are better adapted to warmer climates. New breeds may be better adapted (e.g. UNAM Ongongo campus is trialling a cross breed between Sanga and Brahman, which may bear higher production levels, whilst being well adapted to hotter and drier climates), or traditional breeds could be improved production levels. In certain areas a change of species assemblages may be encountered. In terms of wildlife, those species that are usually found in drier and hotter climates may change their natural distribution ranges naturally. Generally indigenous game will be better adapted to the local conditions – and maintain more natural biodiversity.
- *Crop and tree management*: Especially, but not only, in northern Namibia a great number of trees are used, particularly certain fruit trees. Trees can be interspersed on crop land and should be conserved in woodlands as alternative natural resources products can be garnered that can provide a critical source of alternative food stuff during drought conditions or provide alternative nutrition in general.
- *Livestock, game, aquaculture and wild fish management*: A great number of options arise from changing management practices, both in low intervention and high intervention systems. Generally farmers / natural resource users adapt slowly to changes and innovation; however, demand and needs-driven inventions are finding their way and are being mainstreamed. It is important to ensure that people have access to best available information, that extension services are professional and effective and that necessary financial opportunities are in place to promote new management systems. Micro-credit, savings and other financial mechanism can go a long way in unlocking such potential.
- *Moisture management, irrigation and soil & water conservation*: As water will become a much more restricted resource (as it is already in highly water constrained Namibia) even more efforts have to be placed into water conservation and use. Still to date in Namibia people act as water wasters, and precious resources are not taken advantage of. The huge run-off from the 2008 and 2009 floods in northern Namibia, for example, are still largely standing as open water sources at this time of the year (late dry season), and although the waters harbour fish populations and serve as drinking reservoir for domestic

⁹ Based on McCarl, 2007.

animals, appropriate water harvesting and storage capacity as well as flexible irrigation could have potentially be used for improved production and preparation for poorer seasons.

- *Pest and disease management*: With extreme weather events usually pest and disease outbreaks are exacerbated. For example, after the 2008 and 2009 floods in northern Namibia, an outbreak of armyworm was observed and many crops went to waste. Adaptation can occur through investments into integrated pest management and improved veterinary services and care.
- *Management of natural areas*: Generally it is believed that natural areas will respond naturally to climate change. Shifts in species composition and distribution can be expected. Some research has been undertaken by Thuiller, Midley et al. (e.g. 2006) and some information on expected changes is available. It might be possible to “manage” adaptation, e.g. the extinction of species living in marginal area; however, considering the extensive nature of natural areas may render management inputs too expensive. Generally applied conservation biology principles such as the establishment and maintenance of corridors etc. also apply in an adaptation context.
- *Fire management*: Drier and hotter climates may lead to increased fire occurrence and threats, even if fuel load may be reduced overall. Fire management may need to be improved under adaptation scenarios, and should include fire proofing of settlements and human habitation.

Identifying key infrastructure and development investments that require “climate change proofing”

- Although infrastructure investments are generally extremely expensive, it is important that Namibians do make strategic future investments. Projects that are already on the drawing board should be improved to take into consideration future CC impacts.
- In the LULUCF context a major concern revolves around long-term water provision. Water infrastructure investments, which only a decade ago seemed ludicrous, may need to be considered. If Namibia, for example, would like to further pursue irrigation of any kind, today’s water supplies cannot meet the demand. Transfer pipelines from far away sources, large scale desalination plants etc. may be better options – or the building of dams that would store run-off from e.g. central Angola, pending that CC scenarios for that area would predict a more reliable water flow.
- A systematic assessment of investment needs and opportunities relating to LULUCF and other sectors should be conducted and integrated into long term development planning in Namibia, e.g. into Vision 2030.
- The business community and investors need to be informed about threats, challenges and opportunities to ensure visionary development.
- Relating to LULUCF and e.g. drought and/or flood risk management, it would be desirable if the private sector (i.e. the insurance industry) could become more

responsive to the needs and risks of farmers. The 2006 floods in Mariental, for example, have led to all major insurance companies withdrawing coverage of flood damage in Mariental, which leaves a great number of people more vulnerable to CC. It would be desirable to develop better suited and flexible insurance regimes that would reduce the vulnerability of Namibias. This holds true also for farmers insurance against crop failure and pest outbreaks in the CCA context.

Upscaling EWS and generally improving information on CC and CCA

- Good information is a prerequisite to strong decision making. It has been identified that in Namibia EWS are relatively weak. The Omusati CCA pilot project is trying to establish what type of local level EWS are being used to inform farming decisions, and at the same time attempts to improve the information from Meteorological services and through agricultural extension to be responsive to the needs and circumstances of local farmers.
- An integrated national information system that combines weather forecasts with relevant range and agricultural management decision making processes is needed, which may use information provided from further afar through regional and international partnerships.
- In terms of information it is important to have a framework that identifies critical information and research needs, as well as identifies clear communication strategies tailored to the diverse requirements of different stakeholder groups in Namibia. Delivery and dissemination mechanisms, use of appropriate media and language or other communication tools is an ever underestimated gap, which needs to be filled.
- National research capacities need to be strengthened to bring Namibia ahead on the CCA and sustainable development path. It is noted that the Polytechnic of Namibia and UNAM have launched Master level programmes that respond to capacity needs in the LULUCF sector, which also need to integrate CCA elements.

Key Issues in assessing Investment and Financial Flows to address Climate Change Adaptation in the LULUCF sector

Background

- Analysis of the cost of adaptation is needed to devise short and long-term financing strategies. Although a majority of adaptation investments are thought to be leveraged autonomously by the private sector, it is important that public funds and policies promote such natural adaptation action. Certain investments in large-scale public infrastructure, such as water infrastructure, most certainly will require public funding and international support.
- It is asserted that under current CC scenarios the cost of inaction will be higher than the cost of action.¹⁰ Consequently countries are well advised to plan for **adaptation investments as early as possible.**
- This is the first time that I&F flows are being considered in CCA planning in Namibia. Although a previous study has looked at establishing economic costs of CC to various sectors in Namibia¹¹, this study remained very peripheral in its approach and findings.

Key information needs

- Reliable information on expected CC impacts are needed to ensure that all sectors, private and public can take well-targeted response actions. The costs and benefits of action vs. inaction need to be established to make a good business case. Currently such information is not readily available for Namibia.
- Based on the broad suite of identified adaptation options, key options that address the most pressing adaptation needs need to be strategised. Once an overview of adaptation priorities are identified these can be costed.
- Opportunity cost of upgrading and CC proofing existing investments, policies, and project interventions should be relatively low, and should be identified as a matter of priority.
- Information on current investments and financial flows need to be established as a baseline.

Key information available in Namibia

- Under the SNC various expert studies have been undertaken, which should contribute to a better information base for decision-making. However, it is clear that long-term investments into research and information management are required, as well as the information therein to ensure that CCA-related information needs are covered satisfactorily.

¹⁰ Stern, 2006.

¹¹ Reid et al., 2007.

- Through the national development planning and budgeting process, key information on baseline activities and investments relating to the LULUCF sector and otherwise are available. For example, the 4 year national budget.¹²
- The Natural Resource Accounts (NRA) for natural assets such as fish, wildlife, forests, water and minerals are available in Namibia, as well as for tourism. Namibia also has established a Social Accounting Matrix (SAM) database, which may aid analysis.
- ODA flows can be relatively easily accessed through the National Planning Commission Secretariat and relevant line Ministries.
- Planned key development projects are set out in Namibia's National Development Plan for a 5 year periods, and guided by Vision 2030, the 30-year development strategy of the country.
- It is probably more difficult to assess current domestic and private investments that would serve as a baseline to establishing future adaptation costs.

Some key recommendations for the I&FF assessment of the LULUCF sector in Namibia

- Although some good data sources exist in Namibia, it is clear that the broad definition of the LULUCF sector in Namibia will make data generation quite difficult. It is therefore recommended to first identify clearly defined sub-sectors that could be analysed initially. The choice of such sub-sectors should follow the "lowest hanging fruit" principle – use one or two sub-sectors where good information is relatively easily accessible.
- The fact that data is scattered across many different institutions will require strong involvement of these institutions to unearth and make accessible the existing data. Commitment from the highest management level in the various Ministries and organisations is required for data sharing to take place.
- The Environmental Economic Unit at the Directorate of Environmental Affairs in the Ministry of Environment and Tourism already has a good foundation database for relevant economic and budget information – this data needs to be accessed for quality and the potential to build on it.
- The initial economic assessment may contain some useful initial data that can be made use of also.¹³ It might be possible to contact the relevant persons at IIED for such data to be shared.
- It is clear that data collation will be a major task and challenge in the I&FF assessment process. Sufficient time, resources and political will are needed to ensure that meaningful baseline data can be derived for the assessment.

¹² Based on The Medium Term Expenditure Framework MTEF 2007/08 – 2009/10) is available online at the website of the Ministry of Finance.

¹³ Based on Reid et al. (2007).

Various other issues

- The National Capacity Self Assessment (NCSA) for Global Environmental Management carried out for Namibia indicated that there is a severe shortage of natural resource economists in the country. Although this assessment was completed already in 2004, up to today this critical skills shortage has not been filled. Other technical capacity gaps relevant to the assessment of I&F flows may impede a systematic country wide analysis.

Proposed approach/recommendation for conducting the assessment of investment and financial flows to address climate change adaptation in the LULUCF sector

Key stakeholders

It is recommended that the I&F flow assessment process be aligned with existing CC and CCA structures (see Figure 7). Furthermore, the assessment should be integrated into the National CCA Framework Project supported by UNDP (Africa Adaptation Programme (AAP) with funding from the Government of Japan).

The inclusion of additional experts and stakeholders into existing structures needs to be discussed. Representatives of the Ministry of Finance, of the National Planning Commission (already NCCC member) and experts such as natural resource economists, as well as representatives of the private sector (e.g. represented by the NCCI) should potentially be included in a project steering committee (which could be aligned/part of the NCCC).

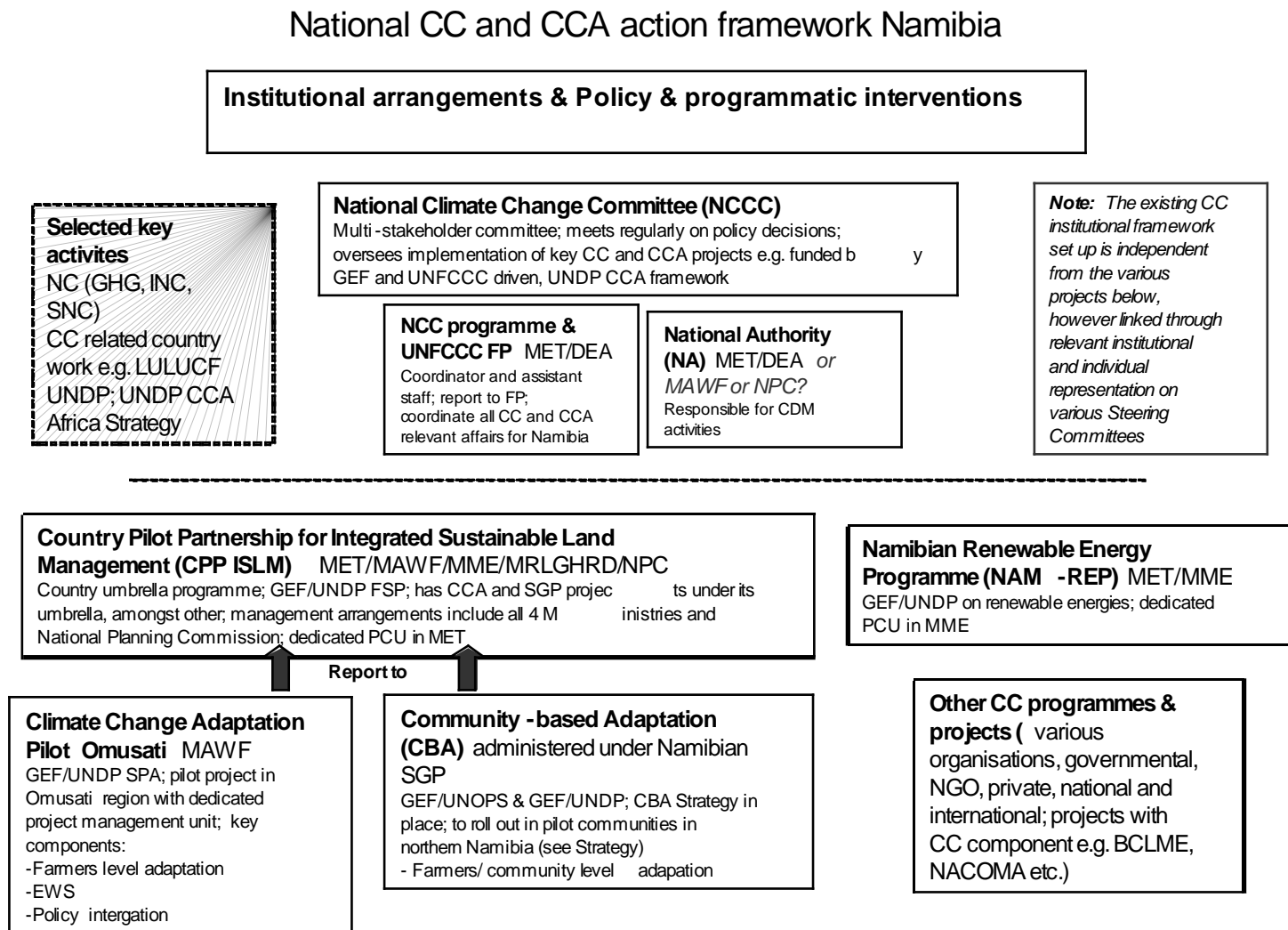
In the case of Namibia, and in the context of this project, it was decided that based on the initial consultations with the MET team and the NCCC, although the study covers nearly all ministries, the National team will consist mainly of the following essential institutions:

- Ministry of Environment and Tourism (MET) – UNFCCC focal point
- National Planning Commission (NPC) – National statistics
- Ministry of Agriculture, Water and Forestry (MAWF) – LULUCF data
- Ministry of Mines and Energy (MME) – Energy data
- Office of the Prime Minister (OPM) – Emergency Management Unit
- UNDP Namibia – Environment and Statistics department
- Ministry of Finance – Financial planning
- 2 National consultants – 10 days (to assist the team in mitigation and adaptation modeling scenarios).

Time permitting, other ministries may be considered as key role player in addressing I&FF assessments.

Due to the limited number of technical experts in Namibia it is important to reduce committee meeting and workshop burdens, and find pragmatic governance structures for new projects and initiatives. Making use of already established and existing entities also facilitates longterm involvement and continuity.

Figure 2: Current CCA related project and institutional arrangements in Namibia (Zeidler, 2008).



Note: Current CCA related project and institutional arrangements in Namibia (Zeidler, 2008, prepared for UNDP CCA Africa Strategy, country case Namibia). It is recommended to align the I&F flows assessment with the ongoing umbrella programme that aims to develop a national longterm approach and strategy on CCA. The UNDP/Japan fund support will roll out in 2009 and is for a 3 to 4 year period. Implementation arrangements and aligned workplans should be developed to enhance synergy and longterm sustainability.

Institutional Arrangements:

In terms of institutional arrangements, key ministries were requested to delegate two senior development planners/ finance officers/economists/statisticians/researchers that are conversant in some climate change issues particularly in issues of mitigation, adaptation and/or policy formation to be form part of the national the working group.

These persons will bring from their department relevant data/publications which might be useful during the period of the assessment. Given the demands on the National Team, it was requested that these organizations ensure the part-time participation of the experts during the course of the assessment.

Considering that Namibia includes the following key production systems in its definition of the LULUCF sector encompasses key production systems: (1) Agriculture, including both crops and livestock, (2) Forestry, (3) Fisheries (inland), (4) Tourism, (5) Wildlife and (6) the underlying Ecosystem Services, it is clear that a great diversity of stakeholders would need to be involved in the assessment. An indicative list of stakeholders could be as indicated below. Please note that the National Planning Commission, the Ministry of Finance and the Environmental Economics Unit at DEA/MET should be part of all production system specific groups.

(1) Agriculture, including both crops and livestock,

- Ministry of Agriculture, Water and Forestry, Directorate of Planning (MAWF/DoP)
- Ministry of Trade and Industry (Directorate to be identified)
- Ministry of Environment and Tourism
- Namibian National Farmers Union (NNFU)
- Namibia's Agricultural Union (NAU)
- Agro-economic Board of Namibia
- Meat Board.

(2) Forestry,

- Ministry of Agriculture, Water and Forestry, Directorate of Planning (MAWF/DoP)
- Ministry of Agriculture, Water and Forestry, Directorate of Forestry (MAWF/DoF)
- Nacso (Namibian Association of CBNRM Service Organisations) /Community Forestry representatives.

(3) Fisheries (inland),

- Ministry of Marine Resources and Fisheries (MMRF) (Directorate to be identified)
- Representative of the Fishing Industry (inland fishing)
- Representative of community fisheries (if any).

(4) Tourism,

- Ministry of Environment and Tourism, Directorate of Tourism (DoT)
- Namibia Tourism Board
- Federation of Namibian Tourism Associations (FENATA)
- NACOBTA (Namibian Community-based Tourism Association) and/or Nacso.

(5) Wildlife

- Ministry of Environment and Tourism, Directorate of Parks and Wildlife (DPW)
- Meat Board
- Private sector representatives (professional hunters, game meat farmers).

(6) Ecosystem Services

- Ministry of Environment and Tourism, Directorate of Parks and Wildlife (DPW)
- Ministry of Environment and Tourism, Directorate of Environmental Affairs (DEA)
- Ministry of Agriculture, Water and Forestry, Department of Water Affairs (MAWF/DWA)
- NGOs and research institutes.

It is apparent that a good part of financial information is vested within the Government structures, however clearly much of the economic information will be in the private sector and its various representatives. It is therefore recommended to include such private sector representatives in the analysis.

Furthermore, given the “dual” economic situation in Namibia, with a “commercial’ and a “communal” land and resources management system, representatives of community-based LULUCF sector stakeholders should take part in the assessment. Larger NGOs working with CBNRM and being knowledgeable about the I&FF’s related to community-based contributions to the LULUCF sector could serve as such representatives.

References

Berry, P. Adaptation Options on natural ecosystems. A report to the UNFCCC Secretariat, Financial and Technical Support Division, http://unfccc.int/cooperation_and_support/financial_mechanism/financial_mechanism_gef/items/4054.php.

De Klerk, J.N., 2004. Bush Encroachment in Namibia. Report on Phase 1 of the Bush Encroachment Research, Monitoring and Management Project, Ministry of Environment and Tourism.

DRFN, 2008. Draft Vulnerability & Adaptation Assessment for Namibia. Second National Communication, Ministry of Environment & Tourism.

Government of the Republic of Namibia (GRN), 2002. *Namibia: Initial National Communication to the United Nations Framework Convention on Climate Change*. Windhoek: Ministry of Environment and Tourism, Republic of Namibia. (<http://www.dea.met.gov.na/data>), 79 pp + appendices.

McCarl, B. A., 2007. Adaptation options for agriculture, forestry and fisheries. A report to the UNFCCC Secretariat, Financial and Technical Support Division, http://unfccc.int/cooperation_and_support/financial_mechanism/financial_mechanism_gef/items/4054.php.

Mendelsohn, J. & el Obeid, S., 2005. Forests and Woodlands, Ministry of Agriculture, Water and Forestry, <http://www.mawf.gov.na/Directorates/Forestry/mendelsohn.htm>.

Mendlesohn, J., Jarvis, A., Roberts, C. & Robertson, T. 2002. *Atlas of Namibia : A portrait of the Land and it's People*. David Philip Publishers, Cape Town, http://209.88.21.36/Atlas/Atlas_web.htm.

MET, 2002. Namibia – Initial National Communicatiotn to the UNFCCC. Ministry of Environment and Tourism.

MET, 2008. NamibiaTourism Satellite Account. 2nd edition, Ministry of Environment and Tourism and Namibia Tourism Board.

National Planning Commission (NPC), 2007. Third National Development Plan (2008-2012). Governement of Namibia, Windhoek.

Namibia Tourism Board (NTB), 2008. Namibia Tourism Satellite Account 2nd Edition. http://www.namibiatourism.com.na/trade_cat_sub.php?sub_cat_id=28. (accessed 11 October 2009).

Midgley, G., G. Hughes, W. Thuiller, G. Drew and W. Foden (2005) *Assessment of Potential Climate Change Impacts on Namibia's Floristic Diversity, Ecosystem Structure and Function*. South African National Botanical Institute, Cape Town.

MoF, 2007. Medium Term Expenditure Framework, MTEF 2007/08 – 2009/10. Ministry of Finance, Government of Namibia.

Nacso, 2006. Namibia's communal conservancies: a review of progress and challenges in 2005. Namibian Association of CBNRM Support Organisations (Nacso), Windhoek.

Reid, H., Sahlen, L., MacGregor, J & Stage, J., 2007. The economic impact of climate change in Namibia. How climate will affect the contribution of Namibia's natural resources to its economy. Environmental Economics Programme Discussion Paper 07-02, International Institute for Environment and Development, London, UK.

ANNEX 1: Detailed overview of Namibian sectors considered as part of LULUCF

For the purpose of this issues paper, selected status and trends information is presented, mainly determined by priorities and information accessibility. The following are considered: An overview of land uses and tenure in Namibia (Figure 1), and then in depth considerations on status and trends of forests and woodlands, land clearance for crop production, and stocking intensities identifying areas that are over stocked. The farming risk in Namibia is mapped out, while finally the extent of wildlife based or mixed livestock and wildlife areas are shown. This overview provides an indicative view of the status and trends in the LULUCF sector, as already introduced in Section 1 of this paper.

Major land uses in Namibia

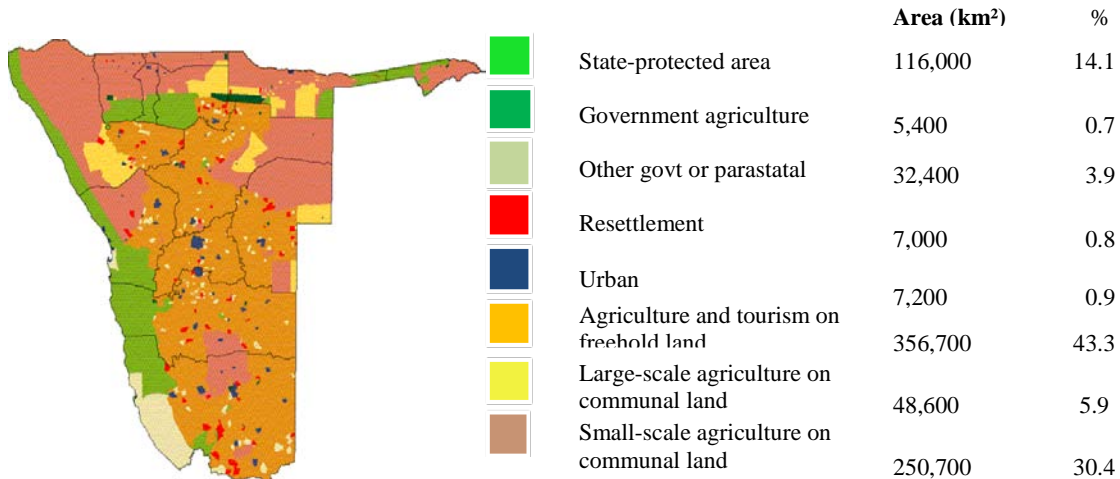


Figure 1: Map of major land uses and tenure in Namibia. It is clear that land uses are applied in a more integrated manner and thus cannot be mapped as distinct land use categories as set out in the UNFCCC context. Tenure arrangements and associated land management practices have major impacts on ecosystem health and need to be considered in a CCA context.

Source: Mendelsohn et al., 2002.

Status & Trends 1: Forests and woodlands

Due to the prevailing arid conditions in Namibia, only an overall 9.3%, or about 7,661,000 ha, of is forested (forest and open forest), with a gradient following rainfall distribution, and with the highest tree density and biomass in north-eastern Namibia (Caprivi & Kavango).

Change in forest cover (incl. woodlands) has been recorded as follows: Between 1990 and 2000, Namibia lost an average of 72,900 hectares of forest per year. The amounts to an average annual deforestation rate of 0.83%. Between 2000 and 2005, the rate of forest change increased by 11.3% to 0.93% per annum. In total, between 1990 and 2005, Namibia lost 12.6% of its forest cover, or around 1,101,000 hectares. Measuring the total rate of habitat conversion (defined as change in forest area plus change in woodland area minus net plantation expansion) for the 1990-2005 interval, Namibia lost 9.3% of its forest and woodland habitat.

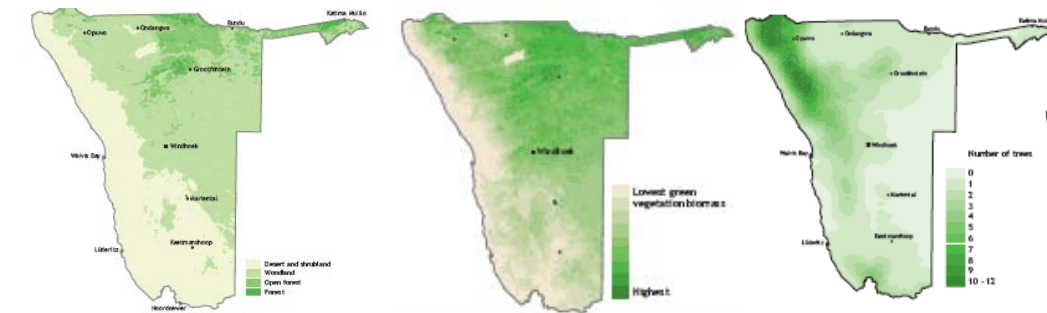


Figure 2
Distribution

Figure 3
Biomass

Figure 4
Endemism
hotspots

Figures 2 to 4: Figure 2 depicts the approximate distribution of forest, open forest and woodland areas throughout Namibia. It is clear that Namibia overall has a very low level of forests, which is natural due to the prevailing arid climate. In terms of biomass (Figure 3), the distribution follows Namibia’s natural rainfall gradient with increasing rainfall from the south-west to the north-east. The values of “low” and “high” are given in relative terms in Namibia, and fair overall low compared to more tropical countries in Africa, for example. Figure 4 reveals an unexpected pattern, indicating that the relatively lowly forested area in north western Namibia (Kaokoland) has the highest level of endemic woody plants! *Source, Mendelsohn & el Obeid, 2005.*

When considering the importance of woody plants, it is important to realise that benefits and uses are not just related to timber – there is more than wood (domestic, non-cash consumption and commercial production) to a tree. Overall uses are for fuel wood, charcoal production, household construction and fencing, carvings, mopane roots, non-timber products e.g. fruits, honey, oils, beverages (e.g. Marula fruits and kernels, Mangetti fruit and kernels, Makalani palm sap and fruits).

The estimated annual contributions of the use of fuel wood, construction and fencing poles and non-timber forest products (NTFPs) to the Namibian economy in 2004: (i) Direct contribution to national product: N\$ 1,05 Mio, (ii) Direct and indirect contribution to national economy: N\$ 1,85 Mio (after Mendelsohn & el Obeid, 2005).

A special environmental treat related to woody vegetation is the phenomenon of bush encroachment, which poses a huge desertification problem in Namibia. Previously productive rangeland is transformed into thorn bush thicket, which renders large areas of as unproductive. The effect of 26 Mio ha of range land lost to bushencroachment and it is believed that annually an economic loss of more than 700 Mio N\$ (or 100 Mio US\$) is caused, due to decreasing livestock stocking rates and land use carrying capacity throughout Namibia (de Klerk, 2004). The causes of bushencroachment are manifold, but include inappropriate land management, and change sin rainfall, soils and nutrients. It is very possible that climate change is a major contributor to the observed changes in vegetation patterns, aggravated by degradation. On the more positive side, bushencroachment can be considered to serve as a carbon sink.

Status & Trends 2: Cropland cleared

Overall agricultural production is limited to relatively restricted areas in northern Namibia, where relatively higher rainfall occurs. Rainfed cultivation is practiced on a household level; few larger scale irrigation schemes are situated near the larger border rivers (esp. along the Okavango, Kunene and Orange), water canals (such as e.g. Etunda), dams (Hardap and Naute), or from underground sources (for example, the boreholes at Stampriet and artesian springs at Sesfontein).

Although livestock production is by far more common than cultivation, large areas have been cleared for crop farming (see Figure 5). Overall, 70% of the land cleared is for cereal production, 25% for maize and 5% for wheat production. Namibia’s total cereal requirements amount to 270 000 tons per year, while average domestic production is seldom more than 150 000 tons. Additional food stuff is imported. The total area that has been planted in the last few years amount to only about 3 600km². This is almost six times less than the cumulative area of over 20 000km² cleared for crop production, which means most fields have been abandoned and are now unproductive.

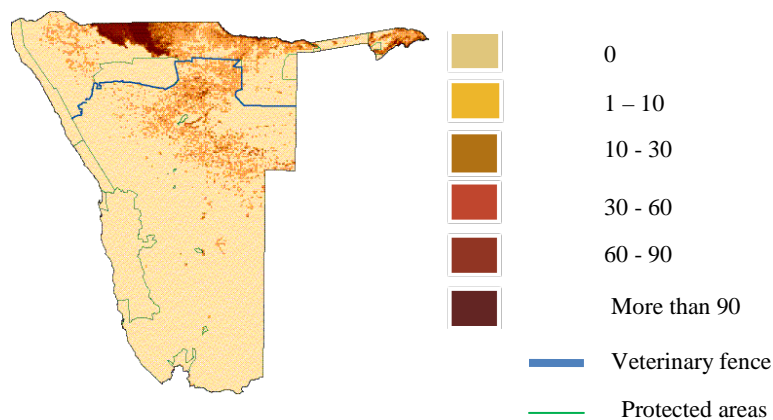


Figure 5: Although cultivation is relatively limited in Namibia due to the already low rainfall (most of Namibia is classified as “unfit for cultivation”), still large areas of land

continue to be cleared for this largely inappropriate land use. It is asserted that less than 20% of cleared land are used for cultivation in the longer term. This seems to be a very poor return on a huge degradation threat, and other land uses, e.g. forest based, may be considered economically more lucrative. After, Source: Mendelsohn et al., 2002.

Status & Trends 3: Livestock farming – carrying capacities and farming risk

There are about 2 Mio cattle, 140,000 donkeys, 2,2 Mio goats and approximately 200,000 sheep in Namibia (esp. sheep numbers fluctuate greatly, with numbers in the 1970'ties to reach 3 Mio). Highest livestock densities are generally in the Cuvelai system in northern Namibia, with the exception of sheep, which are mainly reared in the south (mainly Karakul sheep production for the pelt industry).

Although the “carrying capacity” concept is often strongly debated, considering ecological and economic factors, in drylands it is clear that carrying capacities due change from season to season, and are strictly rainfall depended. Thus adaptive management of livestock numbers needs to be practiced to “fluctuate” with the carrying capacity each season.

Mendelsohn et al (2002) created a map that illustrates current stocking rates versus the calculated approximate carrying capacity across Namibia. Figure 6 indicates that certain areas are stocked at carrying capacity, whilst north central Namibia is over-utilised. Certain areas are marked as “potential for stock”, however there seems to be a overlap of certain of these areas with the main impacts of bushencroachment, which needs to be examined in more detail.

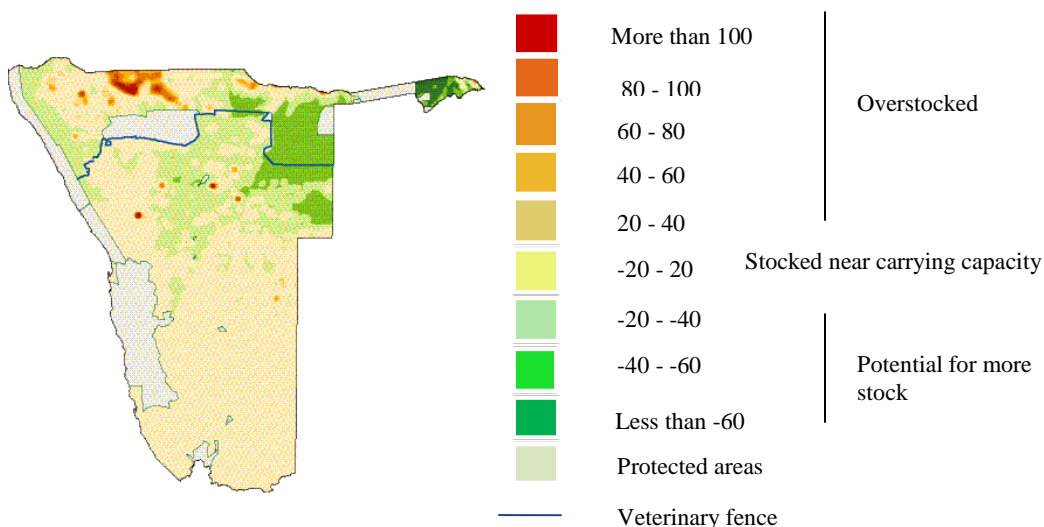


Figure 6: Overall about 3.7% of the land area in Namibia (excl. Protected Areas) are overstocked (Mendelsohn et al., 2002). Certain areas, esp. in Otjozondjupa may be able to accommodate further livestock. It is noted though that certain areas marked as

“potential for more livestock”, do coincide with the severe infestation through bush encroachment. Natural pastures are likely to be damaged in overgrazed areas, and livestock will be less productive than in other areas where they will grow faster and produce more young.

Mendelsohn et al. (2002) further created a map that illustrates the overall farming risk in Namibia. In some areas farming is much more risky than in others: areas with greatest risk are those with short growing seasons, low rainfalls and high rainfall variability from year to year. Most risky is farming in southern and western Namibia, however even the lower risk areas (Kavango, Caprivi, limited parts of Ohangwena and Oshikoto) do not mean that all land is suited to all kinds of farming. The soils in many parts of north-eastern Namibia are not fertile enough for crop growth, and livestock grazing in certain places may be limited because of bush encroachment, overgrazing or poor quality grasses.

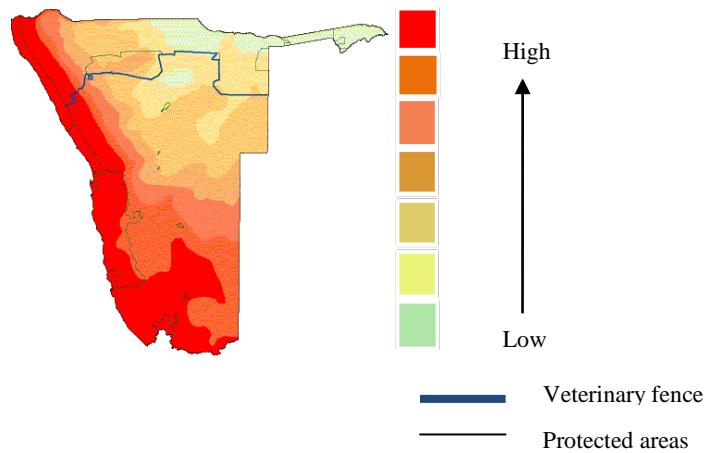


Figure 7: The farming risk is extremely high in most areas in Namibia, considering the extremely variable climatic conditions prevailing naturally. Climate change is expected to worsen this scenario.

Status & Trends 4: Wildlife and tourism based land uses – autonomous adaptation

There are a total of 20 proclaimed nature reserves or national parks. National parks make up 14.1% of Namibia’s surface area; this area is now being enlarged by the addition of the old Sperrgebiet diamond-mining concession, which would add some 72,600 km² to Namibia’s impressive Protected Areas (PA) Network. In addition to the state protected areas, large areas have been declared as conservancies in recent years. These consist of private farmland or communal land where natural resources are protected but also managed and used for the benefit of conservancy members living there. By 2006, 13% of communal land, and 6% of freehold land were managed as at conservancies, and additionally a good number of private reserves has been established. Under the draft Wildlife and Conservation Bill, the Government intends to promote

Protected Landscape Conservation Areas (PLCAs), which would further Namibia's conservation effort. More private farms, which currently may not directly use of wildlife currently, but mix some conservation and tourism activities with livestock farming, would get more incentives for pro-conservation management. Overall it is believed that this land use is to Namibia's climatic conditions best attuned, which would also provide the best alternatives under the current CC scenarios for the country.

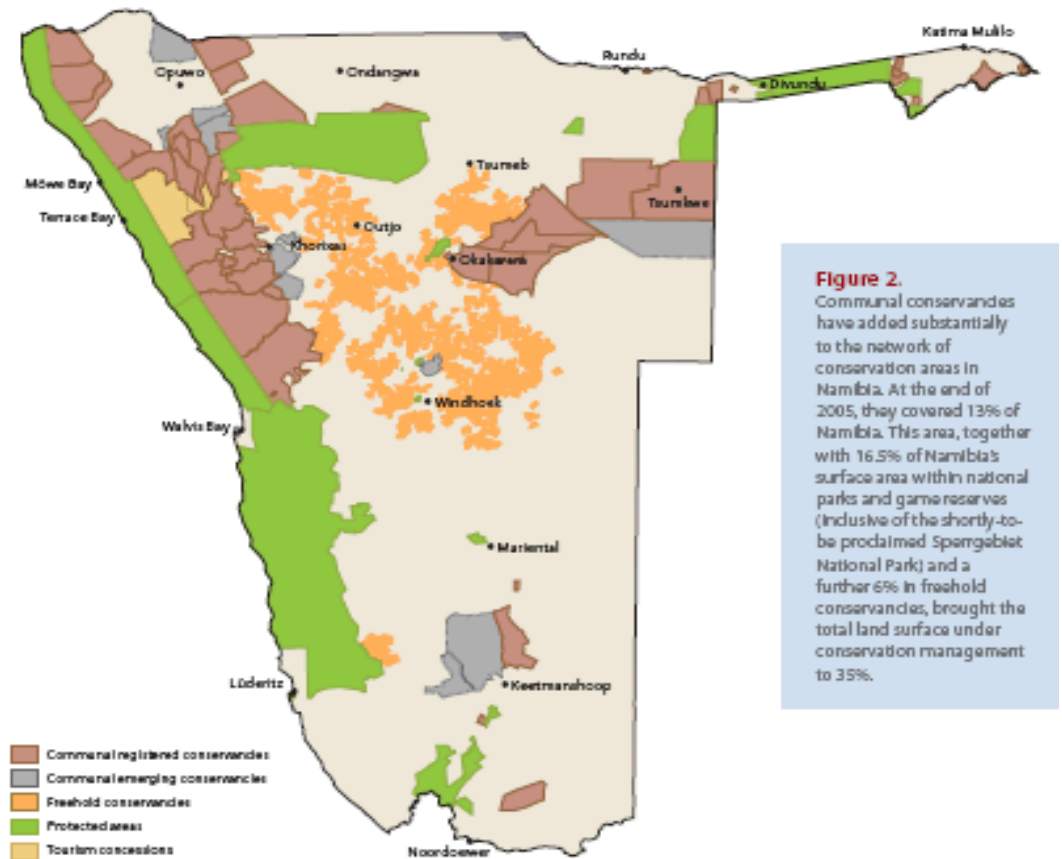


Figure 8: More than 16.5% of state land in Namibia are protected as Protected Areas (PAs) (incl. the Sperrgebiet), and an additional 19% through conservancies both on communal (13%) and commercial (6%) farmland. Wildlife based land uses esp. tourism are considered extremely well adapted to Namibia's arid and variable climate, and there is a strong notion that this land use should be promoted as a key adaptation strategy.

Source: Nacso, 2006.