



THINK NAMIBIA

FACT SHEET ON:

Forests, Rangelands and Climate Change in Namibia

The purpose of this factsheet is to provide an overview of the status of issues and actions related to the adaptation to climate change of forest, woodlands and rangeland resources in Namibia.

Introduction

Namibia, one of the driest countries in the world, has 20% of its surface area (16 million ha) covered by dry forests and woodlands mainly contained in the north eastern region of the country (UNDP/GEF, 2014). However, the dryland forest resources are under high pressure from agriculture and livestock production. The consequent deforestation and degradation as a result of crop and livestock farming is leading to loss of ecosystem goods and services which form the livelihood support for rural communities and which support economic development, and maintain a variety of endemic and economic plant and animal populations.

Namibia's vulnerability to climate change

Namibia is vulnerable to climate change for several reasons, which are explained below:

- Namibia receives low but highly variable rainfall (25 - 700mm) and is characterised by high temperatures that range from 30C to 400C (Mendelsohn, et al., 2002).
- Namibia's climate for the rest of this century will become warmer and drier due to climate change. Seasonal rainfall patterns will be more erratic and Namibia will experience droughts more frequently. Evaporation is anticipated to rise by 5% per degree of warming (MAWF, 2012).
- Agriculture is the predominant land use in

Namibia, and 70% of the population depends directly or indirectly on the natural rangeland resource for their economic well-being and food security.

- The diverse rangelands, and arable land make up a valuable natural resource base on which the economy of Namibia depends (Karuaihe et al., 2007). These diverse ecosystems provide goods and services that are valuable to both the livelihoods of all Namibians at local as well as national level.
- Total population is expected to grow by 66% by 2031. Such an increase in population will exert more pressure on the land and other resources. This will worsen the vulnerability of many people as well as natural resources to impacts of climate change (Kuvare et al., 2008).
- Poverty, lack of income and lack of employment opportunities greatly exacerbate the vulnerability of households to impacts of climate change (Dirkx et al., 2008) because these factors influence the resilience of households to cope with impacts of climate change.

Namibia is a world leader in the Community Based Natural Resource Management (CBNRM) programme that addresses both sustainable natural resource management and use and socio-economic development (Long et al., 2004). The conservancy approach has led to an increase in wildlife, generation of income for local communities and creation of new jobs (NACSO, 2007). For instance, in 2006, consumptive use of wildlife generated about N\$8.3 million from conservancies in Namibia. The above indicates that the economy of Namibia largely depends on its natural resources. Most predicted impacts of climate change will adversely affect natural resources. This makes Namibia very vulnerable to impacts of climate change.

Economic, social and environmental functions of forest cover

- Forests purify the air, preserve catchments and improve water quality and quantity. In addition, forests stabilize soil and prevent erosion, provide natural resources such as timber products and medicinal plants, and are home to many of the world's most endangered wildlife species.
- Forests help to protect the planet from climate change by absorbing carbon dioxide (CO₂), a major greenhouse gas.
- In Namibia, direct use of forest resources is largely from harvesting of fuel wood and poles for construction of houses and fences

(mostly consumed by rural households), and consumption of other forest products for craft production, food, medicine and cosmetics (UNDP/GEF, 2014).

- Domestic forest resources contribute indirectly to arable farming through conservation of soil fertility and water, which is extremely vital given the countries low use of commercial fertilisers and the harshness of the climate.
- An additional environmental function of forest resources is its support of biological diversity, genetic material and their ability to sequester (absorb) carbon.
- The current genetic material stored by forest resources and their contribution to agricultural production and medicinal production is vital to the economy.

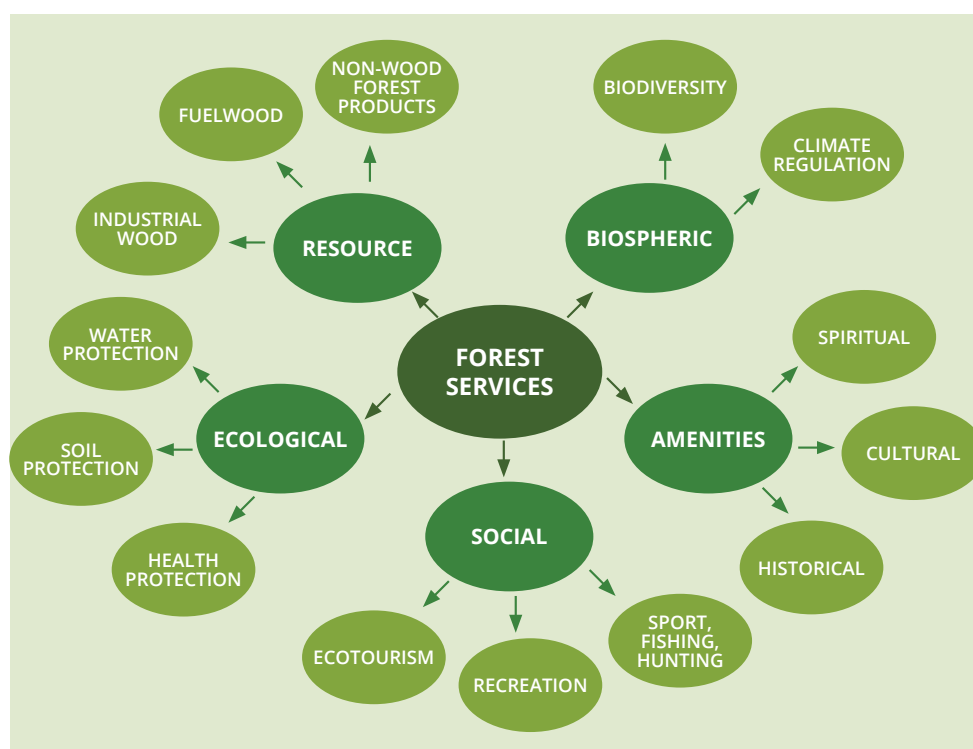


FIGURE 1:
*Services Provided by
Forests and Woodlands*

Vulnerability of forests and forest communities to climate change

Current trends in deforestation, degradation and damage to ecosystem services in forests and rangelands have been accompanied by a decline in supply of many forest services. These impacts are felt most acutely by rural communities living in or near forests, who suffer a decline in livelihood resources and well-being (Byron and Arnold, 1999).

Similar to the global trend, vulnerability of forests in Namibia is as a result of deforestation and desertification; frequent forest fires; changes in forest types, species composition and distribution; and the disappearance of medicinal plants (UNDP/GEF, 2014). A vulnerability assessment of the Okongo Community Forest and Conservancy done by Munyayi et al., (2014), shows that the most relevant threats affecting forests and specifically community forests are mainly related to changes of the local climate and inadequate human management as shown in table 1 on the next page.

TABLE 1:
Key threats to the Okongo Community Forest

OVERGRAZING	The carrying capacity of the land for livestock has been exceeded. Grazing in the open common areas, where years of overgrazing have led to poor pastures, indigenous perennial and climax grasses have long disappeared from these open areas. Grass species richness and evenness in the degraded lands has decreased over time with a few undesired species dominating in the rangelands.
UNCONTROLLED VELD FIRES	Increasing uncontrolled fires remain one of the key threats to the ecosystem. The constant occurrence of man-induced fires is reducing the productive capacity of the land, damaging property and infrastructure, and destroying resources such as grass for grazing and thatching as well as valuable wood and even wildlife. The most detrimental effects of fire are limiting the recruitment of young trees, killing older and larger trees and/or damaging larger trees. This leads to a change of the forests towards a more savannah-like vegetation and ultimately to the complete loss of vegetation.
LOSS OF TREES	Loss of trees is posing a serious threat to habitats, carbon sinks capacities and to hydrological and nutrient cycles. Forest resources are harvested to meet various household needs providing both direct and indirect values to rural communities. Loss of forest resources within the Okongo Ecosystem Complex is largely driven by unsustainable harvesting of forest resources for the construction of houses, fences for agricultural fields and kraals.

In addition, the key contributing factors, which are driving vulnerabilities in the Okongo Ecosystem Complex, are not related to the ecosystem directly but rather are related to governance systems, poverty and poor targeting of knowledge and awareness raising interventions.

Impacts of Climate Change in Namibia

In Namibia, some of the expected impacts include livestock losses, reduced grain/ crop production and yields and severe water scarcity due to droughts and increased temperatures. Projections show that rangeland degradation will negatively influence the livelihoods of a large portion of the Namibian nation and will result in a downward trend in the ability of farmers to produce food (MAWF, 2013).

Degradation of rangelands in the country are attributed to poor rangeland management practices. This includes too many people and livestock in one place for too long, land clearing for crop farming and in many cases the application of inappropriate cultivation techniques; inappropriate provision of artificial water points and poor range management associated with them; and overexploitation linked to insecure land tenure arrangements.

Climate change adaptation measures for forest and woodland management

Without adaptation, further climate change combined with factors such as deforestation, forest and rangeland degradation, habitat fragmentation, poor forest and rangeland management and extreme weather events threaten plants and animals. Healthy forests and rangelands are critical both to mitigating climate change and helping people and communities adjust to the impacts of climate change.

Table 2 presents forest and woodland management options that promote resilience, reduce vulnerability and enhance adaptation.

TABLE 2:
Climate Change Adaptation Measures

TOPIC	ADAPTATION MEASURES
I. Food security and sustainable resource base	Reassess the location of conservation areas and seed banks; breed pest-resistant genotypes; determine the adaptability of genotypes and their responses to climate change
II. Forest protection	Manage forest fire and pests to reduce disturbance; restore destroyed forest; protect trees from disease
III. Forest regeneration	Use drought-tolerant genotypes; use artificial regeneration; control invasive species
IV. Silvicultural management	Selectively remove poorly adapted trees; adjust rotation periods; manage forest density; adjust species composition and forest structure
V. Non-wood resources	Minimize habitat fragmentation; conserve wildlife; maintain primary forests and the diversity of functional groups
VI. Park and wilderness area management	Conserve biodiversity; maintain connectivity between protected areas; employ adaptive management

Source: Kleine, Buck and Eastaugh, 2010, adapted from Spittlehouse and Stewart, 2003 and Kalame et al., 2009

Conclusion

As weather patterns become more unpredictable and extreme, the role of forest, woodland and rangeland ecosystems in regulating watershed quality and quantity, rainfall, erosion and other services will be increasingly important for sustaining agriculture, energy production, and drinkable water supplies. Thus the urgent call for conservation of these resources, not just for today but also for Namibia's future generations.

Glossary

Climate Change

Long-term changes to global climate such as increases in temperature, rainfall and increased frequency of drought and flooding due to significant departure of the earth's climate from average weather conditions.

Food security

A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2002).

Rangeland

Land on which the indigenous vegetation is predominantly grasses, grass-like plants, forbs, or shrubs and is managed as a natural ecosystem.

Woodland

The type of land cover characterized by trees and shrubs.

Forest

Ecosystems that are dominated by trees (defined as perennial woody plants taller than 5 metres at maturity), where the tree crown cover exceeds 10% and the area is larger than 0.5 hectares (FAO 2000, 2001a, 2001b).

References:

Byron, R.N. and J.E.M. Arnold, (1999) *What futures for the people of the tropical forests?* World Development, 27 (5), 789–805.

FAO, (2001a). *Forest Resources Assessment homepage*. Available on the Internet www.fao.org/forestry/fo/fra/index/jsp.

FAO, (2001b). *Global Forest Resources Assessment. (2000) Main Report*. FAO Forestry Paper 140, Food and Agriculture Organization of the United Nations, Rome, 482 pp.

Karuaihe, S., Mfune, J.K., Kakujaha-Matundu O. and E. Naimwhaka (2007). *MDG7 and Climate Change: challenges and opportunities: Namibia Country study*. Prepared for the Ministry of Environment and Tourism.

Kuvare, U., Maharero, T., and Kamupingene, G. (2008) *Research on Farming systems Change to enable adaptation to Climate change*. Prepared for the Ministry of Environment and Tourism.

Mendelsohn, J. and el Obeid, S. (2005) *Forests and Woodlands of Namibia*. Directorate of Forestry, Ministry of Agriculture, Water and Forestry, Windhoek, Namibia.

Ministry of Agriculture, Water and Forestry. (2011) *A Forest Research Strategy for Namibia (2011–2015)*. Ministry of Agriculture, Water and Forestry, Windhoek, Namibia

Ministry of Agriculture, Water and Forestry (MAWF). (2012) *National Rangeland Management Policy (Part I) & Strategy (Part II): Restoring Namibia's Rangelands June 2012*, Windhoek: MAWF

Ministry of Environment and Tourism (MET). (2011a) *'National Policy on Climate Change for Namibia 2011'*, Windhoek: MET.

Ministry of Environment and Tourism (MET). (2011b) *Namibia Second National Communication to the United Nations Framework Convention on Climate Change, July 2011*, Windhoek: MET.

Ministry of Environment and Tourism (MET). (2012) *Draft Climate Change Strategy and Action Plan for Namibia*, Windhoek: MET.

Mfune, J.K. and Ndombo, B. (2005) *An Assessment of the capacity and needs required to implement Article 6 of the United Nations Framework on Climate Change (UNFCCC) in Namibia*. Prepared for The Ministry of Environment and Tourism, Government of Namibia

Munyayi, R. Kinyaga, V. Lubinda, M. Mutota, E. Faschina, N. Tischtau, C. and Schick, A. (2014) *Strategic analysis of risks and vulnerability by applying the MARISCO method on Okongo Conservancy and Community Forest & Omufituwekuta Community Forest, Namibia*. Prepared for Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ).

Spittlehouse, D.L. & Stewart, R.B. (2003) *Adaptation to climate change in forest management*. *Journal of Ecosystems and Management*, 4(1): 1–11.

UNDP/GEF. (2014) *Sustainable Management of Namibia's Forested Lands (NAFOLA)*, Windhoek

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