

European Commission, Namibia



National Planning Commission of Namibia



Country Environmental Profile (CEP) of Namibia

Specific Contract nr 2006/127826

Final Report

February 2007



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Member of **COWI** Consortium

European Commission, Namibia



National Planning Commission of Namibia



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Acronyms and Abbreviations

ACP	African, Caribbean and Pacific Group of States
BCLME	Benguela Current Large Marine Ecosystem Programme
BENEFIT	Benguela Environment Fisheries Interaction and Training Programme
BIOTA	Biodiversity Monitoring Transect Analysis in Africa
CBNRM	Community Based Natural Resource Management
CBO	Community Based Organisation
CC	Climate Change
CCP	Country Pilot Partnership
CITES	Convention on International Trade of Endangered Species
CP	Cleaner Production
CSO	Civil Society Organisation
CSP	Country Strategy Paper
DEA	Department of Environmental Affairs
DOT	Directorate of Tourism
DPWM	Directorate of Parks and Wildlife Management
DRFN	Desert Research Foundation of Namibia
DSS	Directorate of Scientific Service
EC	European Commission
EDF	European Development Fund
EEIS	Environment Education and Information Service
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EIS	Environmental Information System
EMA	Environmental Management Act
EMIN	Environmental Monitoring and Indicators Network
ENR	Environment
ENSO	El Niño Southern Oscillation
EU	European Union
FAO	Food and Agriculture Organisation of the UN
GDP	Gross Domestic Product
GEF	Global Environmental Fund
GHGEs	Greenhouse Gas Emissions
GRN	Government of the Republic of Namibia
GTZ	Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
HDI	Human Development Index
HIV / AIDS	Human Immunodeficiency Virus / Acquired Immune Deficiency Syndrome
HPI	Human Poverty Index
HZW	Hazardous Waste
ICEMA	Integrated Community-based Ecosystem Management
IFAD	International Fund for Agricultural Development
IGA	Income Generating Activities
ISLM	Integrated Sustainable Land Management
ITCZ	Inter-Tropical Convergence Zone
JAR	Joint Annual Report

KfW	Kreditanstalt für Wiederaufbau
LIFE	Living in a Finite Environment
LSU	Large Stock Unit
MAWF	Ministry of Agriculture, Water and Forestry
MAWRD	Ministry of Agriculture, Water and Rural Development
MCA	Millennium Challenge Account
MDG's	Millennium Development Goals
MET	Ministry of Environment and Tourism
MFMR	Ministry of Fisheries and Marine Resources
MLR	Ministry of Lands and Resettlement
MLRR	Ministry of Land, Resettlement and Rehabilitation
MME	Ministry of Mines and Energy
MRLGHRD	Ministry of Regional and Local Government, Housing and Rural Development
MTI	Ministry and Trade and Industry
NACSO	Namibia Association of CBNRM Support Organisations
NAMFI	Namibian Maritime and Fisheries Institute
NAMREP	Namibian Renewable Energy Programme
NAPCOD	National Programme to Combat Desertification
NAPHA	Namibia Professional Hunting Association
NAU	Namibia Agricultural Union
NBSAP	National Biodiversity Strategy and Action Plan
NCEI	National Core of Environmental Indicators
NDP	National Development Plan
NDTF	National Drought Task Force
NEPRU	Namibia Economic Policy Research Unit
NIP	National Indicative Program
NGO	Non Governmental Organisation
NNF	Namibia Nature Foundation
NORAD	Norwegian Agency for Development Cooperation
NPC	National Planning Commission
NPCS	National Planning Commission Secretariat
NRM	Natural Resource Management
NSA	Non State Actor
NSSD	National Strategy for Sustainable Development
NTFP	Non Timber Forest Products
N\$	Namibia Dollar
PA	Protected Areas
PCB	Polychloroliphenyl
POP's	Persistent Organic Pollutants
PPP	Public Private Partner Ship
PTA	Preferential Trade Area
PTT	Permanent Technical Team on Land Reform
OECD	Organization for Economic Cooperation and Development
ORP	Orange River Project
RDPRP	Rural Development and Poverty Reduction Programme

RPRP	Rural Poverty Reduction Programme
RSA	Republic of South Africa
SACU	Southern African Customs Union
SADC	Southern African Development Community
SANBI	South African National Biodiversity Institute
SEA	Strategic Environmental Assessment
SME	Small, Medium and Micro Enterprise
SOER	State of the Environment Report
SPAN	Strengthening of Protected Area Network
SWAP	Sector Wide Approach Programme
TAC	Total Allowable Catch
UK	United Kingdom
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Convention on Climate Change
USAID	United States Agency for International Development
USD	US Dollar
WASP	Water and Sanitation Policy
WB	World Bank
WTO	World Trade Organisation
WTTC	World Tourism and Travel Council
WWF	World Wide Fund

Units of Measurement

ha	Hectares
kg	Kilograms
kg/yr	Kilograms per year
km ²	Square kilometres
ktoe	Thousand tonnes of oil equivalent
mm	milli metres
Mm ³	Million cubic metres
MW	Megawatts
N\$	Namibian Dollar
n.mile	Nautical mile
t/yr	tons per year
yr	Year
y.o.	Years old
~	Approximately

1. SUMMARY

1.1 State of the environment

About 67% of Namibia's estimated population of ~ 2.0 million lives in rural areas and the total population is expected to double over 27 years. The average population density is with 2.4 inhabitants/km² one of the lowest in the world but distribution is very inequitable; the central and southern parts of the extreme arid country have population densities of < 5 people/km², often < 1 people/km², and the north central and north eastern regions have population densities exceeding 25 people/km², in some areas 150 people/km². With a Gini Coefficient of 0.67 (slight improvement from 0.7 in 1993/4), Namibia has the most unequal distribution of income in the world. About 0.3% of the population own 44% of the land in the commercial area and 5% of the population earn almost 70% of the income. High levels of poverty exist especially in the rural communal areas (41% of the land), where ~ 1 million people live mainly from subsistence agriculture and livestock keeping.

The over-riding environmental issues in the sensitive dry environment of Namibia are high vulnerability to climate change, water scarcity and vegetation/land degradation resulting from land pressure, especially in the densely populated northern regions. The key issues are vegetation degradation (desertification and bush encroachment, deforestation), soil erosion and decreasing soil fertility. Extreme climatic variations with periodic drought periods affect not only the livestock and agricultural production, but nearly all sectors of the economy. Namibia is, referring to different climate modelling, one of the most severe affected countries by global climate change, which is locally accelerated by unsustainable land use practices and resulting anthropogenic climate change (aridifying). Major problems currently are:

Inappropriate land management practices, especially on rangeland and agriculture land. Livestock farming is the principal activity in rural areas and overgrazing leads to vegetation destruction or bush encroachment and accelerates soil erosion. Soil fertility is decreasing due to inadequate agriculture techniques and salinisation problems in several irrigation schemes. Bush encroachment impacts 26 million hectares of woodland savannas, including 11 million ha in the communal area, and lead to loss of carrying capacity and reduction of the available and exploitable ground water.

The scarcity of fresh water is the major threat to development. Water supply is actually only assured due to high investments in water supply systems. Decreasing groundwater levels in some areas, hydrological changes in river systems and huge water lost in the supply system (dams, canals) due to evaporation are unavoidable side effects of improved water supply. Improved water supply through boreholes especially in the northern regions, has led to increasing numbers of livestock and in several areas to additional pressure on the vegetation due to overgrazing.

The few forest resources (< 10% of the country) are under pressure due to exploitation for construction material and energy supply especially in remote rural areas. Only 15 – 20% of the rural areas are electrified and wood is the dominant energy source for poor rural households. The remaining energy demand is assured mainly by electricity and petrol product imports from the neighbouring countries, especially South Africa. Attention on Non Timber Forest Products (NTFP) as sources of alternative or complementary sources of income is increasing with the risk of over exploitation of these resources as a consequence.

Namibia has remarkable biological diversity and a high level of endemism (higher plants 687, avian species 13, reptiles ~70, insects ~ 8,500). Furthermore, 217 species of mammals are found, 26 of which are endemic including Mountain Zebra, rodents and small carnivores, as well as unique desert-dwelling rhino and elephants. The country hosts the world's largest population of cheetah.

There are 20 national Protected Areas (PAs) (13.8% of the country, including the Sperrgebiet 16.8%), 31 registered communal conservancies, an additional 30 sites in the process of registration and ~140 registered private reserves in the commercial area. Wildlife is found for 75% outside state protected areas. Due to the economic value, valorisation for the rapidly growing tourism and increasing wildlife management outside of PA, the numbers of most of the large mammal species are raising. Trophy hunting has been of great benefit to wildlife conservation. Since the late 1970's wildlife have been protected by game farmers on privately-owned land and the game population has increased by > 60% since the start of commercial trophy hunting in the communal conservancies. Poaching seems very rare among local communities since the transfer of competences for game management to the registered conservancies, but habitat modification, unsustainable wild harvesting of natural resources, inadequate land use practices, population pressure, mining and visitor impacts (tourists) in fragile ecosystems are still threats to the biodiversity outside the managed areas.

The fisheries sector is very important, with marine commercial fisheries of 550,000 - 630,000 tons/year, accounting for 5.9% to the Gross Domestic Product (GDP). Fisheries are the second contributor to Namibia's export. After serious over-fishing in pre - independence time, the commercial stocks have been partly rehabilitated by adapted management measures, but some commercial species are still under threat. Inland fisheries for subsistence and local commerce are important in the northern regions Kavango and Caprivi along the perennial rivers. Fresh water stocks show decreasing catches since the mid 1970's due to over-fishing, sometimes not adapted fishing techniques and human activities like farming, deforestation, road construction and harvesting of vegetation for building materials. Aquaculture and fish farming are not yet well developed and today with few exceptions limited to culture of oysters, mussels and seaweed in coastal harbour towns.

The country has a well-developed mining industry based on world-class deposits of diamonds and uranium as well as a number of vibrant smaller mines producing copper, gold, zinc and lead. Mining is still the largest foreign exchange earner (> 50% of exports) and contributes ~ 10% to the GDP. New prospecting licences are attributed to international companies for petrol and diamonds even in some protected areas. The mining industry has been forced in the last years to employ recycling or use alternative inputs to freshwater, but the sector uses still > 12% (17.3 million m³) of the total exploited water. Mining is a local, but significant threat to the environment. The open sky mines create locally noise, dust, air pollution from furnaces, and effluent by-products. Until today rehabilitation of the sites at the end of the operation is better than in much other low and middle income countries, but still inadequate and groundwater pollution has been observed in several metal mining areas. Environmental Impact Assessments (EIAs) are today systematically conducted to mitigate the negative Environment (ENR) impacts.

The environmental impact of industries is still low due to the few existing factories, but the only new large industry, the textile company RAMATEX, has already polluted the groundwater. The promotion of industrial development by Government of the Republic of Namibia (GRN) includes a risk of increasing industrial pollution in the future if mitigation measures are not implemented in time.

The bigger towns are already equipped with sewerage plants, adapted landfill sites and some with water recycling systems. Urban areas have high immigration rates about 4%, pushing urban growth rates to ~ 6%. After a first migration phase following independence to Windhoek, population densities rise now sharply in the smaller regional urban settlements, especially in the northern – central regions. Major environmental problems especially in these less equipped smaller urban settlements are housing, sanitation, water supply, waste and waste water management. These pressures will deteriorate with the estimated increase of urban population from 35% today to 50% in 2015.

1.2 Environmental policy, legislative and institutional framework

Namibia's Constitution makes provision for a three tier governance system comprising central, regional and local-levels, but actually most environment issues are still managed at central level by the different sector ministries in line function. Cross - sectoral coordination in the environment sector should be assured by the Ministry of Environment and Tourism/Department of Environmental Affairs (MET/DEA), but coordination is still poor. The implementation of effective harmonised environment management is seriously hampered by the missing approval of the Environment Management Assessment Bill, which gives MET/DEA the mandate for cross - ministries coordination of environmental issues and to control the respect of EIAs, which are usually done, but on a voluntary base.

Human capacity is a general challenge in GRN. Ministries, especially the MET/DEA, are understaffed to assure in the actual institutional framework all their responsibilities (planning, management, implementation, monitoring and control). Technical capacities are missing in several 'new' disciplines related to environment (pollution control, waste and waste – water management).

Environment issues are well integrated in the Constitution of Namibia, the guiding overall development policies (Vision 2030, National Development Plan (NDP) 2, and draft NDP 3) and the Poverty Reduction Strategy (PRS). Since independence a host number of sector policies, that have direct or indirect relevance to sustainable resources management, have been developed and implemented. Due to the sectoral focus, the policy framework is very complex and documents are rarely known, except in the relevant departments and ministries. There is a need to ensure policy and legislation harmonisation across sectors. Some strategies and action plans within different departments that address common resources (land, water), are not harmonised, creating confusion and conflicts of interest across departments (ex: mining prospecting – PA) responsible for implementation.

Civil society integration and strengthening of their capacities for Natural Resource Management (NRM) is a declared priority of the GRN. But land use planning and extension is still centrally administered and Regional and Local authorities have weak institutional mandates for land and resource management. GRN tries to improve through the Community Based Natural Resource Management (CBNRM) programme, but changing from sectoral top down to holistic participatory bottom up approaches is still in an early stage and the capacities of decentralised structures are currently weak. The professional Civil Society Organisations (CSOs) and the strong private sector currently play a key, underpinning role in the support and implementation of local ENR activities.

Namibia is signatory of many International and Regional Treaties and Conventions concerning Environment and Natural Resources and has implemented important programmes referring to the signed conventions (National Programme to combat Desertification (NAPCOD), National Biodiversity Programme, National Biodiversity Strategy and Action Plan (NBSAP)). Regional agreements are signed with neighbouring countries (Angola, Zambia, Botswana, and South Africa) on shared watercourses, wildlife management and law enforcement, energy, mining, forestry and fisheries.

1.3 EU and other donor co-operation with the Country from an environmental perspective

The major donors working in environment, or closely linked sectors, in recent years are: European Commission (EC), Germany, Spain, Finland, Sweden Norway, United Kingdom (UK), France, Luxemburg, Netherlands, Iceland, United States Agency for International Development (USAID) and UN agencies specially United Nations Development Program/Global Environmental Fund (UNDP/GEF), International Fund for Agricultural Development (IFAD), Food and Agriculture Organisation (FAO). Environment is not a focal area in EC-Namibia cooperation but it is addressed as one of the cross-cutting issues required for sustainable development and is imbedded in the focal sector 'Rural Development', where the EC is

the main donor with € 53 mil in the European Development Fund (EDF) 9. Germany is actually the leading bilateral European partner in natural resource management. Issues of agricultural productivity, sustainable land and water management and land reform are addressed by UNDP. A large number of programs related to international treaties are financed by GEF and implemented through UNDP. USAID is promoting conservancies and other community based natural resource management (CBNRM), debushing and Land reform. In the future, Namibia could receive up to US\$ 300 million for its MCA (US Millennium Challenge Account) project.

There are international and national NGOs and networks (World Wide Fund (WWF), Namibia Association of CBNRM Support Organisations (NACSO), Namibia Nature Foundation (NNF), Desert Research Foundation Namibia (DRFN)) operating in the country, mainly financed through donor funds. Most of the assistance is still implemented through specific sector programs. Sector Wide Approach Programmes (SWAPs) exist only for 'Education' and further are planned for water supply and transport. SWAPs for the environment-related sectors (mainly agriculture) are not developed but actual trends are towards more integrated cross – sectoral 'sustainable livelihood approaches' that correspond to the GRN's priorities formulated in Vision 2030, NDPs and the PRS.

Coordination of donor's activities is generally done through the National Planning Commission (NPC) but limited to assure the coherence with national priorities and development goals. Cross-sectoral links do not come out strongly due to the implementation through sector based line ministries. Donor coordination is actually rare, informal and not institutionalised. Interventions from not bilateral or multi-lateral donors don't pass even through the NPC.

Environmental aspects are generally included in the project preparation phase for new projects and follow usually national policy and practice for Strategic Environmental Assessments (SEAs) and EIAs which are in line with international standards. But absence of legislation - the Environmental Management Act (EMA) is not yet adopted - reduces effective implementation. Regular monitoring is specific to the project/program objectives. This monitoring approach is so focussed on the specific targets, that secondary and long term environmental effects may not be recognised. Environmental Audits for the EC cooperation have not yet been conducted in Namibia.

The donor's support in the ENR sector has in several sectors already significant positives results. Various successful mitigation measures have been taken to deal with sustainability of ENR initiatives. But it is difficult to evaluate the environmental impact of cooperation due to the fact that impacts on the environment take much longer than project life or the young development cooperation with Namibia and long term impact monitoring mechanism are not operational. Several donor supports risk to have - in the actual form - negative long term environmental impacts, especially support to mining and industries, resettlement programs, water supply and irrigation.

1.4 Conclusions and recommendations

Conclusion 1: Development potentialities in the sensitive natural environment are restricted by the scarcity of water and arable land. The fragile ecosystems are under threat due to overexploitation of water resources, land pressure and population growth, poverty, inadequate rangeland and agricultural practices, deforestation, and increasing economic activities in mining, fisheries and tourism. The main results of these pressures are degradation of vegetation and soils, decline of water, habitat's destruction and pollution. The importance of key environmental pressures and their linkages to the society and the economy are well-understood and described, some natural resources are already well managed, but adapted management systems are only partly implemented at the local level.

Conclusion 2: The country is one of the most advanced concerning policies and strategies for natural resources management and sustainable development in the world. Environmental issues are a priority in the constitution, long and medium term global development planning and sector strategies. But implementation is limited because important legislation, especially in the environment and water sector, are written but not yet approved by the parliament. Legislations of different sectors are often not harmonised and contradictory.

Conclusion 3: Decentralisation, transfer of competences and CBNRM systems are potential mechanisms to enhance more sustainable use of natural resources, but government structures are still centralised and in line function, using top – down approaches. Implementation of CBNRM at local level depends still on external support but had already significant positive impact on sustainable NRM utilisation and conservation.

Conclusion 4: The important function of environment monitoring and information sharing/circulation seems to be neglected at national level. The absence of coordinated regular and viable data collection and sharing, both through and across relevant departments, and the lack of an operational National Environmental Information System (EIS) prevent the objective evaluation of environmental impact of government and donor funded programs at national level.

Conclusion 5: The whole country is still characterised by the dual system of the pre – independence time resulting in extreme different capacities in the society for individual application of environmental sustainable management methods and technologies, ranking from world leading standards (ex: private wildlife tourism sector on commercial land) to poorest Least Developed Countries (LDC) level (dense populated, poor areas in the communal land).

Recommendations

The recommendations are addressed to all stakeholders and decision makers for sustainable development. The recommendations which concern the future EC cooperation (planning of the 10th EDF programme) have been integrated mainly in the sector 'rural development', indicated by a "code" (EC).

Rural development and Land Reform

- Give in the water supply component priority to technologies for water conservation, harvesting and recycling especially in rural areas to avoid additional environmental risk from new boreholes boreholes –such as artificial watersheds by applying different water retaining materials, by creating them directly on a natural surface applying physical methods of soil treatment; or with the help of engineering methods that allow increased water yields from natural watersheds; or roof of houses and shelters having different roofing or watertight coatings- (EC).
- Concentrate support to the livestock sector on rangeland management and marketing strategies (EC).
- Promote alternative high value adding income generation activities (IGA) like tourism, game ranching, NTFP, agro processing, environment friendly Small and Medium Enterprises (SME), in rural areas and facilitate access to small credits outside the agriculture sector. (EC).
- Promote mechanical debushing and valorisation of this biomass for energy supply (ex: wood pellets) in remote rural areas (EC).
- Include training for new farmers and investments/credits for farm infrastructure in the resettlement programme (EC).

- Promote in the northern agriculture and rangeland regions agro – forestry with adapted multi - purpose trees to increase household income, to establish fodder reserves and to protect the soils (EC).
- Integrate an urban environment component (water and sewerage, waste, housing) for the fast growing regional towns in the infrastructure programme. (EC).
- Include support to energy supply and modern communication (telephone, internet) in the rural infrastructure component to facilitate access to and exchange of environmental information.

EU specific recommendations outside the focal sectors

- Facilitate access to EC finance mechanisms outside the EDF, especially ACP facilities for water and energy.
- Simplify the internal monitoring and the indicators for the 'Rural Poverty Reduction Support Programme' in the Joint Annual Report (JAR) and harmonise the system with national systems used in NDP 3 and Environmental Monitoring and Indicators Network (EMIN)

Decentralisation

- Promote the transfer of competence for natural resource management and public administration (human, legal mandate, technical and financial capacities) to decentralised structures (Regional and Local Councils, Community Based Organisations (CBO)).
- Promote local land use planning and holistic bottom – up approaches concerning NRM and support by training, TA and organisational development decentralised NRM structures (EC).

Institutional and legislation framework (GRN)

- Finalise and implement important environment legislation (EMA, wetlands, parks and wildlife) and harmonise contradictory legislations
- Assure that EIA and SEA are conducted and that the recommendations are implemented
- Improve effectiveness and cross-sectoral coordination and exchange between the different ministries, donors and Non State Actors (NSA) by creating an institutionalised regular platform of stakeholders (men and women) in the environment sector.
- Reduce the multiple responsibilities of the MET/DEA leaving GRN to focus on the core functions: policy, coordinating, regulations and control and promote Public Private Partnership (PPP) and NSA to implement government's policies and programmes.

Monitoring/information/communication

- Implement an operational National Environment Monitoring Desk to collect and interpret on a regular base data for defined and standardised key indicators of nationwide state of environment which are able to translate the performance of sustainable development across all sectors.
- Valorise/support indigenous knowledge and successful initiatives for better environment management and improved productivity.
- Develop and implement Environment – Economic modelling for the most important renewable natural resources in the framework of Vision 2030 (water, fish, wildlife, land).
- Improve ground water monitoring especially in regions with high extraction or sensitive environment (industrial and mining areas).
- Conduct a new energy balance study at national level.
- Continue to promote environmental awareness and understanding by sharing, circulation and transparency of environmental information and adapted explanatory material for the public.

Urban development, industries, mining

- Develop strategies and guidelines for the 'grey' environment (pollution, waste, waste water) for urban and mining areas.
- Support waste reducing and recycling by appropriate waste management systems and promote the use of cleaner production technologies by adopting fiscal and other financial regulations.
- Implement the 'pollutant pays' principal, starting with the most polluting mining, industries and private sectors.
- Implement an 'environment account' in the mining sector for rehabilitation of mining sites.

Biodiversity: Install marine PAs for breeding grounds to assure stock rehabilitation of the commercial fish species.

2. STATE OF THE ENVIRONMENT

2.1 Physical and biological environment

2.1.1 Climate, climate change and climate variability

Namibia is about 1,300 km long and 450 - 900 km wide (1,400 km in the Caprivi Strip), with a total area of 824,290 km² (82.4 million ha). To the west the territory borders the Atlantic Ocean with ~ 1,300 km of coastline. The only permanently flowing rivers lie near to, or form part of the international boundaries in the north and south.

Lying between roughly latitude 17° and 29° S and longitude 12° and 21° E (24° E in the Caprivi), the climate is the driest in sub-Saharan Africa and 92% of the land mass is defined as hyper-arid, semi-arid or arid. This region is under the strong aridifying influence of the cold Benguela current and is positioned in the latitudinal zone of stable descending air of the Hadley Cell, limiting convective rainfall throughout much of the country's interior. Most of Namibia has a single wet season between November and March with annual average rainfall of 270 mm. Regional variation differs from < 20 mm in the western Namib to > 700 mm at the eastern end of the Caprivi Strip and only about 8 % of the country received > 500 mm. The rainfall is not only low, but also highly variable (40 to 100%) and unpredictable over time and space. Additionally, high temperatures lead to high evaporation rates, resulting in a net water deficit.

Drought periods are endemic in Namibia due to disturbances of the Inter-Tropical Convergence Zone (ITCZ), shifts in the global circulation pattern and the El Niño Southern Oscillation (ENSO) phenomenon.

The climate is highly sensitive to unsustainable land use practices and resulting anthropogenic climate change. This natural vulnerability is likely to be aggravated by the effects of human induced global Climate Change. Based on the initial National Communication to the UNFCCC (July 2002), the worst case scenario for the year 2100 predicts the range of mean annual temperature increase for the central plateau region to be 4.5-6°C above the 1961-1990 mean temperature, while a more optimistic simulation estimates a rise of 2-3°C. There is less agreement amongst the various models regarding future rainfall. The projections range from small increases in annual rainfall of less than 30 mm per year to big decreases, such as 200 mm per year less than the current average. The largest projected changes in rainfall are associated with the highest projected temperature changes. The greatest impact is projected to occur in the central, inland areas. Evaporation rates are also estimated to increase by around 5% (SANBI, 2005). These impacts threaten Namibia's water supply in general and water dependent activities such as agriculture and mining, in particular. Namibia's wetlands have been identified as the ecosystems most vulnerable to Climate Change.

2.1.2 Geology and mineral resources

The geology of Namibia can be divided into several geotectonic and lithologic domains. The oldest domain (2.6 to 1.65 billions years) belongs to the Paleoproterozoic Vaalian to lower Mokolian, followed by the Mesoproterozoic middle to upper Mokolian rocks. The sedimentary and volcanogenic succession of the Neoproterozoic Damara Belt (850 to 600 million years) comprises more than 60% of Namibia's rock outcrops. This northeast - southwest striking belt is folded and metamorphosed with the metamorphic grade progressively increasing towards the axial centre of the fold belt. Granites occur in the central part of the Damara Belt.

A relatively undeformed syn- to post-orogenic succession of the Cambrian Nama Group (600 to 543 million years) covers parts of southern Namibia. The terrestrial Kalahari Beds of Tertiary to recent age are predominantly unconsolidated aeolian sand dunes and occupy large parts of eastern Namibia. Pan-African and early Cretaceous alkaline ring complexes and carbonatites occur along a north-east

trending structural zone, a continental expression of an extensive transform fault that offsets the Mid-Atlantic ridge.

Namibia is endowed with a rich variety of mineral resources and has a long tradition of mining. Diamonds remain the country's premier mining commodity although uranium, gas, oil, copper, fluorspar, gold, lead, zinc, semi – precious stones, salt, industrial minerals and dimension stones are produced. Apart from diamonds, almost all valuable minerals are found in the western part of Namibia where the oldest rocks (older than 600 mil years) of the Namaqua Metamorphic Complex and the Damara Supergroup are exposed at the surface. Diamonds were eroded out of the kimberlite pipes in central southern Africa and then swept down the Orange River.

2.1.3 Land and soils

The country comprises three main physiographic regions. The first is the western coastal plain of the Namib Desert, occupying 12% of the total land, the second is the central plateau stretching from the southern to the northern border and covering more than half the country, and the third is the semi-arid Kalahari zone lying along most of the eastern portion of the country.

The western coastal plains are largely composed of mobile dunes, gravel and sandy plains. The central plateau comprises mountains, highland areas and the Great Western Escarpment. The Kalahari zone is covered by sand of varying thickness.

Unconsolidated sand (arenosols) and shallow, weakly developed soils on bedrock (lithosols, xerosols, regosols and yermosols) characterise the main groups of soils in this semi-arid to arid country (FAO 2002). Some 97% of the country's soils have a clay content of less than 5%, and thus have a very low water holding capacity. They are generally deficient in most of the major nutrients, and also deficient in micro-nutrients such as manganese, iron and zinc. Salinity is a significant factor in and around the Etosha pan. Considering soils and rainfall, only about 1% of the land surface or 820 000 hectares, mainly in the north-east, is considered to have medium to high potential for rainfed and irrigated crop production (NDTF, 1997).

Land pressure and land degradation (soil erosion and decreasing soil fertility) are principal environmental problems facing Namibia, with ~70% of the country's population living in rural areas. Different forms of soil degradation are a nation wide problem, but erosion vulnerability is higher in areas with thin or destructed vegetation cover and high soil fertility loss occurs mainly in the densely populated northern region due to population pressure, inappropriate land management practices and deforestation.

2.1.4 Water (lakes, rivers, surface water, groundwater)

Namibia's surface water can broadly be divided into two types, those derived from ephemeral, and those derived from perennial river systems at the northern and southern boarder of Namibia. With the exception of short lengths of the Okavango and Kwando Rivers in the northeast of Namibia, all the rivers in Namibia's interior are ephemeral. Since all surface waters can also be considered as wetlands, there are a number of surface water sources which are derived directly from rainfall or groundwater. These include pans, vleis and open sinkholes.

The main river basins in Namibia are:

- The Zambezi River Basin with a basin area of 17,426 km² in Namibia is the country's richest water source. The Zambezi has a mean flow of 40 km³/yr and in the north-eastern Caprivi strip forms the

border between Zambia and Namibia for about 100 km and over a short distance between Zimbabwe and Namibia.

- The Okavango River basin is an interior basin with an area of 106,798 km² in Namibia. The river rises in Angola, then, flowing in a narrow alluvial plain up to 6 km wide, forms the border with Namibia for some 350 km before crossing the Caprivi Strip and flowing into Botswana, where it forms the Okavango Swamps. Its mean flow is slightly above 10 km³/yr. It has two major tributaries, the Cubango and the Cutie. While the flow in the Cubango River upstream of the Cuito River confluence drops to very low levels during dry years, the flow from the Cuito River is more reliable. A Namibian tributary of the Okavango is the Omatako River, which contributes no flow at all. Originating in the dry interior of Namibia, there is no evidence that the Omatako has ever flowed further than 400 km from its source.
- The southwest coast basin including the Kunene River covering an area of 17,549 km². Rainfall over the Kunene catchment is unreliable and variable, and the mean flow of the river is 5 km³/yr. The relatively small catchment area and steep river bed slope in the upper section also mean that flows run relatively quickly to the coast, leaving the river almost dry at the end of the dry season. The Kunene supplies a significant amount of water to the four northern regions of Namibia, where approximately 700 000 people live.
- The south Atlantic coast including the Huab, Ugab, Omaruru, Swakop and Kuseb Rivers with a total area of 264,160 km².
- The Orange River Basin has an area of 219 249 km² in Namibia. The river forms the southern border of Namibia with South Africa over a distance of ~ 600 km. It has a mean flow of about 11 km³/yr. The major Namibian tributary, the Fish River, has a mean flow of 0.48 km³/yr at its confluence with the Orange River. The flow in the lower parts of the Orange has been cut by nearly two thirds, especially over the last 35 years since the start of the Orange River Project (ORP) in South Africa.
- The interior basins, including the Cuvelai River basin and part of the Kalahari Desert, cover an area of 199,718 km²; The Cuvelai River enters Namibia as a 130 km wide delta of ephemeral watercourses, known as Oshanas, which then converge to terminate in the Etosha Pan. Runoff in the Cuvelai is erratic and has been observed to vary from no flow to 0.1 km³/yr, as it was gauged in 1995.

Due to flat topography and shallow saline groundwater, surface water storage facilities are limited to shallow earth or excavation dams, which suffer from high evaporation rates. The percentage of mean annual precipitation that ends up as river flow in ephemeral systems in Namibia varies from as little as below 1% up to around 12.5% for parts of the Fish River basin. The remainder goes to direct evaporation and evapotranspiration. The majority of ephemeral river floods disappear entirely, the river systems are 'effluent' systems which feed the groundwater table, rather than having its flow sustained by a high groundwater table, as is the case with 'influent' rivers.

Namibia's groundwater occurs in a wide range of rock types making groundwater management a complex process. It provides a buffer against drought in many regions of the country, but it does remain inherently vulnerable to over - abstraction and pollution. Aquifers occurring in Namibia are classified as alluvial, Kalahari, fracture, Karst or artesian aquifers. Although the ephemeral rivers of Namibia have dry sandy or rocky river beds for most of the year, they are conduits for subsurface flow and contain a number of wetlands defined as 'shallow, swampy or marshy areas with little or no water flow' or 'waterlogged solid dominated by emergent vegetation'. In Namibia this description applies to most sections of all westward flowing rivers north of the Kuseb River.

Total natural renewable water resources of Namibia are estimated at 45.46 km³/yr, of which only 6.16 km³/yr are internally produced. Over half of the external water resources come from the Zambezi River, while smaller amounts are contributed by the Orange, Kunene and Kwando rivers and rivers from the Okavango. From the total accounted natural flow of the border rivers Zambezi, Kunene and Orange of

28 km³/yr, only 0.255 km³/yr is under agreement (0.07 from the Orange River and 0.185 from the Kunene River) and should thus be considered as actual flow. This reduces the natural renewable water resources of 45.46 km³/yr to actual renewable water resources of 17.715 km³/yr.

A number of ephemeral rivers have been tapped by building dams. The total storage capacity of the major dams is about 0.71 km³ and their 95 percent assured combined yield is 95.83 million m³/yr. In addition to these larger reservoirs, there are thousands of small farm dams scattered around the ephemeral river basins. The total assured safe yield of Namibia's water resources is 660 million m³/yr, distributed as follow: groundwater 300 million m³/yr, ephemeral rivers 200 million m³/yr, perennial rivers 150 million m³/yr and unconventional sources 10 million m³/yr.

Water resources and wetland systems are very fragile to overexploitation of alluvial aquifers and the building of dams, reducing the flow downstream. The scarcity of fresh water is the major threat to development in Namibia.

2.1.5 Ecosystems and biodiversity

- Ecosystems

Namibia lies at the heart of the species-rich Namib-Karoo-Kaokoveld Deserts Ecoregion (WWF Global 200 Ecoregions). This ecoregion is composed in Namibia of five major terrestrial biomes classified according to vegetation type and climate (Namib Desert, Nama Karoo, Succulent Karoo, tree and shrub savannah, and lakes and salt pans). The tree and shrub savannah biome is further divided into broadleaved tree and shrub savannah and acacia tree and shrub savannah. There are 29 vegetation types within these biomes including wetlands such as pans and Caprivi Floodplains (Annex 7.1. 5). Savannas cover 64%, desert vegetation 16% and dry woodlands 20% of the land.

The marine ecosystem of the cold Benguela Current at the western coast is characterised by upwelling cells with cold, nutrition and oxygen rich water and a huge marine biodiversity. This north flowing current driven by winds of the South Atlantic Anticyclone is the main factor of the extreme dry conditions in the Namib Desert and an average of 87 to 143 of days of fog per year at the Namibian coast.

- Biodiversity

Namibia has remarkable species diversity and a high level of endemism due to its central position in Africa's arid southwest and its history as an evolutionary hub for certain groups of organisms like melons, succulent plants, solifuges, geckos and tortoises. There are ~ 4,350 species and subspecies of higher plants, of which 687 species or 17% are endemic. In addition, a further 275 species or more are Namib Desert endemics. 644 avian species have been recorded, of which over 90 are endemic to southern African and 13 to Namibia (Robertson et. al, 1998). Furthermore, 217 species of mammals are found in Namibia, 26 of which are endemic. They include the Mountain Zebra, rodents and small carnivores, as well as unique desert-dwelling rhino and elephants. The country also hosts the world's largest population of cheetah (with a healthy gene pool). About 35% of the roughly 100,000 known southern African insect species occur in Namibia (Barnard, 1998). Twenty-four percent of the insect species are endemic. Among the arachnids, 11% of spiders, 47% of scorpions and 5 % of solifuge species are endemic. Finally, 28% of the 256 species of reptiles in Namibia are endemic.

There are 20 national PAs in Namibia, comprising approximately 13.8% of the country's land surface (114,000 km²). These national PAs consist of 16 game parks, 2 nature reserves and 2 tourist recreation areas. Including the newly declared Sperrgebiet 16.8% of the land is state protected. In addition, 31 already registered communal *conservancies* cover an area of 79,032 km²; an additional 30 sites are

undergoing the process of registration. Approximately 140 registered private reserves in the commercial area cover 760,000 ha and include mixed ranches of livestock and commercial game production.

Wildlife is found for 75% outside state protected areas. Due to the economic value, valorisation for tourism and increasing wildlife management outside of PA most of the large mammal species are on the incline. But habitat alternation, unsustainable wild harvesting of natural resources, inadequate land use practices, population pressure, mining and visitor impacts (tourists) in fragile ecosystems are still threats to the terrestrial biodiversity.

Namibia has some of the richest marine fish resources, including important commercial species (hake, monkfish, horse mackerel, pilchard, orange roughy, deep sea red-crab, lobster) in the world because of the presence of the nutrient-rich Benguela Current. But before Independence in 1990 these resources had been seriously over-exploited and become depleted because of unregulated fishing by many nations. Marine species stocks have been rehabilitated after serious over – fishing in the pre – independence time, but they are still far from the stocks in the sixties and several commercial species show decreasing trends.

Freshwater species are under threat of over-fishing, in-adapted fishing methods, poor catchment area management, destruction of riverine vegetation and changes in channel morphology.

2.1.6 Risk of natural disasters

Namibia has a very high risk of climatic and hydrological hazards (drought and floods) (Annex 7.2. 6). The country has had six major droughts and six floods since 1982. Almost the entire country is vulnerable to drought, but the southern and western parts of the country are most affected. The rainfalls usually appear as few heavy showers after long dry periods causing damaging floods (ex: erosion, destruction of dams and infrastructures). Recurrent droughts periods over sometimes several years are characteristic for Namibia and a National Drought Policy and Strategic Plan exists since 1997.

Drought problems are aggravated by human activities such as vegetation and soil degradation (overgrazing and –cultivation, deforestation) and overuse of water resources.

Due to the stable geologic situation Namibia has practically no earthquake risk and pest hazards due to invader species exists but are not yet a major problem.

2.2 Socio-economic environment

2.2.1 Pressures on the natural resources

- Agriculture and livestock raising

Namibia's agriculture accounts only for 5.3% of GDP (MAWF, 2005), for 7.6% in 1994, but agriculture supports, directly or indirectly, approximately 70-75% of the population. The decrease was partly due to the impact of drought and/or the better performance of other sectors, such as fishing and mining. The cereal area planted (mainly localised in North Central) has decreased of 1.5% between 1995 (320,581ha) and 2004 (315,921ha), especially millet/sorghum area with - 8.2% (Table 1).

Table 1: Variation of cereal areas planted (ha) according to the cereal between 1995 and 2004

Cereal	1995	2004	Variation (%)
White Maize	18,000	38,884	+ 116
Yellow Maize	3,021	1,052	- 65.2
Wheat	1,160	1,985	+ 71.1
Millet/Sorghum	298,400	274,000	- 8.2
Total	320,581	315,921	- 1.5

Source: MAWF, 2005

The agriculture production systems are closely linked to the three broad categories of land tenure in Namibia (State land, "commercial" land and "communal" lands) which have the following aspects:

-State land, including state protected areas, represents 15% of Namibia.

-Commercial land, owned by individuals under freehold title, covers 44% of the country (362,000 km²), comprises 6,000 farms owned by 4,200 farmers, though probably only those exceeding 3,000 in total size are economically viable. Commercial farming is dominated by livestock, especially cattle and sheep. Most of these animals are used to produce meat for the Namibian market and for export to South Africa and the European Union. Stocking rates (numbers of animals kept per unit area) are generally lower than in communal areas, and the majority of farms are big ranches, the animals grazing extensively and rotationally in large, fenced camps. Most of the limited area used for commercial rain-fed crop cultivation is in the Tsumeb-Otavi-Grootfontein triangle, where maize is the predominant crop. Small irrigation schemes elsewhere in the country are used to produce maize, wheat, vegetables, fodder and various fruits.

-Communal land, owned by the State, covers 41% of the country (335,000 km²), mostly in the north and north east of the country, and contains an indigenous population of over 1 million people (~140,000 households). The majority of communal farms consist of small fields of Mahangu (pearl millet), sorghum or maize, and herds of cattle and goats. Farm products in communal areas are used for a variety of purposes. Harvests may be consumed at home or sold at local markets; more-over, some of the harvest in good years will be stored for possible use in years when food is in short supply. Sorghum is grown in many areas to produce beer, while livestock are kept for more diverse reasons: as capital investments, for use as draught power, for meat and milk production, for social security and other cultural reasons, and less for commercial sale. Only 4% of the livestock in communal areas is commercialised. Communal farming is often characterised as 'low input – low output'. Relatively few inputs of equipment, fertilisers, high-yielding crop varieties and livestock breeds are used, and yield productivities are generally low as a result. Labour is often the biggest input, in the form of ploughing, weeding and harvesting crops, and tending herds of animals. Many communal farming activities are adapted to the semi-arid environment in which they occur. Farming strategies have also evolved as measures to counter the terrible famines that have occurred in some areas during the past two centuries.

Livestock rearing is more suitable for Namibia's climate. However, the numbers of cattle and small stock fluctuate considerably in response to high and low rainfall years. Livestock populations in communal and freehold farming areas have changed in substantial and opposite ways in recent years (Table 2).

Table 2: Livestock variations between 1995 and 2004 according to the tenure (MAWF, 2005)

	1995	2004	Variation (%)
Cattle	2,031,353	2,309,390	+ 13.7
Commercial	887,224	887,667	0
Communal	1,144,129	1,462,033	+ 27.8
Sheep	2,409,699	2,619,363	+8.7
Commercial	2,064,291	2,272,715	+10.1
Communal	345,408	346,648	+0.4
Goats	1,616,090	1,997,172	+23.6
Commercial	575,707	529,131	-0.1
Communal	1,040,383	1,468,041	+41.1
Pigs	19,979	52,624	+163.3
Commercial	13,193	15,700	+19.0
Communal	6,786	36,924	+444.1
Ostriches	21,241	30,762	+ 44.8
Commercial	20,811	30,733	+47.7
Communal	430	29	-93.2
Poultry	487,031	957,966	+96.7

On freehold farms, the number of cattle and goats has dropped by between 20 and 25% between 1988 and 2000 (same level between 1995 and 2004), while sheep bred for meat (lamb and mutton) declined by over 40% between the late 1980s and 2000. The number of karakul sheep totalled around 195,000 in 2000, being less than 10% of what it was in the early 1960s. These declines occurred throughout the country and are generally attributable to changes of economic priorities (tourism), decreasing returns from livestock farming, poor rainfall, and increasing levels of bush encroachment. In communal areas, by contrast, cattle numbers almost doubled between 1988 and 2000 (28 % between 1995 and 2004), and the number of goats rose about 40% over the same period. Much of this growth is due to the increased availability of surplus income, which could be invested in larger herds, usually as capital investments. This livestock's development plays a major contribution to poverty alleviation (NPC 1998) but has a negative impact on the environment. There are roughly two millions of cattle in Namibia, of which over half (58%) are in the northern communal areas. Densities are particularly high in the Cuvelai System, along certain areas of the Okavango River and on the eastern Caprivi Floodplains. Elsewhere, densities are high in the Rietfontein and Aminuis areas, around larger settlements in Otjozondjupa, and in various other scattered places. There are about 140,000 donkeys in Namibia, the great majority (86%) in the communal areas. By far the greatest numbers and densities of donkeys occur in Ohangwena, Omusati, Oshana and Oshikoto. The donkey population of these four regions makes up 75% of the total number in Namibia. The animals are used largely to provide draught power, to plough fields and to transport water containers. The goat capital of Namibia is in the Cuvelai System where the vast majority of the country's goat live, making up about 36% of approximately 2.0 million goats in Namibia. Approximately 89% of all Dorper and other sheep bred for lamb and mutton are on freehold farms, especially in the eastern areas of the Hardap and Karas regions. The majority of karakul sheep are in the southern half of Namibia.

Some central areas have good grazing potential. The most important palatable and nutritious species for grazers are *Schmidtia kalahariensis* and *Cynodon dactylon*, and various species of *Brachiaria*, *Digitaria*, *Anthephora*, *Eragrostis*, *Enneapogon* and *Panicum*. However, this usually thin grass cover cannot support high stocking rates and the country observed severe overgrazing and bush encroachment in bad managed rangelands.

Overgrazing occurs in the whole country but is more intense and damaging in the relatively dense populated central northern Namibia. It is the principal cause of vegetation degradation (lost of perennial grasses) and associated soil degradation (wind and water erosion) on the unprotected ground. Cost estimation of losses of the most basic goods, shows that continuing land degradation severely impacts rural livelihoods. Aggregating these costs over the estimated number of households in the northern areas indicates a total subsistence loss of about N\$ 81 million per year, in terms of reduced output and resource-availability due to long-term degradation (UNDP, 2004).

Bush encroachment happens when relatively open areas become covered by dense layers of woody plants. Overgrazing due to inappropriate farming practices and absence of bush fires is generally thought to cause encroachment in areas used mainly for commercial farming. According to de Klerk (2004), bush encroachment impacts 26 million hectares of woodland savannas in Namibia, including 11 million ha in the communal area. There is a loss of land productivity of as much as 50% or more. This means that the carrying capacity declined from 1 LSU per 10 ha to 1 LSU per 20 or 30 hectares for example. The dense bush vegetation reduced further the available and exploitable ground water resources from 0.6% to 0.02% (pers. communication Namibia Agricultural Union (NAU)).

Bush can be cleared by cutting or applying chemicals. Charcoal can be produced by harvesting encroaching bush in the hope that useful revenues can be earned from this environmental problem. However, bush-clearing for charcoal or other biomass energies has been limited to small areas because the markets remain too meagre to justify producing. Bush cut grows again unless additional (and expensive) steps are taken to kill and remove the roots. Due to globally increasing energy costs, the use of biomass energy from debushed areas might be more economically viable in the future.

Although livestock ranching predominate in most areas, large tracts of land have been cleared for crop farming, especially in the northern communal areas. Historically much of Kavango and Caprivi comprised closed forests, today, woodlands and forests are highly fragmented: in 2000 alone, 17,900 km² was cleared for cultivation. Along large stretches of the Okavango River, and in the settlements around Ondangwa in northern Namibia, the original vegetation has been almost entirely lost (land cleared exceeds 90%). In the remaining parts of the north central and north eastern regions, land cleared varies from a 'modest' 10% to 60% (UNDP, 2004). The total planted area has doubled between 1995 (18,000 ha) and 2004 (39,000 ha) according to MAWF (2005). Most fields are used for cereal production, 70% of which is made up of Mahangu and sorghum. The other main cereals grown are maize and wheat, which make up 25% and 5% of production, respectively. Namibia's total cereal requirements amount ~3,000,000 tonnes per year, while average domestic production is seldom more than 120,000 tonnes (MAWF, 2005). Imports of maize from South Africa make up most of the shortfall. Some fields are no longer used because soil nutrients have been exhausted, while others have been deserted because farmers and their families have found better sources of income and food. Still others were cleared following years of unusually high rainfall but were then abandoned when conditions reverted to the more normal mix of good and bad years. The vast majority of crops are grown on dryland fields where they depend on rainfall for moisture. Cereal production varies substantially from year to year because of the high degree of variation in both timing and total amount of rain. Other crops are grown on irrigation schemes, which draw water from rivers (the Kunene, Okavango and

Orange), dams (Hardap and Naute), or from underground sources (for example, the boreholes at Stampriet and artesian springs at Sesfontein).

The Namibia's potential irrigable is estimated at 40,000 ha. Currently 8,500 ha are under irrigation of which about 2,600 ha are under dam schemes, 1 000ha from boreholes and the rest along perennial rivers.

Land reform is the national objective of creating an equitable society, in which all citizens have equal opportunities before the law to contribute and gain from the wealth of the land. Since 1990, the government has distributed four million hectares of freehold (or commercial) land to formerly disadvantaged Namibians. The National Resettlement Programme in the freeholds areas has benefited some 1,526 families (Ministry of Lands and Resettlement (MLR), 2005). The average hectares per household are very low (159 ha per household in the MLR project (Group) farm), 1,768 ha/household in the MLR project individual smallholder Model – MLR 2005) considering the arid farming environment in Namibia. Due to the size of land allocations, small-scale farmers do not have much opportunity to practise flexible management. Such strategies are important in mitigating the impacts of drought on the grazing areas, livestock and ultimately on the people. Some of the project farmers focus on irrigated communal gardens for their livelihoods, others on livestock farming. Actually, the land reform programme requires a significant boost, especially for the rural development and to mitigate negative environment impacts on the distributed lands.

Further, the lack of quality land information, of individual ownership rights and of clear land administration in communal areas has exacerbated illegal fencing and encroachment.

- Forest exploitation (timber and non timber products)

Forested areas make up less than 10% of Namibia. According to FAO (2001), the forest's cover (land with a tree canopy of more than 10%) was 8,040,000 ha in 2000, while it was 8,774,000 ha in 1990 (diminution of 734,000 in 10 years). Deforestation is modest in Namibia with an annual rate of 0.9%. Namibia has about 4 hectares of forested land per capita. However, forestry resources are under pressure due to agricultural expansion and the growing demand for wood energy for both domestic and construction materials. This situation is rather preoccupying, as ~70% of the population live in rural areas and eke out a living directly from natural resources.

The annual production of wood is largely under pressure due to the permanent increasing demand for construction, domestic fire wood (see energy) and charcoal production. Indigenous Forest volumes are estimated at 2.7 m³/ha for Zambezi teak, 0.3 for Kiaat, and less than 0.2 for Ushivi and Burkea (Mendelsohn, 2005). These low volumes are further reduced by bushfires.

The widespread frequent bush fires have a major impact on the structure of woodlands in north-eastern Namibia. The most important effect is limiting the growth of young trees and killing older, larger trees. This keeps the woodlands more open and savannah-like with a greater cover of grass. As a consequence, that part of the country would be more heavily wooded, and bush encroached, if fire were less frequent. The other major impact of fires is on the species composition of woodlands. Some species are more vulnerable to fire than others. Unfortunately most valued timber species are sensitive to fire, and there would probably be many more Zambezi Teak, Ushivi and Kiaat trees if broad-leaved woodlands in north-eastern Namibia burnt less often. Namibia has few invador plants such as *Acacia mellifera*, *A. reficiens*, *Colophospermum mopane*, *Dichrostachys cinerea*, *Rhigozum trichotomum*, *Terminalia sericea*.

Only fifteen plantations (mainly Eucalyptus), covering a total area about 300 hectares have been established in Namibia. Most of these cover just a few hectares and were intended more as experiments than as plantation to produce timber. The accumulated wood stocks amount varies from 10 m³ /hectare to 100 m³ /hectare on a 25-year rotation. Namibia has penury of timber. All the industrial timber, paper, panels, except for treated fencing posts are still imported, currently dominated by suppliers from South Africa.

The sector contributes values indirectly to the rural economy through biomass energy, shelter, non-timber products and through ecosystem values which support wildlife based tourism and environmental conservation. Non-wood products include a number of fruits and nuts, medicines and grass and have considerable economic value but are yet not traded commercially in significant quantities to get a place in national accounting systems. Nuts from Marula and Manketi trees have immediate commercial value for use in the pharmaceutical and cosmetic industries, in addition to their traditional use in local diets. Marula fruit itself can be used to make jam and its juice is already used in the commercial manufacture of liqueur. The fruits of Strychnos and Berchemia have a local market, attending to be more efficiently exploited by greater promotion, packaging and more intensive plant propagation. Of the medicinal plants, only the devil's claw (*Harpagophytum procumbens*) has an international market. The attention on NTFP as sources of alternative or complementary sources of income is increasing. The major constraints remain inadequate information on utilisation, management and marketing of NTFPs and the risk of over exploitation of these resources as a consequence.

As most other natural resources on communal land, trees and forest resources are still State property. The challenge is to find participatory and cost-effective processes that take into account the socio-economic characteristics of the country, and also to find the best way for a sustainable development and to share knowledge and experience.

- Hunting

Namibia has the second biggest hunting industry in Africa after Tanzania, and is regarded as one of the best hunting grounds. Hunting is a form of consumption tourism. "Animals are hunted as trophies", but it has a very low impact on biodiversity with a very high return form of tourism." Hunting in Namibia has been of great benefit to wildlife conservation. Since the late 1970's wildlife have been protected by game farmers on privately-owned land and the game population of Namibia has increased by more than 60% since the start of commercial hunting in the communal areas. Illegal hunting, or poaching, seem very rare among local communities since the transfer of competences for game management to the registered conservancies.

According to Namibia Professional Hunting Association (NAPHA), there are currently 505 registered hunting professionals in Namibia. In 2004, the country was visited by 5,363 international hunters (an increase of 12.2% from the 2003 season) who took 22,500 trophies home. In 2004, hunters in Namibia spent N\$ 28,600 per hunter for an approximate direct income earned of N\$153.4 million. There is a "higher expenditure per person" in the hunting market compared to the normal tourist. To keep the resource intact, NAPHA has recently raised N\$ 100,000 to initiate an age determination study of trophy animals.

Game Translocation plays a significant role in the repopulation of areas and is an excellent conservation tool. The translocation of game plays a major role in genetic diversity, increasing minimum population sizes of introduced groups, boosting existing populations, supporting the recovery of natural biodiversity and is benefiting to all Namibians and future generations.

- Fisheries

The Fisheries sector is one of the important contributors to the Namibian economy. In 2005, the sector contributed 5.9% to GDP, compared to 6.5% to GDP in 2004 (Ministry of Fisheries and Marine Resources (MFMR), 2005). It is the second sector in terms of export value, after the mining sector. Over 20 commercially important fish species are landed using various fishing methods. The fisheries sector provides employment, food, rural income, import substitution. Currently, it directly employs 14,500 to 15,000 people. In 2000, annual food supply from fish and fisheries products amounted to 7 - 12 kg per person (FAO, 2003), increasing from ~ 1 kg/person/year at independence. Fish comprises only ~ 10% of total animal protein intake except for the northern region in the Kavango and Caprivi and the northern floodplains, where fish is more important in the diet.

Namibia's marine fisheries sector has changed greatly in the years since independence. In 1990, the fish stocks had been severely over-fished by foreign distant water fishing fleets. For example, the population of pilchards (sardines) was estimated to > 10 millions tonnes in the mid-1960s, but only a few hundred tonnes remained in the 1990's. To prevent overexploitation and to promote economic viability in the industry, the Ministry issues rights of exploitation, fishing vessel licenses, and in some fisheries, TACs and individual catch quotas (MFMR, 2004). Since the earliest 1990s, all important commercial species, such as hake, monkfish, rock lobster, deep sea red crab, pilchard, horse mackerel, orange roughy, large pelagics and seals are harvested through Total Allowable Catches (TACs) and quota manage fisheries. In addition, there are a number of less abundant fish or shellfish, for example snoek, kingklip, chub mackerel and linefish that are of economic importance. These are landed primarily as by-catch of other target species or species that are managed by effort control. In 2002, a moratorium for pilchard was declared. However, anchovy and horse mackerel allocations to the pilchard fishery operators as relief helped to offset the impact of a zero TAC for pilchard. In 2005, total fish harvest amounted to 552,164 tonnes for an export value of N\$ 3,697 millions (Annex 7.2.6).

The inland fisheries are limited to the north-eastern regions of Caprivi and Kavango. These fisheries contribute 50% of the total inland fisheries and support a population of 400,000. All inland fisheries have been impacted by human activities such as farming, deforestation, building of roads and harvesting of vegetation for building materials. Historically, fishing was an important part of the ritual and political power base in the traditional management in the Caprivi region, and also today fish occupies a central place in people's daily life. Households eat fish daily for most of the year, and fish is the most important protein source ranked over beef, game and poultry. The main fish species are *Brycinus lateralis*, *Schilbe intermedius*, *Hydrocynus vittatus*, *Synodontis species*. Seventy-five percent of the households are engaged in subsistence fishing, with a mean reported catch of 370 kg per year per household.

A perceived decrease in the fish catches has been reported since the mid 1970's. The fisheries provide a crucial source of protein, employment and income for households in the region. The trade in the fish products is especially important to the poorest households, which have no other means of generating income. A further important aspect is the barter of fish products for other essential commodities. The fish resources in the Zambezi and Chobe Rivers are limited. As the local population grows and fishing activities increase, conflicts arise between subsistence, commercial and recreational fisheries. In addition, all the perennial rivers in Namibia, border on neighbouring countries. Management regulations and control measures are different in countries sharing the same fish resources. This has, among other problems, resulted in conflicts between foreign and native fishermen.

Aquaculture in Namibia is very limited (70,000 tonnes in 2000 –FAO, 2003) but it is set to become a more significant contributor to Namibia's fish production both for domestic consumption and exports. The

government envisages considerable growth of the sector, predicting that it will become a "thriving industry" (Vision 2030). Aquaculture has been identified as a means of increasing rural income (IGAs) and reducing environmental pressures on marginal land.

Currently the range of aquaculture activities includes the culture of oysters, mussels and seaweed in Lüderitz harbour and in salt-ponds around Walvis Bay and Swakopmund. The Government foresees marine aquaculture producing "various types of high-value finfish and shellfish, destined mainly for the export market". It also sees inland aquaculture providing "food, income and employment of rural communities". Inland aquaculture is focused at present on the culture of tilapia, catfish and freshwater crayfish. Three community-based fish farms in the Caprivi and Kavango regions have been established to facilitate fish production in the north-east of Namibia. Fingerlings are being produced and 72 subsistence fish farmers in the north east of Namibia were supplied with fingerlings in 2004 (MFMR, 2004). But inland aquaculture presents especially to smaller rivers a risk by modifying the hydrological regimes.

- Mining

Historically, Namibia has been well known for a mining industry that has thrived for over 100 years, with diamonds at the centre of all. Mining is still the largest foreign exchange earner (just over 50% of exports), followed by commercial fishing. Namibia's mining sector contributes < 10% to the GDP in 2005 (18% in 1990, ~ 14% in 2002). Diamond remained the most economically significant mineral commodity produced by the mining industry; zinc and uranium ranked second and third. Namibia, is the world's sixth leading producer of uranium and seventh ranked gem diamond producer. Other mineral production included copper, fluorite, gold, lead, salt, silver, and stone (Mobbs, 2005). The sector directly employs more than 7,500 people (Insight, 2006) and there are about another 1,000 informal miners who independently excavate semi-precious stones, tantalite, tin and others minerals.

The country has a well-developed mining industry based on world-class deposits of diamonds and uranium as well as a number of vibrant smaller mines producing copper, gold, zinc and lead. Apart from diamonds, almost all of Namibia's valuable mineral resources have been found in western Namibia where the oldest rocks are exposed at the surface. The mines of Oranjemund produce a large proportion of the world's gem-quality diamonds, the Rössing Mine at Arandis produces uranium (it was once considered the largest low-grade uranium mine in the world and huge volumes of rock have been excavated and mined to extract uranium), large scale mining of copper and other metals has taken place around Tsumeb, and gold is extracted from the Navachab Mine near Karibib.

Changes in the areas covered by licences largely reflect changing economic interest in minerals as well as a greater knowledge of the available resources in specific areas. Mining activities, especially in protected areas, where a huge of prospecting licences are actually attributed, can create conflicts of interests and undermine ecology and tourism priorities in the region.

Claims over large areas off the coast in the 1990's followed the discovery of diamonds on the floor of the Atlantic Ocean, in tandem with the development of suitable methods for sucking them up onto processing ships. New prospecting activities for copper and other base metals started north of Gobabis in the 1990's. Early interest in possible oil and gas reserves focused on the Owambo and Nama basins. During the 1960's, four exploration wells were drilled in and around Etosha. More recently, several large international companies have begun prospecting of petroleum reserves, particularly off the coast, following the discovery of the huge Kudu Gas Field (about 300 km²), some 170 km west of Oranjemund in 1974. Since the early 1900's, much of south-western Namibia was allocated as a sole diamond concession to De Beers Diamond Mining Company.

Given the driest conditions of Namibia, the mining industry has been forced in the last years to employ recycling or use alternative inputs to freshwater. In combination these factors often lead to a high productivity and efficiency of fresh water use, but the sector uses still > 12%, or 17.3 million of m³ (MAWRD, 2000) of the total exploited water in Namibia.

The mining sector is a significant threat to the environment. During the operations, the open sky mines create noise, dust, air pollution from furnaces, and effluent by-products. Until today rehabilitation of the site and of the environmental damage at the end of the operation is inadequate. Groundwater pollution by Cadmium has been observed in several metals mining areas, especially around Tsumeb.

- Water use and management

Total water consumption in Namibia amounted to 300 million m³ in 2000 (FAO, 2005). Agriculture was the largest water user accounting for 213 million m³, of which 136 million m³ for irrigation and the remaining 77 million m³ for livestock. The domestic sector followed with 73 million m³ and industry with 14 million m³. The highest consumption of irrigation water was in the Fish and Orange River Basins with 41.5 and 41.0 million m³ respectively. In 2000, 30 million m³ of groundwater were used for irrigation, which is 22 percent of the total consumption of irrigation.

It is estimated that the country's total water demand will reach about 475 million m³/yr by 2015, against 300 million m³ at present, made up of 93 million m³ for domestic purposes (including industry and tourism), 342 million m³ for agriculture (including irrigation and livestock) and 40 million m³ for mining.

The Population Census of 1991 indicated that 43% of the rural population had access to clean water within reasonable distance. The 2001 Population and Housing Census shows that 80% of the rural population has access to clean water (the criteria is: a maximum walking distance of 2.5 km to a domestic water point, a minimum of 15 litres of water per person per day and a waiting time at a water point not in excess of 30 minutes). Some regions are below the target of 80% such as Kavango, Kunene and Ohangwena.

The majority of the water points are on pipeline schemes (40%). The pipeline schemes are fed by the perennial rivers on Namibia's borders which are essential for Namibia's water supply. Agreements or joint commissions on water exploration from these shared international rivers (Kunene, Zambesi, Orange, Okavango, Kwando) exist with all concerned neighbouring countries. The second highest technology is diesel engines (27%) followed by windmill (16%), hand pumps (14%). Solar power is only 1%. With regard to village level operation and maintenance techniques, pipelines, hand pumps and windmills combined amount to 70% of the total number of water points.

A number of rivers have been tapped by building dams. The total storage capacity of the major dams (Hardap, Swakopoort, Naute, Van Bach, Omatako) is about 0.71 km³. In addition to these larger reservoirs, there are thousands of small farm dams scattered around the ephemeral river basins. 46 dams have been constructed since 1993. Building dams, especially on the Kunene River and the Orange River, which reduce the flow downstream are potential threats to those wetlands that depend on them. Ramsar sites on wetlands are therefore installed in the Etosha Pan, the Orange River Mouth, Sandwich Harbour and Walvis Bay. High evaporation rates in the dams and canal systems reduce the water efficiency of dams and infesting with reeds (*Phragmites australis*) causes severe problems especially in the Hardap Dam.

The great majority of boreholes were drilled privately on freehold farms. The comparative scarcity of boreholes elsewhere is due to several factors: the depth or salinity of the groundwater, high installation

costs, presence of better sources of water and, in some cases the low priority given in the past on water supply in sparsely populated areas. The lack of boreholes in the Cuvelai, for example is due to the very salty underground water in that area and the presence of other water sources. The availability of water is a limiting factor for livestock in many areas of the country. Thousand of boreholes have therefore been drilled and equipped with windmills and other kinds of pumps to bring groundwater to the surface.

The overall rate of pumping remained higher than the rate of recharge. The dangerous overuse of water resources has occurred in many aquifers in Namibia.

The Namibia's potential irrigable land is estimated at ~ 50,000 ha. Currently 7,500 ha (FAO, 2005) is under irrigation of which about 2,600ha is under dam schemes, 1,000ha from boreholes and the rest along perennial rivers. Salinisation from irrigation is a serious risk in Namibia, already in 1992, area salinated by irrigation has been 1,300 ha.

Given the water scarcity of Namibia, it is natural that there is competition for water. According to the Water and Sanitation Policy (WASP) of 1993, the first priority for water allocation should be accorded to domestic use, while irrigation has second priority together with mining and industry. It was also proposed that irrigation should be regarded as an interim use until the water is used for higher value consumption with higher economic returns. Water recycling is practised since 1968 in Windhoek, but it becomes more and more important, especially in the mining sector and regional urban areas. Desalination at the coast is planned to reduce water scarcity.

- Energy production and use

Namibia's energy needs (1,263,000 tonnes of oil equivalent – ktoe -) are met by a balance of 66.5% petroleum products, 14.5% of fuel wood, 9.9% hydro-electric, 8.9% electricity and 0.2 % coal (OECD, 2003). Seventy six per cent of Namibia's energy is imported (840,000 ktoe of petroleum, 113 ktoe of electricity, 2 ktoe of coal) mainly from South Africa. The remainder is supplied mainly by the hydroelectric scheme at Ruacana (125 ktoe but rainfall dependant) on the Kunene River.

Electricity is also generated by the coal-fired Von Eck power station in Windhoek (120 MW), diesel-powered generators at Walvis Bay (24 MW) and Katima Mulilo (3 MW). Other sources that have been investigated in recent years include another hydroelectric scheme (400-500 MW) on the Kunene River, Kudu Gas Field (750 MW) and wind parks (20 MW) near Luderitz. Moreover, a large number of small diesel units are running throughout the country. The national electricity grid of 15,500 km of transmission lines serves to distribute power. High-voltage lines deliver power via a network of lines of successively decreasing voltages to the final consumers of electricity. In addition to the electricity, many rural homesteads, schools, clinics, tourist resorts and other small settlements use so-called off-grid sources of power. Most of these are diesel, wind, solar power and other generators that produce relatively small amounts of electricity. According to the 2005 Rural Electrification Master Plan, only 1/3 of Namibia's population has access to electricity (67% for urban areas and 10% for rural areas). An Off-Grid Energisation Master Plan had also been formulated in 2006, with focus on renewable energy application; however, the effective and time-frame implementation of both the Master Plans are hampered by lack of sufficient funding.

Generation, transmission and bulk supply of electricity is the responsibility of NamPower. Electricity distribution is decentralised, with three regional electricity distributors covering about 60% of the country and about a two dozen municipalities and local authorities being responsible for supply to end-users in urban and peri-urban areas. It is envisaged that by the end of 2007, the whole electricity distribution to end users in the country will be consolidate into five regional electricity distributors only.

At present, Nampower also supplies electricity directly to large mining and industrial customers and also has an involvement in rural areas, being responsible for the main rural transmission and distribution system and direct supply to certain end-users.

The transport sector's energy consumption predominates over all other sectors. In 2003, it accounted for 43% of all energy consumed in the economy. That same year, residential accounted for 15%, agriculture for 14%, industry for 6%, commerce and public services for 0.2% (no specified: 22%). Namibia's total consumption is on the increase, though erratically.

Wood is used for cooking by over 213,500 or 62% (73% in 1991) of all households in Namibia with 89% in the rural area and 20% in the urban area (NPC, 2003). Over three-quarters of these households were 2001 in Caprivi, Kavango, Ohangwena, Oshikoto, Oshana, Omusati and Kunene, and over 80% of households in these regions use wood for cooking. This resource is currently heavily over-exploited in certain areas, resulting in severe woodland degradation.

Though Namibia has one of the best solar energy resources in the world, the solar industry is relatively small. To date, Ministry of Mines and Energy (MME) is setting up demonstration units (solar home systems, solar water heaters and photovoltaic pumps in all the 13 regions of Namibia (Namibian Renewable Energy Programme –NAMREP-). Wind energy is largely used in remote areas for water pumping.

Beside the pressure on the wood resources, energy production through thousands of often old diesel generators is a threat to air quality and the transport of the fuel to the remote areas increases once more the high energy needs in the transport sector. The new hydro power scheme at the Kunene is actually often criticized due to the impact on the highly variable hydrological regime of the river and the fragile surrounding environment.

2.2.2 Urban areas and industries

- Urbanisation and infrastructure

Urban population has increased from 27% in 1991 to 33% in 2001. Compared with 10% of 1936, the number of people living in urban areas has increased dramatically over the past 70 years. About one of three people lives in towns for employment and business opportunities. Windhoek is by far the largest urban centre housing 39% of the urban population in 2001, followed by Walvis Bay (7.7%), Rundu (6.1%) and Oshakati (4.7%).

Urban growth rates in Namibia vary from town to town, but some of the highest include Walvis Bay, Rundu and Katima Mulilo with 6.5%. Almost 600 people moved into Windhoek each month between 1991 and 1995, and the city's population has been expected to double every 12 to 13 years. After a first migration phase to Windhoek in the first decade after independence, people's movement is today focus on the smaller regional centres. Overall rates of urban growth for the whole country have been between 5% and 6% over the past few decades. It is estimated, that ~ 75 - 85% of Namibians will be living in towns by 2020 if these rates of urban growth continue.

Table 3: Population and growth rates of the Namibian most important cities and towns in 2001

City	Total Population	Total urban population (%)	Annual growth rates (%)
Windhoek	233,529	38.7%	4.44% (2001)
Walvis Bay	43,611	7.2%	6.5 % (1995 estimates)
Rundu	36,964	6.1%	6.5 % (1995 estimates)
Oshakati	28,255	4.7%	2.76
Swakopmund	23,808	3.9%	2.98
Katima Mulilo	22,134	3.7%	6.5 % (1995 estimates)
Rehoboth	21,308	3.5%	-0.06

Source: NPC (2003)

Approximately 40% of the urban population lives in informal settlements, and unemployment is a major problem in these unplanned settlements, particularly in the north. Except the major cities Windhoek and Walvis Bay which have special infrastructure construction programs in the informal settlements, urban planning and environment management address infrastructure needs in the unplanned new settlements insufficient. Access to housing is inadequate and urban service delivery such as water, electricity, sewage and waste disposal represent severe problems. Especially in the today fast growing smaller and middle towns the councils haven't got sufficient financial capacities to adapt urban infrastructure improvement to the high immigration rates. Delivery of sufficient low cost housing is a general problem in all urban settlements and squatters are observed in most of the urban areas. Lack of secured land titles in these uncontrolled settlements hamper individual investments in housing.

Road transport is the most important in terms of the volume of goods and people. Most traffic is concentrated on relatively few sections of roads. Thus, only 7% of the whole network of about 43,000 km of proclaimed roads carries an average of 200 vehicles or more per day. Tared roads about 5,200 km concentrate 75% of all traffic. Most of the remaining roads are in gravel. The rail network consists of about 2,400 km of tracks. Freight train volume declined at a rate of 5.2% per year between 1988 and 1998, because road transport is considered better in getting goods delivered "on time". The number of registered cars (140,000) has significant increased since independence, but due to the low population density air pollution is locally and not yet a problem in Namibia.

An average of 2,000 vessels reach Namibia's two harbours each year. Walvis Bay handles 95% of 2,500,000 tonnes of marine freight transported in and out of Namibia in 1998; Lüderitz harbour is devoted largely to the fishing industry and some coastal shipping. Marine transport (and fisheries) is always a source of marine pollution, but major accidents of marine pollution are not reported in Namibia.

- Industries and private sector

Industry plays a minor role in the economy of Namibia's predominantly agrarian society. Namibia's manufacturing sector contributed ~ 12% to the GDP in 2004 but has historically been inhibited by a small domestic market, dependence on imported goods, limited supply of local capital, widely dispersed population, and subsidized competition from South Africa. Small and medium-scale industries are concentrated in urban areas of Windhoek, Walvis Bay and Swakopmund.

Agro-processing industries is the dominating sector with fish processing on shore and meat processing which contribute respectively 2.5% and 0.3% to the GDP. One-third of the manufacturing firms are engaged in food and beverage production (beer and soft drinks). Other activities include metal fabrication, furniture and wood products, and chemicals including paints, plastic packaging, clothing and leather products. In 2004, AGOA has invested close to \$ 300 million and has created thousands

jobs in the textile industry. The textile factory RAMATEX is the first large scale enterprise outside the food processing sector in Namibia. Environmental problems (ground water pollution) of this factory have sensitized government and the public on environmental risks of industrialisation.

Fishing and fish processing, tourism (largely reflected in "hotels and restaurants" but not shown separately) and manufacturing are expected to show strongest growth, averaging 7% since 1996. But the strong growth sector, especially manufacturing, are starting from such a low base, that their growth performance will not dramatically alter the composition of the economy. However, a good start towards diversification will have been made.

Namibia is a member of the Southern African Customs Union (SACU) – whose other members are South Africa, Botswana, Lesotho and Swaziland – and this is the core of Namibia's regional trade relations. Namibia is also a member of the Southern African Development Community (SADC), the Preferential Trade Area (PTA) and the World Trade Organisation (WTO). Some Namibian products –largely agricultural and fisheries – enjoy preferential treatment under the Lome IV convention of the European Union.

The Environmental Assessment Policy of 1995 requires all major industries and mines to prepare EIAs and waste management plans and to present these to the local authorities for approval.

- Tourism

In 2005, tourism was elevated to the position of the fourth pillar of the Namibian economy, among mining, fisheries, and agriculture. In 2006, World Tourism and Travel Council (WTTC) estimated that tourism contributes directly to 3.7% to GDP and indirectly to 16% to GDP. The sector's growth is estimated to be 11% for 2006 and 5.4% annually for the next ten years. In 2006, 4.7% of total direct employment was travel and tourism, while spill-over employment associated with the industry accounts for 71,800 jobs (17.9% of total employment).

Tourism industry in Namibia (~ 700,000 tourists in 2003, compared to ~ 255,000 in 1993) has undergone rapid growth since the late 1980s, with an average increase in international arrivals of 16 % per year (Weaver & Elliott (1996); Krug *et al.* (2002), MET (2004)). Over 70% of international visitors are from African countries, especially South Africa. Regional visitors tend to visit Namibia alone, whereas overseas visitors are generally visiting at least one other country.

The tourism sector is highly dependent on natural resources, with up to 70% of total tourism expenditure having been attributed to nature-based tourism (Turpie & al, 2004). Protected areas form an integral part of the package of attractions for tourists visiting Namibia. Nature-based tourism activities are the top stated reasons for visitors coming to Namibia (1997: game viewing - 73% and bird-watching - 62%; 2003: nature and landscape touring - 51%; game viewing - 45%; (MET 1997, SIAPAC 2003). About 2 - 4% of visitors are on hunting trips, and about 9% engage in fishing (SIAPAC 2003). Visitors differ from area to area. Etosha attracts the highest number of visitors (~ 156,000 in 2003), followed by Cape Cross, Namib-Naukluft, Waterberg and Ai-Ais (all 25 – 60,000). All other parks receive less than 10,000 visitors per year, with several receiving less than 1,000 visitors.

However many Namibia's ecosystems and landscapes are fragile, and are easily scarred by inappropriate land use and actions. Vision 2030 emphasizes the importance of conserving Namibia's valuable wildlife and other types of heritage. Like in all other economic activities, tourism uses resources, produces waste and creates environmental and social costs. As these impacts accumulated can result in the degeneration of tourist sites and natural settings, and are capable to

destroy the foundation upon which the tourism industry thrives. Negative environmental impacts from tourists are mainly observed in the high frequented sites like Sossusvlei or Khorixas where tourists leave their waste and off – road drivers damage the fragile vegetation and soil structures. Archaeological remains such as rock painting or remnants of Stone Age shelters are all protected under the National Heritage Act and advice of an expert archaeologist must be obtained before even considering expansion or development near these sites.

In 2006, an eco award Namibia was published. The Best Practices Handbook aims to encourage and improve the environmental acceptability and sustainability of tourism projects in the face of growing tourism pressure. This eco award can give five flowers to an establishment (highest eco-rating based on its excellent community relations, conversation ethic, waste management, water conservation use of renewable energy, and maintenance of 'sense of place').

- Waste water and management

Human waste disposal and management is generally poor in Namibia. Over 54% of the households have no toilet facility and only 44% of the households in the country use flush or long drop toilet facility (NPC, 2003). In 1991 just 15% of the rural population had access to basic sanitation such as flush toilet or a ventilated improved pit latrine. Ten years later that share has increased to 21 %. The gap between urban and rural areas is wide: access to basic sanitation is four times higher in urban areas. Khomas ranks highest with almost 80% of households having access to basic sanitation, while in Ohangwena only 10% do. Reduction in access to basic sanitation in urban areas since 1991 is a result of growing informal settlements in the country's towns (NPC, 2004).

Re-use of water is practised in many urban areas such as Swakopmund, Walvis Bay, Tsumeb, Otjiwarongo, Okahandja, Mariental, Oranjemund and Windhoek. The return flow in Windhoek and urban centres equals 40% of freshwater consumption which can be reused after treatment. In Windhoek, 1.14 million m³ of treated effluent was used for irrigation in 1997 and reclamation of water for potable re-use has been practised since 1968. In 1997, the plant supplied 8,000 m³/day, which was about 19% of the average daily water demand of the city. In 2002, a new reclamation plant with a capacity of 21,000 m³/day has been completed. It is estimated in the future that 7 million m³/year from Windhoek and 10 million m³/year from other centres could potentially become available. Recently a contract for the design and construction of a coastal desalination project was tendered.

Wastewater recycling is practised by a number of mines. Industrial effluent is usually collected in septic tanks or discharged into the sewerage systems, and pre-treatment of industrial waste water is still uncommon.

- Solid waste disposal and management

Waste management in Namibia is regular collection, which is utilised by 31% of the households. In the urban areas, over 65% of the households have their garbage regularly collected and in rural areas only 8%. The most common means of rubbish disposal in most of the regions is the rubbish pit and incineration, except for Khomas and Erongo regions where regular collection is relatively high (NPC, 2003). According to MET, due to financial deficiencies, there is no adequate waste management and pollution control mechanisms for a sustainable development in Namibia.

Table 4: Means of garbage disposal (percent of households)

Area	Regularly Collected	Irregularly collected	Incinerated	Roadside dumping	Rubbish pit	other	Not stated
Namibia	30.9	11.5	18.0	14.7	20.3	3.4	1.2
Urban	65.3	11.3	2.8	10.3	8.6	0.9	0.8
Rural	8.4	11.7	27.9	17.6	28.0	5.1	1.4

Source: NPC, 2003

Hazardous Waste (HZW) in Namibia comes from mining industry (i.e. from copper/sulphur, uranium, zinc, gold and diamond mining), hospitals (medical waste), agriculture (pesticides), abattoirs, tanneries and fishing processing industries. Others HZW are due to power stations, transformers (PCBs) and motor vehicles (waste oils and lead-acid car batteries). Waste oils are sometimes sold to the mining industry and used as an ingredient in the explosives used for blasting. In the interior, used oils are often used to prevent insects on cattle and as an impregnating material for wooden poles used in fencing. The Windhoek Municipality is piloting a project for the collection of chemicals from photo shops, pharmacies, laboratories etc. for recycling or treatment. Some used acid-lead batteries are exported to South Africa.

Apart from mining, the limited industrial activities are mostly located in Walvis Bay and Windhoek. There are no reliable figures on quantities of hazardous waste generated within the various categories.

There are no landfills or proper dumpsites in many of Namibia's proclaimed and not proclaimed towns. In these towns and villages, the common practice is to dump HZW together with general waste at municipal landfill sites. The usual waste management procedure is to "burn and bury". Only Windhoek and Walvis Bay control landfill sites for disposal of HZW and mining industries manage their own wastes in the landfill sites.

Finally, liquid HZW in small volumes from small- and medium size enterprises are usually disposed to the sewage systems. These small hazardous waste discharges might pose long-term risks to common health, especially where some of the sewage water is reused, such as in Windhoek.

The control mechanisms of Solid Waste disposal and management must be effective, especially with increasing living standards, rapid urbanisation and promotion of industrial development which increase the waste production.

- Atmospheric emissions

Air pollution levels do not yet pose any major threat to ecosystems. According to Namibia's First National Communication to the UNFCCC (2002), Namibia is a net absorber of greenhouse gases. CO₂ removals (in forests and other biomass stocks) equalled 5.7 million tonnes. Of the total emissions of 1.8 million tonnes of CO₂ the energy sector contributed practically all.

Generally in main urban areas gaseous emissions from industries, car exhaust fumes and burning of old tyres are the major air pollutants. The number of new vehicles registered annually has risen over the years and fuel imports, mainly diesel have increased significantly since independence. With additional vehicle fumes introduced to the atmosphere and growths in urbanisation, mining, transport and industrialisation, air pollution could become a problem in urban areas. Other pollutants include smoke and haze in the rural areas, mostly due to bush fires and dust. Impacts from coal mines have been suspected but without any accompanying data.

Namibia has to comply with regional and international declarations that ensure the reduction of emissions from motor vehicles by reducing the emissions of sulphur and known aromatic carcinogens to levels as agreed in those declarations. Namibia is using international best practices in the specifications of petroleum fuels and has upgraded its fuels specifications (95 Octane Unleaded Petrol –ULP- Lead Replacement Petrol –LRP- 93, Diesel, which was upgraded from a 0.55% Sulphur to a 0.05 % Sulphur) in line with the SACU region's fuel specifications and international best practice. Eventually all Sulphur will be phased out from Diesel to become more environmentally friendly, starting from this year (2006) when the RSA oil refineries are able to supply that product to the regional market (MME, 2006).

2.2.3 Poverty and living conditions in human settlements

Actual estimations put the current population at 2.0 million (1,820,330 census 2001), with an annual population growth rate of 2.6 % between 1991 and 2001. This is a slight decline to the 1981 – 1991 decade with 3.1%. The population density is with 2.4 inhabitants/km² one of the lowest in the world but distribution is very inequitable, the central and southern parts of the country have population densities of no more than 5 people/km², often less than 1 people/km², and the north central and north eastern regions have population densities exceeding 25 people/km², in some areas 150 people/km². The rural population is 67%, but population densities rise sharply in and around the main urban settlement areas, such as Ondangwa, Rundu, Katima Mulilo and Windhoek and a few other minor urban areas. By 2015 urban population is estimated to be almost 50% of a predicted total population of 2.5 million. Despite this rapid rate of urbanisation, the rural population will continue to grow at about 11% over the next decade, placing increasing demands and pressure on the fragile dryland environment.

The HIV/AIDS pandemic has emerged as a significant factor compounding Namibia's development challenges. Until 1996 malaria was the main cause of deaths in government hospitals; since then HIV/AIDS has taken over as the main killer. Rates of infection in adults have increased from an average of 4% in 1992 to over 25% today, reaching up to 35% in some areas of the country. A quarter of all infected people are in the 25-29 year old age group. Life expectancy has dropped from 61 (1991) to 49 years in 2001 (NPC, 2003) and will drop to under 40 in 2005 (NPC, 2005). High morbidity and mortality from this disease is weakening the capacities of individuals, households and communities, as well as businesses, organisations and government to deliver essential services in health care, education and basic amenities. This erosion in capacities across society is weakening human, financial and institutional safety nets and is leaving the country less able to respond to natural disasters and to manage the development process. The debilitating impact of HIV/AIDS on households, livelihoods, development, capacity building, and every aspect of private and public life is, inevitably, also of major concern in the context of land management.

With an average per capita income of USD 1,800 (2004) Namibia is ranked as a lower middle income country, but this categorisation masks the large social inequity of income distribution due to the inherited dualistic economy. The Human Development Index (HDI) is 0.65 (0.75 in urban and 0.57 in rural areas), the Human Poverty Index (HPI) 25 (17 in urban, 29 in rural areas), and the Gini Coefficient, which provides a measure of equity, is today 0.67 (slight decrease from 0.7), which is the most unequal distribution of income in the world. In essence, some 0.3% of the population owns 40% of the land, and 5% earn almost 70% of the income. High levels of poverty exist especially in the rural areas. Namibia uses Food Consumption Ratio to measure poverty in terms of share of total income spent on food. According to the preliminary results of the 2003/04 Namibia Household Income and Expenditure Survey, the proportion of households spending more than 60% of their total income on food declined from 38% in 1993/94 to 28% in 2003/04. The figure on extreme poverty, which is defined as those households spending more than 80% of their income on food, has declined from 9% in 1993/94 to 4% in 2003/04.

People in rural areas are poorer than their counterparts in the urban areas i.e. 42% compared to 7% in urban areas (NPC, 2006). In rural areas household food security is often not assured due low productivity in the subsistence sector and income derived in cash from paid work are indispensable components of most families 'diversified systems of survival'.

Poverty alleviation in Namibia has shown progress in the last decade, mainly in education, water supply and health, but 55.8% (2003) of the population are still living below US\$ 2 a day and 34.9% below US\$ 1 a day (UNPD, 2005). HDI and HPI show negative trends in the last years due mainly to the HIV/AIDS pandemic and its social impacts.

The general GDP growth rate for the last decade is about 3.5%/year with 1%/capita/year. This rate is too low to create enough job opportunities. Unemployment rate has dramatic increased from already high 31% in 2001 to 36.7% in 10/2006 (IPR), affecting mostly young people and rural areas.

These general living conditions, characterized by widespread poverty and decreasing trends in economic security due to unemployment create a dependence on short-term income generation instead of long-term, sustainable natural resource management.

2.3 Environment situation and trends

Despite the prevalence of HIV/AIDS, Namibia's population of ~2.0 million is expanding at the rate of 2.6% per annum which means at this rate a doubling of the population in 27 years (Central Bureau of Statistics, 2003). In 2000, Namibia's urban population comprised about 35% of the total population. By 2015 it is estimated to rise to almost 50% of a predicted total population of 2.5 million. Despite this rapid rate of urbanisation, mainly in regional centres in the northern regions, the rural population will continue to grow at about 11% over the next decade, placing increasing demands and pressure on the fragile dryland environment. Environmental problems in the regional centres (housing, waste, water and sewerage) are predictable in the fast growing urban areas which have no sufficient financial resources for adequate management of the urban environment.

The impact of the HIV/AIDS pandemic, affecting the economic most active population (15 – 49 years old), will continue to weak social networks and to slow down the improvement of general development (HDI index). Resulting reduced available workforce mainly in dense populated agriculture production areas are a challenge for sustainable - but more work intensive - agricultural production methods which are necessary to reduce and to reverse environment degradation. Food security from national agriculture production beside proteins will further decrease. Land degradation from overgrazing especially in the communal areas will continue to be a major threat to the environment. Increasing stock numbers and very slow change of habitudes (livestock as a social assurance instead of productive capital) risk deteriorating overgrazing and land degradation problems.

CBNRM has already improved wildlife stock. This trend with increasing animal numbers and their valorisation for tourism objectives will continue, leading to more diversified income generation from natural resources but higher risk of conflicts between wildlife management and other land uses as well (damages in agriculture, livestock attacks).

Referring to most of the global Climate Change Models, the climate in most of the country will trend to hotter and drier conditions in the medium term (years 2050 – 2080), reducing the already limited potentialities for rainfed agriculture and livestock keeping. Water scarcity will increase corresponding.

The national development strategy, promoting mining, industry, fisheries and tourism, will transform and diversify the economic and social structure of the country. But higher individual consumption (for the people who have a paid job), increasing need of water and energy and waste/pollution problems are predictable.

2.4 Environmental Indicators

Environment data collection and databases exist in Namibia in the different line ministries since long time before independence. But data collection is not institutionalised and information sharing is based on informal networks and relationships, leading to duplication of data collection efforts due to the cross-cutting nature of the environmental themes. Some environmental indicators are integrated and monitored in overall documents and planning (MDG goal 7, NDPs). But these on general development focusing documents are not appropriated to evaluate environment performance.

GRN has seen the need the importance of national environmental monitoring, the formulation of key indicators, and a national environmental information system (EIS). With the support of Finland (1998 – 2004) the DEA has identified a list of 184 indicators according to 7 themes (Freshwater Resources, Social and Economic Environment, Agriculture and Land Resources, Biodiversity, Parks and Tourism, Mining, industry, Energy and Transport, Waste Management and Pollution Control, Marine, Fisheries and Coastal Resources)(Annex 7.2.9). National State of Environment Reports (SOER) for the 7 themes have been produced 1998 – 2001 and a Meta - database to facilitate communication between data producers and data users of environmental information was established in 2000. A multi stakeholder workshop in 2001 was hold to identify the core environmental indicators to be used in the Environmental Monitoring and Indicators Network (EMIN) and for long term environment monitoring. But the mandated EEIS Unit in the DEA for managing the system is still in process to set the National Core of Environmental Indicators (NCEI) and no recent SOER have been produced since the first series. The proposed EMIN system is not operational up to now. The key challenges for effective environmental information and knowledge management include:

- Inadequate staff complement (staff shortage) and technical skills since the end of the technical support from Finland.
- Inadequate financial resources: to overcome staff and technical skills shortages, money needs to be available to outsource some of the technical tasks
- Inadequate coordination of information within MET and with other ministries, leading to duplication of efforts and inefficient use of resources.
- Insufficient utilisation of - and cooperation with - the EEIS Unit to make environmental information more accessible to decision makers, policy makers and stakeholders

The lack of an operational national cross-sectoral monitoring system makes it difficult to objectively assess national environmental trends and the environmental impacts of activities and programmes.

3. ENVIRONMENTAL POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

3.1 Environmental institutional framework

Namibia's Constitution makes provision for a three tier governance system comprising central, regional and local-levels, but actually most environment issues are still managed at central level. Environment issues are integrated in the Constitution of Namibia and the guiding overall policies.

The National Planning Commission (NPC) in the Office of the President is the central coordinating body for development. NPC is in charge of planning national priorities and directing the course of national development and of preparing and monitoring development plans, projects and programmes in conformity with national development goals and objectives with a view to ensure sustainable economic growth, equity, social harmony and balanced development.

As the Line Ministry with the mandate to safeguard Namibian environmental resources and develop sustainable tourism, the Ministry of Tourism and Environment (MET) is one of the key stakeholders in the Namibian ENR sector.

The MET implements its functions through five directorates: Directorate of Administration and Support Services, Directorate of Environmental Affairs, Directorate of Parks and Wildlife Management, Directorate of Scientific Services and the Directorate of Tourism. It fulfils its national mandate through the following programme areas managed by its 5 directorates: Regulation of environmental protection and sustainable resource management (DEA), Community-based natural resources management and tourism (DoT, DEA, DSS, DPWN), Tourism development (DoT), Protected area management (DPWM), Protection and management of key species and natural resources (DSS), Improving the economic value of natural resources and protected areas (DEA, DSS, DPWM, DoT)

A number of independent Institutions fall under the jurisdiction of the MET: *Namibia Tourism Board*, which regulates and sets standards for the tourism industry, *the Gobabeb Training and Research Centre*, a joint venture between MET, DRFN and Gobabeb Trust focusing on research and training on desert ENR issues for the SADC region, *the Environmental Investment Fund*, which will be responsible for sourcing long-term financial resources to be invested in natural resource management and environmental activities, *The Namibia Wildlife Resorts*, a parastatal managing the government wildlife resorts and the *Game Product Trust Fund*, which manages funds from trophy hunting fees and legal sales of game and ivory and utilises the funds for conservations efforts, conservancies and areas of conservation importance.

Since ENR issues are cross-sectoral, MET has to coordinated and collaborated closely with various line ministries, communities, NGOs, private sector agents and donor's. The most relevant structures are:

The Ministry of Agriculture and Water (MAWF) has jurisdiction over water, agricultural resources and forest resources. The overall goal of the Ministry is to increase and sustain levels of agricultural productivity, real farm incomes and national and household food security within the context of the country's fragile ecosystem. The Ministry comprises three departments, namely, the Department of Agriculture (5 directorates), the Department of Water Affairs (2 directorates) and the Department of Forestry which is responsible for data management, assessment of forestry resources and development of conservation strategies, to provide extension services to community forests (community based forest management), to promote a-forestation, to combat desertification and to prevent and mitigate forest fires. Several parastatal agencies have been established for the main production sectors.

Ministry of Lands and Resettlement (MLR) is charged to oversee land administration. Four directories are responsible for Land Reform, Survey and Mapping, Resettlement and Rehabilitation and Deeds Registry (cadastral authority).

The Ministry of Regional, Local Government, Housing and Rural Development (MRLGHRD) has the mandate to lead and coordinate the establishment of local and regional government structures and these in the areas of housing, community development and physical planning. The Ministry hosts four directories namely the Directorate for Housing, Directorate for Town and Village Administration, Directorate for Regional and Local Government Administration, and the newly established Directorate for Community Development.

The Ministry of Fisheries and Marine Resources (MFMR) has to monitor and to assure the sustainable use of fish resources. The Ministry of Mining and Energy (MME) role is to reduce and to mitigate environmental impacts of the mining sector and to assure the energy supply in the country. The Directorate of Energy is the key structure to reduce pressure on biomass resources. The Ministry of Trade and Industry (MTI) has to assure an environmental sustainable industrial development including the promotion of cleaner production mechanisms. The Ministry of Health plays an important role in the management of medical waste.

Regional and Local Governments are responsible for the overall well-being of their constituents and play a role in planning and promoting the development of their constituencies

The NSAs (NGO, Producer Unions, CBO and the private sector) are important implementation structures of concrete environment related actions in the country.

The current Institutional Framework is highly complex due to the number and size of institutions involved in administering environmental affairs in the different line ministries. There is confusion about responsibilities and a general lack of addressing cross-cutting environmental issues. In addition, the delivery of environmental management services is fragmented across the various NRM sector ministries dealing with environmental issues, resulting in a lack of coordination.

- Coordination

Cross - sectoral coordination in the ENR sector between the different line ministries should be done by the MET/DEA, but it is still poor and only institutionalised at lower levels for the implementation of signed international treaties. In general planning and implementation is done in line function by each ministry with few, informal ad-hoc exchanges with other concerned ministries. Contradicting planning and regulations, low inter - ministerial information flow and reduced efficiency due to duplication of work are results of poor coordination.

Cross sectoral coordination at high political level is planned - but not yet implemented - in form of a Permanent Committee for Land Reform, SWAPs for Water and Transport, but not for sustainable resource management or environment. Only one delegate of the MET is imbedded in another ministry, the MME, to assure the respect of environmental aspects in the mining sector.

MET and most of the other line ministries haven't enough decentralised structures to assure coordinated participatory planning and management at local level and government programmes are mostly implemented in a top – down approach and decision making in the capital. NGOs and donor funded programmes on the other hand use effective participatory approaches at grass root

level which are in general promoted by the line ministries at central level, but Regional and Local Councils are purely involved in the coordination of activities.

- Civil society integration

Civil society integration and strengthening of their capacities for NRM is a declared priority of the GRN. It is important to note that the policy development process at national level includes always NSAs (NGOs, CBOs, Scientific Research Institutions) and they are largely consulted and involved in medium term planning (Vision 2030, NDP 1, 2, 3). CSOs and the private sector currently play a key, underpinning role in the support and implementation of local ENR activities.

Rural communities manage the land and its natural resources, yet land use planning and extension is centrally administered, falling under the jurisdiction of several Ministries. Top-down and sectoral service provision at national level inhibits integrated management at local level. Regional and local authorities have still weak institutional mandates for land and resource management. GRN tries to improve through the CBNRM programme, but changing to a participatory bottom up approach, where the local communities are the principal decision makers is still in an early stage, needs time and the complete implementation of institutional reforms.

In the civil society at grass root level is further still a lack of understanding about the impact of environmental issues on rural livelihoods. Roles and responsibilities in environmental management at the village level are not yet well understood, often resulting in expectancy that the Government &/or Donors should pay for and manage everything. Several programmes with support from international donors are implemented by GRN to improve the situation.

- Capacities (human, finances)

Human capacity is generally constrained starting from Central level, right through to the Regional and Local Governments and local communities. Migration of qualified personnel to the private sector is a huge problem for GRN. Central government ministries are understaffed to assure in the actual institutional framework all their responsibilities (planning, management, implementation, monitoring and control). The responding strategy - outsourcing of activities to consultants, NGOs and Universities - results in a reduced institutional memory and poor information use/management in the ministries. Furthermore is the efficiency of central structures reduced by the temporary absence of key persons who have to assure beside their usual responsibilities the local presence of the ministries in the country and the participation in regional (SADC) and international organisations. Technical capacities are missing in several 'new' disciplines mainly waste and waste – water management, pollution control (MET), Environment – economic modelling and environment monitoring. The MET is still in a weak position for ENR coordination and implementation of control systems due to legislative constraints (the EMA is not yet signed by the parliament, see chapter 3.2). Administration and internal processes are very slow in the centralised structures in line function. Only the MAWF has regional bodies for agriculture and water supply which are authorised for decentralised decision making.

Local government structures (Regional and Local Councils) should be responsible for environment management but they haven't yet the financial and human capacities to assure management and coordination of environment activities and issues at their level. They are purely financed through the national budget and trained people for cross-cutting environmental issues are not in place.

CBOs, mainly for conservancies and community forestry got several technical supports in the last years, but their organisational and management skills are still weak.

Namibia disposes on the other side - partly due to the dualistic system in the pre-independence time – of a small, but very dynamic and professional private sector and CSOs (NGOs, Universities, research stations). About 25 national NGOs, several with international reputation, work in the environment sector and 12 of them are organised in the NACSO network to support CBNRM organisations. Most of the Namibian professional private sector is sensitive for environment items and try to respect high international standards.

3.2 Environmental policy and legislation

The mandate for environmental policy is derived from the Constitution of Namibia (GRN), 1995. Articles 91 and 95 provide the principles of national policy and state the environment principles: maintenance of ecosystems, utilisation of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future...

Based on the foundation laid by the Green Plan (adopted in 1993), an effort was made to incorporate environmental and sustainable issues and options into Namibia's Second National Development Plan (NDP II), for the years 2001-2006. NDP II (following NDP I covered the period from 1995/1996 to 1999/2000) sets the following National Development Objectives: to reduce poverty; to create employment; to stimulate and sustain economic growth; to reduce inequality in income distribution; to reduce regional development inequalities; to promote gender equality and equity; to enhance environmental and ecological sustainability, and to combat the further spread of HIV/AIDS. These are all interlinked objectives that require integrated and multi-sectoral approaches.

In addition, in 2004 the GRN finalised a 30-year planning framework known as Vision 2030. Vision 2030 aims to help guide the country's five-year development plans from NDP III to NDP VII, while providing direction to government ministries, the private sector, non-governmental organisations (NGOs) and local authorities. Vision 2030 includes the following broad strategies such as: i) Maintaining stable, productive and diverse ecosystems managed for long-term sustainability; ii) Implementing a land-and natural resource policy that ensures fair access to all means of production; iii) Maintaining an economy that is sustainable, efficient, flexible and competitive; iv) Achieving collaboration between public, private and civil society organisations in policy formulation, programming and implementation.

Although Namibia does not have a National Strategy for Sustainable Development (NSSD), NDP II and Vision 2030 have attempted to place sustainable development at the heart of national planning.

Various environmental and natural resource-related policies, bills and legislations have been developed in the timeframe since Independence (Annex 7.2.1). These include: Environmental Investment Fund Act, the Environmental Management and Assessment Bill, Pollution Control and Waste Management Bill, Nature Conservation Amendment Act of 1996, Wildlife Management, Utilization and Tourism in Communal Areas Policy, Wild Life Production and Utilisation Policy, Access to Genetic Resources Policy, Access to Genetic Resources Bill, Draft Wetlands Policy, Parks and Wildlife Bill, Forest Act of 2001, Development Forestry Policy for Namibia of 2001, Namibia Tourism Board Act of 2000, Declaration and Regulation of Tourism Regulated Sectors of 2004, Draft Wetlands Policy of 2004, National Water Policy of 2000, Water and Sanitation Policy, Water Resource Management Bill of 2001, National Drought Policy and Petroleum Products and Energy Act of 1990 to mention but a few.

But the current policy framework is sectoral in focus, and lacks the integration needed to facilitate sustainable land management. Issues that need attention include land tenure rights on communal rangelands, management control over natural resources other than wildlife, and rural development and agricultural policy. Due to the sectoral approaches the policy framework is very complex and

documents are rarely known, except in the relevant departments and ministries. There is a need to ensure policy harmonisation across sectors.

- Environmental Legislative Framework

Namibia's Environmental Assessment Policy for Sustainable Development and Environmental conservation was approved in 1995. A sixth and 'final draft of the Environmental Management Bill had been negotiated with the key stakeholders but the Bill had still not been submitted to Parliament. The main difficulty faced in drafting the legislation was accommodating diverse sectoral interest, especially in the fields of land-use planning, water management, pollution control and waste management. Currently at least five ministries have some statutory responsibility for pollution control. In addition, local authorities (cities, municipalities) have their own by-laws and yet another institutional layer for management. Each institutions issues permits, carry out inspection, issues fines and sets standards, but since there are not obliged to coordinate or liaise with each over, enforcement is fragmented and often inadequate. At the present, there is no co-ordinated and integrated management and there is a lack of Sustainable Development Commissions and Environmental Commissioner.

The implementation of effective harmonised environment management is seriously hampered by the missing approval of the EMA, which gives MET/DEA the mandate to assure coordination of environment issues and to control the respect of Environmental Impact Assessments (EIAs), which are usually done, but on a voluntary base.

Furthermore some strategies and action plans within different departments that address common resources (land, water), are not harmonised, creating confusion and conflicts of interest across departments (ex: mining prospecting – PA) responsible for implementation.

- International treaties

Namibia is signatory to many International and Regional Treaties and Conventions concerning Environment and Natural Resources including biodiversity, climate change, desertification, migratory birds, plant protection, CITES and wetlands conservation (Annex 7.2.1). GRN has implemented important programmes referring to the signed conventions (NAPCOD, National Biodiversity Programme, NBSAP...). Regional agreements are signed with neighbouring countries (Angola, Zambia, Botswana, and South Africa) on shared watercourses, wildlife management and law enforcement, energy, mining, and forestry and fisheries.

3.3 Integration of environmental concerns into the main economic sectors

Currently, the main identified causes in natural resources and the environmental degradation are poverty and the lack of awareness of the synergies between the natural environment and land productivity at local level. The key environmental pressures identified in Chapter 2 are: land pressure and population growth, poverty, degradation of vegetation (desertification, bush encroachment) and soils (erosion, lost of fertility), climate change, decline of water (availability and quality), habitat's destruction and pollution. The primary sector is most affected by environmental degradation, but nearly all sectors are affected by or could influence environmental issues as shown in the matrix below.

Table 5: Sector Influence on Environmental Issues

Environmental Pressures	Population Growth	Widespread Poverty	Land pressure*	Vegetation degradation,	Soil degradation	Wetlands Degradation	Climate Variability	Threat to Fisheries	Waste Water, Management	Solid Waste Management	Air Pollution	Threats to Biodiversity
SECTOR												
Food security												
Roads and Works												
Agriculture												
Forestry												
Fisheries												
Livestock raising												
Mining												
Energy												
Industry												
Tourism												
Trade												
Education												
Health (inclusive AIDS)												
Water & Sanitation												
Justice Law & Order												
Decentralisation												
Public administration												

* including lands sector

GRN recognises these linkages and current policies guiding environmental affairs and broadly defined by: Rural Development and Poverty Reduction Programme (RDPRP, 1998), Namibian Vision 2030 (2004), Namibia 2004 Millennium Development Goals.

Regarding decentralisation, the MET is currently formulating a decentralization plan to be submitted to the MRLGHRD. There is a possibility of devolving specific wildlife management functions in communal and commercial areas to regional and local authorities; however, PA management will remain under the control of the MET. At present, Community-based Natural Resource Management (CBNRM) allows devolution of tenure, rights and authority over open-access common property resources to communities at local-level. This important policy recognises the threat of "the tragedy of the commons" to environmental integrity, and makes provision for group management and group accountability for stewardship of natural resources. In the case of wildlife, forestry and commercial tourism, the rights are exclusive to the respective community members, but this is not yet the case for rangelands and other natural resources. This policy has been widely implemented in Namibia under the Conservancy and Community Forest schemes, with good encouraging results.

The potential of trans-boundary environmental impact is significant in Namibia, especially in the context of water pollution along shared rivers, wildlife management and tourism. Trans-boundary

agreements exist in the areas of shared water and marine ecosystem management, but much more needs to be done in terms of shared terrestrial ecosystems and mobile species.

Under the NDP the economic growth strategy in the next planning phase will focus on agriculture, water, tourism, mining, fisheries, urban areas and industries as priority growth and development sectors. The inclusion of environmental issues is briefly discussed below:

* Water: Given population growth, rapid urbanisation and economic growth, groundwater is vulnerable to over-extraction as it is difficult to set rates of abstraction for the different uses that are sustainable. Actually, it is important to continue the Basin Management approach, to improve the Community Based Natural Resource Management and to combine rural water supply with sustainable rangeland management.

* Agriculture and land use: Irrigation projects in an arid country raise a number of questions such as use of precious water resources on low-value crops. EIA in the agricultural sector should be improved.

* Fisheries: Declining fresh fish populations occur, mainly, in the Okavango River, largely due to an increase in subsistence fishing practices. The monitoring must be improved. At the opposite the marine fisheries seem well managed.

* Forestry: Referring to the forested area per capita, the involvement of rural communities in forest management and the development of community forests should be improved.

* Mining: A century of mining with little or no planning to reduce environmental damage has impacted heavily on large areas. There are approximately 40 abandoned, un-rehabilitated mines in Namibia, of which 16 are in nature reserves. At least one abandoned mines (Oamites) has resulted in health problem for nearby residents. At the present, Small-scale miners are expected to adhere to an environmental contract but, actually the environmental rehabilitation is not systematic.

* Tourism: Only few EIA have been conducted for tourism projects – despite tourism being regarded as Namibia's fastest-growing industry. Tourism projects are often located in sensitive environments, including areas of high species endemism, nature reserves and along river banks. Moreover, where EIAs have been undertaken, the recommendations risk being not implemented, such as in Etosha National Park, Sossusvlei area of the Namib Naukluft Park (TARR, 2003). EIA must be done and respected. On the other side seems the private sector tourism industry to be sensitive for environmental issues and efforts are made to avoid negative environmental impacts.

* Urban areas and industries: Water pollution levels are still comparatively low, but a growing population and an expanding development have begun to cause a decline in water quality. Since 2005, MET has initiated a Cleaner Production (CP) component. The overall objective of the CP Component is to achieve a significant reduction in negative environmental impacts of Namibian economic development activities, and thereby contribute to the achievement of Namibia's Vision 2030. This is expected to lead to improved external environmental sustainability and improved productivity, industrial/service competitiveness through the introduction of continuous technology adaptation and improved occupational health and safety within the industry/service sectors. The CP Component will engage with regulators industries and their associations as well as with service providers such as the tertiary institutions, local consultants and supply companies. Finally, *Pollution Control and Waste Management Bill* (second draft in July 1999) is ongoing. Moreover, the MTI is engaged since 1996 with trainings for the private and public sector to outface ozone depleting substances in Namibia and since 2004 financial incentives of 60% of the conversion costs are offered to convert refrigeration and air –conditioning. But these efforts are not accompanied by financial or fiscal incentives for the private sector.

4. EU AND OTHER DONOR CO-OPERATION WITH THE COUNTRY FROM AN ENVIRONMENTAL PERSPECTIVE

Namibia's development partners have provided incredible financial and technical support (over N\$900 million since independence, excluding support to NGOs) to the ENR sector. Over twenty development partners provided or provide assistance to the sector and about 300 ENR initiatives - not taking into account all initiatives in others sectors such a mining, fishing and agriculture – have been implemented since 1990. The major donors working in environment, or closely linked sectors, in recent years are: EU, Germany, Spain, France, Luxemburg, UK, Netherlands, Finland, Sweden Norway, Iceland, USAID and UN agencies specially UNDP/GEF, IFAD, FAO. The WB supports GEF programmes, 'Integrated Community based ecosystem management project' (ICEMA) and 'Namibia coast conservation and management project' (NACOMA) implemented by GRN Ministries, UNDP and other donors, but the projects are managed from the regional office in South Africa without a WB office in Namibia. There are international and national NGOs and networks (WWF, NACSO, NNF, DRFN) operating in the country, mainly financed through donor funds. Most of the assistance is still implemented through specific sector programs. SWAPs exist only for 'Education' and further are planned for water supply and transport. SWAPs for the environment-related sectors, (mainly agriculture), are not developed but actual trends are towards more integrated cross – sectoral 'sustainable livelihood approaches' that correspond to the GRN's priorities formulated in Vision 2030, NDPs and the PRS.

4.1 EU co-operation from an environmental perspective

Environment is not a focal area in EC-Namibia cooperation but it is addressed as one of the cross-cutting issues (with gender and HIV/AIDS) required for sustainable development and is imbedded in the focal sector 'Rural Development'. Focal areas under EDF7 were Agriculture, Health and Education; and under EDF8 Education; Agriculture and Rural Development; Productive Sectors (tourism + trade and investment). In addition assistance was provided under Sysmin.

Under the actual EDF9, focal areas are Rural Development, Education and Capacity Building. With a contribution of Euro 53 mil in the EDF9 the EU is the main donor in the area of rural development. The programme is since 2005 implemented through the Rural Development and Poverty Reduction Programme which includes the 5 components: Institutional Support, rural access roads, rural water supply, capacity building for Land Reform and Decentralized Demand Driven Actions. Several, mainly agriculture and rural infrastructure programmes, from 7 and 8 EDF continue and NGO relevant activities in the ENR sector are supported through the Multi –annual Micro-Project Programme.

The main relevant programmes are:

- Support to Rural Development and Land Reform initiatives
- Rural Towns Sewerage Scheme (RTSS), Lüderitz
- Capacity building for development planning
- Tourism Development Programmes
- Livestock Marketing Project
- Fisheries Training Institute
- Micro-Projects Programme (MPP)
- National Agricultural Services Support Programme (NSSAP)
- Rural Poverty Reduction Programme (RPRP)
- Support Programmes to the Mining Sector (SYSMIN) (through EIB).

Additional ENR relevant opportunities of EDF financing mechanisms, such as the EC Water and Energy Facilities, are not yet used in Namibia. Other EU support administered by the EIB went largely to

infrastructure and private sector loans and has impact on environment issues (sewerage schemes, Mining sector).

Programme components funded under EDF follow national policy and practice for SEAs and EIAs which are in line with international standards, but absence of legislation - the EMA is not yet adopted - reduces effective implementation. Environmental Audits have not yet been conducted in Namibia.

Germany is since independence the most important European bilateral donor and Natural Resources Management is since 1990 a priority area. Current development assistance (technical and financial) is the continuation of former successful programmes in the ENR sector and includes: Support to Land Reform, Land Policy and Land Use and related Infrastructure Investments; Sustainable Management of Natural Resources; Management of Namibian Water Resources; Groundwater Exploration, Investigations on Selected Mineral Indications and support of the Geological Survey of Namibia; Capacity building for Biodiversity, Conservation and Sustainable Natural Resource Management; Community Forestry and the Bwabwata, Mudumu, Mamili National Parks (BMMNP)

Regional programs supported in Namibia concern Benguela environment fisheries interaction, Desert research and training and Global Climate Change.

Spain is supporting the Land Reform process through various resettlement projects and the fishery sector. Support might increase in the next years.

France supports through the FFEM the GEF programme ICEMA. 10 conservancies are concerned by this wildlife management project. In 2005 France has phased out rural development, but is still co – financing an epidemio-surveillance network in the Directorate of Veterinary and supporting smaller activities (ex: publications, farmer unions).

Luxemburg supports together with the EC through direct budget supports the 'rural water supply'.

There was strong Scandinavian (Finland supported the elaboration of the SOERs) as well as UK involvement in the ENR sector, mainly forestry, in the first decade after independence, but their supports is gradually phased out in line with different priority setting.

4.2 Co-operation funded by other agencies from an environmental perspective

Under the United Nations Development Assistance Framework (UNDAF) 2006 - 2010 the United Nations system's strategic response to the development challenge of the Triple Threat focus among others on improved livelihoods and food security. Issues of agricultural productivity, sustainable land and water management and land reform are addressed particularly by UNDP. A large number of programs related to international treaties are financed by GEF and implemented through UNDP.

USAID is promoting Conservancies and other Community Based Natural Resource Management (CBNRM) practices through the 'Living in a Finite Environment' (LIFE) programme. Further support concerns debushing, Land reform (resettlement) and contribution to UNDP for the Strengthening of Protected Area Network (SPAN).

In terms of the emergence of new actors with a growing influence on the development agenda of Namibia, the U.S. Government's Millennium Challenge Account (MCA) initiative and the President's Emergency Plan for AIDS Relief are significantly boosting the aid levels that can be expected to flow

into Namibia. Although the MCA process is still in its preparatory phase and funding levels are thus unknown, Namibia could receive up to US\$ 300 million for its MCA project.

A non-exhaustive list of the most important projects is provided in Annex 7.2. 11.

Coordination of donor's activities is generally done through the NPC but limited to assure the coherence with national priorities and development goals. ENR initiatives have been broad; it is not very clear what the ENR priorities are exactly. Moreover, cross-sectoral links do not come out strongly due to the implementation through sector based line ministries. Donor coordination is actually rare, informal and not institutionalised. Interventions from not bilateral or multi-lateral donors don't pass even through the NPC. A first donor cross – sectoral meeting on ENR issues took place in 8/2005 but the impact of ENR initiatives could be greatly enhanced through strengthened cross-sectoral cooperation through Donor Committees on cross – cutting issues.

Environmental aspects are generally included in the project preparation phase for new projects, and regular monitoring (mid-term reviews, reporting ...) is specific to the project/program objectives. This monitoring approach is so focussed on the specific targets, however, that secondary and long term environmental effects may not be recognised.

The support of EU and other donors in the ENR sector has in several sectors significant positives results in Namibia. Various mitigation measures have been taken to deal with sustainability of ENR initiatives. These have included institutional capacity building, the integration of the activities of the project into the normal activities of the implementing agency, provision in the future budgetary allocation of the implementing agency, establishment of trust funds for various ENR sub-sectors and legislation. Although some of these mitigation measures take time to take off, great progress has been made to this regard, but it is difficult to evaluate the general environment impact of cooperation due to the fact that impacts on the environment and natural resources take much longer than project life or the young development cooperation with Namibia; it takes decades to reverse damages or to cause irreversible damage to the environment. Several donor supports risk to have - in the actual form - negative long term environmental impacts, especially support to mining and industries, resettlement programs, water supply and irrigation.

Long term environmental impact monitoring should be done through the concerned local structures, but adapted long term monitoring systems are not in place and the capacities of local structures are often too weak or completely lacking. Environmental impacts of (EU) co-operation projects (other than those foreseen in the intervention) are rarely recorded and difficult to evaluate. The EC used since 2002 in the Poverty reduction Support Programme a list of 173 indicators referring to the 6 objectives of the programme. Some of these indicators (ex: forest cover, % of desertificated areas) can be used for global impact monitoring, but the system seems to be too complicated and objective orientated for general application.

Only the GTZ Namibia has implemented knowledge management reports to mitigate institutional memory losses at the end of project.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The main conclusions of the precedent analyses can be summarised as follow:

Conclusion 1:

Development potentialities in the sensitive natural environment are restricted by the scarcity of water and arable land. The fragile ecosystems are under threat due to overexploitation of water resources, land pressure and population growth, poverty, inadequate rangeland and agricultural practices, deforestation, and increasing economic activities in mining, fisheries and tourism. The main results of these pressures are degradation of vegetation (desertification, bush encroachment) and soils (erosion, lost of fertility), decline of water (availability and quality), habitat's destruction and pollution. The importance of key environmental pressures and their linkages to the society and the economy are well-understood and described, some natural resources are already well managed (ex: wildlife), but adapted management systems are only partly implemented at the local level.

Conclusion 2:

The country is one of the most advanced concerning policies and strategies for natural resources management and sustainable development in the world. Environmental issues are a priority in the constitution, long and medium term global development planning and sector strategies. But implementation is limited because important legislation especially in the environment and water sector are written but not yet approved by the parliament. Legislations of different sectors are often not harmonised and contradictory.

Conclusion 3:

Decentralisation, transfer of competences and CBNRM systems are potential mechanisms to enhance more sustainable use of natural resources, but government structures are still centralised and in line function, using top – down approaches. Implementation of CBNRM at local level depends still on external support but had already significant positive impact on sustainable NRM utilisation and conservation.

Conclusion 4:

The important function of environment monitoring and information sharing/circulation seems to be neglected at national level. The absence of coordinated regular and viable data collection and sharing, both through and across relevant departments, and the lack of an operational National Environmental Information System (EIS) prevent the objective evaluation of environmental impact of government and donor funded Programs at national level.

Conclusion 5:

The whole country is still characterised by the dual system of the pre – independence time resulting in extreme different capacities and in the society for individual application of environmental sustainable management methods and technologies, ranking from world leading standards (ex: private wildlife tourism sector on commercial land) to poorest LDC level (dense populated, poor areas in the communal land).

5.2 Recommendations

The recommendations are addressed to all stakeholders and decision makers for sustainable development. The recommendations which concern the future EC cooperation (planning of the 10th EDF programme) have been integrated mainly in the sector 'rural development', indicated by a "code" (EC).

Rural development and Land Reform

- Give in the water supply component priority to technologies for water conservation, harvesting and recycling especially in rural areas to avoid additional environmental risk from new boreholes boreholes –such as artificial watersheds by applying different water retaining materials, by creating them directly on a natural surface applying physical methods of soil treatment; or with the help of engineering methods that allow increased water yields from natural watersheds; or roof of houses and shelters having different roofing or watertight coatings- (Conclusion 1, 5) (EC).
- Concentrate support to the livestock sector on rangeland management and marketing strategies (Conclusion 1, 5) (EC).
- Promote alternative high value adding income generation activities (IGA) like tourism, game ranching, NTFP, agro processing, environment friendly SME, in rural areas and facilitate access to small credits outside the agriculture sector. (Conclusion 1, 5) (EC).
- Promote mechanical debushing and valorisation of this biomass for energy supply (ex: wood pellets) in remote rural areas (Conclusion 1) (EC).
- Include training for new farmers and investments/credits for farm infrastructure in the resettlement programme (Conclusion 1, 5) (EC).
- Promote in the northern agriculture and rangeland regions agro – forestry with adapted multi - purpose trees to increase household income, to establish fodder reserves and to protect the soils (Conclusion 1, 5) (EC).
- Integrate an urban environment component (water and sewerage, waste, housing) for the fast growing regional towns in the infrastructure programme. (Conclusion 1) (EC).
- Include support to energy supply and modern communication (telephone, internet) in the rural infrastructure component to facilitate access to and exchange of environmental information. (Conclusion 1, 5).

EU specific recommendations outside the focal sectors

- Facilitate access to EC finance mechanisms outside the programmed EDF, especially ACP facilities for water and energy.
- Simplify the internal monitoring for the 'Rural Poverty Reduction Support Programme' in the JAR and harmonise the indicators with these used in national systems (NDP 3 and EMIN).

Decentralisation

- Promote the transfer of competence for natural resource management and public administration (human, legal mandate, technical and financial capacities) to decentralised structures (Regional and Local Councils, CBO) (Conclusion 3, 5).
- Promote local land use planning and holistic bottom – up approaches concerning NRM and support by training, technical assistance and organisational development decentralised NRM structures (Regional and Local Councils, Land Boards, CBOs on conservancies and community forestry) (Conclusion 1, 3, 5) (EC).

Institutional and legislation framework (GRN)

- Finalise and implement important environment legislation (EMA, wetlands, parks and wildlife) and harmonise contradictory legislations (Conclusion 2).

- Assure that EIA and SEA are conducted and that the recommendations are implemented.
- Improve effectiveness and cross-sectoral coordination and exchange between the different ministries, donors and NSA by creating an institutionalised regular platform of stakeholders (men and women) in the environment sector. The tasks of this platform should be: definition of priorities, collective planning, reviews of sector activities and sharing of experiences. (Conclusion 2).
- Reduce the multiple responsibilities of the MET/DEA by leaving GRN to focus on the core functions: policy, coordinating, regulations and control and promote PPP (Public – Private – Partnership) and NSA to implement government's policies and programmes. (Conclusion 2, 3).

Monitoring/information/communication

- Implement an operational National Environment Monitoring Desk to collect and interpret on a regular base data for defined and standardised key indicators of nationwide state of environment which are able to translate the performance of sustainable development across all sectors. Remark: Most of adapted indicators have already been developed through EMIN. (Conclusion 4).
- Valorise/support indigenous knowledge and successful initiatives for better environment management and improved productivity. (Conclusion 1, 5).
- Develop and implement Environment – Economic modelling for the most important renewable natural resources in the framework of Vision 2030 (water, fish, wildlife, land). (Conclusion 1, 4).
- Improve ground water monitoring especially in regions with high extraction or sensitive environment (Industrial and mining areas). (Conclusion 1, 4).
- Conduct a new energy balance study at national level. (Conclusion 4).
- Continue to promote environmental awareness and understanding by sharing, circulation and transparency of environmental information and adapted explanatory material for the public. (Conclusion 1, 3).

Urban development, industries, mining

- Develop strategies and guidelines for the 'grey' environment (pollution, waste, waste water) for urban and mining areas (Conclusion 1).
- Support waste (solid and liquid) reducing and recycling by appropriate waste management systems and promote the use of cleaner production technologies by adopting fiscal and other financial regulations (Conclusion 1)
- Implement the 'pollutant pays' principal, starting with the most polluting mining, industries and private sectors (Conclusion 1).
- Implement an 'environment account' in the mining sector for rehabilitation of mining sites (Conclusion 1).

Biodiversity

Install marine Protected Areas for breeding grounds to assure stock rehabilitation of the commercial fish species (Conclusion 1).

Constraints to preparing the profile

There have been two predominant constraints to preparing this profile: 1) Lack of viable recent environmental data/studies and an operational central national monitoring system. Considerable time was used to obtain some information of the actual situation and trends, scattered in different ministries, departments and donor structures. Mission time could have been better deployed on evaluation and appreciation of the information instead of having to seek it out. 2) Difficulties to get in contact with key persons in the ministries due to multiple occupations, conferences and official trips.

6. COUNTRY STRATEGY PAPER ENVIRONMENTAL ANNEX SUMMARY

A. State of the environment

About 67% of Namibia's estimated population of ~ 2.0 million lives in rural areas and the total population is expected to double over 27 years. The average population density is with 2.4 inhabitants/km² one of the lowest in the world but distribution is very inequitable; the central and southern parts of the extreme arid country have population densities of < 5 people/km², often < 1 people/km², and the north central and north eastern regions have population densities exceeding 25 people/km², in some areas 150 people/km². With a Gini Coefficient of 0.67 (slight improvement from 0.7 in 1993/4), Namibia has the most unequal distribution of income in the world. About 0.3% of the population own 44% of the land in the commercial area and 5% of the population earn almost 70% of the income. High levels of poverty exist especially in the rural communal areas (41% of the land), where ~ 1 million people live mainly from subsistence agriculture and livestock keeping.

The over-riding environmental issues in the sensitive dry environment of Namibia are high vulnerability to climate change, water scarcity and vegetation/land degradation resulting from land pressure, especially in the densely populated northern regions. The key issues are vegetation degradation (desertification and bush encroachment, deforestation), soil erosion and decreasing soil fertility. Extreme climatic variations with periodic drought periods affect not only the livestock and agricultural production, but nearly all sectors of the economy. Namibia is, referring to different climate modelling, one of the most severe affected countries by global climate change, which is locally accelerated by unsustainable land use practices and resulting anthropogenic climate change (aridifying). Major problems currently are:

Inappropriate land management practices, especially on rangeland and agriculture land. Livestock farming is the principal activity in rural areas and overgrazing leads to vegetation destruction or bush encroachment and accelerates soil erosion. Soil fertility is decreasing due to inadequate agriculture techniques and salinisation problems in several irrigation schemes. Bush encroachment impacts 26 million hectares of woodland savannas, including 11 million ha in the communal area, and lead to loss of carrying capacity and reduction of the available and exploitable ground water.

The scarcity of fresh water is the major threat to development. Water supply is actually only assured due to high investments in water supply systems. Decreasing groundwater levels in some areas, hydrological changes in river systems and huge water lost in the supply system (dams, canals) due to evaporation are unavoidable side effects of improved water supply. Improved water supply through boreholes especially in the northern regions, has led to increasing numbers of livestock and in several areas to additional pressure on the vegetation due to overgrazing.

The few forest resources (< 10% of the country) are under pressure due to exploitation for construction material and energy supply especially in remote rural areas. Only 15 – 20% of the rural areas are electrified and wood is the dominant energy source for poor rural households. The remaining energy demand is assured mainly by electricity and petrol product imports from the neighbouring countries, especially South Africa. Attention on NTFP as sources of alternative or complementary sources of income is increasing with the risk of over exploitation of these resources as a consequence.

Namibia has remarkable biological diversity and a high level of endemism (higher plants 687, avian species 13, reptiles ~70, insects ~ 8,500). Furthermore, 217 species of mammals are found, 26 of which are endemic including Mountain Zebra, rodents and small carnivores, as well as unique desert-dwelling rhino and elephants. The country hosts the world's largest population of cheetah.

There are 20 national PAs (13.8% of the country, including the Sperrgebiet 16.8%), 31 registered communal conservancies, an additional 30 sites in the process of registration and ~140 registered private reserves in the commercial area. Wildlife is found for 75% outside state protected areas. Due to the economic value, valorisation for the rapidly growing tourism and increasing wildlife management outside of PA, the numbers of most of the large mammal species are raising. Trophy hunting has been of great benefit to wildlife conservation. Since the late 1970's wildlife have been protected by game farmers on privately-owned land and the game population has increased by > 60% since the start of commercial trophy hunting in the communal conservancies. Poaching seems very rare among local communities since the transfer of competences for game management to the registered conservancies, but habitat modification, unsustainable wild harvesting of natural resources, inadequate land use practices, population pressure, mining and visitor impacts (tourists) in fragile ecosystems are still threats to the biodiversity outside the managed areas.

The fisheries sector is very important, with marine commercial fisheries of 550,000 - 630,000 tons/year, accounting for 5.9% to the GDP. Fisheries are the second contributor to Namibia's export. After serious over-fishing in pre - independence time, the commercial stocks have been partly rehabilitated by adapted management measures, but some commercial species are still under threat. Inland fisheries for subsistence and local commerce are important in the northern regions Kavango and Caprivi along the perennial rivers. Fresh water stocks show decreasing catches since the mid 1970's due to over-fishing, sometimes not adapted fishing techniques and human activities like farming, deforestation, road construction and harvesting of vegetation for building materials. Aquaculture and fish farming are not yet well developed and today with few exceptions limited to culture of oysters, mussels and seaweed in coastal harbour towns.

The country has a well-developed mining industry based on world-class deposits of diamonds and uranium as well as a number of vibrant smaller mines producing copper, gold, zinc and lead. Mining is still the largest foreign exchange earner (> 50% of exports) and contributes ~ 10% to the GDP. New prospecting licences are attributed to international companies for petrol and diamonds even in some protected areas. The mining industry has been forced in the last years to employ recycling or use alternative inputs to freshwater, but the sector uses still > 12% (17.3 million m³) of the total exploited water. Mining is a local, but significant threat to the environment. The open sky mines create noise, dust, air pollution from furnaces, and effluent by-products. Until today rehabilitation of the sites at the end of the operation is inadequate and groundwater pollution has been observed in several metal mining areas. EIAs are today systematically conducted to mitigate the negative ERN impacts.

The environmental impact of industries is still low due to the few existing factories, but the only new large industry, the textile company RAMATEX, has already polluted the groundwater. The promotion of industrial development by GRN includes a risk of increasing industrial pollution in the future if mitigation measures are not implemented in time.

The bigger towns are already equipped with sewerage plants, adapted landfill sites and some with water recycling systems. Urban areas have high immigration rates about 4%, pushing urban growth rates to ~ 6%. After a first migration phase following independence to Windhoek, population densities rise now sharply in the smaller regional urban settlements, especially in the northern – central regions. Major environmental problems especially in these less equipped smaller urban settlements are housing, sanitation, water supply, waste and waste water management. These pressures will deteriorate with the estimated increase of urban population from 35% today to 50% in 2015.

B. Environmental policy, legislative and institutional framework

Namibia's Constitution makes provision for a three tier governance system comprising central, regional and local-levels, but actually most environment issues are still managed at central level by the different sector ministries in line function. Cross - sectoral coordination in the environment sector should be assured by the MET/DEA, but coordination is still poor. The implementation of effective harmonised environment management is seriously hampered by the missing approval of the Environment Management Assessment Bill, which gives MET/DEA the mandate for cross - ministries coordination of environmental issues and to control the respect of Environmental Impact Assessments (EIAs), which are usually done, but on a voluntary base.

Human capacity is a general challenge in GRN. Ministries, especially the MET/DEA, are understaffed to assure in the actual institutional framework all their responsibilities (planning, management, implementation, monitoring and control). Technical capacities are missing in several 'new' disciplines related to environment (pollution control, waste and waste – water management).

Environment issues are well integrated in the Constitution of Namibia, the guiding overall development policies (Vision 2030, NDP2, and draft NDP 3) and the Poverty Reduction Strategy (PRS). Since independence a host number of sector policies, that have direct or indirect relevance to sustainable resources management, have been developed and implemented. Due to the sectoral focus, the policy framework is very complex and documents are rarely known, except in the relevant departments and ministries. There is a need to ensure policy and legislation harmonisation across sectors. Some strategies and action plans within different departments that address common resources (land, water), are not harmonised, creating confusion and conflicts of interest across departments (ex: mining prospecting – PA) responsible for implementation.

Civil society integration and strengthening of their capacities for NRM is a declared priority of the GRN. But land use planning and extension is still centrally administered and Regional and Local authorities have weak institutional mandates for land and resource management. GRN tries to improve through the CBNRM programme, but changing from sectoral top down to holistic participatory bottom up approaches is still in an early stage and the capacities of decentralised structures are currently weak. The professional CSOs and the strong private sector currently play a key, underpinning role in the support and implementation of local ENR activities.

Namibia is signatory of many International and Regional Treaties and Conventions concerning Environment and Natural Resources and has implemented important programmes referring to the signed conventions (NAPCOD, National Biodiversity Programme, NBSAP). Regional agreements are signed with neighbouring countries (Angola, Zambia, Botswana, and South Africa) on shared watercourses, wildlife management and law enforcement, energy, mining, forestry and fisheries.

C. EU and other donor co-operation with the Country from an environmental perspective

The major donors working in environment, or closely linked sectors, in recent years are: EC, Germany, Spain, Finland, Sweden Norway, UK, France, Luxemburg, Netherlands, Iceland, USAID and UN agencies specially UNDP/GEF, IFAD, FAO. Environment is not a focal area in EC-Namibia cooperation but it is addressed as one of the cross-cutting issues required for sustainable development and is imbedded in the focal sector 'Rural Development', where the EC is the main donor with € 53 mil in the EDF 9. Germany is actually the leading bilateral European partner in natural resource management. Issues of agricultural productivity, sustainable land and water management and land reform are addressed by UNDP. A large number of programs related to international treaties are financed by GEF and

implemented through UNDP. USAID is promoting conservancies and other community based natural resource management (CBNRM), debushing and Land reform. In the future, Namibia could receive up to US\$ 300 million for its MCA (US Millennium Challenge Account) project.

There are international and national NGOs and networks (WWF, NACSO, NNF, DRFN) operating in the country, mainly financed through donor funds. Most of the assistance is still implemented through specific sector programs. SWAPs exist only for 'Education' and further are planned for water supply and transport. SWAPs for the environment-related sectors (mainly agriculture) are not developed but actual trends are towards more integrated cross – sectoral 'sustainable livelihood approaches' that correspond to the GRN's priorities formulated in Vision 2030, NDPs and the PRS.

Coordination of donor's activities is generally done through the NPC but limited to assure the coherence with national priorities and development goals. Cross-sectoral links do not come out strongly due to the implementation through sector based line ministries. Donor coordination is actually rare, informal and not institutionalised. Interventions from not bilateral or multi-lateral donors don't pass even through the NPC.

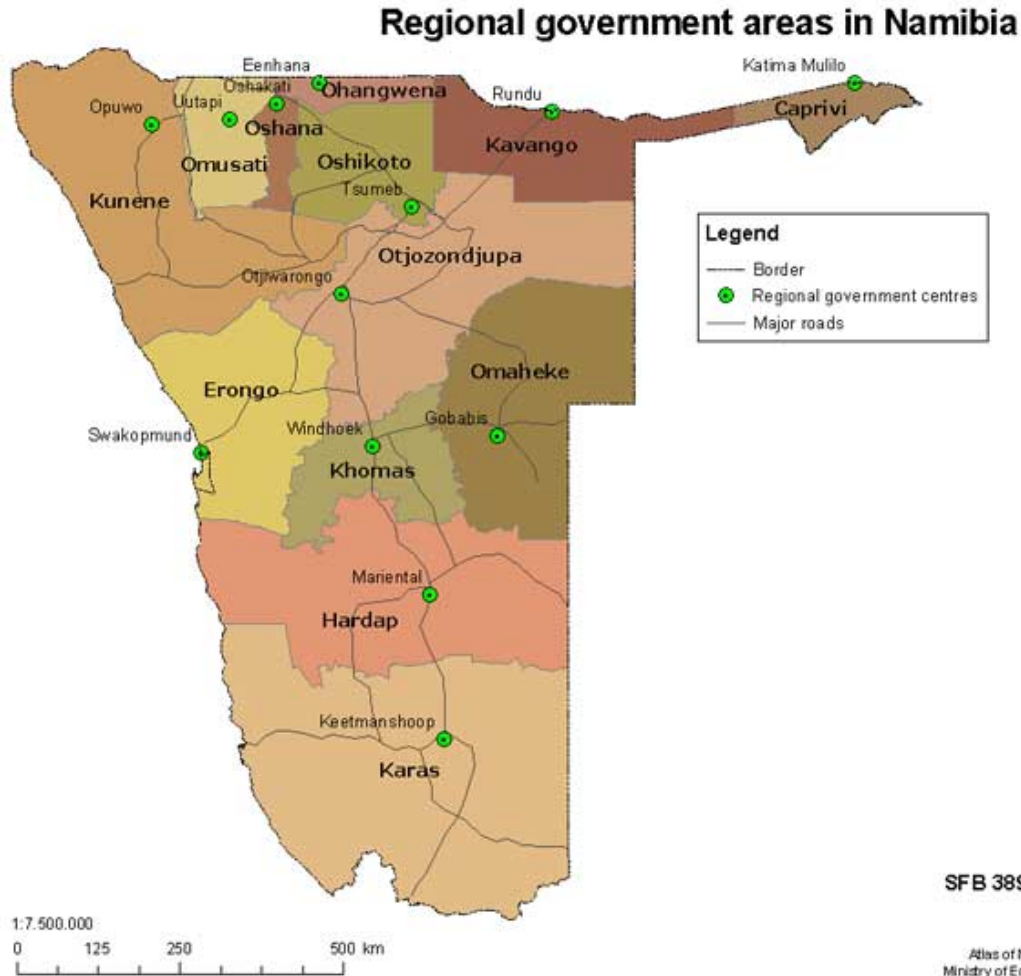
Environmental aspects are generally included in the project preparation phase for new projects and follow usually national policy and practice for SEAs and EIAs which are in line with international standards. But absence of legislation - the EMA is not yet adopted - reduces effective implementation. Regular monitoring is specific to the project/program objectives. This monitoring approach is so focussed on the specific targets, that secondary and long term environmental effects may not be recognised. Environmental Audits for the EC cooperation have not yet been conducted in Namibia.

The donor's support in the ENR sector has in several sectors already significant positives results. Various successful mitigation measures have been taken to deal with sustainability of ENR initiatives. But it is difficult to evaluate the environmental impact of cooperation due to the fact that impacts on the environment take much longer than project life or the young development cooperation with Namibia and long term impact monitoring mechanism are not operational. Several donor supports risk to have - in the actual form - negative long term environmental impacts, especially support to mining and industries, resettlement programs, water supply and irrigation.

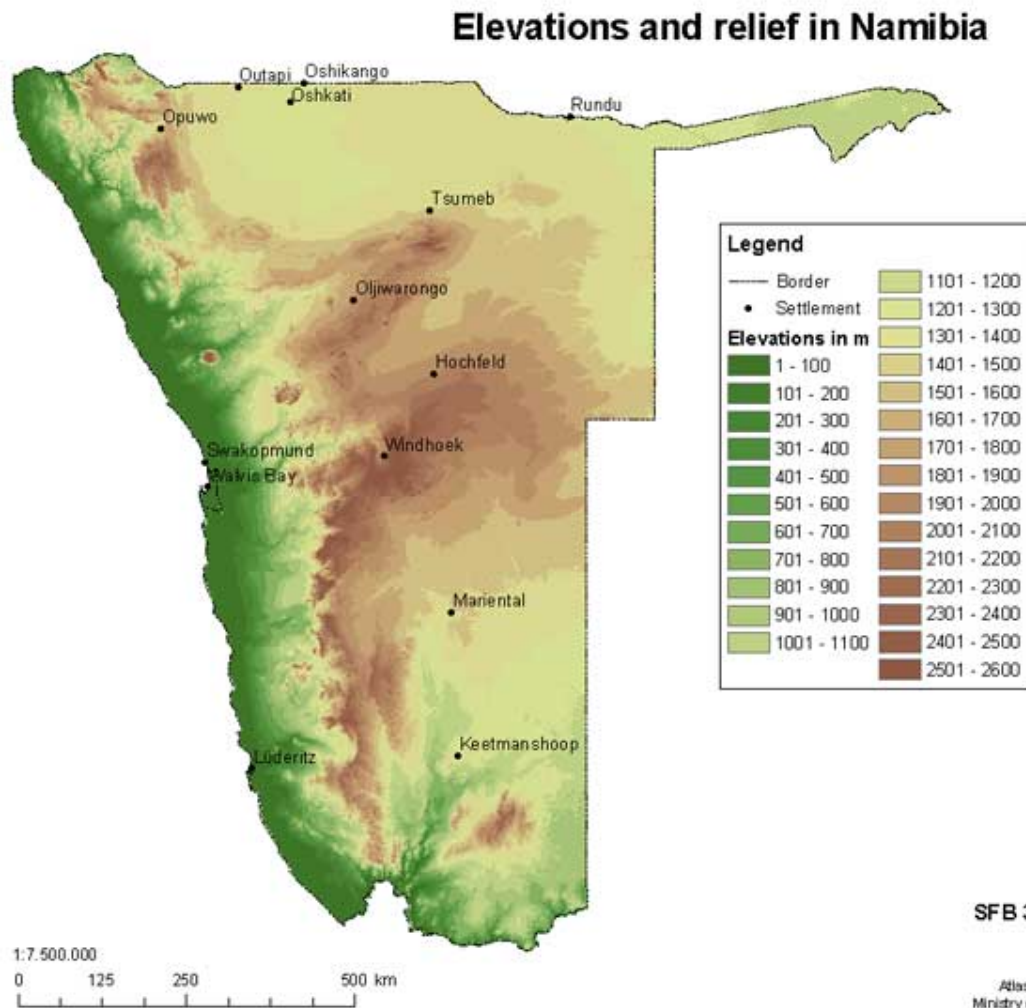
7. TECHNICAL APPENDICES

7.1 Environmental maps of the Country

Map 1 Regional government areas in Namibia



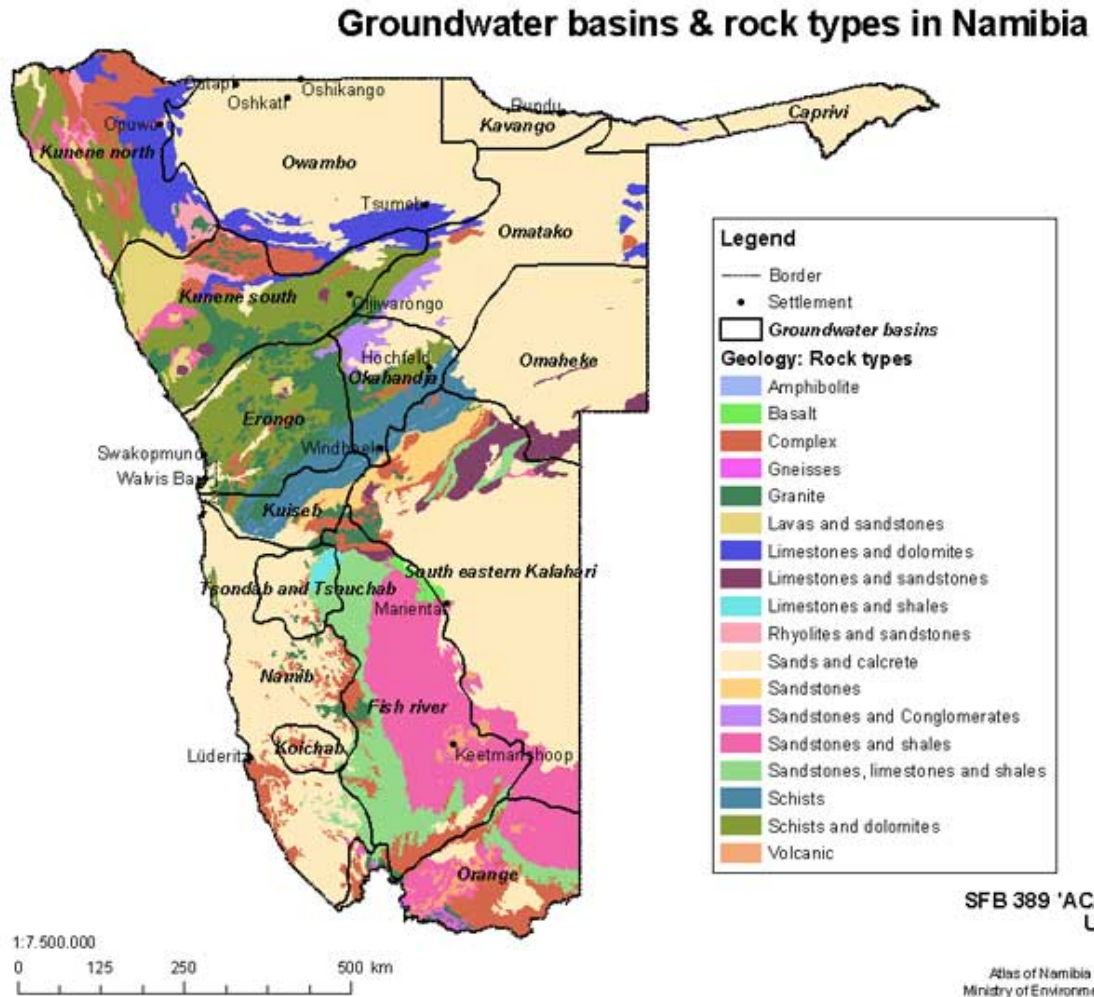
Map 2 Elevation and relief in Namibia



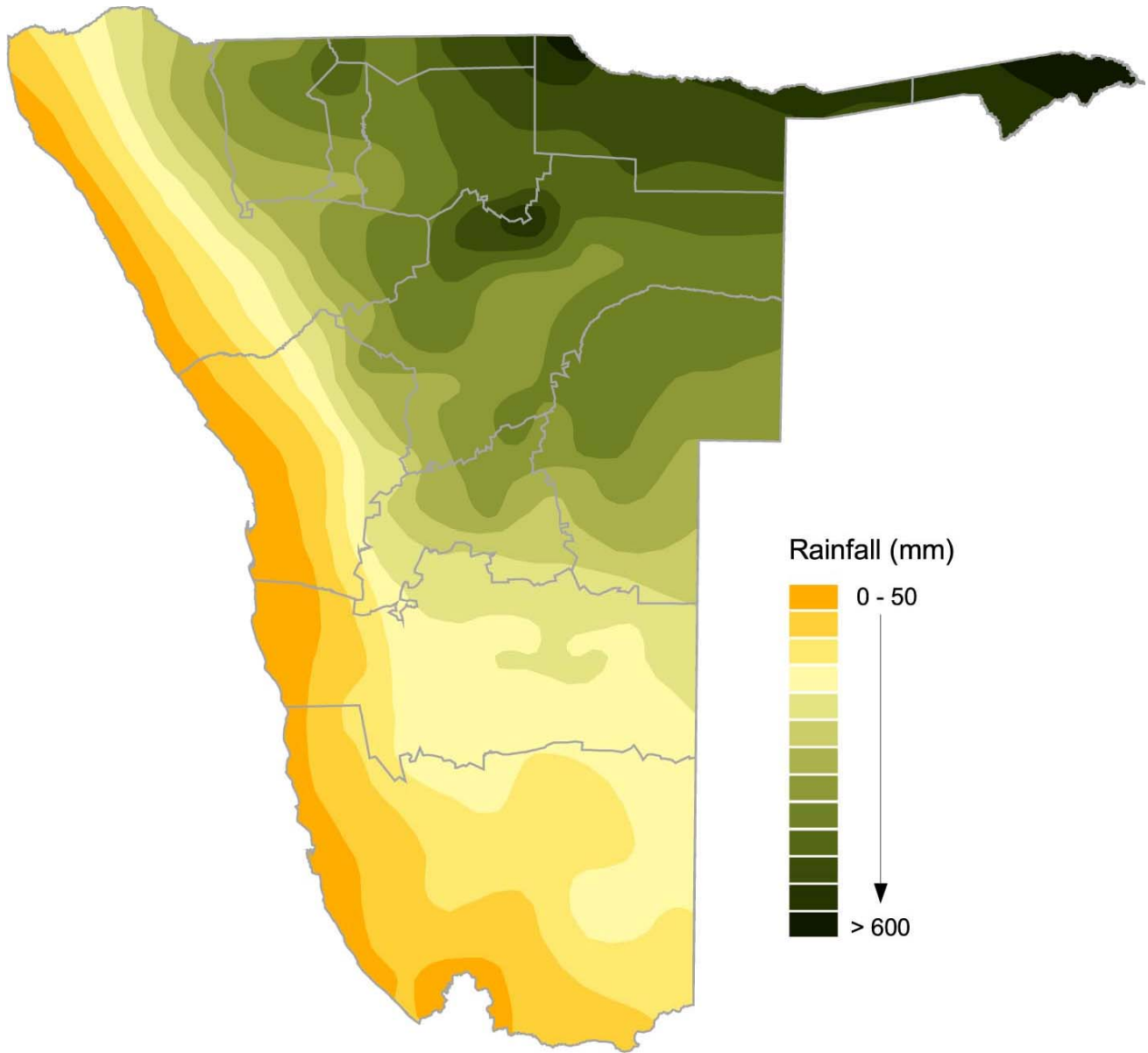
Map produced by
SFB 389 'ACACIA', subproject E1
 University of Cologne **E1**

Data source:
 Atlas of Namibia Project, 2002, Directorate of Environmental Affairs,
 Ministry of Environment and Tourism. <http://www.dea.met.gov.na> (2003)

Map 3 Groundwater basins and rock types in Namibia

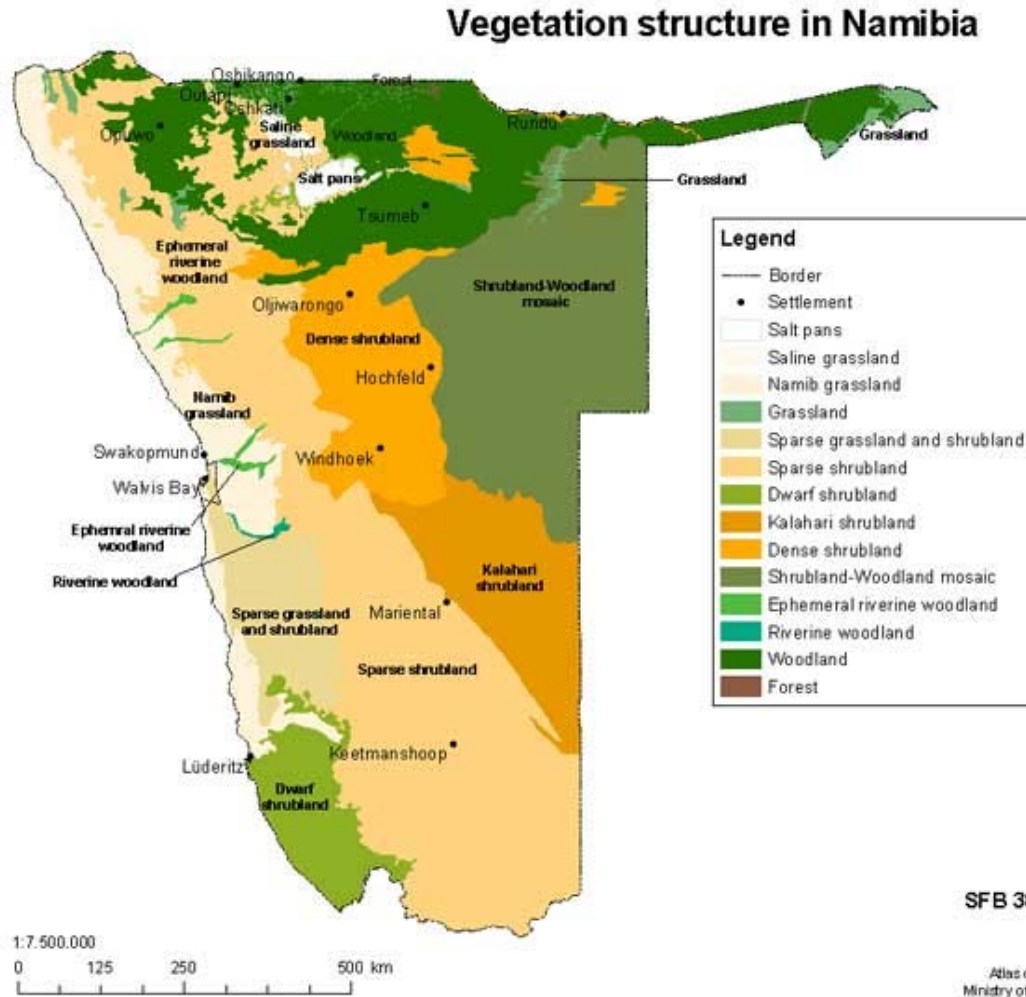



Map 4 Annual rainfall



Source: UNDP, 2005

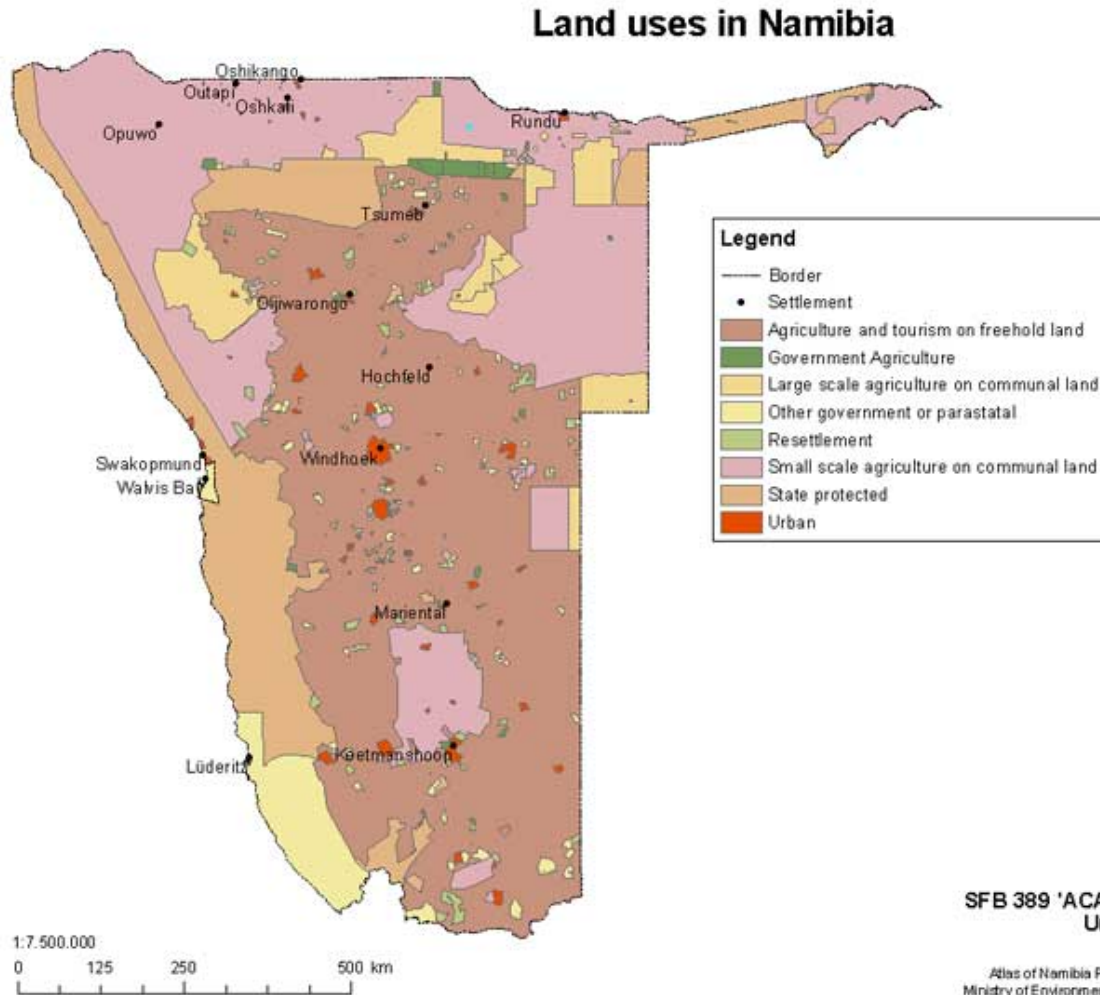
Map 5 Vegetation structure in Namibia



Map produced by
SFB 389 'ACACIA', subproject E1
 University of Cologne  **E1**

Data source:
 Atlas of Namibia Project, 2002, Directorate of Environmental Affairs,
 Ministry of Environment and Tourism. <http://www.dea.met.gov.na> (2003)

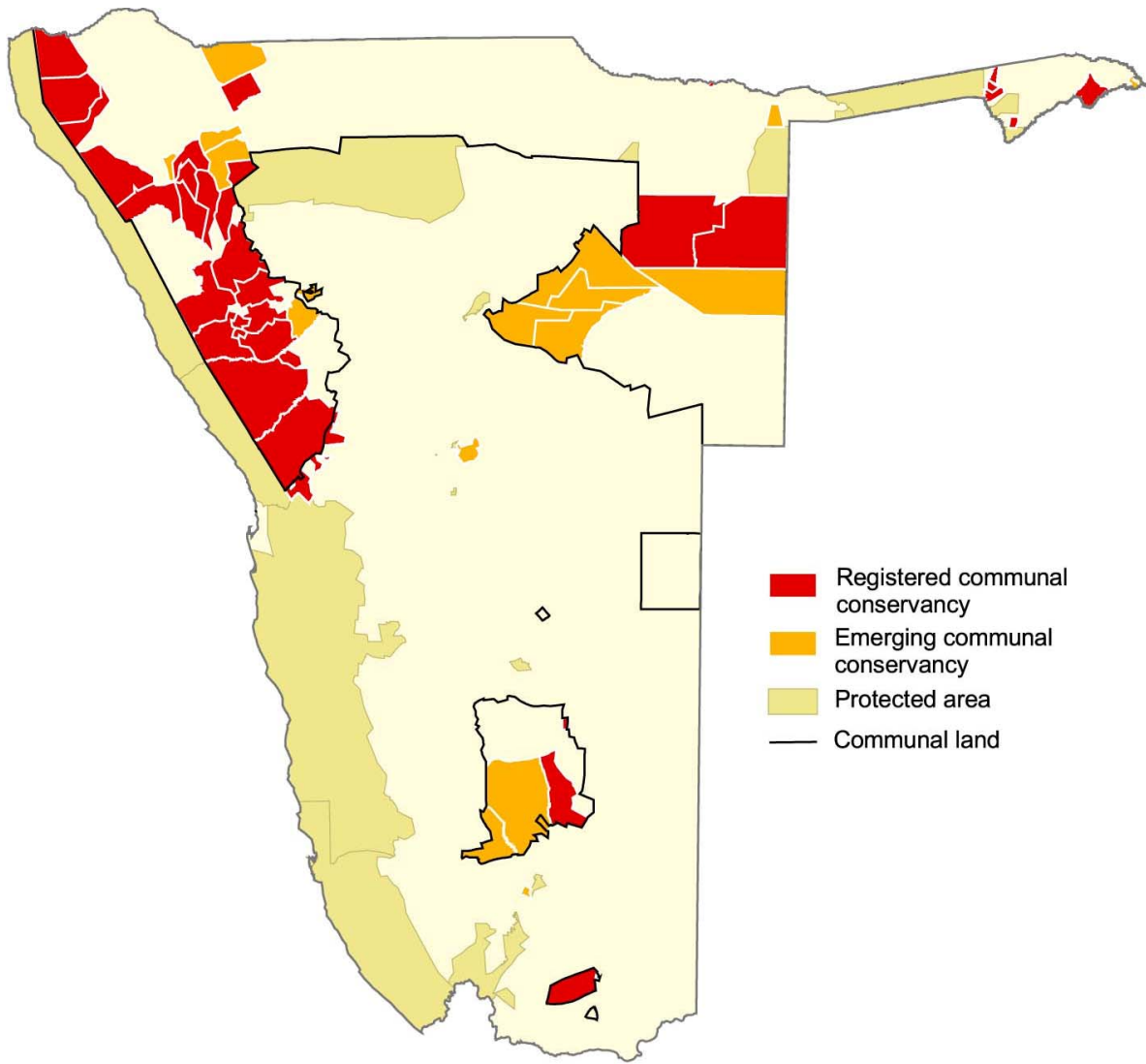
Map 6 Land uses in Namibia



Map produced by
SFB 389 'ACACIA', subproject E1
University of Cologne

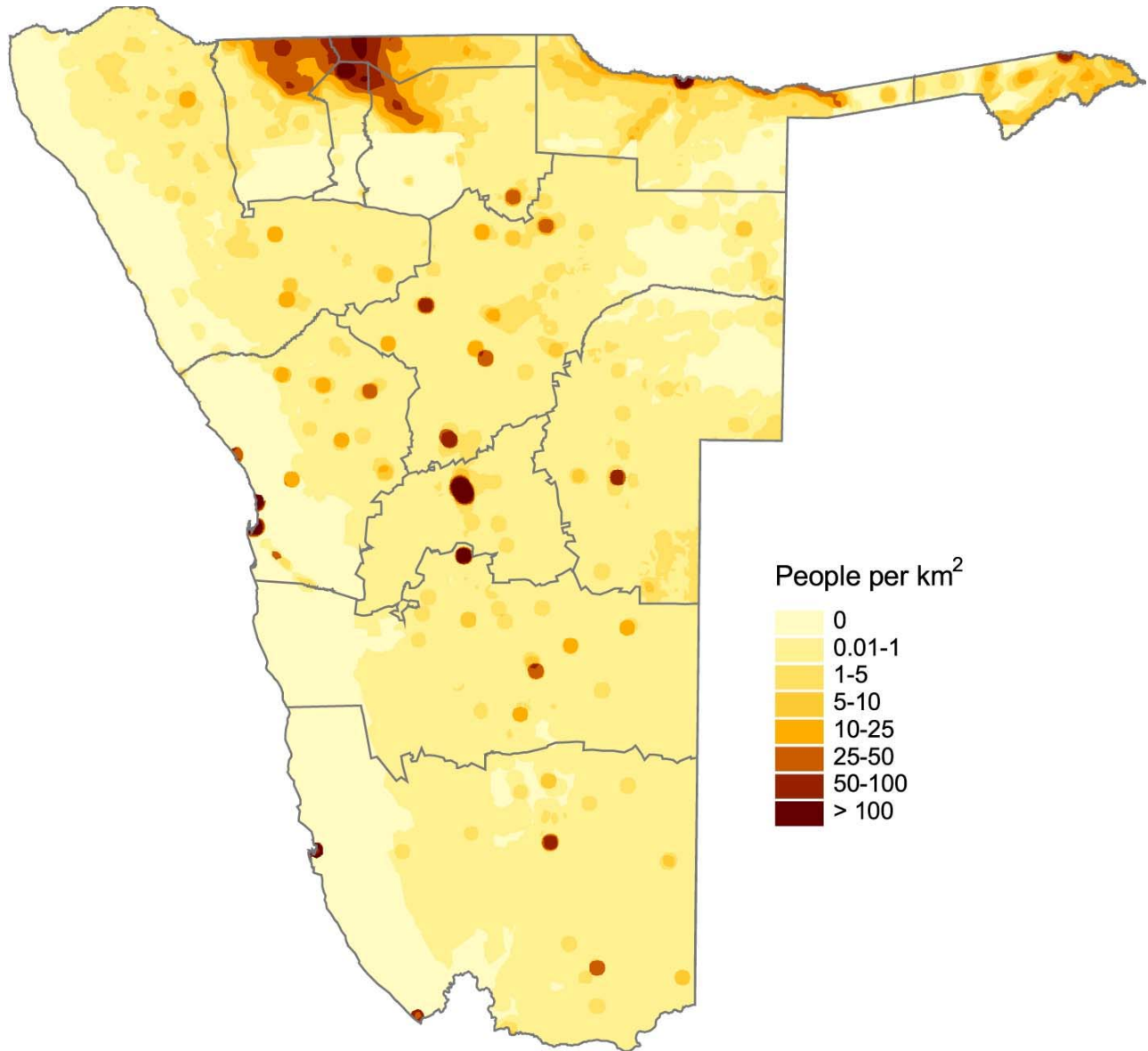
Data source:
 Atlas of Namibia Project, 2002, Directorate of Environmental Affairs,
 Ministry of Environment and Tourism. <http://www.dea.met.gov.na> (2003)

Map 7 Protected Areas and Conservancies in Namibia



Source: UNDP, 2004

Map 8 Population density



Source: UNPD, 2004

7.2 Reference list of environmental policy documents, statements and action plans, and other relevant technical information.

Annex 7.2. 1: Reference list of environmental policy documents, statements and action plans

	Policies/Laws	Year of Enactment
A	Overall policies	
	Namibia Vision 2030	2004
	The Poverty Reduction Strategy (NPC)	1998
	National Development Plan 2 (NDP) (NPC)	2001
B	Environmental Management	
	Environmental Management and Assessment Bill Act	1999 (draft)
	The National Environmental Policy	1993
	Environmental Assessment Policy (MET)	1995
	Environment Investment Fund of Namibia Act	2001
C	Decentralization and Natural Resources Management	
	Traditional Authorities Act	2000
	Decentralisation Policy (MRLGHRD)	1993, 1998
	Commencement of Decentralisation Enabling Act	2000
	Regional Councils Amendment Act	2000
	Local Authorities Amendment Act	2000
D	Land Use and Management	
	Agricultural Commercial Land Reform Act (MAWRD)	1995
	Regional Planning and Development Policy (NPC)	1997
	The National Land Policy (MLRR).	1998
	Communal Land Reform Act (MLRR)	2002
	Town and Regional Planners Act	1996
	National Resettlement Policy	2001
E	Water and Irrigation	
	Water Supply and Sanitation Sector Policy (MAWRD)	1993
	National Water Policy (MAWRD)	2000
	Wetland's Policy	Draft (2004)
	Water Resources Management Act	2004
	Namibia Water Corporation Act	1997
F	Forestry	
	The Forestry Act (MET)	2001
	Development Forestry Policy for Namibia	2001
G	Energy	
	White Paper on Energy (MME)	1998
	Electricity Act	2000
	Fisheries	
	Sea Fisheries Act	1992
	Walvis Bay and Off- shore Islands Act	1994
	Inland Fisheries Resources Act	2003
	Marine Resources Policy	2004
	Marine Resources Act	2000
	Territorial Sea and Exclusive Economic Zone of Namibia Act	1990

	National Fishing Corporation of Namibia Act	1991
	Mining, petroleum	
	Diamond Act	1999
	Minerals Development Fund of Namibia Act	1996
	Minerals Act	1992
	Petroleum Act	1991
	Petroleum Products and Energy Amendment Act	2000
	Minerals (Prospecting and Mining) Act	1992
	National Parks, Wildlife and Tourism	
	Wildlife Management, Utilization and Tourism in Communal Areas (MET)	1995
	Nature Conservation Act	1975
	Nature Conservation Amendment Act (MET)	1996
	Community-based Tourism Policy (MET)	1995
	Namibia Tourism Board Act	2000
	Parks and Wildlife Management Bill	Draft
	Regulations for the Sperrgebiet	Draft
	Game Products Trust Fund Act	1997
	Declaration and Regulation of Tourism Regulated Sectors	2004
	Namibia Wildlife Resorts Company Act	1998
	Wild Life Production and Utilisation Policy	
	Waste Management and Sanitation	
	Pollution Control and Waste Management Bill	draft
	National Environmental Health Policy	2002
	Toxic substances and chemicals	
	Prevention and Combating of pollution of sea by oil Act	1981
	Regulation on the import of ozone depleting substances (ODS) (MTI)	2004
	Agriculture	
	National Agricultural Policy (MAWRD)	1995
	Livestock Improvement Act (MAWRD)	1977
	Soil Conservation Act (MAWRD)	1969
	Food Security Policy (MAWRD)	1998
	Green plan	1992
	Biological Resources	
	National Biodiversity Strategy and Action Plan 2001 – 2010 (NBSAP)	2002
	Bill and Regulations of Access to Genetic Resources and the Protection of Associated Traditional Knowledge	draft
	Disaster Management	
	National Drought Policy and Strategy (MAWRD)	1997
	Science & Technology	
	National Policy of Safe Use of Biotechnology	1999

Source: ECOLEX (FAO/IUCN/UNEO) and UNDP 2005 (draft)

Annex 7.2. 2: Status of International Conventions

Convention/Protocol	signed	ratified
Convention on the Conservation of Antarctic Marine Living Resources, 1980	X	X
UN Convention on Law of the Sea (UNCLOS), 1983	X	X
Convention on the Law of the Non-Navigational Uses of International Watercourses, 1997	X	X
Convention on the Conservation and Management of Fishery Resources in the South East Atlantic Ocean (SEAFO), 2001	X	X
Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995	X	X
Amendment to Article 6 and 7 of Protocol to amend the Convention on Wetlands of International Importance especially Waterfowl Habitat, 1987	X	
Memorandum of Understanding concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa, 1999	X	
International Convention for the Conservation of Atlantic Tunas, 1966	X	X
International Convention for the Safety of Life at Sea, 1974	X	X
International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969, as amended by the 1973 protocol	X	
International Convention on Civil Liability for Oil Pollution Damage, 1969, as replaced by the Protocol, as amended in 2000	X	X
Comprehensive Nuclear Test - Ban Treaty , 1996	X	X
Convention on the Prohibition of the Development , Production , Stockpiling and Use of Chemical Weapons and on their Destruction, 1993	X	X
Ramsar Convention (1971) Wetlands of international Importance, 1995	X	X
Protocol to Amend the Convention on Wetlands of International Importance Especially Waterfowl Habitat, 1982	X	
Trade in Endangered Species CITES (1990)	X	X
Amendment to Article XI of the Convention on International Trade in Endangered species of Wild Fauna and F flora, 22 June 1979	X	
Conservation of Migratory Species of Wild Animals (1983)	---	
Vienna Convention (Ozone depleting substances), 1993	X	X
Montreal Protocol on Substances that Deplete ozone Layer, 1987	X	X
Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Adopted at the Fourth Meeting of the parties at Copenhagen on 25 November 1992	X	
Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, Adopted at the Second Meeting of the parties at London on 29 June 1990	X	
International Treaty on Plant Genetic Resources for Food and Agriculture, 2001	X	
Convention on Biological Diversity (1992)	X	X
Convention to Combat Desertification (1994)	X	X
UN Framework for Climate Change (1992)	X	X
Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal 1989	X	X
Hazardous Substances Ordinance 14 of 1974	X	
Persistent Organic Pesticides (POPs)	X	---
Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998	X	X
Cartagena Protocol on Biosafety to the Convention on Biological Diversity,	X	X

2000		
Kyoto Protocol	X	X
African Convention on the Conservation of Nature and Natural Resources, 2003	X	
Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume 1-Aircraft Noise, Chicago,1944	X	
regional		
Agreement Amending the Treaty of the Southern African Development Community, 2001	X	X
Revised SADC protocol on Shared Watercourses, 2000	X	X
SADC Amendment Protocol on Trade, 2000	X	X
SADC Protocol on Wildlife Conservation and Law Enforcement, 1999	X	X
SADC Protocol on Fisheries, 2001	X	X
SADC protocol on Mining, 1997	X	X
SADC protocol on Energy, 1996	X	X
SADC Protocol on Forestry, 2002	X	X
SADC Protocol on Wildlife Conservation and Law Enforcement,1999	X	X
SADC Protocol on the Development of Tourism, 1998	X	X
The African Nuclear-Weapon-Free Zone Treaty, 1996	X	
Protocol on Shared Watercourse Systems in the Southern African Development Community (SADC) Region, 1995	X	X
Agreement between the Governments of Angola, the Republic of Botswana and the Republic of Namibia on the establishment of a Permanent Okavango River Basin Water Commission (OKACOM), 1994	X	
Agreement between the governments of the Republic of Botswana , the Kingdom of Lesotho, the Republic of Namibia and the Republic of South Africa on the establishment of the Orange-Sengu River Commission		
Agreement for the Establishment of Southern African Centre for Ivory Marketing (SACIM), 1991	X	
SADC Charter of the Regional Tourism Organisation of Southern Africa(RETOSA),1997	X	X

Source: ECOLEX, FAO/IUCN/UNEP and UNDP, 2005

Annex 7.2. 3: Biomes and vegetation types of Namibia

Biome	Vegetation Types
Lakes and Salt Pans	Pans
Nama Karoo	Central-Western Escarpment and Inselbergs Desert Dwarf-Shrub Transition Dwarf Shrub Savannah Dwarf-Shrub Southern Kalahari Transition Etosha Grass and Dwarf Shrubland Karas Dwarf Shrubland North Western Escarpment and Inselbergs
Namib Desert	Central Desert Northern Desert Southern Desert
Succulent Karoo	Succulent Steppe
Broadleaved Tree and Shrub Savannah	Caprivi Floodplains Caprivi Mopane Woodland Eastern Drainage North-eastern Kalahari Woodland Northern Kalahari Okavango Valley Omatako Drainage Riverine Woodlands and Islands
Acacia Tree and Shrub Savannah	Central Kalahari Cuvelai Drainage Highland Shrubland Karstveld Mopane Shrubland Southern Kalahari Thornbush Shrubland Western Kalahari Western Highlands

Source: UNDP, 2004

Annex 7.2. 4: Summary of Namibian State-owned Protected Areas

Name	PA type	Size (km ²)	Proclaimed	Vegetation type
Ai-Ais Hot Springs / Huns Mountains	Game Park	3,461	01/04/1968 (Ai-Ais) 15/03/1988 (Huns Mt.)	Desert/dwarf Shrub Transition, Succulent Steppe, Dwarf Shrub Savannah, Karas Dwarf Shrubland, Riverine Woodland
Cape Cross Seal Reserve	Game Park	60	16/06/1968	Central Desert
Caprivi Game Park	Game Park	6,000	01/04/1968	North-eastern Kalahari Woodlands, Riverine Woodlands and Islands, Okavango Valley
Daan Viljoen Game Park	Game Park	40	01/04/1968	Highland Shrubland
Etosha National Park	Game Park	22,270	20/06/1975	Karstveld, Pans, Western Kalahari, Mopane shrubland, Etosha grass and dwarf shrubland, North-eastern Kalahari Woodlands, Western Highlands, Cuvelai drainage
Gross Barmen Hot Springs	Game Park	1	01/04/1968	Highland Shrubland
Hardap Recreation Resort	Game Park	252	01/04/1968	Dwarf Shrub Savanna.
Khaudum Game Park	Game Park	3,842	01/02/1989	Eastern Drainage
Mahango Game Park	Game Park	225	01/02/1989	North-eastern Kalahari Woodlands, Riverine Woodlands and Islands Okavango Valley
Mamili National Park	Nature Reserve	320	01/03/1990	Caprivi Floodplain
Mudumu National Park	Nature Reserve	1,010	01/03/1990	Caprivi Mopane Woodland and Caprivi Floodplains
Namib-Naukluft Park	Game Park	49,768	01/08/1979	Southern Desert, Central Desert, Desert/dwarf Shrub Transition, Central-western Escarpment and Inselbergs, Succulent Steppe, Dwarf Shrub Savanna.
National Diamond Coast RA	Tourist Recreation Area	50	02/05/1977	Succulent Steppe
National West Coast RA	Tourist Recreation Area	7,800	21/08/1973	Central Desert
Naute	Game	225	15/11/1988	Dwarf Shrub Savannah, Karas Dwarf

Name	PA type	Size (km ²)	Proclaimed	Vegetation type
Recreation Resort	Park			Shrubland.
Popa Game Park	Game Park	0.25	01/02/1989	Okavango Valley
Skeleton Coast Park	Game Park	16,390	15/10/1971	Northern Desert, Central Desert, North-western Escarpment and Inselbergs.
South West Nature Park	Game Park	0.04	02/11/1970	Highland Shrubland
Von Bach Recreation Resort	Game Park	43	15/08/1972	Thornbush Shrubland, Highland Shrubland
Waterberg Plateau Park	Game Park	405	15/07/1972	Northern Kalahari Thornbush Savannah.
Mangetti Game Camp	N/A	422	Not proclaimed	North-eastern Kalahari Woodlands
Sperrgebiet	N/A	26,000	Not proclaimed	Succulent Steppe, Southern Desert, Riverine Woodland.

Source: UNDP, 2006

Annex 7.2. 5: Summarized Table of natural disasters in Namibia from 1982 to 2006

	# of Events	Killed	Injured	Homeless	Affected	Total Affected	Damage US\$ (000's)
Drought	6	0	0	0	783,200	783,200	2,739
avg per event		0	0	0	130,533	130,533	457
Epidemic	4	258	0	0	12,203	12,203	0
avg per event		65	0	0	3,051	3,051	0
Flood	6	7	0	0	44,300	44,300	8,490
avg per event		1	0	0	7,383	7,383	1,415

*Epidemics include: Malaria, Meningitis(Meningococcal disease), Meningitis(Polio)

Source:"EM-DAT: The OFDA/CRED International Disaster Database, www.em-dat.net - Université catholique de Louvain - Brussels - Belgium", Created on Nov-3-2006. - Data version v06.06.

Annex 7.2. 6: Harvest of the main commercial species 2000-2005 (tonnes except seals)

Species	2001	2002	2003	2004	2005
Pilchard	10763	4160	22255	28605	25128
Hake	173277	154588	189305	173902	158060
Horse mackerel	315245	359183	360447	310405	327700
Monk	12390	15174	13135	8961	10466
Kingklip	6607	7210	6603	7067	5567
Tuna	3198	2837	3371	3581	3654
Crab	2343	2471	2092	2400	2480
Rock lobster	365	361	269	214	248
Other fish species (1)	30810	77407	33644	31997	18934
Total fish harvest	549980	623391	631119	567133	552164
Seals (numbers)	44223	40000	34000	31971	64167
Seaweed (gracilaria)	800	500	288	n/a	n/a

Source: MFMR, 2005

(1): other fish species are orange roughy, alfonsino, anchovy, shark, sole, and line fish species

Annex 7.2. 7: Water points, water point committees and dams according to the region

Region	Water points (number)	Access to safe water (% rural population)	Water Point Committees (%)	Dams
Caprivi	794	86.3	39.2	3
Erongo	307	95.7	79.5	11
Hardap	395	94.6	102.6	0
Karas	,446	93.7	100.0	3
Kavango	334	62.3	90.7	0
Kunene	938	72.8	56.8	5
Ohangwena	609	77.5	92.5	6
Omaheke	478	89.1	76.4	0
Omusati	1059	82.5	83.1	6
Oshana	288	93.7	67.8	6
Oshikoto	702	88.2	88.5	6
Otjozondjupa	501	94.3	90.1	0
Total	6867	87.2	72.3	46

Source: MAWRD (2004)

Annex 7.2. 8: Minerals and Metals production (t) variations (%) between 1995 and 2004

Minerals and Metals	1995	2004	Variation (%)
Copper	133,960	94,670	- 29.3
Zinc	89,416	189,401	+ 111.8
Lead	73,189	42,076	-42.5
Dolomite	5,401	13,536	+150.6
Granite	4,518	25,492	+464.2
Marble	16,935	8,356	- 50.6
Uranium	2,007	4,107	104.6
Diamond (carat)	1,381,757	2,003,868	+ 45.0

Source: Insight, 2006

Annex 7.2. 9: Proposed Environmental Indicators (EMIN)

Environmental Issue	Indicator
1. Ecosystem degradation/ desertification	<ul style="list-style-type: none"> • Monitoring of changes in water quality • Salinisation of irrigated land • Area under forest management (i.e. area of forest and other wooded lands being managed according to a plan for the production of wood-based products) • Salinisation of dams • Mean annual rainfall.
2. Availability of water	<ul style="list-style-type: none"> • Population pressure • Quality of water in the Goreangab Dam • Cooperation with neighbouring riparian states under transnational initiatives • Draft White Paper on Water and the new Water Bill • Unsustainable irrigation development.
3. Depletion of natural resources	<ul style="list-style-type: none"> • Monthly abstraction in strategic aquifers • Total woody biomass of national forest • Water consumption by resource type (by sector) • Total biomass consumption • Total area of national forest, plantations and other wooded lands.
4. Change in biodiversity	<ul style="list-style-type: none"> • Change in number and/or distribution of keystone and indicator species • Algae index • Change in land use % of protected forest • Benthic macro-invertebrates • Change in proportion of fish catches by species per season.
5. Water quality	<ul style="list-style-type: none"> • Pollution of groundwater • Ambient change of water quality • Goreangab Dam water quality • Amount of chlorine used per cubic metre of water supply • Growth rate of urban population • Algae index • Population pressures • Maintenance of hydrological function of wetlands.
6. Toxic chemicals	<ul style="list-style-type: none"> • National fuel consumption • Use of pesticides • Chemical fertiliser reports • Coastal oil pollution • International conventions and/or policies implemented

7. Waste generation	<ul style="list-style-type: none"> • Number of tyres to the Kupferberg dump site per capita per annum • Number of tyres imported per annum • Medical waste • Number of complaints received by authorities • Number of jobs created in private sector per capita • Tonnage of cans exported per year • Number of wheel-bins used per capita • Number of private contractors in waste management • Number of entrepreneurs involved in waste collection • Amount of packaging imported per capita • Collection infrastructure in use per local authority • Transport infrastructure in use per capita per local authority • Used batteries exported as proportion of imports • Number of local authorities with composting facilities.
<hr/>	
8. The greenhouse effect (global warming)	<ul style="list-style-type: none"> • Total area of national forest, plantations and other wooded lands • Rainfall index • Climate change • Proportion of Caprivi and Kavango burned • Number of rainfall gauging stations.
<hr/>	
9. Ozone-layer depletion	<ul style="list-style-type: none"> • Ozone-layer depletion • Enforcement and control of illegal trade in CFCs • Recycled materials • Dependence on shared resources • International conventions and/or policies implemented.
<hr/>	
10. Acidification	<ul style="list-style-type: none"> • Mean annual rainfall • Number of rainfall gauging stations • Annual run-off • Rain pH • National energy sources and consumption.

Note: The top five scores are listed. Were more than one on rank 5 was listed, all indicators fetching the same score are included. Data availability, sources and means of monitoring of key data from these indicators will be provided as soon as the information is available.

Source: www.dea.met.gov.na

Annex 7.2. 10: Namibia Donor Matrix (Source: EC, CSP 2002 – 2007)

Annex V: Namibia Donor Matrix

AREAS OF INTERVENTION		DONOR MATRIX - 2000 DISBURSEMENTS (Million Euro)																		TOTAL		
		EDF	A*	B	D	DK*	EL	ES	F	FIN	IRL	IT	LUX	NL	PT	SW	UN*	WB*	UK		USAID	
ECONOMIC DEVELOPMENT	Economic Policy																1.09					
	Enabling Environment	0.33	0.97		0.90											0.32	0.549			0.65		
	Public Sector					1.37											0.377	0.36				
	Research																					
	Tax Policy																					
	Urban Development				2.28			0.12	0.02					0.15								2.57
TOTAL	0.33			3.18			0.12	0.02				0.15			0.32				0.65		6.29	
PRODUCTIVITY SECTOR ACTIVITY	Rural Dev/Fisheries	3.40			0.55			0.94	0.80	1.68			0.22				0.52	0.42	0.17	2.66	11.359	
	Energy / Mining	4.24																			4.24	
	Infrastructure	0.50			5.93								0.60			1.62					8.65	
	Tourism	0.64																			0.64	
	TOTAL	8.78			6.48			0.94	0.80	1.68			0.82			1.62			0.17	2.66		24.839
SOCIAL DEVELOPMENT	Education	0.90			1.74	1.06		0.25	0.45				1.21	1.93	0.16	5.30	1.64	0.10	0.34	1.61	16.686	
	Health	1.10			0.19				0.10	1.24							3.096		0.14		6.7858	
	Population																					
	Refugees													0.10								0.10
	Water & Sanitation	0.82								1.59				0.17								2.58
	TOTAL	2.82			1.93			0.25	0.55	2.83			2.13	2.20	0.16	5.30				0.48	1.61	26.152
THEMATIC CROSS-CUTTING ISSUES	Civil Society				0.10			0.09	0.20	0.80		0.1									1.26	
	Cultural Co-operation				2.63				0.70	0.10				0.04	0.03		0.047					3.55
	Environment				5.30	0.44		0.56	0.03	0.23						0.43	0.148	0.23	0.26	2.66		10.289
	Gender								0.02								0.741					0.761
	Good Governance		1.11		1.30				0.10	0.42				0.24		0.65			0.04			3.8608
	HIV / AIDS	0.18			0.47			0.05	0.45							0.54				0.006		1.696
	Human Rights									0.17										1.99		2.16
	Regional Integration																					
	Conflict Prevention																					
	Other (not specified)	0.30								0.08			0.18			0.76	0.469			0.07		1.8487
TOTAL	0.48			9.80			0.70	1.50	1.80		0.1	0.18	0.28	0.03	2.38				0.37	4.655	25.411	
GRAND TOTAL (ALL AREAS)		12.41	2.19		21.39			2.01	2.87	6.31		0.1	3.28	2.48	0.19	9.62	8.66		0.72	8.93		82.74

* Austria, Denmark, UN and World Bank (1999 Figures)

UN (FAO, UNAIDS, UNDP, UNESCO, UNFPA, UNICEF, UNIDO, WHO)

Annex 7.2. 11: Donor funded environment or environment related projects in Namibia (since 2000)

European Union (EDF 8 and 9*)

Project Abbr.	Project	Partner	Duration	Costs (€)
	Namibia Tourism Development Programme	MET	2000 -	7,200,000
	SADC Regional Monit.-Control-Surveill. of Fisheries	SADC	1998 -	840,000
	Research Extension Management Programme	MAWF	1999 -	7,450,000
	Rural Towns Waterborne Sewerage scheme - Khoab		2000 -	629,769
MPP	Multi Annual Microproject Programme - Namibia	NGOs	2001 -	4,000,000
	Rural Development & Strategic Framework		2001 -	200,000
	Support to Agricultural Marketing and Trade Negotiat.		2001 -	190,000
NASSP	National Agricultural Services Support Programme	MAWF	2002 -	6,080,000
NAMFI	Upgrading Namibian Maritime & Fisheries Institute at W/Bay	MFMR	2001 -	1,900,000
RPRP	Rural Poverty Reduction Programme*	NPC	2005 -	53,000,000
	Sewerage scheme Lüderitz*			
	Developing Management Tools for Conservation of Hornbills		1999 – 2001 (closed)	315,384 N\$
	Namibia South Africa Interconnector Project, Energy		1998 – 2000 (closed)	8,520,707 N\$
	Sewerage Scheme Karasberg		2002 (closed)	1,550,000 N\$

Germany

Project Abbr.	Project	Partner	Duration	Costs (€)
	Support to land reform	MLR	1/03 – 12/12	9,250,000
	Management of Namibian water resources management	MAWF	1/99 – 7/09	5,000,000SADC
	Sustainable management of natural resources	MET	8/04 – 7/10	3,500,000
PEG	Partnership for economic growth	multi	4/05 – 7/08	3,000,000
	Proklima (ozone layer), regional		1996 -	
	Support for the Gobabeb training and research centre, regional	SADC	8/99 – 12/06	4,999,000
BENEFIT	Benguela environment fisheries interaction and training programme, regional	SADC	10/97 – 1/08	4,860,000
	Advisory services for an communal dry forest management programme, Namibia component			

	Community Forestry in North-Eastern Namibia (DED)		2004 - 2007	17,676,076 N\$
	Bwabwata Mudumu Mamili National Parks (KFW)	MET	5/04 - 2007	22,125,696 N\$
	Land reform (KFW)		7/04 -	
	Support to Namibia's Biodiversity Conservation Programme		2000 – 2004 (closed)	11,842,977 N\$
	Support to the National Programme to Combat Desertification (NAPCOD)		1995 – 2004 (closed)	52,807,277 N\$
SARDEP	Sustainable Animal and Range Development Programme		1991 – 2004 (closed)	

Finland

Project Abbr.	Project	Partner	Duration	Costs (€)
	Strengthening regional government (Strengthening Local government, phase II)		2004 - 2007	6.0 mil
	Bush Encroachment Programme		1999 – 2004 (closed)	2,574,059 N\$
	Information and Communication Services for Sustainable Development		1997 – 2004 (closed)	5,236,967 N\$
	Namibia-Finland-forestry programme, phase II		2001 – 2005 (closed)	6.0 mil

Norway

Project Abbr	Project	Partner	Duration	Costs (N\$)
	Support to review the MFMR Economic Model Database	MFMR	ongoing	
	Environment Activities		1991 – 2000 (closed)	17,875,033

Denmark

Project Abbr	Project	Partner	Duration	Costs (N\$)
	Environmental Review of the Namibia Green Plan		1999 – 2001 (closed)	1,200,000
	Erongo Integrated Coastal Zone Management Programme		1997 – 2000 (closed)	8,400,000
	Land – use Plan for Sperrgebiet		1999 – 2000 (closed)	390,000

GEF/UNDP, WB*, UNOPS**

Project Abbr	Project	Partner	Duration	Costs(US\$)
NCSA	National capacity needs self-assessment for global management	MET, NPC	2/03 – 12/05	200,000
	Strengthening capacity to implement global environmental conventions in Namibia	MET	10/06 – 12/09	400,000
NAMREP	Namibia renewable energy programme	MME	4/03 – 6/07	6,000,000
DLIST-Benguela	Distance learning and information sharing tool for the Benguela coastal area**	regional	8/05 – 7/08	700,000
UNFCCC	Namibia's second national communication to the United Nations framework convention on climate change	multi	2006 - 2009	405,000
ICEMA	Integrated Community based ecosystem management project*	MET	10/04 – 1/10	7,000,000
SPAN	Strengthening the protected areas network	MET	4/06 – 3/12	8,200,000
NACOMA	Namibia coast conservation and management project*	MET, MRLGHRD, MFMR	10/05 - 10/10	6,000,000
GEF/SGP	Global environment facility small grants programme**	NNF, NGO, CBO	ongoing	500,000/year
BCLME	Integrated management of the Benguela current large marine ecosystem (Angola, Namibia and South Africa**	multi	1/02 – 12/07	15,000,000
CCA	Adapting to climate change through the improvement of traditional crops and livestock farming	MAWF, MET, NPC, MLR, MRLGHRD	10/06 – 12/09	1,000,000
CPP-ISLM	Country pilot partnership for integrated sustainable land management	MAWF, NPC, MET, MLR, MRLGHRD, NNF, DRFN	10/06 – 12/11	9,000,000
	Strategic action for the Orange – Senqu river basin – Lesotho, South Africa, Botswana, Namibia**	multi	10/06 – 3/08	6,000,000
	Removing barriers to biomass energy conservation in SME's and institutions in the SADC	SADC	10/06 – 9/09	1,000,000

	Climate Change Enabling Activities		2001 – 2004 (closed)	1,610,000 N\$
	Desertification		2002 – 2003 (closed)	2,101,400 N\$

USAID

Project Abbr.	Project	Partner	Duration	Costs (US\$)
LIFE (plus)	Living in a finite environment	MET	1992 - 2009	9.8 mil (2004-2009) total > 40 mil
	Strengthening protected areas (with UNDP)	MET	2004 - 2007	175,000
	Cheetah conservation fund's debushing project	MAWF	2001 - 2006	1,225,000
	GDA agreement with wilderness Safaris (training field guides)		2004 - 2005	40,000
	Land reform, resettlement programme	MLRR	2003 - 2009	774,783

FAO

Project	Partner	Duration	Costs (NAD)
Indigenous fruit tree promotion		2001 - 2003	190,000
Support to National Forest Programmes		2003 - 2005	382,000
Development of Aquaculture legislation	MFMR		
Establishment of a national dairy training centre for the small-scale dairy sector		2004 - 2006	312,979
Capacity building and assistance in the review of sanitary and phytosanitary legislation		2004 - 2007	218,128
TCP Facility for FAORs		2004 – 2006	27,233
Technology transfer on Cactus Pear (Opuntia spp.) production and utilization		2005 - 2007	254,001
Support to the formulation of the National Programme for Food Security (NPFS) and related South-South Cooperation (SSC) Programme		2006 - 2007	172,000
Response to priority areas of AU Maputo Summit Declaration: irrigation training		2005 -2006	294,658
Regional and subregional capacity building for the exchange of official phytosanitary information under the New Revised Text of the IPPC		2005 -2007	242,000
Assistance for the establishment of the African Common Market for basic food products - Phase II of TCP/RAF/3007		2006 - 2007	318,000
Support to the implementation of major African Union policy and strategic initiatives on fisheries		2006 -2006	98,000
Strengthening disease control through improved		2006 -2007	159,000

Transboundary Animal Disease Information Management System (TADinfo) - Phase II of TCP/RAF/3006)			
Assistance for the implementation of the integrated plan of the Comprehensive Africa Agriculture Development Programme (CAADP) and the Sirte Declaration		2006 - 2007	270,000
Strengthening Livelihoods through Food and Nutrition Security in Vulnerable SADC Countries		2006 - 2007	13,014,395
Surveillance and Control of Epidemic Foot-and-Mouth Disease (FMD) and Contagious Bovine Pleuropneumonia (CBPP) in Southern Africa		2006 - 2007	2,986,910
Environmental Protection and Sustainable Management of the Okavango River Basin		2004 - 2007	5,390,998
Support to the Date Production Programme, Namibia - Introduction of Date Palm Cultivation into Communal Farming and Hardap Settlement (Phase II)		2001 - 2007	2,479,664
Support to Food Security and Nutrition Development in Namibia (Phase II)		2001 - 2006	4,264,651
Institutional Support in Fisheries Management, Policy and Planning		2004 - 2006	866,299

WWF

Project Abbr.	Project	Partner	Duration	Costs (€)
	Rhino conservation in Namibia	MET	12/96 – 6/09	
LIFE	Living in a finite environment	MET/ USAID	4/93 – 6/07	
	Community based natural resources management Kunene		3/90 – 6/07	
	Integrated river basin management in the Zambezi river basin		1/06 – 6/07	
	African elephant programme		7/00 – 6/10	
	The Miombo ecoregion conservation programme, Zamezian woodlands and savannas		1/01 – 6/08	
	Monitoring illegal, unregulated and unreported (IUU) Vessels in south African ports		1/05 – 2/06	

Other Donors

Donor	Project	Partner	Duration	Costs (N\$)
CIDA	National tree seed centre (SADC)		1994 - 2000	2,800,000
France	Annual Support to Environment		2003 - 2005	133,928
Spain	Capacity centre for the sustainable use of eco-tourism		2002 - 2003	3,646,230
Iceland	Technical Assistance to NAMFI and MFMR to set	MFMR	ongoing	

	up fisheries economics database			
Sweden	Environmental Economics		2002 – 2005 (closed)	3,499,909
Austria	Tourism in the North- Western Region		1997 – 2000 (closed)	7,393,589
UK	Capacity Building for Trade in Fish		ongoing	
UK	Wildlife Integration (WILD)		2000 – 2003 (closed)	
UK	North Central CBNRM and Enterprise Development Project		2000 – 2004 (closed)	23,400,000
IFAD	Northern Regions Livestock Development Project (NOLIDEP)		1994 – 2003 (closed)	15.09 mil US\$
Malawi	TA aquaculture development projects		ongoing	
Cuba	TA aquaculture development projects		ongoing	

8. ADMINISTRATIVE APPENDICES

8.1 Study methodology/work plan

Activity	Organisation and outcomes	Work days	Place
Desk analysis	Internet research of key documents and reports	3	Place of residence
Field phase in Namibia			
International travel		1	Residence - Windhoek
Briefing in Namibia with the EC Officers	<ul style="list-style-type: none"> Analysis of the specific issues to be addressed during the briefing Discussions on the mission ToR and preparation of the mission Identification of the key actors and major stakeholders to meet and/or to contact. 	1	Windhoek
Literature review and Desk Analysis	<ul style="list-style-type: none"> Collect, review of key documents and reports, including NDP2 and (draft) NDP3; NPRAP and NPRAP environmental mainstreaming review; Vision 2030; the State of the Environment Reports (SoER); the National Capacity Self-Assessment for Global Environmental Management (NCSA); the current EC Country Strategy Papers; evaluation reports, existing Strategic Environmental Assessments (particularly those concerning potential focal sectors), EIA of EC funded projects; environmental literature, environmental policy and regulatory framework, legislation, regulations and enforcement relating to environmental issues, information on monitoring and environmental performance indicators. 	4	Windhoek
Meetings with key actors	<ul style="list-style-type: none"> Meetings and consultations with other key actors and major stakeholders (GTZ, WB, USAID, research institutions, line ministries, other development partners, NGOs, the private sector and civil society) Assessment of the environment sector of Namibia and identification and prioritisation of needs. This will be done through : Assessment of the environment identifying key environmental factors influencing Namibia's development and the responses to these ; Assessment of national environmental policy and legislation; institutional structures and capacity, and the involvement of civil society in environmental issues ; Analysis of past and ongoing international cooperation in the environmental conservation and management field ; Assessment of past and anticipated future trends of environmental indicators ; 	7	Windhoek
Field visits	Field visits to sites of key environmental concern: a judicious itinerary of visits will be made and agreed during the meeting with the EC Officers that will ensure that the needs of the mission are met effectively and efficiently. The field visits will also allow the team to collect data from the field.	3	Out of Windhoek

Work on the Draft Report / Debriefing Note	<p>Presentation of the initial findings of the Team, in the form of a Draft Report, at a workshop to be held in Namibia. The key environmental concerns and follow-up actions are identified and, as far as possible, a consensus is obtained on these;</p> <p>On the reporting side, we propose to submit the Draft Profile few days after the field mission (and not in Namibia) in order to let the experts integrate the comments received during the workshop and the debriefing in Namibia. More, this would also allow the experts in AETS's HQs to monitor the content of the Report before submitting it. If the Contracting Authorities agree on that reporting timing, the presentation of the initial findings of the Team would be done in the form of a <i>Debriefing Note</i>, introduced at the workshop.</p>	2	Windhoek
Debriefing with the EC Officers in Namibia	The team will present its findings to the EC Officers in Namibia, enabling them to discuss and clarify some aspects if deemed necessary.	1	Windhoek
Workshop	Organisation of a workshop in Namibia to which national authorities, international donors, experts and civil society representatives will be invited with the aim of identifying and attempting to obtain a consensus on key environmental concerns and follow-up actions. The team will present its initial findings. This workshop will also provide the different stakeholders in Namibia with an opportunity to clarify any issues identified by or proposals suggested by the team. This approach will enhance the participatory planning process. This workshop will be convened incorporating the advice of the EC Delegation on matters such as subject matter, format, attendance, protocol and timing. We suggest that this workshop be held towards the end of the mission in order to discuss and verify the findings of the mission.	1	Windhoek
Finalisation of Draft Report	All the relevant data are collected and analysed, enabling the team to prepare the Draft Report, taking into consideration the results of the workshops and of the meetings.	2	Windhoek
International travel		1	Windhoek - Residence
Final Report			
	<i>Submission of the final Draft Report by AETS</i>	---	
Final Report	Integration of the comments received from the several authorities and stakeholders on the Draft Report <i>Expected result: Submission of the Final Report</i>	2	Residence of the expert

8.2 Consultants' Itinerary

Date (nov/dec 2006)	Activity
Sat 11/11	Travel to Namibia
Sun 12/11	Travel to Namibia
Mon 13/11	Briefing EC Delegation (9:30) Meeting NPC, Rural Poverty Reduction Programme (RPRP) (14:00)
Tue 14/11	Meeting MAWF, Department of Water Affairs (11:30) Meeting USAID (14:30)
Wed 15/11	Meeting MRLGHRD (8:30) Meeting NNF (11:30) Meeting MFMR (14:00) Meeting UNDP (16:00) Meeting Coopération française (18:00)
Thur 16/11	Meeting City Council Windhoek (8:00) Meeting MET (10:00) Meeting MTI (11:00) Meeting GTZ (14:30) Meeting MLR (16:00)
Fri 17/11	Meeting NAU (8:30) Meeting MAWF, Department of Agriculture (10:00) Meeting DRFN (11:00)
Sat 18/11	Field visit Katutura (urban environment: Industrial areas, housing)
Sun 19/11	Analyse of key documents received in the country
Mon 20/11	Meeting MME, Department of Mining (9:00) Meeting MET, Department of Environmental Affairs (15:30)
Tue 21/11	Meeting MME, Department of Energy (9:30) Meeting MAWF, Department of Forestry (14:30)
Wed 22/11	Assessment and evaluation of the information
Thur 23/11	Assessment and evaluation of the information Logistical preparation of the workshop
Fri 24/11	Field visit Okahandja, Uis (debushing/charcoal factory/conservancies)
Sat 25/11	Field visit Okahandja, Uis (conservancies)
Sun 26/11	Work on the Draft Report / Debriefing Note
Mon 27/11	Meeting FAO (9:00)
Tue 28/11	Work on the Draft Report / Debriefing Note
Wed 29/11	Debriefing EC Delegation (11:30)
Thur 30/11	Workshop preparation (handouts)
Fri 1/12	Workshop
Sat 2/12	Finalisation of Draft Report
Sun 3/12	Finalisation of Draft Report
Mon 4/12	Travel back to country of residence
Tue 5/12	Travel back to country of residence

8.3 List of persons/organisations consulted

Name	Organisation	Function	Contact details
KROSIGK von, Lydia	Delegation EC	Programme Officer Rural Development	Tel: 0612026234 or 081 1293965 e-mail: lydia.von-krosigk@ec.europe.eu
ENGEL, Albert	GTZ	Responsible focal area 'Natural Resources and Rural Development'	Tel: 061222447 e-mail: albert.engel@gtz.de
BROUCKE, Guy	NPC/RPRP	Environmental cross-cutting Expert	Tel: 061226501 or 0812187580 e-mail: gbroucke@npc.gov.na
AMAKALI, Maria	MAWF, Dep. Of Water Affairs	Chief Hydrologist	Tel: 0612087212 e-mail: Amakalim@mawrd.gov.na
SKYER, Patricia	USAID	Senior CBNRM Advisor	Tel: 061273700 or 081 1272031 e-mail: psyker@usaidgov
CONTIS, Laurent	MRLGHRD	Senior Technical Adviser	Tel: 0612975290 or 0812332921 e-mail: lcontis@mrlgh.gov.na
JOUVE, Marcel	French Embassy	Counsellor for Co-operation and Cultural Affairs	Tel: 061276742 e-mail: marcel.jouve@diplomatie.gouv.fr
MWANDINGI, Martha	UNDP	National Programme Officer, Environment Unit	Tel: 0612046111 or 0812455826 e-mail: martha.mwandingi@undp.org
BROWN, Chris	NNF	Executive Director	Tel: 061248345 e-mail: cb@nnf.org.na
FITTER, Jörn	GTZ	Advisor NRM and Rural Development (DEA)	Tel: 0612842709 e-mail: fitter@iafrica.com.na
ERASTUS, Anna	MFMR	Director Policy Planning and Economics	Tel: 0612053121 or 081 1420394 e-mail: anerastus@mfmr.gov.na
UULENGA, Aina	MFMR	Deputy Director PPE	Tel: 0612053129 or 081 1240535 e-mail: auulenga@mfmr.gov.na
IILENDE, Titus	MFMR	Deputy Director Resource Management	Tel: 0612053071 e-mail: tiilende@mfmr.gov.na
PICKARDT, Tanja	GTZ	Associate expert Natural Resources and Rural Development	Tel: 061222447 or 081 1421700 e-mail: tanja.pickardt@gtz.de
HARRIS, Braam	City of Windhoek	Dep. of Planning, Urbanisation and Environment	Tel: 0612902377 e-mail: ach@windhoekcc.org.na
KAPERRE, Maria	MET	Under Secretary	Tel: 0612842186

		Dep. of Environment and Tourism	e-mail: mkapere@met.gov.na
HAMUNYELA, Sarah	MTI	Ozone layer Unit	Tel: 0612837278 e-mail: hamunyela@mti.gov.na
RIDGWAY, Richard	MLR	Land Reform Technical Adviser	Tel: 0612965325 or 0813003006 e-mail: ridway@iway.na
HAILWA, Joseph	MAWF	Director of Dep. Forestry	Tel: 0612087663
NAMBUNDINGA, Beata	MAWF	Div. of Agricultural Planning, Deputy Director	Tel: 0612087678 or 0811296101 e-mail: ambunungai@mawrd.gov.na
HAGER, Claus	NAU		Tel: 061237838 e-mail: claus@agrinamibia.com.na
SEELY, Mary	DRFN	Director	Tel: 061377500 e-mail:
SIKABONGO, Freddy	MET/DEA	Head of Unit EIA and pollution control	Tel. 0612842111 or 0812930537 e-mail: freddy_sikabongo@yahoo.co.uk
AMUNGHETE, Mathews	MME, Dep. Mining	Chief Inspector of Mines	Tel: 0612848254 or 0812535665 e-mail: mamumghete@mme.gov.na
HAMUTWE, Shimweefeleni	MME, Dep. Energy	Energy Technical Advisor	Tel: 0612848169 or 0811244192 e-mail: ghamutwe@mme.gov.na
KAMWI, Esther	MAWF, Dep. Forestry	Deputy Director	Tel: 0612087327 or 0811294577 e-mail: KamwiE@mawrd.gov.na
MOKATI, Moeketsi	FAO	Country Representative	Tel: 0612046111 e-mail: fao-na@fao.org
COETZEE, Desmond	Jumbo Charcoal	Factory Manager Okahandja	Tel: 062503838 or 0812486942 e-mail: jumboch@iway.na
XAWEB, Eric	Tsiseb Conservancy	Coordinator	e-mail: tsiseb@iway.na
!OEAMSEB, Tertius	Brandberg Monument	Chief Tourist Guide	
KIHLBERG, Madeleine	EC, DGD ACP	Desk Officer for Botswana, Namibia	Tel: 0032-22964833 e-mail: Madeleine.kihlberg@ec.europa.eu
MORETTINI, Macro	EC, DGD ACP	Administrator	Tel: 0032-22990384 e-mail: marco.morettini@ec.europa.eu
VAN UYTVANCK, Marc	Delegation EC	Attached Rural Development	Tel: 0612026000 e-mail: marc.van-uytvanck@ec.europa.eu

8.4 List of documentation consulted

Year	Author	Title
2006	GTZ	Biodiversity Knowledge Management: 1994 – 2005, some lessons learnt
2006	Insight Namibia	Mining in Namibia – past performance, future prospects
2006	OECD	2003, Energy Balances for Namibia
2006	MAWF	Directorate of Forestry – Annual Report 2005 – 2006
2006	MET / DEA	Promoting environmentally sound decision-making of communal land boards
2006	MME	Annual Report 2005/6
2006	NNF	Good Practices Handbook – eco awards Namibia -
2006	NPC	Guidelines for the preparation of the 3 rd NDP. (draft)
2006	NPC	Mid Term Review – Agriculture chapter
2006	UNDP/GEF	Full Project – Strengthening the Protected Area Network (SPAN).
2006	Travel news	Travel news Namibia – Etosha 100, 1907 - 2007
2006	UNDP/GEF	Project executive summary: Barriers removal to Namibian renewable energy programme (NAMREP)
2005	UNDP	Human Development Report 2005
2005	CMI	Local governance, urban poverty and service delivery in Namibia.
2005	EC	Joint Annual Report 2005
2005	FAO	Aqua stat survey – Irrigation in Africa
2005	FJELDSTAD O. D.	Local Governance, urban poverty and service delivery in Namibia
2005	GTZ/MLRR	Security on tenure for urban areas in Namibia
2005	HOPWOOD G.	Regional Councils and Decentralisation
2005	NEPETI, Nicanor	The Namibian environment and natural resource sector. An overview. (draft)
2005	NPC	Civic Organisations Partnership Policy
2005	NPC	Development cooperation policy guidelines and procedures for Namibia (draft)
2005	MAWF	Agricultural statistics bulletin
2005	MAWF	Basin Management Approach – a guidebook-
2005	MENDELSON J.	Forests and woodlands of Namibia.
2005	MET / DEA	Cleaner Production Strategy and Context Analysis, vol. I: Implementation strategy, vol.2: Development context and sector profiles
2005	MFMR	Annual Report 2005
2005	MLRR	Background research work and findings of the Permanent Technical Team
2005	MLR	Strategic options and action plan for land reform in Namibia
2005	MOBBS P.M.	The mineral industry of Namibia
2005	SANBI	Assessment of potential climate change impacts on Namibia's floristic diversity, ecosystem structure and function
2005	UNDP/GEF	Namibia's National Capacity Self Assessment (NCSA) for global environment management. Final NCSA Report
2004	De KLERK J.N.	Bush encroachment in Namibia
2004	IAK AGRAR	Rural Development and Poverty Reduction Programme – Final Report -

2004	MAWRD	10 years – Directorate of rural water supply 1993 - 2003
2004	MFMR	Toward responsible development and management of the marine resources sector.
2004	NAESJE F.	Fish populations, gill net catches and gill net selectivity in the Kwando River
2004	NPC	Namibia 2004. Millenium Development Goals
2004	TURPIE J.	Economic analysis and feasibility study for financing Namibia's protected areas
2004	UNDP/GEF	Country Pilot Partnership (CPP) for Integrated Sustainable Land Management (ISLM)
2003	EC/FAO	Experience of implementing National Forestry Programmes in Gabon, Namibia, Nigeria, Senegal and Sudan
2003	EC/FAO	Synthesis report. Experience of implementing national forestry programmes in Gabon, Namibia, Nigeria, Senegal and Sudan
2003	FAO	Earth Trends Country Profile – Coastal and Marine Ecosystems - Namibia
2003	MENDELSON J.	Atlas of Namibia – A Portrait of the Land and its people
2003	MET	Environmental and Social Assessment (vol1), ICEMA, Final Report
2003	NPC	2001 Population and Housing Census – National Report, Basis Analysis with Highlights
2003	TARR P., TARR J.	Environmental Impact Assessment in Southern Africa –Namibia-
2002	FAO	Country Pasture/Forage Profiles. Namibia
2002	EC	Joint Annual Report 2002
2002	MET	Namibia's second national report of the implementation of the UN Convention to combat desertification
2002	NPC	Mid-Term review NDP 2, Agriculture chapter.
2001	EC	Namibia –Country Strategy Paper and Indicative Programme for the Period 2002 – 2007
2001	EURATA	Rural Profile and Strategic Framework for Namibia – Orientations -
2001	FAO	State of the world's forests
2001	KRUGER, AS	Coping in a fragile environment, the SARDEP experience
2001	MET	State of Environment Report, 7 thematic volumes 1998 – 2001
2000	FAO	Country pasture / Forage Resource Profiles
2000	KOJWANG H.O.	Forest Outlook Studies in Africa (FOSA)
2000	MAWRD	Socio-Economics and Financial Issues: Theme Report
1998	BARNARD, P.	Biological diversity in Namibia
1997	NDTF	Towards a drought policy for Namibia
1996	NAPCOD	Policy factors and desertification – Analysis and proposals

8.5 Curricula vitae of the consultants

CURRICULUM VITAE – International Expert Category I – Team Leader – Birgit Halle

Born: 30th December 1963 in Unna (Germany), German, single

Education (1983 -1989):

Study of Geography at the University of Cologne (Germany), title 'Master of Geography'

Further trainings:

Conflict – management, Organisational development in technical cooperation, Local dynamic and development planning; local planning and NRM, System management: network thinking and strategic acting in development co-operation, Planning of national - and sector programs, Methods of project – and program planning ZOPP and PRA, Impact – monitoring in technical cooperation

Key qualifications:

Natural resource management, desertification, tropical forest, ecology, rural development, land use planning, feasibility and evaluation studies, participatory approaches, gender, civil society integration, organisational development, training programs

Professional experience record:

Since 4/2002: Independent consultant:

- Short term missions:

- 2006, Namibia, for European Commission: Country Environmental Profile of Namibia, Team Leader.
- 2006, Malawi, for European Commission: Country Environmental Profile of Malawi, Team Leader.
- 2006, Côte d'Ivoire, for European Commission: Country Environmental Profile of Côte d'Ivoire, Team Leader.
- 2006, Mali, for European Commission: Country Environmental Profile of Mali, Team Leader.
- 2005, Guinea, for European Commission: Final evaluation program AGIR, regional program of integrated management of natural resources.
- 2004 for European Commission in Brussels : Member of the external evaluator group: Evaluation of EC environment proposals (call for proposals Reference EuropeAid/117490/C/G/Multi)
- 2004, RD Congo : Household survey (for IFESH/CARE/IRC): Demobilisation and Community- based Reintegration of Former Child Soldiers in Eastern DR Congo, Team Leader
- 2003, Cameroon, for European Commission: Mid-term evaluation of the Project: Protection and rehabilitation of forests in the Noun Department.

1/1996 - 3/2002: Long term overseas Expert for GTZ (German Technical Cooperation) in following countries:

- 7/1999 – 3/2002 (Cameroon): Project: Protection of natural forests in S-E Cameroon. Responsible for self – help activities, negotiation and communication with the local population, minority problems
- 6/1997 – 6/1999 (Rep. Central Africa): Project: Development of basic – organisations in Ouham – Pende. Responsible for the development of basic self – help organisations.
- 1/1996 – 5/1997 (Zaire/DRC): Project: Rural development Kabare, Zaire. Responsible for self – help, development of basic – organisations, women promotion, gender, alphabetisation and energy saving stoves

Internal short term missions during GTZ contract:

- 2000, RCA: Follow up strategy of the project 'Development of basic – organisations in Ouham – Pende'
- 1999, Cameroon: Internal evaluation of the social-economic activities of the project 'Protection of natural forests in South – East Cameroon'
- 1998, Rwanda: Delimitation of the modified Akagera National Park (secondary marks)
- 1998, Bukavu (DRC): Evaluation of the project activities since 10/96 and elaboration of propositions for the continuation of the project 'rural development Kabare'
- 1997, Congo Brazzaville: Elaboration of the conception to integrate the local population in the buffer zone management in North Congo (project: Protection of ecosystems, PROECO)
- 1997, Zaire (DRC): Feasibility study of the project 'Co-operation with NGOs in Zaire'
- 1996, Zaire (DRC): Mid term review : Project 'Promotion of coffee production, Mahagi'

10/1991 - 4/1994 (Mali): Volunteer DED (German Volunteer Service)

Project Leader: PAE (Projet Agro-Ecologie) in Kita: combating erosion/desertification, energy saving stoves, land use planning, agro-forestry

3/1989 – 9/1991 and 5/1994 – 12/1995: Independent Consultant and Trainer:

- Trainer: Preparation courses for overseas experts, country knowledge for Namibia and Mali (monthly) (DSE, Germany)
- Environment Impact Assessments (waste water treatment stations and other construction projects), Germany
- Scientific assistant consulting GEOPLAN: contribution to studies on ACP countries

Other regional experiences:

Namibia: scientific research on geo-ecology/desertification and actualisation of country documentation for DSE (1986, 1987, 1988, 1990, 1995)

CURRICULUM VITAE – International Expert Catégorie II – Environmentalist – Véronique Bruzon

Date of birth: 04th July 1957 in Fontenay le Comte (France), French, Married

Education (1984 -1990)

1990: Doctorate level on environmental management and dynamics: 'The savannahs of the North Ivory Coast: mesology and dynamics – grass, fire and pasture - '

1984: Master level on structure and environmental dynamics: 'The Guinea savannahs, mesologic and human influence determinisms in Ivory Coast'.

Membership of professional bodies

- External lecturer on ecology and agropastoralism, for the University of Paris XII. DESS "Ecology and pastoralism in tropical areas" (01-02/03, 11/03, 10-11/04). MASTER2 "Bio resources in Mediterranean and Tropical areas (11-12/05). Supervisor and jury's member (08-09/03, 08-09/04, 08-09/05, 09/06).
- External lecturer for a French engineering school – ISTOM, Cergy Pontoise in agropastoralism (from 1996 to 2003), zootechnic (from 96 to 2000) and animal physiology (from 97 to 99), Supervisor and jury's member (from 96 to 2003).

Key qualifications

- Environment: environmental policies, vegetal and animal biodiversity review, soil potentialities and land degradation analysis, Country Environmental Profile (CEP), Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), soil and water conservation, waste management, sanitation.
- Rural development: Agro pastoral, pastoral -agro forestry, fodder and feed production, seed production and by-products utilisation-, Integrated Rural development projects. Integrated farming: strategy, organisation, extension workshops, farmer training, use of agricultural by-products, intensive pasture areas.
- Participatory approaches, gender issues, applied research, extension and dissemination
- Thorough knowledge of current international policies, legislative and institutional framework on the environment. Organisation of workshops.
- Training / Teaching in environment, livestock production systems, prevention of land degradation, development of additional by-products. Conception, setting up, management and monitoring of integrated rural development programme (environment, production, marketing, infrastructures, farmer associations).
- Planning, monitoring, economic evaluation and study of all livestock development schemes.

Professional experience record

- 2006, Namibia, for European Commission: Country Environmental Profile of Namibia.
- 2006, Ivory Coast, for European Commission: Country Environmental Profile of Ivory Coast.
- 2006, Chad, for European Commission: Country Environmental Profile of Chad.
- 2005, Niger, for European Commission: Final support to Rural Development Strategy (action plans of the programmes).
- 2004, Mali, for European Commission: Support to local development of the communes (Menaka, Anderamboukane), TL.
- 2000 - 2002, Eritrea, for ADB: National Livestock Development Project. Team Leader of the Range Management and Pastoral Hydraulic component.
- 2000, Mali, for Netherlands Cooperation - SNV: Land cover mapping in the 8th area and recommendations for agriculture, TL.
- 2000, Tunisia, Tunisian funds: Identification of agro pastoral and environmental indicators for a GIS.
- 1999, 1998, Turkmenistan, for EC/TACIS: Support to Pilot Project on improvement of livestock. Senior range management.
- 1996, 1997, 1998, Mali, OPEP funds: Support to Development Project of Western Sahel (PRODESO), TL.
- 1997, 1998, Mali, for European Commission: Hydrological analysis, review of agriculture development in 6th, 7th, 8th areas, TL.
- 1997, Tunisia, WB/FAO TCIE: Second Forestry Development Project – PDF2 - , Mid – Term Review.
- 1997, Burundi, ADB: National plan of livestock, Appraisal mission (feeding and pasture development).
- 1997, Chad, for European Commission: Support to the Ecological component of the National Park of Zakouma, TL.
- 1996, Senegal, IFAD: Regional Development in the area of Louga, Appraisal mission, TL.
- 1996, Tunisia, WB/FAO TCIE : Natural Resource Management Project (PGRN), Appraisal mission.
- 1994, 1995, 1996, Tunisia, WB – Regional Study on rangeland development in arid and semi arid area (evaluation).
- 1995, Burkina Faso, EC : Sectional Programme to support Livestock (PSAE), Support to setting up fodder bank, TL.
- 1990 - 1993, Central African Republic, for European Commission: National Agency for Livestock Development (ANDE), Team Leader of the Range Management and Fodder Component.
- 1988 - 1990, Central African Republic, for European Commission: Project of Development of North Area (PDRN), including rural areas and national parks (Manovo-Gounda-Saint Floris, Bamingui-Bangoran), Ecologist.
- 1984 - 1987, Ivory Coast, French National Scientific Research (CNRS) / Society for Animal production (SODEPRA), Ecologist and Range Management Researcher.

8.6 Terms of Reference for the Country Environmental Profile

TERMS OF REFERENCE FOR THE PREPARATION OF THE COUNTRY ENVIRONMENTAL PROFILE (CEP) OF NAMIBIA

1. Background

1.1 Political and economic context

Namibia gained independence in 1990 and is classified as a lower middle-income country with an annual average per capita income of approximately US\$1800. However, the economic growth has slowed down; since independence, the economy has annually grown just over 1% per capita. Unemployment has risen steadily. The economy is small-scale and highly dependent on regional trade. Trading relations with the EU and other international partners are slowly growing. The country's export earnings continue to be largely dependent on the mining sector.

In terms of human development, national performance is considerably weaker than in terms of GDP. The HDI has decreased by 10% since 1995. Poverty is growing, particularly in rural areas and in formal and informal urban settlements. HIV/AIDS is a major concern, resulting in a life expectancy that has dropped from over 60 to less than 50 since 1990.

Long-term Government development planning is guided by Vision 2030. Medium-term planning is done through 5-year National Development Plans (NDP). In addition, specific targets and responses are identified from the MDGs, such as the National Poverty Reduction Action Plan (NPRAP).

1.2 Environment and natural resources

Namibia has a semi-arid to arid climate. More than 70% of the population depends on small-scale agriculture for its livelihood. This is a direct factor contributing to rural poverty when seen combined with the scarcity and unpredictability of rainfall; population pressure and low fertility of the soil. Less than 5% of the land is considered suitable for arable agriculture. Pressure on water resources is rapidly increasing, with the only perennial rivers shared with neighbouring countries and groundwater reserves either fully committed or overexploited. Land degradation is a major concern and is attributed to overgrazing, clearing and inappropriate land management practices, as well as the lack of tenure and inequitable access to land. This situation is of concern in the more densely populated communal land, which makes up around 40% of the of the country but also on freehold land which covers about 50% of the surface area.

More than 60% of the country is covered by savanna range types; only about 20% -in the north and north-east- by dry woodland. Bush encroachment is a highly visible form of land degradation and a step towards desertification in nearly one-third of the country, severely affecting productivity and biodiversity.

The Initial National Communication to the UNFCCC indicates that while Namibia is most likely a net sink for greenhouse gases; it is highly vulnerable to Climate Change and desertification. In this context biodiversity is also under severe pressure. The main Climate Change scenarios predict less and more erratic rainfall.

From its independence, Namibia included environment in the Constitution and on the political agenda. Namibia is a signatory to the Rio Declaration on Environment and Sustainable Development; and the resulting international environmental Conventions: the UNFCCC; UNCBD and UNCCD. Under these conventions, significant initiatives have been undertaken, mostly 'upstream', such as the National Biodiversity Programme (NBP); National Capacity for Self-Assessment for Global Environmental Management (i.e. implementation of the Conventions) (NCSA); Environmental Monitoring & Indicators Network (EMIN); National Integrated State of the Environment (ISoER); Namibia's Programme to Combat Desertification (NAPCOD) and the National Climate Change Programme. Significant bilateral and multilateral funding for these and other environmental programmes has been secured, making Namibia one of the highest recipients of environmental funding per capita.

In a country highly dependent on its natural resource base, it is not surprising that Vision 2030 dedicates an entire chapter to the need for a "Sustainable Resource Base". Recommended strategies include the need to shift water consumption to higher value uses such as tourism, service sectors and high value crops; efficient water pricing and focus on demand management rather than supply; equitable access to land and appropriate tenure of natural resources; promoting diversification away from the agricultural sector towards secondary and tertiary activities such as manufacturing and tourism; promoting rapid destocking and marketing of livestock; rehabilitation of forest and vegetation cover in deforested catchment areas and on ephemeral river systems; extending conservancies, improve and accelerate income-generation on conservancies and develop other sustainable tourism options; add value to marine products; adopt an integrated coastal zone management plan; address urban environmental issues such as pollution and waste management.

The State of the Environment Reporting, supported by the Government of Finland, has produced 7 (draft) reports between 1998 and 2002: (1) fresh water resources; (2) the socio-economic environment; (3) transport, energy and mining; (4) marine fisheries and coastal resources; (5) bio-diversity, parks and tourism; (6) agriculture and rangeland resources; and (7) laws, regulations and institutional framework. The issues raised were (1) Desertification; (2) Decline of water availability; (3) Depletion of natural resources; (4) Loss of biodiversity; (5) Decline of water quality; (6) Pollution and toxins; (7) Waste; (8) Greenhouse effect; (9) Ozone depletion; (10) Socio-economic; (11) Economic. Resultant from this, 43 national indicators were agreed.

The policy environment is developing at a slow but reasonable pace compared to regional standards.

The Environmental Assessment Policy was approved in 1995 and is of high international standard, taking a broad view of "environment" as social, cultural, economic and natural environment; as well as recommending "assessment" not only at Project level through Environmental Impact Assessments (EIA) but also at Policy level through Strategic Environmental Assessments (SEA). Policy implementation varies, due to limited capacity for monitoring by the mandated Ministry (MET); limited awareness in other public institutions and the absence of legislation. The Environmental Management Act has been ready

in draft form since 1998 but has yet to be passed by Parliament; despite the fact that it is one of the key environmental management actions identified in Vision 2030 and successive NDPs. Practically this means that many major projects and virtually all policies, plans and programmes are undertaken without EIA or SEA. The Pollution and Waste Management Act; Park and Wildlife Management Act and Biosafety Acts are equally still in draft form.

In addition, Vision 2030 points out policy conflicts such as the planned irrigation without mitigative strategies to address soil salinisation, pesticide run-off and fertiliser control; and livestock expansion within a consensus that this is impossible without increasing land degradation. Additional contradictions between sectoral policies or lack of intersectoral awareness exists regarding policies on renewable energy and energy-efficiency; water, sanitation and waste management.

1.2 EC cooperation experience on environment in Namibia

The main focus of EC cooperation with Namibia has been Rural Development and Education; through support to selected relevant sectors, in a complementary manner to other donor support.

Namibia has benefited from a National Indicative Programme under the 7th, 8th and 9th EDF. Focal areas under EDF7 were Agriculture, Health and Education; and under EDF8 Education; Agriculture and Rural Development; Productive Sectors (tourism + trade and investment). In addition assistance was provided under Sysmin. Under EDF9, focal areas were Rural Development, Education and Capacity Building.

In addition to the support administered by the EC, other EU support administered by the EIB went largely to infrastructure and private sector loans.

Environment has therefore not been a focal area in EC-Namibia cooperation. It is addressed as one of the cross-cutting issues (with gender and HIV/AIDS) required for sustainable development, as required by the EC-ACP 'Cotonou' Agreement. Under Rural Development, actions are required to mainstream these principles towards sustainable development. As such, the 2002-2007 EC country strategy acknowledges the "low fertility of the soil" and "scarcity and unpredictability of the rainfall" resulting in the "limited potential and absorption capacity of agriculture", "aggravated by overgrazing, pressure on land due to the population growth"; and therefore puts emphasis on the need to target "development and diversification away from the agricultural sector towards other areas". This falls under the general principle that "sustainable use of natural resources offers one of the major ways to diversify economic activity."

This CEP will be the first undertaken for Namibia and will be part of the preparations for the third Country Strategy Paper.

Programme components funded under EDF have followed national policy and practice for SEAs and EIAs. However, it is acknowledged that the Environmental Assessment Policy (1995) while being in line with international standards, has not been widely adopted by the various Line Ministries. Barriers to effective implementation include the absence of legislation -the Environmental Management Act has been ready in draft form since 1998- and the limited capacity of the MET/EIA unit to implement the EA Policy. It is expected that there will be opportunities for the EC and its implementing partners to improve

mainstreaming environmental concerns in its programmes in Namibia. Additional opportunities may lie in the fact that Namibia has not yet been able to secure dedicated natural resources funding under the EDF financing mechanisms, such as the EC Water Facility.

1.3 EC timetable for CSP.

The CSP is currently being developed.

2. Objective

The main objective of the Country Environmental Profile is to identify and assess environmental issues to be considered during the preparation of the Country Strategy Paper, which will directly or indirectly influence EC co-operation activities.

The Country Environmental Profile will provide decision-makers in Namibia and in the European Commission with clear information on the key environmental challenges, the current policy, legislative and institutional framework and the strategies and programmes (including those of the EC and other donors) designed to address them.

This information will ensure that the EC co-operation strategies systematically integrate environmental considerations into the selection of focal sectors and co-operation objectives/strategies, and also establish the necessary environment safeguards for all co-operation activities undertaken in Namibia.

The Profile will establish the key linkages between the environment and poverty reduction. It will constitute an important source of baseline information and contribute to focusing political dialogue and co-operation with Namibia on key areas of concern including sustainable development as well as raising awareness among policy-makers.

3. Results

The profile will deliver the following results:

- An assessment of the state of the environment and key environmental factors and trends influencing the Namibia's development and stability.
- An assessment of national environmental policy and legislation, institutional structures and capacity, and the involvement of civil society in environmental issues.
- An assessment of the integration of environmental concerns in development policy and sectors with key linkages with environmental issues.
- An overview of past and ongoing international (including EC) co-operation in the environment sector.
- Recommendations and, as far as possible, guidelines or criteria for mainstreaming environmental concerns in co-operation areas. These recommendations should support the preparation of the Country Strategy Paper/National Indicative Programme and include guidelines or criteria to be used for environmental mainstreaming in subsequent phases of the cycle of operations.

4. Issues to be assessed

The following issues should be assessed:

4.1. The state of the environment

This Chapter should identify the state and trends of key environmental resources or components in the country, including (as relevant), but not limited to:

Themes	Aspects
Mineral resources and geology	Mineral resources Geological risks (seismic, volcanic and related risks)
Land	Soil erosion and degradation Desertification Land use, arable land, losses due to urbanisation or infrastructure building Land rights Resettlement
Water	Water regime Ground water Water quality
Air and climate	Air quality Potential climate changes and vulnerability
Forest, vegetation, ecosystems	Forest cover and volume Pastureland State of particular ecosystems (savannas, mangroves, coral reefs...)
Biodiversity, wildlife	Local status of globally threatened species/habitats Alien invasive species Fish stocks Species with special value
Landscape	Aesthetic and cultural value of landscape
Living conditions in human settlements	Air and water quality Sanitation Slums Health Vulnerability to disasters

Pressures explaining the main negative trends should be identified, as well as pressures contributing to global environmental problems, using the following Table as a guiding checklist.

Themes	Possible aspects to consider
Mining, extraction of hydrocarbons	Extraction, treatment and transport of minerals and hydrocarbons
Water use and management	Water extraction (surface- and ground-water) Waste water discharges

	Water use
Land management	Land use planning
Forest exploitation, hunting, fisheries, biodiversity	Forest extraction Forest and fisheries management practices Hunting and fishing activities, poaching Use of NTFP (non-timber forest products) Fires Introduction of alien species
Livestock raising	Overgrazing Rangeland management, use of fire, water management
Agriculture	Extension of agricultural land Shifting cultivation Intensification Irrigation and water use Pest control Agricultural practices
Energy production and use	Sources of energy Energy consumption Energy efficiency
Urbanisation, infrastructure and industry	Urban growth and sprawl, urban planning, dams, roads, major infrastructure, polluting industries, tourism
Waste disposal and management	Waste production Waste management Public behaviour and practices, existing systems, hazardous waste management
Atmospheric emissions	Emissions of greenhouse gases and ozone-depleting substances Air pollutants affecting local or regional air quality (point-source and non-point source emissions)
Culture and heritage	Impacts of tourism and development, natural and cultural heritage protection
Socio-economic issues	Population, employment, income, social safety nets

As far as possible the driving forces influencing these pressures should be identified, such as economic incentives, demographic pressure, access rights to natural resources and land tenure systems.

Environmental trends should be assessed with regard to their social and economic impact, including:

- Declines in economic production or productivity (e.g. agriculture, forestry, fisheries);
- Threats to human health;
- Human exposure to environmental disasters (e.g. floods, drought);
- Conflicts and security;
- Impact on poverty and on vulnerable groups (including women, children and indigenous peoples);
- Sustainability of resource use;

- Cultural values.

This Chapter should lead to the identification of problems, described in terms of situations or trends that are undesirable due to their current socioeconomic consequences (e.g. falling productivity, health problems, natural risks, social crises, conflicts), their future consequences (e.g. decline in natural resources, cumulative pollution) or their contribution to global environmental problems.

If appropriate the consultant could refer to appropriate environmental indicators in order to establish a consistent basis both for comparisons among countries and for monitoring changes in the studied country. Attention should be paid to the MDG 7¹ indicators, and specific indicators related to the particular environmental issues of the country.

If appropriate, the information could be organised according to eco-geographical subdivisions with the scale (regional, national, local) of the issues indicated.

4.2. Environmental policy, legislation and institutions

A brief description and review should be provided of the strengths and weaknesses of the following aspects, with their associated evaluation criteria given for guidance:

Aspect	Evaluation criteria
Policies	<p>Existence of national policies, strategies and action plans for the environment; including possible National Strategy for Sustainable Development (NSSD) and National Environmental Action Plans (NEAP). Overall policy goals; specific policy objectives and key guiding principles.</p> <p>Policy response to global issues, sustainability issues (depletion of natural resources), and specific environmental issues identified above; including monitoring, evaluation and policy review.</p> <p>Consistency between policies.</p> <p>Environmental integration in sectoral and macro-economic policies and existence of SEA of policies or strategies (especially the PRSP if relevant).</p> <p>Important measures taken by the Government to solve environmental concerns.</p> <p>Effectiveness in achieving targets.</p>
Regulatory framework, including EIA and SEA legislation	<p>Ratification status and implementation of MEAs (Multilateral Environment Agreements) such as those concerning climate change, biodiversity and desertification.</p> <p>Adequacy of (current and in preparation) environmental legislation (including land tenure and land reform, access rights to natural resources, management of natural resources, requirements for environmental assessment such as for EIA and SEA, pollution control, development control).</p>

¹ See <http://www.undp.org/mdg/>

	<p>Provision and procedures for public participation in environmental issues.</p> <p>Effectiveness of legislation enforcement.</p> <p>Use of other (non legislative) instruments, e.g. "green budgeting" (or Environmental Fiscal Reform) and market-based mechanisms, voluntary schemes (environmental management systems, environmental labelling, industry-government agreements).</p> <p>Potential impact of non-environmental legislation.</p>
Institutions with environmental responsibilities	<p>Identity, number and quality of institutions (involved in policy making, legislation, planning, environmental protection, monitoring and enforcement).</p> <p>Level of co-ordination and decentralisation.</p> <p>Strength and capacity of individual institutions.</p> <p>Influence on other institutions.</p> <p>Good governance practices.</p> <p>Capabilities, means, functioning of environmental services.</p> <p>Major NGOs, institutes or other organisations involved in environmental management or policy.</p>
Public participation	<p>Transparency and access to environmental information.</p> <p>Role of NGOs and civil society in environmental decision-making.</p> <p>Effective participation.</p> <p>Access to justice in environmental matters.</p>
Environmental services and infrastructures	<p>Protected Areas: number, areas, relevance, and effectiveness.</p> <p>Sanitation and waste treatment infrastructure.</p> <p>Disaster prevention systems.</p> <p>Emergency response mechanisms.</p>
Environmental monitoring system	<p>Relevance of selected indicators (with reference to MDG7).</p> <p>Measurement of the indicators: periodicity, liability.</p> <p>Integration in the general development indicators.</p>

The analysis should both identify potential institutional/policy/regulatory causes of environmental pressures and the response by the government to solve the environmental problems.

4.3. Integration of environmental concerns into the main policies and sectors

The assessment should examine the integration of environmental concerns in the overall development policy and in sectors/areas that have key linkages with environmental issues and which might be identified for EC support, taking into account the focal areas of the current CSP. This section should examine whether there is a Strategic Environmental Assessment (or similar assessment) for the national development strategy or the Poverty Reduction Strategy and for the sectors. If an SEA exists, it should provide a brief description of it, including its main recommendations. The main legislation and institutional arrangements and measures of the sector which address environmental issues, especially those identified in section 4.1 should be examined.

4.4. EU co-operation with the Country from an environmental perspective

This section should review the past and current experience relating to development co-operation interventions with specific environmental objectives as well as the integration of environment into other co-operation areas, including the application of environmental integration procedures (preparation of SEA or EIA in EC funded programmes/projects). Where information is available the environmental impacts or potential risks of EU co-operation should be identified for the benefit of future programmes. The results of existing evaluations/reviews should be incorporated and lessons drawn for the future, within the context of Namibia's leading policy objectives, i.e. Vision 2030, the NPRAP and the MDGs. The implications for the environment of budgetary support or sector wide approaches should be reviewed if these have been applied. The review should cover both geographical and thematic programmes.

4.5. Co-operation funded by other donors from an environmental perspective

This section should review the past and current involvement of other donors and their experience in the Country, and include a list of recent and planned projects/programmes with an environmental focus or anticipated impact. Co-ordination mechanisms between donors and the EC with respect to the environment should be assessed.

5. Conclusions and recommendations

The key aspects of the state and trends of the environment in the Country, including policy/regulatory and institutional constraints and challenges, should be clearly stated. These may be presented in a matrix, crossing environmental concerns and the main sectors or policies.

Based on a comprehensive assessment of the available information and on consultations with stakeholders, recommendations should be made on how the Commission and the Government can better mainstream the environment into the next Country Strategy Paper, taking into account current CSP and any pre-identified options for the next one, including the anticipated focal sectors.

Recommendations should address (but not necessarily be limited to) the following:

(1) Recommendations concerning the selection of the focal sectors and response strategies, based on environmental considerations. These recommendations should show how best to address the main environmental challenges identified by the CEP. This might be done by selecting environment as a focal area and/or, more frequently, through environmental safeguards in other areas. These may include, for example, proposals for institutional strengthening and capacity building (including the enhancement of the regulatory framework and enforcement capacities) or recommendations for initiating an appropriate Strategic Environmental Assessment (SEA) process.

(2) Recommendations on the use of EC horizontal budget lines (such as Environment and Forests) and facilities (EU Water Facility - EUWF and the EU Energy Facility - EUWF).

(3) Opportunities for co-ordination on environmental issues with other donors, seeking to achieve complementarities and synergies in order to more effectively deliver development objectives.

(4) Proposals for environmentally-relevant indicators to be used in the NIP (National Indicative Programme) or to be considered during the formulation of a GBS or SPSP (if relevant).

Individual recommendations should be clearly articulated and linked to the problems to be solved and grouped according to the sector concerned or institutional stakeholder. The relative priority of the recommendations and an indication of the challenges to their implementation should be given.

Any constraints to preparing the profile resulting from limited information should be described.

6. Work plan

The work plan should include but not necessarily be limited to the following activities:

- Consultations with EC country desk officers and other relevant officials, EC Delegation, the national environmental authority and a selection of national and local authorities, key international donors, plus key national and international civil society actors operating in the environmental field.
- Review of key documents and reports, including NDP2 and (draft) NDP3; NPRAP and NPRAP environmental mainstreaming review; Vision 2030; the State of the Environment Reports (SoER); the National Capacity Self-Assessment for Global Environmental Management (NCSA); the current EC Country Strategy Papers; evaluation reports, existing Strategic Environmental Assessments (particularly those concerning potential focal sectors), EIA of EC funded projects; environmental literature, environmental policy and regulatory framework, legislation, regulations and enforcement relating to environmental issues, information on monitoring and environmental performance indicators..
- Field visits to sites of key environmental concern and (if possible) the organisation of a national workshop that national authorities, donors, experts and representatives of civil society should be invited to participate with the aim of clarifying and validating key environmental concerns.
- On the basis of the outline work plan and time schedule given in these Terms of Reference, a detailed work plan should be proposed.

7. Expertise required

The proposed mission shall be conducted by a team of two experts who should have the following profile:

- Expert level I with at least 10 years wide experience in environmental issues, including institutional aspects; international environmental policies and management; environmental assessment techniques and experience in rapidly assessing information and developing recommendations. He/she would be the team leader.
- Expert level II with 10 years experience and with an environment background complementary to the team leader.

In addition:

- Previous working experience in the Country is requested for at least one of the international team members. He/she has to have an in-depth knowledge of the environmental situation of the country;
- Experts should have an understanding of the EU environment and development policies;
- Experience in undertaking EU Country Environmental Profiles is required;
- Familiarity with Commission guidance on programming, country strategies, PCM, policy mix and integration of environmental issues into other policy areas is desirable;

- Experience of participatory planning processes would be an advantage;
- A team composition bringing in both gender perspectives will be an added advantage.

English will be the working language and language of the final report.

8. Reporting

The results of the study should be presented in the Country Environmental Profile in the format given in section 10 of these ToR. The draft profile, in 5 hard copies and electronic version (CD-ROM; Microsoft Word), should be presented to the EC Delegation by 15/12/2006 at the latest. Within 5 weeks, comments on the draft report will be received from the EC. The consultants will take account of these comments in preparing the final report (maximum 40 pages excluding appendices). The final report in English (5 hard copies and electronic version – MS-Word) is to be submitted by 2/2/2007.

9. Time schedule

	Expert I	Expert II
Desk analysis (start 6/11/06)	3	3
Field phase (including travel)	20	20
Draft report writing (draft submitted before 15/12/06)	2	2
Debriefing (incl. possible workshop)	1	1
Final report writing	2	2
Total days	28	28

10. Report format for a Country Environmental Profile

Standard Report Format for a Country Environmental Profile.

Maximum length (excluding appendices): 40 pages.

The following text appears on the inside front cover of the report:

This report is financed by the European Commission and is presented by **[name of consultant]** for the National Planning Commission and the European Commission. It does not necessarily reflect the opinion of the National Planning Commission or the European Commission.

1. Summary

The summary should succinctly and clearly present the key issues described in the profile following the order of headings 2 to 5 given below. The Summary should not exceed 6 pages.

2. State of the environment

3. Environmental policy, legislative and institutional framework

3.1. Environmental policy and legislation

3.2. Environmental legislation and institutional framework

3.3. Integration of environmental concerns into the main sectors

4. EU and other donor co-operation with the Country from an environmental perspective

5. Conclusions and recommendations

6. Country Strategy Paper Environmental Annex Summary

Comprising the main issues presented in sections 2 to 4 above (excluding section 5) in not more than 4 pages.

7. Technical appendices

I. Environmental maps of the Country

II. Reference list of environmental policy documents, statements and action plans, and other relevant technical information.

8. Administrative appendices

I. Study methodology/work plan (1–2 pages)

II. Consultants' Itinerary (1–2 pages)

III. List of persons/organisations consulted with their affiliation and contact details (1–2 pages)

IV. List of documentation consulted (1–2 pages)

V. *Curricula vitae* of the consultants (1 page per person)

VI. Terms of Reference for the Country Environmental Profile

To be printed on the inside front cover of the report:

This report is financed by the European Commission and is presented by AETS (COWI Consortium) for the National Planning Commission and the European Commission. It does not necessarily reflect the opinion of the National Planning Commission or the European Commission.