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## Swaziland Country Environment Profile



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## ACRONYMS & ABBREVIATIONS

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AEZ	Agro-ecological Zoning
AIDS	Acquired Immunodeficiency Syndrome
CASP	Comprehensive Agricultural Sector Policy
CEP	Country Environment Profile
CSO	Central Statistical Office
CSP	Country Strategy Paper (of EC)
EC	European Commission
EDF	European Development Fund
EIA	Environment Impact Assessment
EU	European Union
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GEF	Global Environment Facility
GMO	Genetically Modified Organism
HIV	Human Immunodeficiency Virus
IFAD	International Fund for Agricultural Development
IUCN	International Union for the Conservation of Nature
JICA	Japan International Cooperation Agency
LUSIP	Lower Usuthu Smallholder Irrigation Project
MEA	Multilateral Environment Agreement
MDG	Millennium Development Goal
MEPD	Ministry of Economic Planning & Development
MHUD	Ministry of Housing & Urban Development
MNRE	Ministry of Natural Resources & Energy
MOAC	Ministry of Agriculture & Co-operatives
MPWT	Ministry of Public Works & Transport
MTEC	Ministry of Tourism, Environment & Communications
NAP	National Action Programme (of UNCCD)
NBSAP	National Biodiversity Strategy and Action Plan
NDS	National Development Strategy
NERCHA	National Emergency Response Council on HIV/AIDS
NGO	Non-Governmental Organisation
NPDP	National Physical Development Plan
NTFP	Non Timber Forest Product
PRSAP	Poverty Reduction Strategy and Action Plan
SADC	Southern African Development Community
SEA	Strategic Environmental Assessment
SEA	Swaziland Environment Authority
SEAP	Swaziland Environment Action Plan
SNL	Swazi Nation Land
SNTC	Swaziland National Trust Commission
TDL	Title Deed Land
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDAF	United Nations Development Assistance Framework
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UNISWA	University of Swaziland
WFP	World Food Programme

# 1 SUMMARY

## STATE OF THE ENVIRONMENT

### LAND AND WATER RESOURCES

#### ***Mineral resources***

The geology of Swaziland is complex and diverse and minerals of economic importance include asbestos, iron, gold, diamonds, coal, green chert and various others which have been mined in the past. Currently there are several viable mining options - in particular the national coal reserve is reported to be substantial -, development of which may lead to increased pressure on the environment through impacts on landscapes and ecosystems, waste accumulation, surface and ground water contamination, end of life site rehabilitation and environmental health.

#### ***Land resources***

The land resources of the country are well described and mapped. Swaziland has diverse and unique landscapes of high aesthetic and cultural value, which offer opportunities for tourism and improved management.

More than half of Swaziland is used for extensive grazing. Other major land uses are industrial forestry, commercial irrigated crop production and small-scale subsistence rainfed agriculture.

Land tenure has two main categories: communal land held in trust by the King, called Swazi National Land and private or Title Deed Land. Under the 2005 Constitution, all people have equal access and rights to land. However there is increasing pressure on land resources, driven by a growing population and the demand for more land, including land for irrigated agriculture, industrial forestry, livestock grazing, biodiversity conservation, urban development and related infrastructure.

Mechanisms of land allocation and administration are not adequate to appropriately deal with the physical development planning of the country. Land use planning in Swaziland is generally ad hoc and uncoordinated.

There are indications that less arable land is actively being cultivated as a result of the HIV/AIDS weakened labour force and recurrent droughts affecting the country and region as a whole.

Due to population pressure, livestock overstocking, overgrazing, veld burning and lack of sustainable natural resource management almost a third of the country and more than half of all communal grazing land has a serious or very serious erosion status.

Land degradation and soil erosion are recognised as very serious problems in Swaziland and a critical issue for continued sustainable social and economic development and poverty alleviation. The causes of the land degradation are poor agricultural land management - in particular range management - but also unsustainable management of forestry, mining, industry and road construction. Degradation takes place as chemical, biological and physical degradation.

Climate change is expected to have a further detrimental effect on land degradation through a reduction in vegetation cover and changes in species composition, as well as through increased deforestation, desertification and disaster hazards.

#### ***Water resources***

The water that Swaziland can utilise from its main river basins is limited by agreements with South Africa and Mozambique. Most rivers rise in South Africa and all flow eventually to Mozambique. The demand for water is strongly increasing as a result of expanding irrigation, industrial activities and residential use, and demand exceeds supply.

The groundwater resources of Swaziland have potential for exploitation, however these resources are not available in sufficient quantity to allow large scale abstraction, hence virtually all irrigation in Swaziland is based on surface water.

The Water Act of 2003 calls for improved catchment management by improved stakeholder participation and planning and decentralization of the management of the water resource. The Act also calls for the establishment of a National Water Authority, a Water Resources Master Plan and the establishment of River Basin Authorities.

Industrialization has led to gradual deterioration of the quality of water resources. Rivers are also affected by polluted drainage water from the irrigated sugar plantations and other cultivated land where fertilisers are inappropriately applied.

Climate change impacts on water resources will translate to increased possibilities of flooding in the rainy season due to higher flows and drought-related conditions in winter due to low flows. Effects of this will likely find its way into groundwater recharges, salinity and dam capacities.

### ***Climate and climate change***

The overall climatic characterization of Swaziland is subtropical with summer rains and distinct seasons. The various geographical zones show different climatic conditions, ranging from subhumid and temperate in the Highveld to semi-arid and warm in the Lowveld.

Climate change studies suggest that by 2050 temperatures and rainfall over southern Africa will be 2-4°C higher and 10-20% less than the 1961-90 baseline respectively. Current climatic zones are expected to shift and be replaced by drier and hotter climates.

Climate change will negatively impact on land degradation and ecosystems, and hence reduce productivity and livelihood possibilities, in particular in the Lowveld and Lubombo, unless adaptation measures to climate change are introduced.

## **ECOSYSTEMS AND BIOLOGICAL DIVERSITY**

### ***Ecosystems***

The four recognised ecosystems of Swaziland are montane grasslands, savanna-woodland mosaic, forests, and aquatic systems, with the savanna-woodland ecosystem dominant and best protected.

Swaziland is extremely rich in biodiversity, supports a diverse assemblage of habitats and contains a significant portion of southern Africa's plant and animal species. The eastern and western regions of Swaziland forms part of two recognised global biodiversity hotspots.

The status of biodiversity of the ecosystems of Swaziland is threatened by lack of protection and land conversions, which are projected to half the area of potential protection worthy ecosystems.

Climate change is a global threat to biodiversity and is expected to have a significant impact on ecosystems and ecosystem services in Swaziland. The country is projected to see the introduction of a tropical very dry forest type of ecosystem in the eastern part of the country replacing half of the current subtropical ecosystem.

Current deforestation and degradation of the natural forest and woodlands areas are caused by a complex of factors including population growth, pressure on land, land conversions, growing poverty, inequities in land tenure and access rights.

Lack of capacity to manage the indigenous forests has led to uncontrolled extraction of forest products such as timber, fruits, edible plants, fuel wood, wood for utensils and craft, medicinal plants. In the rural areas over 75% of the homesteads uses firewood for cooking and heating. Uncontrolled veld fires further contribute to forest degradation.

The rangelands of Swaziland - in particular the communal range - are in a strongly degraded state as a result of heavy pressure from large livestock numbers, overgrazing and poor management. Range degradation is further exacerbated by bush encroachment caused by a lack of browsing, which is found concentrated in the commercial TDL ranches.

### ***Biological diversity***

The local status of globally threatened species is that many species in Swaziland have declining populations, some of which have already gone extinct. Swaziland has produced two recent red data lists, indicating that large numbers of plants and vertebrates are threatened.

The decline in biological diversity is caused by loss of habitat, over-exploitation and invasive alien species. Habitat destruction is also the result of industrial forestry and large-scale irrigated agricultural expansion. It is expected that in the long term climate change and desertification will have a further impact on biodiversity.

The invasion of alien plant species is having a considerable degrading impact on the natural vegetation and ecosystems. It is occurring in such threatening form that it has been declared a national disaster.

Fish stocks of Swaziland have been determined by a fish biodiversity survey. A red data list was produced indicating that several species were found threatened. Pollution of the aquatic ecosystem by persistent pollutants continues to be a major threat to the aquatic biodiversity.

The UN Convention on Biological Diversity 2010 global targets of restoring and maintaining populations of declining species, and improving the status of threatened species are unlikely to be met in Swaziland.

The in-situ conservation through proclaimed nature reserves and game parks covers less than 4% of the country. This is far from the global IUCN target of conserving 10% of ecosystems and areas of importance for biodiversity within the country.

## LIVING CONDITIONS IN HUMAN SETTLEMENTS

### ***Socio-economic environment***

Swaziland's population of approximately 1.1 million is significantly affected by the high incidence of HIV/AIDS, high occurrence of poverty, high unemployment and income inequity. There is high vulnerability to food insecurity and livelihood decline problems in large parts of the country.

The social vulnerability is exacerbated by environmental vulnerability expressed by lack of access to clean water, poor sanitation, inadequate access to energy, degrading land and other factors.

The Government is responding to this situation with the Poverty Reduction Strategy and Action Plan (PRSAP), which intends to empower the poor to generate income through (1) improving access to land, (2) increasing income from agriculture, and (3) reducing unemployment. The strategies proposed under the human capital development focus on (1) education, (2) health, (3) food security and nutrition, and (4) safe water and sanitation.

### ***Energy***

Energy use in rural areas is based on wood fuel, which is estimated to outstrip supply and hence resulting in deforestation. The national strategy to rectify this situation is to use energy efficiently, establish community woodlots and convert to commercial fuels.

Rural electrification is taking place at a steady rate, focusing on supplying clinics, schools, and community centres from where communities can have improved access. However, few rural households are connected due to unaffordable connection and tariff costs.

### ***Pollution and environmental health***

About half of the population has no access to improved sanitation and clean water supply, which is severely impacting on environmental health conditions. Water sources are contaminated and the incidence of respiratory and diarrhoeal diseases, skin disorders and bilharzia remains very high.

Production of solid waste is increasing and Swaziland has capacity and infrastructure constraints to efficiently deal with solid waste management. Growing quantities of urban waste and sewage contaminate soil and water and pose threats to human health and the environment.

Rivers and other water bodies are increasingly threatened by chemical and other pollutants. Air pollution is attributed to emissions from residential and industrial areas, e.g. wood pulp and sugar mills. Pollution and contamination of air, water and land increase environmental health risks.

## **ENVIRONMENT POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORK**

### **ENVIRONMENT POLICY AND LEGISLATION**

#### ***Environment Policy Framework***

The national policy framework includes the 1999 National Development Strategy (NDS) with long-term development Vision 2022 and the 1997 Swaziland Environment Action Plan (SEAP). All other policies and strategies have been formulated to facilitate the vision of the NDS. The NDS identifies environmental protection as a cornerstone in the national development process.

Swaziland has responded in its national policy framework to addressing global environmental issues, of which the most relevant in this context are land degradation and desertification, decline of biodiversity, climate change, food security, health and poverty.

Environmental integration in sectoral and macro-economic policies has taken place in a number of recent sector policies, notably the National Rural Resettlement Policy, the National Forest Policy, the Comprehensive Agricultural Sector Policy, the National Food Security Policy and the National Energy Policy.

The Environmental Management Act of 2002 requires Strategic Environmental Assessment (SEA) of policies, programmes, strategies, action plans and legislative bills to be subjected to this form of assessment. The process of SEA for the aforementioned has not taken place to date.

The 2005 draft Poverty Reduction Strategy and Action Plan (PRSAP) recognizes the importance of the environment in relation to the alleviation of poverty and has formulated a number of actions that relate to general environmental matters as well as to specific concerns in environmental management planning, safe water and sanitation, and ensuring sustainable energy.

Targets have not been set most of the environmental sectors; the only ones are 100% access to safe water by 2015 and 100% access to electricity by 2022. These targets are unlikely to be met.

### ***Environment Legislation Framework***

Swaziland has an extensive legislation framework which is however fragmented and partially outdated. In recent years important initiatives have produced several new acts, such as the Flora Protection Act of 2001 and the Water Act of 2003, and most importantly the Environment Management Act of 2002.

Swaziland has also participated in international developments that have led to important multi-lateral conventions, treaties and protocols, most of which have been duly ratified but have had limited implementation or mainstreaming. The most important are the three Rio Conventions, which were ratified in 1994 (United Nations Convention on Biological Diversity) and 1996 (United Nations Convention to Combat Desertification, United Nations Framework Convention on Climate Change).

There is a comprehensive range of environment related laws with the Environmental Management Act as the supreme environmental law. The legislative framework can be considered adequate though several key areas requiring specific legislative support remain without, e.g. biodiversity.

The Environment Management Act is intended to provide and promote the enhancement, protection and conservation of the environment and the sustainable management of natural resources. It also turned the Swaziland Environment Authority (SEA) into a body corporate and established the National Environment Fund. In terms of this Act, the SEA has the power to halt any and all developments that have not been adequately scrutinised for their environmental impact. Any policy, bill, regulation, programme or plan requires a Strategic Environmental Assessment. The Act provides for public participation, and sets out regulations for a register of environmental information, requests for environmental information, public review and hearings, orders and prosecutions initiate by the public, civil actions and other regulations.

Legislative enforcement remains a weak area covering all legislation. Inadequate technical and human capacity and institutional coherence hamper enforcement.

## **ENVIRONMENTAL INSTITUTIONAL FRAMEWORK**

### ***Institutions with Environmental Responsibilities***

The Swaziland Environment Authority is the supreme institution responsible for the environment. Established in 1992 it remains an effective regulatory institution that coordinates many other supporting institutions. The SEA is responsible for environmental policy making, legislation, planning, environmental protection, monitoring and enforcement using provisions of the Environment Management Act.

### ***Environmental Services and Infrastructure***

Protected areas: A total of seven reserves covering 3.7% of the country have been proclaimed.

Sanitation and waste treatment infrastructure: The institutions involved in the provision of safe domestic water supply and sanitation are the Swaziland Water Services Corporation (for urban

areas), the Rural Water Supply Branch (MNRE) (for rural areas) and the Environmental Health Department (MHSW).

Disaster prevention systems: The Disaster Management Act of 2006 and the Disaster Action Plan provide for an integrated and coordinated disaster management approach and for the institutional mechanism, including structures, functions, authorities and responsibilities of major actors.

Emergency response mechanisms: Disaster management has focused on emergency management through ad hoc response measures, mainly supply of relief commodities by the National Disaster Task Force. The Environment Management Act and National Environment Fund provide financial mechanisms for dealing with disasters.

### ***Environmental Monitoring System***

Indicators for environmental monitoring related to MDG7 are considered relevant in Swaziland for monitoring environmental conditions, however they are not comprehensive and more work is needed to put in place measuring and monitoring systems. The SEA has overall responsibility for environmental monitoring and is required by the Environmental Management Act to prepare bi-annual State of Environment Reports.

### **INTEGRATION OF ENVIRONMENTAL CONCERNS INTO MAIN POLICIES AND SECTORS**

Integration of environmental concerns into the main policies and sectors has been catered for since the formulation of the National Development Strategy and the Swaziland Environment Action Plan in the mid 1990s. Both of these have had a positive influence in the manner in which environmental concerns were integrated in subsequent sector policies.

### **EU AND OTHER DONOR CO-OPERATION WITH SWAZILAND FROM AN ENVIRONMENTAL PERSPECTIVE**

The total external assistance to Swaziland by bilateral and multilateral co-operating partners has been decreasing over the last decade and is now below 5% of the GDP.

#### **EU CO-OPERATION WITH SWAZILAND FROM AN ENVIRONMENTAL PERSPECTIVE**

The European Community remains one of Swaziland's main development partners and is the largest multilateral donor. EU Member States during the past five years have implemented several bi-lateral environment-related interventions; however, current involvement is very limited.

There is presently no experience relating to EC development co-operation interventions with specific environmental objectives. Application of environmental integration procedures (preparation of SEA or EIA) has only incidentally taken place in EC funded programmes/projects.

#### **CO-OPERATION FUNDED BY OTHER DONORS FROM AN ENVIRONMENTAL PERSPECTIVE**

Other multilateral donors include mainly UNDP and other UN agencies with the Global Environment Facility being the most utilised source of funding for environment projects. The environment has not been identified by the 2006-2010 UNDAF as a key priority area of cooperation, although some areas of intervention have linkages with environmental matters. The IFAD are presently active in supporting the implementation of the EIA Comprehensive Mitigation Plan for the LUSIP project during the planning phase 2004-2007.

The Republic of China (on Taiwan) and Japan are non-EU bi-lateral donors with some support related to the environment.

### **CONCLUSIONS AND RECOMMENDATIONS**

#### **CONCLUSIONS**

Swaziland has developed an extensive policy framework related to the environment. However, several policies and strategies still exist in draft form, or have not been developed, e.g. a Water Policy and a Biodiversity Policy and all have had only limited implementation or integration into institutional mandates and activities.

The environmental legislative framework is currently still largely fragmented and outdated, although several essential pieces of legislation have been provided.

The main conclusion of the environmental review and assessment is that undesirable environmental trends related to land and water management, land degradation and pollution, ecosystem and biodiversity degradation, climate change, and living conditions in human settlement have led to the following combined impacts on the society, in a sequence where the components are interactive and impacting on each other.

- Loss of natural resources
- Changes in natural habitats and ecosystems
- Loss of biodiversity
- Changes and diminishment of ecosystem services
- Decrease of harvesting of natural products
- Decrease of affordable energy sources
- Reduced area of land under production
- Land fragmentation
- Conflicts about land
- Decreased land productivity
- Decreased water availability and shortages
- Increase of water pollution
- Increase of air pollution
- Increase of land contamination through uncontrolled waste
- Insufficient clean water and sanitation
- Increased environmental health hazards
- Increased social and economic vulnerability
- Decreased coping mechanisms to disasters
- Increased food insecurity
- Impoverished livelihoods

## RECOMMENDATIONS

Swaziland has a comprehensive environment policy framework that needs to be implemented through partly already existing strategies and action plans. It is important that implementation addresses environmental degradation in a wider holistic manner, rather than focusing on components only. The major issues of land, ecosystem and biodiversity degradation are interrelated and need be addressed in an integrated and comprehensive way.

Improving living conditions in human settlements is a priority as it concerns public health and other primary conditions. There is a wide array of issues and constraints that need be addressed, including safe water, sanitation, waste management, air and water pollution, soil contamination, efficient use of energy, sources of renewable energy, environmental health concerns, etc.

It is recommended not only to provide access to water and electricity in urban, peri-urban and rural areas, but also provide an affordable supply. Current connection and tariff costs are unaffordable to most people. This needs to be looked into in order to include a larger proportion of the population within the realm of these essential services. Greater use of renewable energy systems should be strongly supported.

There is a need to further complete the environment policy framework as a number of essential policies and strategies are still outstanding. This holds true even more for the legislation framework which already contains important elements but requires updating, consolidation and a comprehensive coverage.

There is a general need for institutional strengthening and capacity building related to implementation of environment related programmes and responsibilities, taking into account the recommendations of the National Capacity Self Assessment.

There is a need to develop indicators for environmental monitoring. The set of indicators related to MDG7 are considered relevant in Swaziland for monitoring environmental conditions, however they are not comprehensive and more work is needed to put in place a functional system.

It is recommended to promote and use effectively the EC horizontal budget lines (e.g. Environment and Forests) and facilities (EU Water Facility - EUWF and the EU Energy Facility - EUEF).

It is recommended to enhance co-ordination on environmental issues with other donors, seeking to achieve complementarities and synergies in order to more effectively deliver development objectives.

## **2 STATE OF THE ENVIRONMENT**

### **2.1 LAND AND WATER RESOURCES**

#### **2.1.1 Geology and Mineral Resources**

The geology of Swaziland is complex and diverse; the oldest igneous formations of the basement complex are 3.550 million years old and belong to the oldest rock on earth. Younger sedimentary formations include a variety of rock types: sandstone, claystone and volcanics (basalt and ignimbrite), which are intruded by gabbro and dolerite.

Minerals of economic importance from the basement complex include asbestos, iron, soapstone, green chert, gold, tin and various other base metals such as copper, nickel and chromium. Coal layers are of economic value, with an estimated 1.017 million ton probable and potential reserve. Alluvial reworked diamonds are found derived from kimberlite pipes.

Most exploitation is no longer economically viable and has stopped. However there still is considerable commercial interest to commence, expand or restart mining operations (e.g. coal, green chert, diamonds, and gold) which will lead to increased pressure on the environment.

The mining of minerals has significant environmental consequences. In Swaziland there has been a general lack of rehabilitation and ecological protective measures. Some of the most common environmental effects of mining include: (1) the destruction of landscape and ecosystems by open cast mining; (2) waste accumulation; (3) ground water contamination by leachates from waste; (4) lowering of the ground water level; (5) toxic concentrations of elements such as copper, nickel, zinc and chromium; (6) environmental health threats through unsafe mining operations in general, and specific minerals (e.g. asbestos) in particular.

These environmental concerns are being addressed by the 2003 draft National Mining Policy of Swaziland.

Geological risks are minor; there are no signs of recent or sub recent volcanic events but seismic activities are recorded, although modest at the scale of Richter (5.2 for the latest 2006 earthquake with epicentre in Mozambique).

#### **2.1.2 Land Resources**

Swaziland is located at the transition of the South African Plateau (reaching over 1500m) to the Mozambican coastal plain. The western part of the country lies in the escarpment zone, the eastern part in the coastal plains. The Lubombo Range separates the Swaziland coastal plain from the Mozambique coastal plain.

Swaziland is classified into six Agro-ecological Zones (AEZ), taking into account elevation, landforms, geology, soils, climate and vegetation: Highveld, Upper Middleveld, Lower Middleveld, Western Lowveld, Eastern Lowveld and Lubombo Range. Landforms range from plateaus, hills and mountains, to foot slopes and plains. The AEZ is an accepted framework in the country for the organization and evaluation of land resource data, including land degradation, soils, climate, vegetation, land suitability, land use and agricultural production (Appendix 7.1.1).

#### ***Landscapes***

Swaziland has diverse and unique landscapes of high aesthetic and cultural value. The plateaus and valleys of the escarpment and also the Lubombo Range offer beautiful scenery and biodiversity. Some valleys are very special landscape formations and should be recognised heritage sites. It is suggested that some valleys were formed as glacial valleys when the South Pole was located in southern Africa (hundreds of million years ago), subsequently covered and exhumed. Certain valleys have a unique assemblage of very rare red relict soils that reflect tropical rainforest conditions that were prevalent millions of years ago (e.g. Ezulwini valley). The cultural value of landscapes is also enshrined in the Swazi tradition.

#### ***Impacts on landscapes***

The lack of recognition and insufficient protection of unique landscapes and the increasing pressure from unsustainable land use, including tourism will have a negative impact on unique landscapes.

### ***Land tenure***

Land tenure has two main categories: communal land held in trust by the King, called Swazi National Land (SNL - about 74%), and land that is private, or under Title Deed (TDL - about 26%). However, about a quarter of SNL is not communally used but controlled by government, parastatals, or companies. The TDL area is mainly used for industrial timber plantations, livestock production and sugarcane, and the SNL area for communal extensive grazing and subsistence crop production.

### ***Land tenure issues***

Under the 2005 Constitution, all people have equal access and rights to land. The pressure on land is driven by the growing population and the demand for more land for competing land uses, e.g. agriculture and residential in peri-urban areas, forestry and grazing in the Highveld, transport, tourism, sugarcane and biodiversity conservation in the Lowveld. Mechanisms of land allocation and administration are not adequate to appropriately deal with the multifaceted physical planning, which is exacerbated by poor chiefdom demarcation and disputes, and lack of discussion fora.

### ***Present land use***

The main land use in Swaziland is extensive grazing: communal extensive grazing covers 50% of the country and commercial ranching 19%. Grazing takes place on natural grasslands, savannas and woodlands, which areas are also used for community forestry. Small-scale subsistence rainfed agriculture covers about 12%, and large-scale commercial irrigated and rainfed crop production 6%. Plantation forestry covers about 8%, and the remaining 5% is made up of national parks and urban areas.

### ***Land use changes***

Land suitable for cultivation is rather limited, about 15-20% of the country. The current (2005) area under crops is estimated at only 120,000 ha (70,000 ha rainfed and 50,000 ha irrigated), which is a decrease from levels in the 1980s and 90s. Land under irrigation is increasing annually with 1,000-2,000 ha, mostly driven by expansion of the sugar industry, although alternatives are now being sought due to decreased profitability of the production of sugar in Swaziland and insufficient surface water without artificial storage. This newly irrigated land - mainly in large irrigation schemes such as of the Komati River - was formerly used for subsistence farming or grazing.

### ***Land conversions and effects of AIDS***

There are strong indications that an increasing proportion of potentially arable land is no longer used; most likely as a result of the HIV/AIDS weakened labour force and recurrent droughts affecting the country and region as a whole. However, some of this rainfed arable land - together with land used for grazing - is converted to residential use, in particular in informal peri-urban areas, but also as part of formal urbanisation. Changes in land use for industrial timber plantations or for conservation have been very minor in recent years, although there has been pressure to convert more land to either of these uses.

### ***Land use planning***

Land use planning including physical planning in Swaziland is generally taking place in an ad hoc and uncoordinated manner. In many cases this has led to a poor selection of land use in relation to the suitability and economic potential of the land and indirectly leads to increased land degradation.

### ***Desertification/land degradation/soil erosion***

In the UNCCD definition land degradation is defined as part of desertification. Land degradation is recognised as a very serious problem in Swaziland and a critical issue for continued sustainable social and economic development and poverty alleviation. The most common form of land degradation is soil erosion, which is distinguished in two types, natural or geological erosion and human-induced or accelerated erosion. Poor land management has caused human-induced erosion and has accelerated existing natural erosion.

### ***Causes of soil depletion***

Apart from agriculture, depletion of soil resources occurring in Swaziland is also caused by unsustainable management practices in other sectors such as forestry, mining, industry and road construction. Chemical, biological and physical degradation appears through loss of nutrients, trace elements, organic matter, soil flora and fauna, soil structure etc. It may also become apparent through concentration of substances such as salts, acids, heavy metals and other toxic elements, as caused by mining, waste disposal, use of fertilizers and pesticides, dipping chemicals, irrigation, leaf litter from plantations or acid rain. Soil compaction is a degradation phenomenon caused by machinery and cattle traffic, reducing permeability and water holding capacity. Soil depletion is not widely occurring, but in places it is severe.

### ***Moderate arable land degradation***

Relatively little erosion is found in subsistence arable land as a result of proper soil conservation through grass strip terracing. Irrigated and rainfed large-scale commercial monocultures may have a negative effect on chemical and physical soil properties (fertility and structure) and also increase run-off as a result of surface compaction.

### ***Severe rangeland erosion and degradation***

Due to population pressure, livestock overstocking, overgrazing, veld burning and lack of sustainable natural resource management almost a third (30%) of the country and more than half (55%) of all communal grazing land has a serious or very serious erosion status. Severe erosion is most frequently encountered in the Upper Middleveld and Highveld. Poor range conditions (vegetation cover and composition) characterize 45% of the SNL rangelands. Most other rangelands only qualify as fair, with good rangelands only found in places in the Highveld and Lubombo.

### ***Livestock management improvements not endorsed***

After cattle numbers had gone up continuously for the past 30 years - unless during severe droughts - the trend recently reversed and gave a sharp drop in 2003. This is probably to a large extent the result of coping with the combined effects of drought and HIV/AIDS, but there are also indications that the traditional attitude towards cattle is changing with the younger generation. However, none of the proposals to commercialise livestock production has been endorsed or implemented (e.g. agistment and dipping fees, Livestock Identification Act of 2001).

### ***Impact of climate change***

Climate change is expected to have a further detrimental effect on land degradation through reduction in vegetation cover and changes in species composition, as well as through increased deforestation, desertification and disaster hazards.

### ***Combined impacts on society from unsustainable land management and land degradation***

Undesirable environmental trends related to land management and land degradation have led to the following impacts on the society, in a sequence where the components are interactive and sequentially impact on each other.

- Loss of natural resources
- Changes in natural habitats and ecosystems
- Reduced area of land under production
- Land fragmentation
- Conflicts about land
- Decrease of water availability
- Decreased land productivity
- Decreased coping mechanisms to disasters
- Increasing food insecurity
- Impoverished livelihoods

### **2.1.3 Water Resources**

Surface water resources of Swaziland are estimated at 4.5 km<sup>3</sup>/year, half of which originates from South Africa. The five main river systems in Swaziland include the Komati, Lomati, Mbuluzi, Usutu and Ngwavuma. Most of these rivers rise in South Africa and all flow eventually to Mozambique.

The water that Swaziland can utilise from its main river basins is limited by agreements with South Africa and Mozambique. A Tripartite Permanent Technical Committee addresses international water right issues. As a member state, Swaziland recognises the 1995 and 2004 revised SADC Protocol on Shared Watercourse Systems, which resulted from the Dublin Conference and Agenda 21.

The groundwater resources of Swaziland have potential for exploitation, however these resources are not available in sufficient quantity to allow large scale abstraction, hence virtually all irrigation in Swaziland is based on surface water.

The CIDA Groundwater Project of 1992 estimated the renewable groundwater resources to be of the order of 21m<sup>3</sup>/s in the whole country, with only about 6% being used. The groundwater resources have potential for significant exploitation in several of the higher parts of the country, however not in the Lowveld where most aquifers are very poor for groundwater development. Groundwater recharge in the most critical areas of Swaziland is estimated at 2% in the Lowveld and 5% of annual rainfall in the Lubombo.

### ***Water management***

The Water Act of 2003 establishes a National Water Authority and calls for improved catchment management by improved stakeholder participation and decentralization of the management of the water resource. The Act also calls for the establishment of a National Water Authority, the preparation of a Water Resources Master Plan to equip stakeholders with sustainable water management requirements and makes mandatory the establishment of River Basin Authorities.

In 2006 Swaziland initiated the preparation of its Integrated Water Resources Management Plan (IWRM) in partial fulfilment of the Johannesburg Plan of Implementation with Dutch funding. Though still under preparation, the IWRM Plan will provide crucial guidance to decision-makers and water users on how best to manage the country's water resource.

The demand for water is strongly increasing as a result of expanding irrigation, industrial activities and residential use. Current sectoral water demand in Swaziland is approximately as follows: irrigated agriculture (96%), livestock (1%), industrial (1%), and domestic (2%). The industrial timber sector is also using large amounts of water, however directly derived from rain and substantially reducing runoff. Water is also used non-consumptive for a number of hydro-power generators. Water demand exceeds sustainable supply.

### ***Water quality***

Progressive industrialization has led to gradual deterioration of the quality of water resources in Swaziland. Industries that adversely impact on the river water quality are mainly situated in the Usuthu River Basin, in Matsapha and the pulp mill at Bhunya. The Usuthu and other rivers such are affected by polluted drainage water from the irrigated sugar plantations and other cultivated land where fertilisers are inappropriately applied.

Water quality is monitored by the Water Resource Branch under Ministry of Natural Resources and Energy in industrial and rural areas, Swaziland Water Services Corporation in urban areas and Geological Survey for ground water/boreholes.

Groundwater quality in Swaziland is mostly suitable for domestic use, except in the Lowveld where occurrences of high salinity have been observed. However, contamination of groundwater sources is a potential threat to the future value of these resources. The most likely forms of contamination include bacteria, viruses, hydrocarbons, pesticides and nitrogen.

### ***Climate change impacts on water resources***

Stream flows are projected to be higher than those under the current climate in the late spring to mid summer period but substantially lower for the rest of the year. An overall average reduction in runoff is expected ranging from 2 to 6% in a normal year and higher for dry years. Such changes will translate to increased possibilities of flooding in the rainy season due to higher flows and drought-related conditions in winter due to low flows. Effects of this will likely find its way into groundwater recharges and salinity as well as dam capacities.

### ***Combined impacts on society from unsustainable water management and water pollution***

Undesirable environmental trends related to unsustainable water management and water pollution have led to the following impacts on the society, in a sequence where the components are interactive and impacting on each other.

- Loss of natural resources
- Changes in natural habitats and ecosystems
- Water pollution and environmental degradation
- Reduced domestic water quality and increased health risks
- More frequent water shortages
- Impoverished livelihoods

#### **2.1.4 Climate and Climate Change**

Swaziland does not have sufficiently long instrumental climate data to reliably construct past climates. As a result the wider temperature record for Africa south of the equator is used to present the climate of the twentieth century for the sub-region. Such an analysis shows a warming of almost 1°C between 1900 and 1980 and an average warming of 0.05°C per decade over the almost 100 year period.

Swaziland lies at the transition of major climates zones, as it is influenced by air masses from different origin: equatorial convergence zone, subtropical eastern continental moist maritime (with occasional cyclones), dry continental tropical and marine west Mediterranean (winter rains, with occasional snow).

The overall climatic characterization of Swaziland is subtropical with summer rains and distinct seasons. Higher and lower zones show different climatic conditions, ranging from subhumid and temperate in the Highveld to semi-arid and warm in the Lowveld (Appendix 7.2.3).

##### ***Climate change***

Climate change studies suggest that by 2050 temperatures and rainfall over southern Africa will be 2-4°C higher and 10-20% less than the 1961-90 baseline respectively. The projections from the models relevant to Swaziland indicate that there will be temperature increases of 3-6°C.

Annual rainfall is expected to either remain the same or decrease, however most likely with larger differences between summer and winter and greater intensities of rainfall. This is likely to result in more frequent flooding conditions in the summer and more prolonged drought in the winter.

##### ***Shift of climatic zones to more arid climate***

Current climate classification (Appendix 7.2.3) shows that currently four agro-ecological zones have a warm temperate rainy climate, with a dry season in winter and a cool or hot summer. The Lowveld zones have a dry and hot steppe climate. It is expected that this climate will expand to Lower Middleveld and Lubombo, thus giving the major part of the country a hot steppe type climate.

##### ***Impact of climate change***

Climate change will negatively impact on land degradation and ecosystems, and hence reduce productivity and livelihood possibilities, in particular in Lowveld and Lubombo, unless adaptation measures to climate change are introduced.

## **2.2 ECOSYSTEMS AND BIOLOGICAL DIVERSITY**

### **2.2.1 Ecosystems**

#### ***Ecosystem classification***

The four recognised ecosystems of Swaziland are (1) montane grasslands, (2) savanna-woodland mosaic, (3) forests, and (4) aquatic systems. The savanna-woodland mosaic is the dominant ecosystem, covering the central and lower parts of the country, followed by the montane grasslands predominantly in the Highveld and the two other as minor systems (Appendix 7.1.3). The savanna ecosystem is currently the best protected (5%), while just 2% of each of the other three ecosystems is protected.

The status of biodiversity of each of the ecosystems is given in Appendix 7.2.4. For a small country, Swaziland is extremely rich in biodiversity. Plants and animals are not uniformly distributed across the four ecosystems. Furthermore, species composition varies greatly between ecosystems.

### ***Ecosystem conversion***

Approximately 25% of each of the terrestrial ecosystem has been converted to some form of other land use (Appendix 7.2.5). A total of 4,280 km<sup>2</sup> of biodiversity rich ecosystems have been converted to industrial forestry, sugarcane, urban area and others. From 1985 to 2000 a total of 435 km<sup>2</sup> has been converted representing a conversion rate of 29 km<sup>2</sup> per year. Extrapolation of the same rate indicates that by 2030 a total of 870 km<sup>2</sup> is projected to have been converted. This will reduce by 50% the potential protection worthy ecosystems of the country.

### ***Impact of climate change on ecosystems***

Climate change is a global threat to biodiversity and is expected to have a significant impact on ecosystems and ecosystem services in Swaziland. Projected ecosystems from selected global climate models show a westward shift and shrinking of both the grassland and savanna ecosystem types. The country is projected to see the introduction of a tropical very dry forest type of ecosystem in the eastern part of the country replacing half of the current subtropical ecosystem.

### ***Vegetation inventory***

Several vegetation mapping exercises have been executed over the past 50 years, including land cover classification from satellite imagery, e.g. the National Land Cover 2000 project implemented by the CSIR in South Africa. A new vegetation map has recently been produced and published in the Swaziland Tree Atlas (Appendix 7.1.2).

### ***Forest and woodlands***

The forest cover as indicated by the 1999 Forest Resource Assessment is 788,000 ha, or 45% of the total land area. Three categories of forest types are identified: indigenous forest covering 83%, wattle forests 3% and industrial timber plantations 14%. Indigenous forests are further classified as Montane and Highveld (1%), Riparian (3%), Moist Savanna (22%), Acacia Savanna (23%), Drier Acacia Savanna (4%), and Bushveld (30%). Comparison with a 1990 inventory shows an increase in the total forest cover of 164,000 ha, however this may be the result of different assessment and classification methods.

### ***Degradation of natural forest and woodlands***

The driving forces behind the current deforestation and degradation in the natural forest and woodland areas are a complex of factors including population growth, pressure on land, land conversions, growing poverty, inequities in land tenure and utilisation rights.

Lack of capacity to manage the indigenous forests has led to uncontrolled extraction of timber and non-timber forest products, including fruits, edible plants and vegetables, fuel wood, wood for utensils and craft, medicinal plants, materials for traditional attire, etc. In the rural areas over 75% of the homesteads use firewood for cooking and heating. Uncontrolled veld fires further contribute to forest degradation.

The pressure on e.g. the Lowveld savanna has resulted in a real decrease in the wood volume per hectare of the moist and acacia savanna types. This is currently taking place and expected to exacerbate with climate change.

### ***Rangeland degradation***

Rangelands overlap with forest and woodlands, as most forest types are also used for extensive grazing, either communal or commercial. Grasslands, savannas and open woodland types are under heavy pressure from large livestock numbers, overgrazing and poor management, including fire regimes. Improved pastures hardly occur.

### ***Bush encroachment***

The occurrence of bush encroachment is caused by a lack of browsing and is confined to the Lowveld and the Lower Middleveld with savanna and mixed bush vegetation. Severe encroachment is found concentrated in the commercial TDL ranches as there are less seasonal fires and relatively little wood extraction compared to SNL.

## 2.2.2 Biodiversity and Wildlife

Swaziland supports a diverse assemblage of habitats and contains a significant portion of southern Africa's plant and animal species. The eastern part of Swaziland forms part of the Maputaland Centre of Plant Diversity (one of the world's hotspots of floral, as well as faunal, species richness and endemism), while the western part falls within another area of global significance, the Drakensberg Escarpment Endemic Bird Area.

### ***Species with special value/endemics***

By comparison with the southern African region, the plants and animals of Swaziland have been relatively well surveyed. This is particularly true for trees, birds, frogs and mammals. However, very limited information is available for certain groups such as the majority of invertebrates. Despite its small size, Swaziland has an impressive list of endemic species. In addition, a number of species are near-endemics, e.g. a total of 52 bird species, half of them restricted to montane grasslands occurring in South Africa and Swaziland only. The montane grasslands play an important role by providing habitat for many of Swaziland's endemic and near-endemic plants and animals.

### ***Local status of globally threatened species***

Many species in Swaziland have declining populations, some of which have already gone extinct such as the African wild dog. Swaziland has produced two recent red data lists; one for plants and one for vertebrates. A total of 132 species of vertebrates are listed threatened, representing between 9-20% of the total numbers of fishes, amphibians, reptiles and birds occurring in Swaziland, but a significant 38% of the mammalian fauna. A total of 305 species of plants have been included in the red data list, representing 9% of the total plant species richness.

The UNCBD 2010 global targets of restoring and maintaining populations of declining species, and improving the status of threatened species may not be met. Populations of many species are still in decline, and several species have gone extinct in the past few decades. The UNCBD calls for the identification and monitoring of various components of biodiversity and although a significant amount of work has been conducted on various taxa and ecosystems, this activity remains uncoordinated.

### ***Decline of biodiversity***

The decline in biological diversity is most visible in two groups, large mammals and indigenous flora, but affects the entire spectrum. Main causes are loss of habitat, over-exploitation and invasive alien species. Habitat destruction is the result of agricultural expansion - at present especially irrigation (sugarcane) - commercial forestry, road construction, industrial and urban development, and various other activities. Hunting, poaching, ignorance and weak law enforcement contribute to over-exploitation.

It is expected that in the long term climate change and desertification will have a severe impact on biodiversity, in particular in the savanna-woodland mosaic and aquatic ecosystems.

There is considerable global concern about the introduction of genetic modified organisms and its potential impact on biodiversity. The present use of GMO in the country is not known although it is suspected to be present in cotton and maize production. To address the issue the country has drafted a Biosafety Bill.

### ***Impact of invasive alien species***

Introduced (exotic) species often survive and increase rapidly in new environments. The invasion of certain alien plants is having a considerable impact on the natural vegetation and ecosystems in Swaziland, e.g. *Chromolaena odorata*, *Sesbania* spp., *Psidium guajava*, and *Lantana* spp.

Exotic fish species, such as the rainbow trout (*Onychorhynchus mykiss*) and the large mouth bass (*Micropterus salmoides*) can have devastating effects on local fish populations. The introduced red claw lobster (*Cherax quadricarinatus*) in the Sand river dam is affecting dam and canal structures.

The UNCBD calls for the control of alien invasive species. In 2005 the Prime Minister declared *Chromolaena odorata* a national disaster as it is having a major impact on degrading agricultural land and protected areas - control or management measures have been announced and supported with some initial funding.

### ***Fish stocks/aquatic ecosystem***

The result of a recent fish biodiversity survey determined the occurrence of 60 species in Swaziland, of which six exotic and the others indigenous. A red data list was produced indicating that three species were critically endangered, one endangered and two vulnerable.

### ***Pollution of the aquatic ecosystem***

The pollution of the aquatic ecosystem by persistent organic pollutants, agro-chemicals and increased sediment load resulting from soil erosion continues to be a major threat to the aquatic biodiversity. Certain rare fish species are threatened to become extinct (*Opsaridium peringueyi* and various *Chiloglanis* spp.).

### ***In-situ conservation/nature reserves and game parks***

A total of seven reserves, covering 64,100 ha (3.7% of the country), have been proclaimed. Four are managed by the Swaziland National Trust Commission (Malolotja, Hawane, Mlawula (including Ndzindza) and Mantenga Nature Reserves), and three by Big Game Parks (Mlilwane Game Reserve, Hlane National Park, Mkhaya Game Reserve). These protected areas are distributed widely, but with a concentration in the Northeast and absence in the South (Appendix 7.1.4).

### ***Protected areas***

The global IUCN target of conserving 10% of ecosystems and areas of importance for biodiversity within the country is unlikely to be met. Swaziland does not have an adequate protected area network and clearly needs more proclaimed parks and reserves. Only 50% of red data listed tree species are found in protected areas, compared with almost 80% of threatened mammals. Proclamation of the protection worthy areas identified would go a long way to addressing this issue (Appendix 7.1.4).

Some progress has been made with trans-frontier conservation and the country has established Transfrontier Conservation Areas with Mozambique and South Africa. The country has submitted a GEF proposal for a Biodiversity Conservation and Participatory Development Project which would assist to link fragmented protected areas through a network of corridors.

### ***Combined impacts on society from biodiversity and ecosystem degradation***

Undesirable environmental trends related to biodiversity and ecosystem degradation have led to the following impacts on the society, in a sequence where the components are interactive and impacting on each other:

- Loss of biodiversity
- Changed ecosystems
- Changes and diminishment of ecosystem services
- Decrease of harvesting of natural products
- Decreased coping mechanisms to disasters
- Increase in food insecurity
- Impoverishment of livelihoods

## **2.3 LIVING CONDITIONS IN HUMAN SETTLEMENTS**

### **2.3.1 Socio-economic Environment**

Swaziland has a population of approximately 1.1 million, of which 76% is rural and 42% under 15 years. The population size and structure have been significantly affected by the rapid spread of HIV/AIDS. Swaziland's HIV/AIDS prevalence rate is one of the highest in the world standing at 42.6%. As a result of the pandemic, the population is projected to decline over the next decade.

Swaziland belongs to the medium human development countries with a Human Development Index in 2003 of 0.498 and a HDI rank of 147 in the world. With a Gross National Income per capita of USD 1,245 (2002), Swaziland is a lower middle-income economy; however it is estimated that 69% of the population lives below the poverty line. The average per capita income of the poorest 40% of the population is less than USD 230 annually.

Gross Domestic Product (GDP) grew in the 1970s and 80s by an annual average of almost 7% but decreased afterwards. Growth in 2004 was only 2.1%, caused by low growth rate in Foreign Direct Investment, diminished output by the manufacturing sector and a slump in agricultural production

resulting from three consecutive droughts. The poor economic development exacerbated the severe problems of high unemployment (estimated at 34% in 2003), income inequity and poverty.

### ***Social vulnerability***

Recent surveys point to high vulnerability to food insecurity and livelihood decline problems across large sections of the country. It is estimated that up to 263,000 people are vulnerable and food insecure and require food aid. As a result of HIV/AIDS and drought many people have reached and partially surpassed the limits of their coping capacities and communities are not able to absorb any more future shocks.

### ***Environmental vulnerability***

The social vulnerability is further exacerbated by environmental vulnerability as expressed by lack of access to clean water, poor sanitation, affordable and sustainable energy, degrading land and several other factors.

### ***Poverty reduction strategy***

The Government is responding to this situation with the Poverty Reduction Strategy and Action Plan (PRSAP), which presents a poverty reduction framework consisting of six pillars: (1) rapid acceleration of economic growth based on broad participation, (2) empowering the poor to generate income and reduce inequalities, (3) fair distribution of the benefits of growth through public expenditure, (4) ensuring food security, (5) improving the quality of life of the poor, and (6) strengthening good governance.

The most essential parts of the PRSAP are consolidated under the empowerment of the poor to generate income through (1) improving access to land, (2) increasing income from agriculture, and (3) reducing unemployment. The strategies proposed under the human capital development focus on (1) education, (2) health, (3) food security and nutrition, and (4) safe water and sanitation.

## **2.3.2 Energy**

Swaziland's energy consumption is comprised of: electricity (10%), petroleum products (25%), coal (16%), and biomass (49%). The demand sectors include industry and services (54%), transport (18%), households (25%), agriculture (3%).

Coal and renewable energy resources are the only local sources for primary energy production. Swaziland is reported to possess large reserves of low volatile and low sulphur anthracite of medium to high quality, but imports low grade coal from South Africa. Bagasse from the sugar processing industry and wood waste from industrial timber processing is by far the most important source of renewable biomass energy. The opportunities for exploiting a greater percentage of biomass for fuel have been investigated and a Bio-fuel Strategy is being prepared. The main sugar refineries are expanding ethanol production for blending with petrol with oil seed crops being promoted for bio-diesel.

In many areas energy efficiency can be improved, in particular in households and government services. Although several studies have been executed, few results have been achieved so far.

### ***Deforestation***

Data on energy use in rural areas is limited but it is estimated that annual consumption of wood fuel is in the order of 350,000 Mt, which outstrips supply and hence results in deforestation. The national strategy to rectify this situation is to establish community woodlots and convert to commercial fuels (electricity, paraffin, LPG21). Government and NGOs have initiated programmes to introduce a more efficient use of renewable energy, in particular generated from wood fuel and other biomass.

### ***Electricity supply***

About 40% of national electricity demand is generated locally by hydro and industrial generation from biomass outside the national grid. The remaining 60% is imported from South Africa; however this translates to 80% of the national grid demand. Solar and wind energy generation in Swaziland is very limited. Government and NGOs have established several solar pilot projects mainly to electrify clinics, schools and water-pumps.

Urban areas are covered by the national grid. Rural electrification is taking place at a steady rate, focusing on clinics, schools, Tinkhundla and other community services. However, only about 5% of rural households are connected as the connection and tariff costs are unaffordable for most people.

### ***Dependency on imported electricity***

In the short to medium term the country will continue to rely on the Southern African Power Pool for electricity and petroleum product supplies from South Africa. However, the region is experiencing electricity generation shortfalls and this may affect Swaziland in the future.

A revised 2005 Electricity Act is awaiting enactment that, amongst other changes, will allow independent power generators to sell electricity to the national grid. Several companies are investigating the opportunities this brings about for private generation.

### **2.3.3 Sanitation and Health**

Approximately 52% of the total population have access to improved sanitation and clean water supply, with the rural areas having about 10% less access. Rural water supply and environmental health services jointly implement programmes where safe water supply, sanitation and hygiene education are integrated.

#### ***Impact on health***

About 60% of the rural population still do not have access to safe water and sanitation. Hence water sources in many areas are contaminated and the incidence of environmental health related diseases remains very high. The major cause of consultation in outpatient departments is due to poor environmental sanitation in and around human settlements. Most frequently occurring diseases are respiratory diseases, skin disorders and diarrhoeal diseases. Also the high infestation rate of bilharzias and the occurrence of malaria are environment related.

### **2.3.4 Waste Management and Pollution**

The production of solid waste is increasing and Swaziland has capacity constraints and lack of infrastructure to efficiently deal with waste management. A policy and legal framework was developed in 2005. Statistical data on waste generation and service are incomplete as not all urban areas are serviced and rural information is largely missing. Weighing of waste and taking records from licensed landfills occurs only at few places. Reliable data of waste generation is needed in the future in order to make realistic and affordable waste management plans.

#### ***Contamination by waste***

Contamination of soil and water through improper disposal of waste is taking place in both urban and rural areas throughout the country, but data on the extent of the contamination are not available. Special measures to treat risk waste, e.g. medical and toxic, are often not taken. Growing quantities of urban waste and sewage pose threats to human health and the environment.

#### ***River pollution***

As a consequence of major industrial expansion, the rivers of Swaziland are increasingly susceptible to occasional and accidental release of chemical pollutants. Use of chemicals such as Lindane, Dieldrin, DDT, Gramoxane, Parathion and Malathion has been evident throughout the country. Also the increased sediment load resulting from soil erosion is polluting the river systems. Swaziland has ratified the Basel Convention, which allows the country to take advantage of advanced hazardous waste facilities in neighbouring South Africa.

Nutrient enrichment with accompanying eutrophication is liable to occur as a result of run-off effluent from agro-industry fields and also inadequate sewage facilities in human settlements. Adequate controls are currently lacking. Furthermore, since not all of Swaziland main rivers originate within the country, pollution may occur outside of the country's borders.

#### ***Air pollution***

Air pollution is largely caused by emissions from industrial and residential areas. Another source is the emissions from wood pulp and sugar mills. On a global scale, air pollution in Swaziland is rather limited; however at household level serious problems do frequently occur. Draft Air Quality Regulations are being reviewed that seek to control future emissions.

### ***Impacts on environmental health***

Air pollution both indoor and outdoor has resulted in high incidence of acute respiratory infections. Problems of occupational health and industrial hygiene due to local ambient air contamination are identified to be serious. Contaminated soil and affected land areas increase environmental health risks.

### ***Combined impacts on society from living conditions in human settlements***

Undesirable environmental trends related to living conditions in human settlements have led to the following impacts on the society, in a sequence where the components are interactive and impacting on each other.

- Decrease of affordable energy sources
- Insufficient clean water and sanitation
- Contaminated and polluted soil and water bodies
- Decrease of production and harvesting
- Polluted air
- Poor living conditions
- Increased environmental health hazards
- Increased social and economic vulnerability
- Increase in food insecurity
- Impoverishment of livelihoods

### 3 ENVIRONMENT POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

#### 3.1 ENVIRONMENT POLICY AND LEGISLATION

##### 3.1.1 Environment Policy Framework

The Swaziland environment policy framework is reviewed following six evaluation criteria:

- (a) Existence of national policies, strategies and action plans for the environment; including National Strategy for Sustainable Development and National Environmental Action Plans.
- (b) Policy response to global issues, sustainability issues (depletion of natural resources), and specific environmental issues identified above.
- (c) Consistency between policies.
- (d) Environmental integration in sectoral and macro-economic policies and existence of SEA of policies or strategies.
- (e) Important measures taken by the Government to solve environmental concerns.
- (f) Effectiveness in achieving targets.

**(a) Existence of national policies, strategies and action plans for the environment**

The national policy framework includes the 1999 National Development Strategy (NDS) and the 1997 Swaziland Environment Action Plan (SEAP). The long-term development Vision 2022 is contained within the NDS. All other policies and strategies have been formulated to facilitate the vision of the NDS. The NDS identifies environmental protection as a cornerstone in the national development process.

Criterion (a): Existence of national policies, strategies and action plans for the environment	
Policy	Review (strengths and weaknesses)
Key Swaziland national policies, strategies and action plans for the environment are the following: National Development Strategy (1999) Swaziland Environment Action Plan (1997) National Land Policy (2000 draft) National Environment Policy (1999 draft) National Environmental Education Strategy (2000) National Biodiversity Strategy and Action Plan (2001 draft)	The National Development Strategy sets out the framework for sustainable development in a comprehensive manner across all sectors. It is the umbrella strategy for all other policies and strategies. The Swaziland Environment Action Plan focuses <i>inter alia</i> on prioritizing environmental issues and solutions. Although other key national environment related policies and strategies exist in draft form, they do provide important guidance and support on environmental matters.

**(b) Policy response to environmental issues**

The national policy response to global issues, sustainability issues (depletion of natural resources), and specific environmental issues as identified in Chapter 2 has been formulated in a number of policies, strategies and action plans summarized and evaluated in the following table.

Swaziland has responded in its national policy framework to addressing global environmental issues, of which the most relevant in this context are land degradation and desertification, decline of biodiversity, climate change, food security, health, and poverty. However, it does not always have the technical or financial capacity to fully address these global issues. All the policies mentioned in connection with responding to national sustainability issues also cover the major global concerns. The related Millennium Development Goals of eradicating extreme poverty and hunger and ensuring environmental sustainability are represented in Swaziland’s policy framework.

Criterion (b): Policy response to environmental issues	
Environmental issue	Review of policy response
<i>Land degradation and desertification</i>  High levels of land degradation are having a significant impact on resource management and productivity, in particular on rangelands.	The national policy response to land degradation has been to sign and ratify the Convention to Combat Desertification and to prepare the CCD National Action Plan. Countering land degradation is adequately addressed through the following national and sectoral policies and strategies: 2005 draft Comprehensive Agricultural Sector Policy 2005 draft National Food Security Policy

<b>Criterion (b): Policy response to environmental issues</b>	
<b>Environmental issue</b>	<b>Review of policy response</b>
	<p>2003 National Rural Resettlement Policy  2002 National Forest Policy  2002 draft National Forestry Programme  1997 Swaziland Environment Action Plan  1995 Livestock Development Policy.</p>
<p><i>Biodiversity degradation</i></p> <p>Unsustainable exploitation of biodiversity, conversion of ecosystems, loss of habitat, invasive alien infestations are rapidly reducing biodiversity. Less than 4% of the country is formally protected and managed.</p>	<p>The national policy response to biodiversity degradation has been to sign and ratify the Convention on Biological Diversity and some protocols as well as the preparation of the National Biodiversity Strategy and Action Plan, still in its 2001 draft form.</p> <p>Biodiversity conservation is adequately addressed in the following national and sector policies and strategies:  2005 draft Comprehensive Agricultural Sector Policy  2005 draft National Food Security Policy  2005 draft Biosafety Policy  2002 National Forest Policy  2002 draft National Forestry Programme  2001 National Biodiversity Strategy and Action Plan  1997 Swaziland Environment Action Plan.</p>
<p><i>Climate change</i></p> <p>High vulnerability to climate change impacts on vegetation, soils, biodiversity, productivity and livelihoods.</p>	<p>The national policy response to climate change has been to sign and ratify the United Nations Framework Convention on Climate Change and the Kyoto Protocol and the preparation of the First National Communication to the UNFCCC.</p> <p>Climate change impacts are partially addressed in the following national and sectoral policies and strategies:  2005 draft Comprehensive Agricultural Sector Policy  2005 draft National Food Security Policy.</p>
<p><i>Land management</i></p> <p>Unsustainable land management practices are resulting in the rapid depletion of natural resources with impacts on productivity and livelihoods.</p>	<p>The national policy response to land management is through the related UN Conventions and the Millennium Development Goal 7: Ensure environmental sustainability. The issue of unsustainable land management is addressed comprehensively in the following policies:  2005 draft Comprehensive Agricultural Sector Policy  2003 National Rural Resettlement Policy  2000 draft National Land Policy  1997 Swaziland Environment Action Plan.</p>
<p><i>Water management</i></p> <p>Poor management of surface water resources resulting in over utilization, reduced quality and quantity.</p>	<p>There is no specific national policy response to water management. The draft SADC Water Policy is serving as a guide for water management in Swaziland. A National Water Policy is due to be formulated when funds are made available.</p> <p>The Water Act of 2003 currently provides legislative support for water management. Policy development is needed for rural water.</p> <p>Water management for irrigation purposes is adequately addressed in:  2006 draft National Irrigation Policy.</p>
<p><i>Natural forest and woodlands</i></p> <p>Deforestation and degradation of forest resources for fuel wood, medicinal plants and land conversions is reducing the total area annually. Alien invasive plant species are infesting increasing areas of natural forest.</p>	<p>The national policy response to forest management is related to the signing and ratifying of the Convention on Biological Diversity.</p> <p>Forest management is adequately addressed in the following national and sector policies and strategies:  2002 National Forest Policy  2002 draft National Forestry Programme  2001 National Biodiversity Strategy and Action Plan  1997 Swaziland Environment Action Plan.</p>
<p><i>Energy</i></p>	<p>The national policy response to energy is related to the signing and ratifying of the Convention on Biological</p>

<b>Criterion (b): Policy response to environmental issues</b>	
<b>Environmental issue</b>	<b>Review of policy response</b>
National energy demands are increasing pressure on forest resources for fuel wood resulting in deforestation.	Diversity and the United Nations Framework Convention on Climate Change. Energy is adequately addressed in the following national and sector policies and strategies: 2003 National Energy Policy 2002 draft National Forestry Programme 2001 National Biodiversity Strategy and Action Plan 1997 Swaziland Environment Action Plan.
<i>Pollution and waste management</i>  Lack of management, control and monitoring of impacts on environmental health	The national policy response to pollution and waste management is related to the signing and ratifying of the 1992 Basel Convention on the Transboundary Movement of Hazardous Wastes and their Disposal. Pollution and waste management is adequately addressed in the following national and sector policies and strategies: 2003 National Solid Waste Management Strategy 1997 Swaziland Environment Action Plan.

**(c) Consistency between policies**

The main policies, strategies and action plans related to the environment include:

- 2005 draft Comprehensive Agricultural Sector Policy
- 2005 draft National Food Security Policy
- 2005 draft National Irrigation Policy
- 2005 draft Biosafety Policy
- 2003 Swaziland National Solid Waste Management Strategy
- 2003 National Rural Resettlement Policy
- 2002 National Forest Policy
- 2002 draft National Forestry Programme
- 2002 National Energy Policy
- 2002 Tourism Policy and Strategy
- 2002 National Environmental Health Policy
- 2001 draft National Biodiversity Strategy and Action Plan
- 2000 Disaster Management Plan
- 2000 draft National Land Policy
- 1999 draft National Environment Policy
- 1999 National Disaster Management Policy
- 1997 Swaziland Environment Action Plan
- 1996 National Physical Development Plan 1996-2006
- 1995 Livestock Development Policy.

The above list shows that over the past ten years Swaziland has developed an extensive policy framework related to the environment. However, several policies or strategies still exist in draft form, or have not been developed, e.g. a Water Policy and a Biodiversity Policy, or are not being implemented or mainstreamed into institutional mandates or activities.

A review of the above policies has shown that the earlier documents are considerably less consistent with respect to the environment than the later ones; however none of these documents strongly contradict each other. The formulation and availability of the National Development Strategy and the Swaziland Environment Action Plan in the mid 1990s had a positive influence on the manner in which environmental issues were identified and addressed in later policies and ensured a much higher level of consistency.

Government has recently published guidelines on the structure and design of policy documents which enhanced standardization and coverage of issues.

**(d) Environmental integration in sectoral and macro-economic policies and existence of SEA of policies or strategies**

Environmental integration in sectoral and macro-economic policies has taken place in a number of recent sector policies, notably the National Rural Resettlement Policy, the National Forest Policy,

the Comprehensive Agricultural Sector Policy, the National Food Security Policy and the National Energy Policy.

The Environmental Management Act of 2002 requires Strategic Environmental Assessment (SEA) of policies, programmes, strategies, action plans and legislative bills to be subjected to this form of assessment. The process of SEA for the aforementioned has not taken place to date.

The 2005 draft Poverty Reduction Strategy and Action Plan (PRSAP) recognizes the importance of the environment in relation to its role in the alleviation of poverty and has formulated a number of actions that relate to general environmental matters as well as to specific concerns in environmental management planning, safe water and sanitation, and ensuring sustainable energy.

**(e) Important measures taken by the Government to solve environmental concerns**

<b>Criterion (e): Important measures taken by the Government to solve environmental concerns</b>	
<b>Environmental issue</b>	<b>Review of measures taken by Government</b>
<p><i>Land degradation &amp; desertification</i></p> <p>High levels of land degradation are having a significant impact on resource management and productivity, in particular on rangelands.</p>	<p>A review of the CCD National Action Plan (NAP) indicates that the number of measures taken by government is limited. The NAP implementation is generally not being funded, apart from few interventions by JICA and the Republic of China (Improvement of Rural Environment in Degraded Land; Rehabilitation of Degraded Land). Other government measures related to land rehabilitation and management remain uncoordinated.</p>
<p><i>Biodiversity degradation</i></p> <p>Unsustainable exploitation of biodiversity, conversion of ecosystems, loss of habitat, invasive alien infestations are rapidly reducing biodiversity. Less than 4% of the country is formally protected and managed.</p>	<p>A review of the 2001 draft National Biodiversity Strategy and Action Plan indicates that a number of actions have been initiated:</p> <ul style="list-style-type: none"> <li>Development of an invasive alien species database;</li> <li>Participation in the Southern African Biodiversity Support Programme of the SADC which seeks to co-ordinate the work of the national biodiversity programmes of SADC member states;</li> <li>Participation in the Southern African Botanical Network (SABONET) and the SAFRINET technical support network of BioNET International;</li> <li>Undertook a National Capacity Self Assessment (NCSA) for Global Environmental Management, looking at synergies amongst UNCBD, UNCCD and UNFCCC.</li> </ul> <p>National Biodiversity Data Unit with capacity building in ecosystem approach; no formal field programmes have been implemented;</p> <p>The National Environmental Education Programme (NEEP) for creating environmental public awareness;</p> <p>Biodiversity Conservation and Participatory Development Project identifies areas of important plant diversity and encourages sustainable conservation management.</p> <p>A National Botanical Garden is being constructed for ex-situ conservation of flora.</p>
<p><i>Climate change</i></p> <p>High vulnerability to climate change impacts on vegetation, soils, biodiversity, productivity and livelihoods.</p>	<p>Review of the recommendations related to energy, transport and forest resources of the First National Communication to the UNFCCC indicates that no measures have been taken by government in this respect.</p>
<p><i>Land management</i></p> <p>Unsustainable land management practices are resulting in the rapid depletion of natural resources with impacts on productivity and livelihoods.</p>	<p>Review of the action plans of related UN Conventions and the Millennium Development Goal 7 (<i>Ensure environmental sustainability</i>) indicates that the government has taken some measures:</p> <ul style="list-style-type: none"> <li>Improvement of Rural Environment in Degraded Land;</li> <li>Rehabilitation of Degraded Land.</li> </ul>
<p><i>Water management</i></p> <p>Poor management of surface water</p>	<p>Review of the implementation of related water policies and legislations indicates that government has taken the following measures:</p>

<b>Criterion (e): Important measures taken by the Government to solve environmental concerns</b>	
<b>Environmental issue</b>	<b>Review of measures taken by Government</b>
resources resulting in over utilization, reduced quality and quantity.	Preparing an Integrated Water Resource Management and Water Efficiency Plan; Establishment of the National Water Authority; Rural water supply schemes implemented; Sustainable water management in large- and small scale irrigation projects (Komati Basin, Lavumisa Irrigation, other smallholder developments); Construction of multi-purpose community dams.
<i>Natural forest and woodlands</i>  Deforestation and degradation of forest resources for fuel wood, medicinal plants and land conversions is reducing the total area annually. Alien invasive plant species are infesting increasing areas of natural forest.	Review of the implementation of the National Forestry Programme and the National Biodiversity Strategy and Action Plan indicates that the following measures have been taken: Several comprehensive forest inventories; Management of indigenous forest and wattle plantations; Control of alien invasive plant species; Established the National Herbarium to promote the protection of plant diversity; Prepared the Swaziland's Tree Atlas providing biodiversity information relevant to forest biodiversity; Commercialisation of marula and indigenous plants.
<i>Energy</i>  National energy demands are increasing pressure on forest resources for fuel wood resulting in deforestation.	Review of government initiatives indicates that the following measures have been taken: Renewable energy studies Several fuel efficiency programmes to reduce the uncontrolled cutting of fuel wood Rural electrification programme
<i>Pollution and waste management</i>  Lack of management, control and monitoring of impacts on environmental health	Review of government activities indicates that the following measures have been taken: Water and sanitation programmes implemented (including food hygiene education and pit latrines); Health care risk waste management in health facilities; Assessment of health care risk waste management for home-based care; Surveillance of non-communicable diseases; Assessment of Poly-chlorinated Biphenols in Swaziland.

**(f) Effectiveness in achieving targets**

National targets have not been set most of the environmental sectors; the only established targets are 100% access to safe water by 2015 and 100% access to electricity by 2022. It is unlikely that these targets will be met.

**3.1.2 Environment Legislation Framework**

Swaziland has an extensive legislation framework which is however fragmented and partially outdated. In recent years important initiatives have produced several new acts, such as the Flora Protection Act of 2001 and the Water Act of 2003, and most importantly the Environment Management Act of 2002. The 2005 National Constitution Act calls upon citizens to protect their environment.

Swaziland has also participated in international developments that have led to important conventions, treaties and protocols, most of which have been duly ratified.

The Swaziland legislative and regulatory framework is described below and reviewed following six evaluation criteria:

- (a) Ratification status and implementation of Multilateral Environment Agreements.
- (b) Adequacy of environmental legislation.
- (c) Provision and procedures for public participation in environmental issues.
- (d) Effectiveness of legislation enforcement.
- (e) Use of other (non legislative) instruments.
- (f) Potential impact of non-environmental legislation.

**(a) Status and implementation Multilateral Environment Agreements (MEAs)**

Swaziland has signed and ratified several international environmental conventions and agreements. The signature of international agreements is undertaken through the Ministry of Foreign Affairs and Trade.

The most important are the three Rio Conventions, which were ratified in 1994 and 1996:

- United Nations Convention on Biological Diversity (UNCBD)(1994)
- United Nations Convention to Combat Desertification (UNCCD)(1996)
- United Nations Framework Convention on Climate Change (UNFCCC) (1996).

Implementation of the commitments and obligations outlined within these UN Conventions has been delegated to the Swaziland Environment Authority. The SEA is responsible for ensuring that national obligations under the UN Conventions are met with the Director of the SEA acknowledged as providing a key link between Swaziland and the international community on environmental issues.

Other important international environmental conventions, protocols and treaties ratified (with year of ratification) by Swaziland include:

- Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on their Destruction (1996)
- Convention on the International Trade in Endangered Species of Wild Fauna and Flora (1997)
- Vienna Convention for the Protection of the Ozone Layer (2005)
- Montreal Protocol on Substances that Deplete the Ozone Layer (2005)
- Basel Convention on the Transboundary Movements of Hazardous Wastes and their Disposal (2005)
- Stockholm Convention on Persistent Organic Pollutants (2006)
- Cartagena Protocol on Biosafety to Convention on Biological Diversity (2006)
- Convention Concerning the Protection of the World Cultural and Natural Heritage (2006)
- Kyoto Protocol (2006)

Other important international conventions and treaties signed but not ratified by Swaziland include:

- Convention on Wetlands of International Importance especially as Waterfowl Habitat - Ramsar Convention
- Convention on the Conservation of Migratory Species of Wild Animals

Swaziland has also entered into several regional environmental conventions and agreements:

- African Convention on the Conservation of Nature and Natural Resources (1968)
- Cooperation Enforcement Operations Directed at Illegal Trade in Wild Fauna and Flora (the Lusaka Agreement) (1996)
- The General Transfrontier Conservation and Resource Area Protocol (2000)
- The Lubombo Conservancy-Goba Transfrontier Conservation Area Protocol (2000).

Swaziland has also signed several SADC environmental protocols:

- Protocol on Shared Watercourse Systems (1998)
- Protocol on Energy (1998)
- Protocol on Mining (2000)
- Protocol on Wildlife Conservation and Law Enforcement MOU on Cooperation in Standardisation, Quality (2003)
- Revised Protocol on Shared Watercourses (2003)
- Protocol on Fisheries (2003)
- Protocol on Forestry (2002)
- Declaration on Agriculture and Food Security (2004)

**(b) Adequacy of environmental legislation**

Swaziland has a comprehensive range of environmental laws with the Environmental Management Act of 2002 as the supreme environmental law. The legislative framework can be considered adequate though several key areas requiring specific legislative support currently remain without, e.g. biodiversity.

A National Capacity Self Assessment for Global Environmental Management, which looked at synergies amongst the UNCBD, UNCCD and UNFCCC was carried out in 2005 and found that

there is an inadequate level of harmonisation of sectoral policies and legislation and made recommendations to improve the overall framework and integration.

Supporting acts strengthen specific sectors of the overall environmental legislative framework. The main environmental legislation framework includes the following Acts and Bills.

Land tenure and access is provided for under the Constitution.

**The Water Act** (2003) is intended to harmonise the management of water resources in the country. Its provisions include the establishment of a National Water Authority and of a Water Resources Master Plan. This plan will contain an inventory of the total water resources of Swaziland, and a comprehensive programme of action in which the maximum value can be obtained from this resource for the benefit of the people of Swaziland.

**The Environment Management Act** (2002) is intended to provide and promote the enhancement, protection and conservation of the environment and the sustainable management of natural resources. It also turned the Swaziland Environment Authority (SEA) into a body corporate and established the National Environment Fund. In terms of this Act, the SEA has the power to halt any and all developments that have not been adequately scrutinised for their environmental impact. Any policy, bill, regulation, programme or plan requires a Strategic Environmental Assessment.

**The Flora Protection Act** (2001) is an Act to protect indigenous flora and to provide for matters incidental thereto. This Act prohibits any person from plucking, gathering, cutting, uprooting, injuring, breaking or destroying a plant of any species that is listed in the Schedule to the Act.

**The Waste Regulations** (2000) provides regulations for the management of solid waste and liquid waste disposed of on land.

**The National Trust Commission Act** (1972) provides for the operation of cultural institutions and the proclamation and management of national parks, monuments and related matters. This Act grants the National Trust Commission powers to proclaim national parks and monuments. It can acquire or alienate movable and immovable property subject to this Act with the approval of the Deputy Prime Minister. Any doubts or clarification of this Act require the Minister to obtain the decision of the Ngwenyama in writing which decision shall be final and binding to all concerned.

**The Game Act** (Amended) (1991) is to amend the 1953 Game Act and allows for the enclosure and preservation of areas for wild animals.

Other supportive Acts and draft Bills include:

- The Wild Birds Protection Act (1914)
- The Protection of Fresh Water Fish Act (1937)
- The Natural Resources Act (1951)
- The Private Forests Act (1951)
- The King's Order-in-Council (1954)
- The Grass Fires Act (1955)
- The Mining Act (1958, under revision)
- The Wattle Bark Control Act (1960)
- The Protected Places and Areas Act (1966)
- The Public Health Act (1969)
- The Control of Tree Planting Act (1972)
- The Plant Control Act (1981)
- The Game Amendment Act (1991)
- The Public Health Bill (1999, draft)
- The Seeds and Plant Varieties Act (2000)
- The Forest Bill (2002, draft)
- The Disaster Management Act (2006)
- The Water Pollution Control Regulations (2006, draft)
- The Air Pollution Control Regulations (2006, draft)
- The Biosafety Bill (2006, draft)

### **(c) Provision and procedures for public participation in environmental issues**

The 2002 Environment Management Act provides for public participation, and sets out regulations for register of environmental information, requests for environmental information, public review,

public hearings, findings of public hearings, public participation in licensing decisions, orders and prosecutions initiated by the public, civil actions and other regulations.

**(d) Effectiveness of legislation enforcement**

Legislative enforcement remains a weak area covering all legislation. Inadequate technical and human capacity and institutional coherence hamper enforcement. The Game Act is administered by a private body that manages several game reserves and enforces the provisions of the Act, which is an anomalous situation causing serious mandate problems. The SEA, though suffering from limited staff capacity, does manage to maintain a level of enforcement with respect to EIAs. The National Trust Commission Act is enforced fairly well by the Swaziland National Trust Commission.

**(e) Use of other (non legislative) instruments**

Non-legislative instruments do not specifically exist. Voluntary schemes (environmental management systems) have been adopted by several large industries to implement their own ISO14000 environmental standards, e.g. industrial timber plantations and the sugar industry.

Traditional laws and customs play an important non-legislative role in environmental management. Indigenous knowledge on resource utilisation and management remains important but lacks formal recognition and is generally unwritten.

**(f) Potential impact of non-environmental legislation**

The Environmental Management Act is the supreme environmental law and the implementation of any non-environmental piece of legislation, e.g. the Roads Act, where it is considered to have a direct or in-direct environmental impact falls under the provisions of the Environmental Management Act.

## **3.2 ENVIRONMENTAL INSTITUTIONAL FRAMEWORK**

### **3.2.1 Institutions with Environmental Responsibilities**

There are three key institutions with environmental responsibilities: the Swaziland Environment Authority (SEA), the Swaziland National Trust Commission (SNTC) and the Ministry of Agriculture and Cooperatives (MOAC).

The supreme institution is the Swaziland Environment Authority, established in 1992 and responsible for environmental policy making, legislation, planning, environmental protection, monitoring and enforcement using provisions of the Environment Management Act. The SEA is a parastatal institution that exists both within and outside government control. It is responsible for co-ordinating all national environmental responses and is the official national representative at international environmental fora.

Supporting the SEA, SNTC and MOAC are numerous government and non-governmental institutions with varying levels of responsibility for environmental management. These institutions are listed in Appendix 7.2.6.

In 2005, the SEA conducted a National Capacity Self Assessment for Global Environmental Management, which looked at synergies amongst UN conventions in particular but also assessed the capacity of supporting institutions (Appendix 7.2.6). The assessment found that the majority lacked capacity to effectively implement their institutional mandate. Capacity was particularly weak in the technical areas of environment and financial resources with which to implement their mandate, and was hampered by limited numbers of qualified personnel.

The SEA has a generally positive influence on other institutions through providing advice on environmental matters pertinent to the specific needs of the institution.

In carrying out their environmental responsibilities, these institutions face many challenges in planning and executing their mandates. Administrative weaknesses, poor inter-institutional coordination, low levels of understanding and awareness of environmental issues all combine to limit their effectiveness.

Major NGOs, institutions and other organisations involved in environmental management are listed in Appendix 7.2.6. NGOs executed programmes cover a wide variety of activities, including environmental awareness, soil management, water management, protection and improvement of grazing lands, livestock management, land reclamation, sustainable crop production, etc.

### **3.2.2 Public Participation**

Transparency and access to environmental information is catered for in the Environmental Management Act. Section 50 (1) (2) calls for the SEA to establish and maintain an environmental information registry which shall contain information relating to the environment explaining in ten articles the type of information.

The role of NGOs and civil society in environmental decision-making is regarded highly by both the Environmental Management Act as well as by having representatives of civil society on the SEA Board.

Effective participation in environmental decision-making is catered for in the Environmental Management Act which allows for public participation during the EIAs. Participation is addressed in Part VIII of the Act.

Access to justice in environmental matters is catered for in Section 57 of the Environmental Management Act where any member of the public has the right to call for an investigation where the Act has been allegedly contravened.

### **3.2.3 Environmental Services and Infrastructure**

#### ***Protected areas***

A total of seven existing reserves, covering 64100 ha (3.7% of the country), have been proclaimed. Four are managed by the Swaziland National Trust Commission (Malolotja, Hawane, Mlawula (including Ndzindza) and Mantenga Nature Reserves), and three by Big Game Parks (Mlilwane Game Reserve, Hlane National Park, Mkhaya Game Reserve). These protected areas are distributed widely, but with a bias towards the north-eastern part of the country. Swaziland clearly needs more proclaimed parks and reserves. Proclamation of some or all the protection worthy areas identified during the field survey in 2002 would go a long way to addressing this issue. The global target of conserving 10% of ecosystems and areas of importance for biodiversity within the country has not been met.

#### ***Sanitation and waste treatment infrastructure***

Approximately 52% of the population have access to improved sanitation and clean water supply, with the rural areas having about 10% less access. The institutions involved in the provision of safe domestic water supply and sanitation are the Swaziland Water Services Corporation (for urban areas), the Rural Water Supply Branch (MNRE) (for rural areas) and the Environmental Health Department (MHSW). Rural water supply and environmental health jointly implement programmes where safe water supply, sanitation and hygiene education are integrated.

#### ***Disaster prevention systems***

The Disaster Management Act of 2006 and 2000 National Disaster Action Plan provide for an integrated and coordinated disaster management approach and for the institutional mechanism, including structures, functions, authorities and responsibilities of major actors. However, its weak points include the following: providing for declaration of 'disasters', but specifying what is to be done in 'emergencies', granting executive jurisdiction of the National Disaster Management Council over disaster management activities of Ministries but investing it with advisory/supervisory roles.

#### ***Emergency response mechanisms***

Disaster management has focused on emergency management through ad hoc response measures, mainly by the supply of relief commodities by the National Disaster Task Force.

The development of knowledge and information sharing on disaster management is inadequate. There are several disaster management networks and partnerships and initiatives in information management are emerging. However, education or training in disaster management is lacking and some research efforts hold promise but the extension and adoption of research recommendations is weak. Overall, there is no systematic awareness raising programme. There has been progress in some areas of risk management application but several challenges remain (such as safer construction in the built environment and the use of financial instruments for disaster management). Swaziland receives significant emergency relief assistance but commodity management in the National Disaster Task Force is weak and a national disaster contingency plan does not exist.

### **3.2.4 Environmental Monitoring System**

Indicators for environmental monitoring related to MDG7 are defined as:

- Development and implementation of a national strategy for sustainable development by 2015
- Proportion of land covered by forest
- Proportion of area protected to maintain biological diversity to surface area
- Proportion of population using solid fuel as major source of energy
- Proportion of population with access to improved water sources(urban/rural)
- Proportion of the population with improved sanitation (urban/rural)
- Proportion of households with access to secure tenure

These indicators are considered relevant in Swaziland for monitoring environmental conditions, however they are not comprehensive and more work is needed to put in place measuring and monitoring systems. The SEA have overall responsibility for environmental monitoring and are required by the Environmental Management Act to prepare bi-annual State of Environment Report in which environmental performance is measured using a range of yet to be identified indicators.

Some sectors have established targets, e.g. 100% access to water by 2015 and 100% access to electricity by 2022 but it remains debatable whether these targets are achievable within the given timetable.

### **3.3 INTEGRATION OF ENVIRONMENTAL CONCERNS INTO THE MAIN POLICIES AND SECTORS**

Integration of environmental concerns into the main policies and sectors has been catered for since the formulation of the National Development Strategy and the Swaziland Environment Action Plan in the mid 1990s. Both of these have had a positive influence in the manner in which environmental concerns were integrated in subsequent sector policies.

For example, Swaziland has recognised the importance of climate change in two recent policies, both still in draft form, namely the Comprehensive Agricultural Sector Policy and the National Food Security Policy. Land degradation and degradation of biodiversity concerns have been integrated in a number of recent policies including the National Forest Policy, Energy Policy, Comprehensive Agricultural Sector Policy and the National Food Security Policy.

Strategic Environmental Assessment is a legislative requirement under Section 31 of the Environmental Management Act. All plans, programmes, bills and action plans are required to undergo a strategic impact assessment though this has yet to happen consistently.

## **4 EU AND OTHER DONOR CO-OPERATION WITH SWAZILAND FROM AN ENVIRONMENTAL PERSPECTIVE**

The total external assistance to Swaziland by bilateral and multilateral co-operating partners has been decreasing over the last decade and is now below 5% of the GDP. The main reasons for this decrease are a shift of donor interest to other countries, a greater regional focus, concerns about governance, Swaziland's Lower Middle Income Less Indebted status, low government capacity, and slow implementation of development programmes. The Government has designed an Aid Policy Statement on external assistance to provide a framework for effective resource mobilisation and to ensure consistency with national and sector priorities.

### **4.1 EU CO-OPERATION WITH SWAZILAND FROM AN ENVIRONMENTAL PERSPECTIVE**

The European Community remains one of Swaziland's main development partners and is the largest multilateral donor. Throughout the implementation of the various EDFs since 1976, the three main sectors of support have been Rural Development, Human Resource Development and Private Sector support. During the 9th EDF programme the central objective of EC assistance has been poverty reduction, with education as the focal sector and HIV/AIDS as a central cross-cutting issue.

EU Member State environment-related interventions during the past five years include the United Kingdom (environmental management, solar energy), Denmark (forestry policy, energy policy, solid waste management), Italy (health, conservation agriculture), the Netherlands (water management, renewable energy) and Sweden (rural electrification). Current involvement is very limited.

There is presently no experience relating to EC development co-operation interventions with specific environmental objectives but in some areas there is the integration of environment into other co-operation areas, notably poverty reduction and rural development. The EC is currently supporting the regional Renewable and Efficient Energy for Poverty Alleviation in Southern Africa project and the Water Facility project to improve water supply and sanitation at schools.

The application of environmental integration procedures (preparation of SEA or EIA) has only incidentally taken place in EC funded programmes/projects, e.g. the EIA on phase 1 and 2 of the Lower Usuthu Smallholder Irrigation Development Project (2002).

### **4.2 CO-OPERATION FUNDED BY OTHER DONORS FROM AN ENVIRONMENTAL PERSPECTIVE**

Other multilateral donors include mainly UNDP and other UN agencies. The 2006-2010 United Nations Development Assistance Framework (UNDAF) identified five key priority areas of cooperation: HIV and AIDS; Poverty Reduction; Food Security; Basic Social Services; and Governance. Some of these areas have linkages with environmental matters. UNESCO has funded a demonstration centre for solar technology. FAO has funded Strengthening National Capacities in Formulation and Implementation of Legal Instruments on Genetically Modified Organisms project, including the preparation of the Biosafety Bill of 2006. UNICEF and WFP are supporting fuel efficient stove programmes for neighbourhood care points. WFP has a small food for work programme focusing on environmental rehabilitation.

IFAD are presently active in supporting the implementation of the EIA Comprehensive Mitigation Plan for the LUSIP project during the planning phase 2004-2007.

An important non-EU bilateral donor is the Republic of China (on Taiwan) through support in agriculture, rural electrification and other areas. Japan has contributed to poverty reduction, rural water supply and land rehabilitation. The USA has no regular bilateral aid programme with Swaziland, but provides aid through the Embassy. No programmes are funded from an environmental point of view.

#### ***Donor coordination***

The size of donor support to Swaziland has been decreasing over the past decade, and is very small at present. Furthermore, the relative importance of donor contributions compared to GDP, or government's own budget, is small. This makes coordination of donor activities relatively easy, and a fair degree of complementarity and coherence is achieved in most sectors.

## 5 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 CONCLUSIONS

The environment and natural resources of Swaziland are under pressure from population growth, competing land uses and poverty. There is need for sustainable management of natural resources and a greater involvement and responsibility of the population, in particular in the rural areas.

Degradation of land, water, forest, biological diversity and other natural resources as a result of unsustainable land use practices have a severe impact on the population as the land and water productivity and ecosystem services have decreased and no longer provide the goods that are required by the rural population.

Living conditions in human settlements are in general not improving, although progress is achieved in certain essential deliveries, albeit at a very slow pace. Due to air and water pollution and severe constraints in waste management the environmental health risks are still very high.

Swaziland has developed an extensive policy framework related to the environment. However, several policies or strategies still exist in draft form, or have not been developed, e.g. a Water Policy and a Biodiversity Policy.

The legislation framework is currently still largely fragmented and outdated, although several essential pieces of legislation have been provided. The implementation of the various pieces of legislation remains unsatisfactory.

The main conclusion of the environmental review and assessment is that undesirable environmental trends related to land and water management, land degradation and pollution, ecosystem and biodiversity degradation, climate change, and living conditions in human settlement have led to the following combined impacts on the society, in a sequence where the components are interactive and impacting on each other.

- Loss of natural resources
- Changes in natural habitats and ecosystems
- Loss of biodiversity
- Changes and diminishment of ecosystem services
- Decrease of harvesting of natural products
- Decrease of affordable energy sources
- Reduced area of land under production
- Land fragmentation
- Conflicts about land
- Decreased land productivity
- Decreased water availability and shortages
- Increase of water pollution
- Increase of air pollution
- Increase of land contamination through uncontrolled waste
- Insufficient clean water and sanitation
- Increased environmental health hazards
- Increased social and economic vulnerability
- Decreased coping mechanisms to disasters
- Increased food insecurity
- Impoverished livelihoods

### 5.2 RECOMMENDATIONS

Swaziland has a comprehensive environment policy framework that needs to be implemented through existing strategies and action plans. It is important that implementation addresses environmental degradation at large, rather than focusing on components only. The major issues of land, ecosystem and biodiversity degradation are interrelated and need be addressed in a comprehensive way.

Improving living conditions in human settlements is a first priority as it concerns public health and other primary conditions. There is a wide array of issues and constraints that need to be addressed, including safe water, sanitation, waste management, air and water pollution, soil contamination, efficient use of energy, sources of renewable energy, environmental health concerns, etc.

It is recommended not only to provide access to water and electricity in urban, peri-urban and rural areas, but also provide an affordable supply. Current connection and tariff costs are beyond the reach of many people. This needs to be looked into in order to include a larger proportion of the population within the realm of these essential services.

There is a need to further complete the environment policy framework as a number of essential policies and strategies are still outstanding or missing. This holds true even more for the legislation framework which already contains important elements but requires updating, consolidation and a comprehensive coverage.

There is a general need for institutional strengthening, capacity building and resource mobilisation related to the implementation of environment related programmes and responsibilities, taking into account the recommendations of the National Capacity Self Assessment.

There is a need to develop indicators for environmental monitoring. The set of indicators related to MDG7 are considered relevant in Swaziland for monitoring environmental conditions, however they are not comprehensive and more work is needed to put in place a functional systems.

It is recommended to promote and use efficiently the EC horizontal budget lines (e.g. Environment and Forests) and facilities (EU Water Facility - EUWF and the EU Energy Facility - EUEF).

It is recommended to enhance co-ordination on environmental issues with other donors, seeking to achieve complementarities and synergies in order to more effectively deliver development objectives.

## 6 COUNTRY STRATEGY PAPER ENVIRONMENTAL ANNEX SUMMARY

### STATE OF THE ENVIRONMENT

#### LAND AND WATER RESOURCES

##### *Mineral resources*

The geology of Swaziland is complex and diverse and minerals of economic importance include asbestos, iron, gold, diamonds, coal, green chert and various others which have been mined in the past. Currently there are several viable mining options - in particular the national coal reserve is reported to be substantial -, development of which may lead to increased pressure on the environment through impacts on landscapes and ecosystems, waste accumulation, surface and ground water contamination, end of life site rehabilitation and environmental health.

##### *Land resources*

The land resources of the country are well described and mapped. Swaziland has diverse and unique landscapes of high aesthetic and cultural value, which offer opportunities for tourism and improved management.

More than half of Swaziland is used for extensive grazing. Other major land uses are industrial forestry, commercial irrigated crop production and small-scale subsistence rainfed agriculture.

Land tenure has two main categories: communal land held in trust by the King, called Swazi National Land and private or Title Deed Land. Under the 2005 Constitution, all people have equal access and rights to land. However there is increasing pressure on land resources, driven by a growing population and the demand for more land, including land for irrigated agriculture, industrial forestry, livestock grazing, biodiversity conservation, urban development and related infrastructure.

Mechanisms of land allocation and administration are not adequate to appropriately deal with the physical development planning of the country. Land use planning in Swaziland is generally ad hoc and uncoordinated.

There are indications that less arable land is actively being cultivated as a result of the HIV/AIDS weakened labour force and recurrent droughts affecting the country and region as a whole.

Due to population pressure, livestock overstocking, overgrazing, veld burning and lack of sustainable natural resource management almost a third of the country and more than half of all communal grazing land has a serious or very serious erosion status.

Land degradation and soil erosion are recognised as very serious problems in Swaziland and a critical issue for continued sustainable social and economic development and poverty alleviation. The causes of the land degradation are poor agricultural land management - in particular range management - but also unsustainable management of forestry, mining, industry and road construction. Degradation takes place as chemical, biological and physical degradation.

Climate change is expected to have a further detrimental effect on land degradation through a reduction in vegetation cover and changes in species composition, as well as through increased deforestation, desertification and disaster hazards.

##### *Water resources*

The water that Swaziland can utilise from its main river basins is limited by agreements with South Africa and Mozambique. Most rivers rise in South Africa and all flow eventually to Mozambique. The demand for water is strongly increasing as a result of expanding irrigation, industrial activities and residential use, and demand exceeds supply.

The groundwater resources of Swaziland have potential for exploitation, however these resources are not available in sufficient quantity to allow large scale abstraction, hence virtually all irrigation in Swaziland is based on surface water.

The Water Act of 2003 calls for improved catchment management by improved stakeholder participation and planning and decentralization of the management of the water resource. The Act

also calls for the establishment of a National Water Authority, a Water Resources Master Plan and the establishment of River Basin Authorities.

Industrialization has led to gradual deterioration of the quality of water resources. Rivers are also affected by polluted drainage water from the irrigated sugar plantations and other cultivated land where fertilisers are inappropriately applied.

Climate change impacts on water resources will translate to increased possibilities of flooding in the rainy season due to higher flows and drought-related conditions in winter due to low flows. Effects of this will likely find its way into groundwater recharges, salinity and dam capacities.

### ***Climate and climate change***

The overall climatic characterization of Swaziland is subtropical with summer rains and distinct seasons. The various geographical zones show different climatic conditions, ranging from subhumid and temperate in the Highveld to semi-arid and warm in the Lowveld.

Climate change studies suggest that by 2050 temperatures and rainfall over southern Africa will be 2-4°C higher and 10-20% less than the 1961-90 baseline respectively. Current climatic zones are expected to shift and be replaced by drier and hotter climates.

Climate change will negatively impact on land degradation and ecosystems, and hence reduce productivity and livelihood possibilities, in particular in the Lowveld and Lubombo, unless adaptation measures to climate change are introduced.

## **ECOSYSTEMS AND BIOLOGICAL DIVERSITY**

### ***Ecosystems***

The four recognised ecosystems of Swaziland are montane grasslands, savanna-woodland mosaic, forests, and aquatic systems, with the savanna-woodland ecosystem dominant and best protected.

Swaziland is extremely rich in biodiversity, supports a diverse assemblage of habitats and contains a significant portion of southern Africa's plant and animal species. The eastern and western regions of Swaziland forms part of two recognised global biodiversity hotspots.

The status of biodiversity of the ecosystems of Swaziland is threatened by lack of protection and land conversions, which are projected to half the area of potential protection worthy ecosystems.

Climate change is a global threat to biodiversity and is expected to have a significant impact on ecosystems and ecosystem services in Swaziland. The country is projected to see the introduction of a tropical very dry forest type of ecosystem in the eastern part of the country replacing half of the current subtropical ecosystem.

Current deforestation and degradation of the natural forest and woodlands areas are caused by a complex of factors including population growth, pressure on land, land conversions, growing poverty, inequities in land tenure and access rights.

Lack of capacity to manage the indigenous forests has led to uncontrolled extraction of forest products such as timber, fruits, edible plants, fuel wood, wood for utensils and craft, medicinal plants. In the rural areas over 75% of the homesteads uses firewood for cooking and heating. Uncontrolled veld fires further contribute to forest degradation.

The rangelands of Swaziland - in particular the communal range - are in a strongly degraded state as a result of heavy pressure from large livestock numbers, overgrazing and poor management. Range degradation is further exacerbated by bush encroachment caused by a lack of browsing, which is found concentrated in the commercial TDL ranches.

### ***Biological diversity***

The local status of globally threatened species is that many species in Swaziland have declining populations, some of which have already gone extinct. Swaziland has produced two recent red data lists, indicating that large numbers of plants and vertebrates are threatened.

The decline in biological diversity is caused by loss of habitat, over-exploitation and invasive alien species. Habitat destruction is also the result of industrial forestry and large-scale irrigated

agricultural expansion. It is expected that in the long term climate change and desertification will have a further impact on biodiversity.

The invasion of alien plant species is having a considerable degrading impact on the natural vegetation and ecosystems. It is occurring in such threatening form that it has been declared a national disaster.

Fish stocks of Swaziland have been determined by a fish biodiversity survey. A red data list was produced indicating that several species were found threatened. Pollution of the aquatic ecosystem by persistent pollutants continues to be a major threat to the aquatic biodiversity.

The UN Convention on Biological Diversity 2010 global targets of restoring and maintaining populations of declining species, and improving the status of threatened species are unlikely to be met in Swaziland.

The in-situ conservation through proclaimed nature reserves and game parks covers less than 4% of the country. This is far from the global IUCN target of conserving 10% of ecosystems and areas of importance for biodiversity within the country.

## LIVING CONDITIONS IN HUMAN SETTLEMENTS

### ***Socio-economic environment***

Swaziland's population of approximately 1.1 million is significantly affected by the high incidence of HIV/AIDS, high occurrence of poverty, high unemployment and income inequity. There is high vulnerability to food insecurity and livelihood decline problems in large parts of the country.

The social vulnerability is exacerbated by environmental vulnerability expressed by lack of access to clean water, poor sanitation, inadequate access to energy, degrading land and other factors.

The Government is responding to this situation with the Poverty Reduction Strategy and Action Plan (PRSAP), which intends to empower the poor to generate income through (1) improving access to land, (2) increasing income from agriculture, and (3) reducing unemployment. The strategies proposed under the human capital development focus on (1) education, (2) health, (3) food security and nutrition, and (4) safe water and sanitation.

### ***Energy***

Energy use in rural areas is based on wood fuel, which is estimated to outstrip supply and hence resulting in deforestation. The national strategy to rectify this situation is to use energy efficiently, establish community woodlots and convert to commercial fuels.

Rural electrification is taking place at a steady rate, focusing on supplying clinics, schools, and community centres from where communities can have improved access. However, few rural households are connected due to unaffordable connection and tariff costs.

### ***Pollution and environmental health***

About half of the population has no access to improved sanitation and clean water supply, which is severely impacting on environmental health conditions. Water sources are contaminated and the incidence of respiratory and diarrhoeal diseases, skin disorders and bilharzia remains very high.

Production of solid waste is increasing and Swaziland has capacity and infrastructure constraints to efficiently deal with solid waste management. Growing quantities of urban waste and sewage contaminate soil and water and pose threats to human health and the environment.

Rivers and other water bodies are increasingly threatened by chemical and other pollutants. Air pollution is attributed to emissions from residential and industrial areas, e.g. wood pulp and sugar mills. Pollution and contamination of air, water and land increase environmental health risks.

## **ENVIRONMENT POLICY, LEGISLATIVE AND INSTITUTIONAL FRAMEWORK**

### **ENVIRONMENT POLICY AND LEGISLATION**

#### ***Environment Policy Framework***

The national policy framework includes the 1999 National Development Strategy (NDS) with long-term development Vision 2022 and the 1997 Swaziland Environment Action Plan (SEAP). All other policies and strategies have been formulated to facilitate the vision of the NDS. The NDS identifies environmental protection as a cornerstone in the national development process.

Swaziland has responded in its national policy framework to addressing global environmental issues, of which the most relevant in this context are land degradation and desertification, decline of biodiversity, climate change, food security, health and poverty.

Environmental integration in sectoral and macro-economic policies has taken place in a number of recent sector policies, notably the National Rural Resettlement Policy, the National Forest Policy, the Comprehensive Agricultural Sector Policy, the National Food Security Policy and the National Energy Policy.

The Environmental Management Act of 2002 requires Strategic Environmental Assessment (SEA) of policies, programmes, strategies, action plans and legislative bills to be subjected to this form of assessment. The process of SEA for the aforementioned has not taken place to date.

The 2005 draft Poverty Reduction Strategy and Action Plan (PRSAP) recognizes the importance of the environment in relation to the alleviation of poverty and has formulated a number of actions that relate to general environmental matters as well as to specific concerns in environmental management planning, safe water and sanitation, and ensuring sustainable energy.

Targets have not been set most of the environmental sectors; the only ones are 100% access to safe water by 2015 and 100% access to electricity by 2022. These targets are unlikely to be met.

### ***Environment Legislation Framework***

Swaziland has an extensive legislation framework which is however fragmented and partially outdated. In recent years important initiatives have produced several new acts, such as the Flora Protection Act of 2001 and the Water Act of 2003, and most importantly the Environment Management Act of 2002.

Swaziland has also participated in international developments that have led to important multi-lateral conventions, treaties and protocols, most of which have been duly ratified but have had limited implementation or mainstreaming. The most important are the three Rio Conventions, which were ratified in 1994 (United Nations Convention on Biological Diversity) and 1996 (United Nations Convention to Combat Desertification, United Nations Framework Convention on Climate Change).

There is a comprehensive range of environment related laws with the Environmental Management Act as the supreme environmental law. The legislative framework can be considered adequate though several key areas requiring specific legislative support remain without, e.g. biodiversity.

The Environment Management Act is intended to provide and promote the enhancement, protection and conservation of the environment and the sustainable management of natural resources. It also turned the Swaziland Environment Authority (SEA) into a body corporate and established the National Environment Fund. In terms of this Act, the SEA has the power to halt any and all developments that have not been adequately scrutinised for their environmental impact. Any policy, bill, regulation, programme or plan requires a Strategic Environmental Assessment. The Act provides for public participation, and sets out regulations for a register of environmental information, requests for environmental information, public review and hearings, orders and prosecutions initiate by the public, civil actions and other regulations.

Legislative enforcement remains a weak area covering all legislation. Inadequate technical and human capacity and institutional coherence hamper enforcement.

## **ENVIRONMENTAL INSTITUTIONAL FRAMEWORK**

### ***Institutions with Environmental Responsibilities***

The Swaziland Environment Authority is the supreme institution responsible for the environment. Established in 1992 it remains an effective regulatory institution that coordinates many other supporting institutions. The SEA is responsible for environmental policy making, legislation, planning, environmental protection, monitoring and enforcement using provisions of the Environment Management Act.

### ***Environmental Services and Infrastructure***

Protected areas: A total of seven reserves covering 3.7% of the country have been proclaimed.

Sanitation and waste treatment infrastructure: The institutions involved in the provision of safe domestic water supply and sanitation are the Swaziland Water Services Corporation (for urban areas), the Rural Water Supply Branch (MNRE) (for rural areas) and the Environmental Health Department (MHSW).

Disaster prevention systems: The Disaster Management Act of 2006 and the Disaster Action Plan provide for an integrated and coordinated disaster management approach and for the institutional mechanism, including structures, functions, authorities and responsibilities of major actors.

Emergency response mechanisms: Disaster management has focused on emergency management through ad hoc response measures, mainly supply of relief commodities by the National Disaster Task Force. The Environment Management Act and National Environment Fund provide financial mechanisms for dealing with disasters.

### ***Environmental Monitoring System***

Indicators for environmental monitoring related to MDG7 are considered relevant in Swaziland for monitoring environmental conditions, however they are not comprehensive and more work is needed to put in place measuring and monitoring systems. The SEA has overall responsibility for environmental monitoring and is required by the Environmental Management Act to prepare bi-annual State of Environment Reports.

### **INTEGRATION OF ENVIRONMENTAL CONCERNS INTO MAIN POLICIES AND SECTORS**

Integration of environmental concerns into the main policies and sectors has been catered for since the formulation of the National Development Strategy and the Swaziland Environment Action Plan in the mid 1990s. Both of these have had a positive influence in the manner in which environmental concerns were integrated in subsequent sector policies.

### **EU AND OTHER DONOR CO-OPERATION WITH SWAZILAND FROM AN ENVIRONMENTAL PERSPECTIVE**

The total external assistance to Swaziland by bilateral and multilateral co-operating partners has been decreasing over the last decade and is now below 5% of the GDP.

#### **EU CO-OPERATION WITH SWAZILAND FROM AN ENVIRONMENTAL PERSPECTIVE**

The European Community remains one of Swaziland's main development partners and is the largest multilateral donor. EU Member States during the past five years have implemented several bi-lateral environment-related interventions; however, current involvement is very limited.

There is presently no experience relating to EC development co-operation interventions with specific environmental objectives. Application of environmental integration procedures (preparation of SEA or EIA) has only incidentally taken place in EC funded programmes/projects.

#### **CO-OPERATION FUNDED BY OTHER DONORS FROM AN ENVIRONMENTAL PERSPECTIVE**

Other multilateral donors include mainly UNDP and other UN agencies with the Global Environment Facility being the most utilised source of funding for environment projects. The environment has not been identified by the 2006-2010 UNDAF as a key priority area of cooperation, although some areas of intervention have linkages with environmental matters. The IFAD are presently active in supporting the implementation of the EIA Comprehensive Mitigation Plan for the LUSIP project during the planning phase 2004-2007.

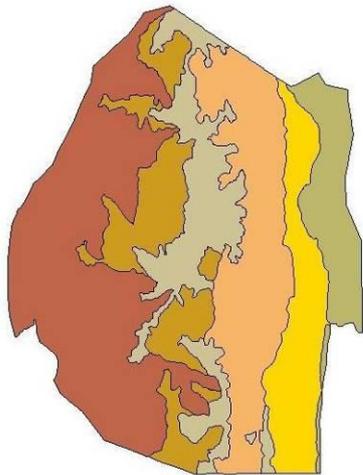
The Republic of China (on Taiwan) and Japan are non-EU bi-lateral donors with some support related to the environment.

## 7 TECHNICAL APPENDICES

### 7.1 ENVIRONMENTAL MAPS

#### 7.1.1 Agro-ecological Zones of Swaziland

##### Agro Ecological Zones of Swaziland

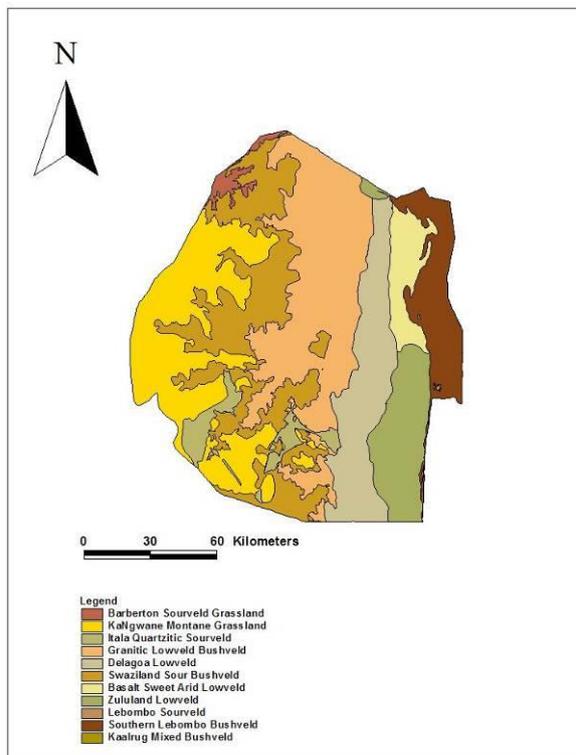


Agro Ecological Zones with corresponding Köppen classification

Cwb	Highveld
Cwa	Western Lowveld
Cwa	Eastern Lowveld
BSh	Upper Middleveld
BSh	Lower Middleveld
Cwa	Lebombo Range

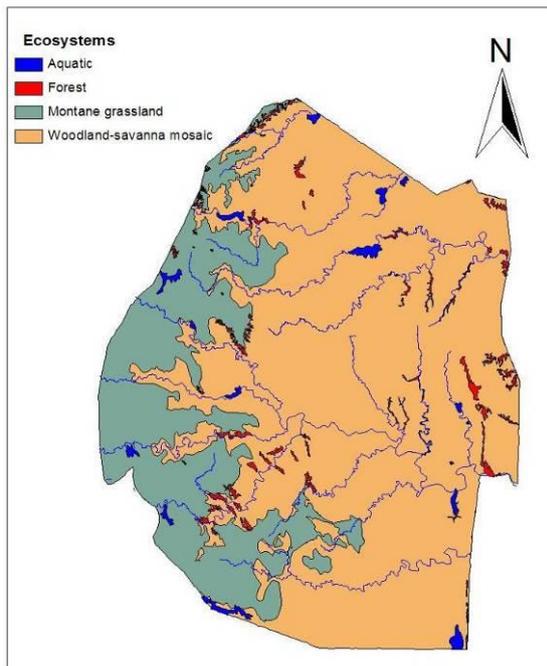


#### 7.1.2 Vegetation Types of Swaziland

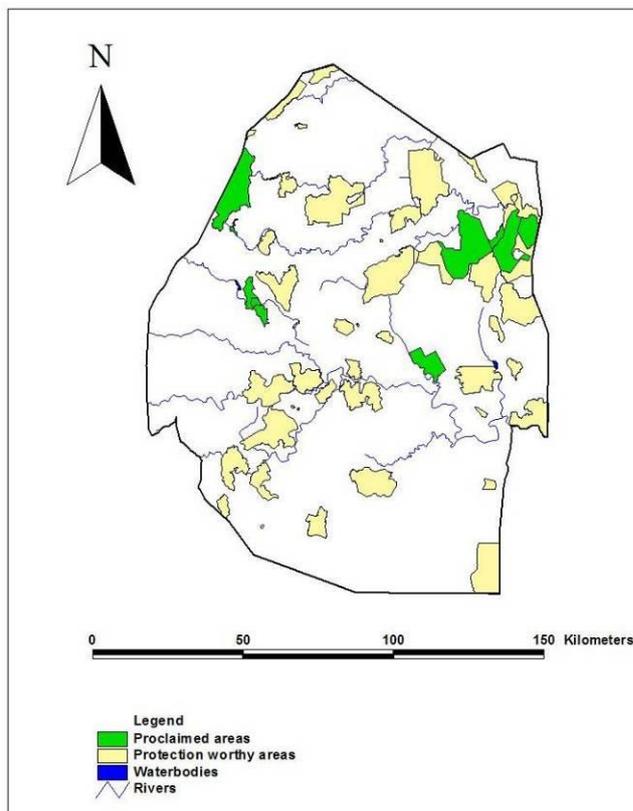


(Adapted from Dobson & Loffler 2004)

### 7.1.3 Ecosystems of Swaziland



### 7.1.4 Protection Areas of Swaziland



(Adapted from Roques 2002)

## 7.2 REFERENCE LIST OF ENVIRONMENT POLICY DOCUMENTS AND OTHER INFORMATION

### 7.2.1 Status of National Policies, Action Plans, Strategies and Legislation

Policy/Action Plan/Strategy	Date	Status
<i>Ministry of Tourism, Environment and Communications</i>		
The Swaziland Environmental Action Plan	1997	Approved
The National Environment Policy	2000	Awaiting approval
The Swaziland Biodiversity Strategy and Action Plan	2000	Awaiting approval
The Environmental Education Strategy for Swaziland	2000	Approved
The Tourism Policy and Strategy	2002	Approved
The Environmental Management Act	2002	Approved
The Swaziland National Solid Waste Management Strategy	2003	Awaiting approval
The Telecommunications Policy	2003	Status unknown
The National Biosafety Bill	2006	Awaiting approval
The Alien Invasive Strategy and Action Plan	2004	Being formulated
National Capacity Self-Assessment Report on National Capacity Needs, Constraints and Priorities for the Implementation of the Climate Change, Desertification and Biodiversity Conventions	2004	Being formulated
Assessment of the Status of Access and Benefit Sharing (ABS) of Genetic Resources in Swaziland	2005	Being formulated
The National Biosafety Policy	2005	Being formulated
The National Biosafety Bill	2006	Being formulated
<i>Ministry of Agriculture and Cooperatives</i>		
The National Livestock Development Policy	1995	Approved
The National Action Program of the Convention to Combat Desertification (NAP)	2001	Approved
The National Forest Policy	2002	Approved
The National Forestry Programme	2003	Approved
The Rural Resettlement Policy	2003	Approved
The Cooperatives (Amendment) Act	2003	Approved
The Swaziland Comprehensive Africa Agriculture Development Programme (CAADP) & NEPAD CAADP National Medium–Term Investment Programme	2004	Awaiting approval
The Animal Diseases Act	2004	Being reformulated
The Swaziland Food Security and Agriculture Development Horizon 2015 (FAO)	2005	Awaiting approval
The National Comprehensive Agricultural Sector Policy	2005	Being formulated
The National Irrigation Policy	2005	Being formulated
The National Food Security Policy	2005	Awaiting approval
The Integrated Tick and Tick Bourne Disease Control Policy		Awaiting approval
<i>Ministry of Natural Resources and Energy</i>		
The National Land Policy	2000	Awaiting approval
The Rural Water Supply and Sanitation Sector Policy	2001	Being reviewed
The National Energy Policy	2002	Approved
The Water Act	2003	Approved
The Mining Policy	2003	Awaiting approval
The Electricity Act	2005	Approved
The Integrated Water Resource Management Plan and Water Efficiency Plan	2005	Being formulated
The National Water Policy		Being formulated
<i>Ministry of Enterprise and Employment</i>		
The Small and Medium Enterprise Policy	2004	Approved
Children, including Orphans and Vulnerable Children Policy	2004	Being formulated
The Sugar Policy		Being formulated
<i>Ministry of Economic Planning and Development</i>		
The 6th Development Plan 1994-95 - 1996/97	1994	Approved
The 9th Development Plan 1998/99 - 2000/01	1998	Approved
The National Development Strategy	1999	Approved

The Economic and Social Reform Agenda	1999	Approved
The Aid Policy	2001	Being formulated
The National Population Policy	2003	Approved
The Poverty Reduction Strategy and Action Plan	2005	Being revised
<i>Ministry of Housing and Urban Development</i>		
The Urban Government Policy	1996	Approved
The Peri-Urban Growth Policy	1997	Awaiting approval
The National Physical Development Plan	1999	Approved
The National Physical Planning Policy	2001	Approved
The National Housing Policy	2001	Approved
The Sectional Titles Act	2003	Awaiting approval
The Lubombo Regional Physical Development Plan	2004	Awaiting approval
The Hhohho Regional Physical Development Plan	2005	Awaiting approval
The Manzini Regional Physical Development Plan	2005	Awaiting approval
The 99 Year-Lease Implementation Strategy	2004	Being formulated
The Urban Agriculture Policy	2004	Being formulated
The Physical Planning and Development Bill	2004	Being formulated
<i>Ministry of Public Works and Transport</i>		
The National Transport Policy	2000	Approved
The National Construction Industry Policy	2002	Approved
Swaziland's First National Communication to the UNFCCC	2002	Approved
<i>Ministry of Health and Social Welfare</i>		
The National Health Policy	1983	Approved
The Swaziland National Plan of Action for Nutrition	1996	Approved
The Multi-sectoral HIV and AIDS Policy	2005	Being formulated
The National Environmental Health Policy	2002	Awaiting approval
The National Health and Social Welfare Policy	2000	Awaiting approval
The National Youth Policy		Awaiting approval
<i>Ministry of Justice and Constitutional Development</i>		
The National Constitution Act	2005	Approved
The Codification of Swazi Law and Custom		Being formulated
<i>Ministry of Public Service and Information</i>		
The Information and Media Policy	2005	Awaiting approval
National Information and Communication Technologies Policy (inclusive of the National Spatial Data Initiative)	2004	Being formulated
<i>Ministry of Education</i>		
The Education Policy	2001	Approved
<i>Ministry of Home Affairs</i>		
The NGO Policy	2005	Approved
The National Sports Policy	2001	Approved
<i>Office of the Prime Minister</i>		
The Millennium Action Programme	2003	Approved
The Smart Programme on Economic Empowerment and Development	2004	Operational
<i>Deputy Prime Ministers Office</i>		
The National Disaster Management Policy	1999	Approved
The National Disaster Management Action Plan	2000	Approved
The National Disaster Management Act	2006	Approved
The National Gender Policy	2004	Status unknown
The Regional Development Policy	2004	Being formulated
The Decentralisation Policy	2005	Approved

Source: [http://www.ecs.co.sz/env\\_ratification.htm](http://www.ecs.co.sz/env_ratification.htm)

## 7.2.2 International & Regional Conventions, Treaties, Declarations, Protocols

<i>Declarations</i>	<i>Date</i>		
Maputo Declaration on Agriculture and Food Security in Africa	10-12 July 2003		
Sirte Declaration on the Challenges of Implementing Integrated and Sustainable Development on Agriculture and Water in Africa	2004		
Dar Es Salaam Declaration on Agriculture and Food Security in the SADC Region	14 Feb 2004		
The FAO Committee on World Food Security Right to Food Guidelines	23 Sept 2004		
Declaration of the World Food Summit: five years later	2002		
World Declaration on Nutrition - Plan of Action for Nutrition	1992		
Rome Declaration on World Food Security and Plan of Action	13-17 Nov 1996		
<i>Conventions, Treaties &amp; Protocols</i>	<i>Date</i>	<i>Date signed</i>	<i>Date ratified / accession</i>
International Treaty on Plant Genetic Resources for Food and Agriculture	3 Nov 2001	10 June 2002	not ratified
Stockholm Convention on Persistent Organic Pollutants (POPs)	23 May 2001	not signed	13 Jan 2006
The Cartagena Protocol on Biosafety to the Convention on Biological Diversity	29 Jan 2000	not signed	13 Jan 2006
The Beijing Amendment to the Montreal Protocol on Substances that deplete the ozone layer	1 Jan 2000	not signed	16 Dec 2005
African-Eurasian Migratory Water Bird Agreement	1 Nov 1999	not signed	not ratified
The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	11 Sept 1998	not signed	not ratified
The Kyoto Protocol	11 Dec 1997	not signed	13 Jan 2006
The Comprehensive Nuclear-Test-Ban Treaty	10 Sept 1996	24 Sept 1996	not ratified
The African Nuclear-Weapon Free Zone Treaty (Pelindaba Treaty)	11 April 1996	4 Nov 1996	not ratified
The Revised SADC Protocol on Shared Watercourse Systems		7 Aug 2000	ratified
Ban Amendment to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	22 Sept 1995	not signed	not ratified
The SADC Protocol on Shared Watercourse Systems	28 Aug 1995	28 Aug 1995	ratified
The Lusaka Agreement on Co-operative Enforcement Operations Directed at Illegal Trade in Wildlife (Fauna and Fauna)	8 Sept 1994	8 Sept 1994	not ratified
United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa	12 Sept 1994	27 July 1995	7 Oct 1996
United Nations Convention on the Law of the Sea	16 Nov 1994		
Agreement on the Implementation of Part XI of the Convention on the Law of the Sea	28 July 1994	12 Oct 1994	not ratified
Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on their Destruction	13 Jan 1993	23 Sept 1993	20 Nov 1996
London Amendment to Montreal Protocol on Substances that deplete the ozone layer	10 Aug 1992		16 Dec 2005
The Rio Declaration on Environment and Development	13 June 1992		
The Convention on Biological Diversity	5 June 1992	12 June 1992	9 Nov 1994
United Nations Framework Convention on Climate Change	9 May 1992	12 June 1992	7 Oct 1996
Convention on the Protection and Use of Transboundary Watercourses and International Lakes	17 March 1992	not signed	not ratified
The Convention on Environmental Impact Assessment in a Transboundary Context	25 Feb 1991	not signed	not ratified
Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes Within Africa (BAMAko)	30 Jan 1991	29 June 1991	not ratified
Adjustments and Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer	29 June 1990		16 Dec 2005
Convention on the Rights of the Child (CRC)	20 Nov 1989		6 Oct 1995
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	22 March 1989	not signed	8 Aug 2005
Montreal Protocol on Substances that Deplete the Ozone Layer	16 Sept 1987	10 Nov 1992	16 Dec 2005
Vienna Convention for the Protection of the Ozone Layer	22 March 1985	12 Dec 1994	16 Dec 2005

Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment (CAT)	10 Dec 1984		25 Apr 2004
United Nations Convention on the Law of the Sea	10 Dec 1982	18 Jan 1984	not ratified
Convention on the Elimination of All Forms of Discrimination against Women (CEDAW)	18 Dec 1979	not signed	26 Mar 2004
Convention on Long-range Transboundary Air Pollution	13 Nov 1979	not signed	not ratified
Convention on the Conservation of Migratory Species of Wild Animals	23 June 1979	not signed	not ratified
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)	3 March 1973	3 March 1973	24 Jan 1997
Convention for the Protection of the World Cultural and Natural Heritage	16 Nov 1972		2006
The Biological and Toxin Weapons Convention	10 April 1972		18 June 1991 acceded
Treaty on the Prohibition of the emplacement of nuclear weapons and other weapons of mass destruction on the seabed and the ocean floor and in the subsoil thereof	12 Feb 1971	11 Feb 1971	9 Aug 1972
The Ramsar Convention on Wetlands	2 Feb 1971	not signed	not ratified
African Convention on the Conservation of Nature and Natural Resources	15 Sept 1968	15 Sept 1968	25 March 1969
International Covenant on Economic, Social and Cultural Rights (CESCR)	16 Dec 1966		26 April 2004
International Covenant on Civil and Political Rights (CCPR)	16 Dec 1966		26 April 2004
International Convention on the Elimination of All Forms of Racial Discrimination (CERD)	7 March 1966		7 May 1969
Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water	10 Oct 1963		29 May 1969
Geneva Convention on the High Seas	29 Apr 1958		16 Oct 1970 acceded
Convention on the Continental Shelf	29 Apr 1958		16 Oct 1970
Convention relating to the Status of Refugees of 28 July 1951	22 Apr 1954		14 Feb 2000
Convention on the Political Rights of Women	31 March 1953		20 Jul 1970
The International Plant Protection Convention	3 April 1952	not signed	not ratified
Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare	19 June 1925		23 July 1991 acceded

Source: [http://www.ecs.co.sz/env\\_policies.htm](http://www.ecs.co.sz/env_policies.htm)

### 7.2.3 Climatic classification based on long term averages (1961-1990)

Physiographic or Agro-ecological Zone	Mean Temperature (°C)			Rainfall (mm)	Köppen Class.
	Annual	January	July	Mean Annual	
Highveld	17	20	12	850-1450	Cwb
Upper Middleveld	20	24	15	800-1000	Cwa
Lower Middleveld	21	25	16	650-800	Cwa
Western Lowveld	22	26	18	625-725	BSh
Eastern Lowveld	22	27	17	550-625	BSh
Lubombo Ridge	21	26	17	700-825	Cwa

The Table gives an overview of the most relevant climatic conditions based on long term averages (1961-1990). The mean annual rainfall ranges from 1450 mm in the Highveld to 550 mm in the Lowveld, however substantial annual variations occur, leading to both drought and floods. Drought has always been an inherent characteristic of the semi-arid climate. Rainfall figures of the zones are overlapping, which is caused by the overall higher rainfall in the northern part of the country.

### 7.2.4 Status of biodiversity by ecosystem

Taxon	Grassland	Savanna	Forest	Aquatic	Total
<i>Flora</i> : <sup>1</sup>					
Trees	78 (19%)	261 (63%)	115 (28%)	4 (1%)	412
Grasses	130 (60%)	103 (47%)	3 (1%)	4 (2%)	218
Plant resource species	158 (41%)	256 (66%)	55 (14%)	11 (3%)	387
Exotics	32 (44%)	30 (41%)	2 (3%)	9 (12%)	73
<b>Total</b>	1225 (51%)	1136 (47%)	238 (10%)	98 (4%)	2418
<i>Fauna</i> (vertebrates): <sup>2</sup>					
Fish	0	0	0	51 (100%)	51
Amphibians	9 (21%)	10 (24%)	1 (2%)	37 (88%)	42
Reptiles	51 (46%)	76 (69%)	12 (11%)	7 (6%)	110
Birds	138 (28%)	290 (58%)	91 (18%)	97 (19%)	500
Mammals	49 (39%)	95 (75%)	13 (10%)	1(1%)	127
<b>Total</b>	247 (30%)	471 (57%)	117 (14%)	192 (23%)	821
Threatened:					
<i>Flora</i> <sup>3</sup>	161 (70%)	71 (31%)	53 (23%)	6 (3%)	231
<i>Fauna</i> (vertebrates) <sup>4</sup>	44 (38%)	51 (44%)	15 (13%)	27 (23%)	116
Endemics:					
<i>Flora</i> <sup>5</sup>	13 (72%)	2 (11%)	3 (17%)		18
<i>Fauna</i> (vertebrates) <sup>4</sup>	1 (100%)	0	0	0	1
Southern African endemics (birds) <sup>6</sup>	26 (50%)	13 (25%)	12 (23%)	1 (2%)	52

### 7.2.5 Status of ecosystems of Swaziland

Figures are in sq km

	Grassland	Savanna	Forest	Aquatic	Total
Extent of coverage <sup>1</sup>	7990 (46%)	8327 (48%)	870 (5%)	213 (1%)	17 400 (100%)
Coverage in South Africa <sup>2</sup>	336 544 (26%)	426 216 (34%)	7265 (1%)	10 427 (1%)	780 452 (62%)
Area formally protected <sup>3</sup>	190 (2%)	426 (5%)	20 (2%)	4 (2%)	640 (4%)
Area informally protected <sup>3</sup>	4 (0%)	164 (2%)	3 (0%)	3 (1%)	174 (1%)
Area converted: <sup>3</sup>					
Forestry	1400	120	210	0	1730
Sugar cane	0	520	0	0	520
Urbanisation	145	205	2	0	352
Other	435	1215	14	14	1678
<b>Total</b>	1980 (25%)	2060 (25%)	226 (26%)	14 (7%)	4280 (25%)
Converted post-1985: <sup>3</sup>					
Forestry	27	0	3	0	30
Sugar cane	0	100	0	0	100
Urbanisation	129	60	1	0	190
Other	100	15	0	0	115
<b>Total</b>	256 (3%)	175 (2%)	4 (0%)	0	435 (3%)

## 7.2.6 Institutions with environmental responsibility

### Government

- Swaziland Environment Authority (MTEC)
- Swaziland National Trust Commission (MTEC)
- Swaziland National Herbarium (MOAC)
- Forestry Section (MOAC)
- Fisheries Section (MOAC)
- Range Management Section (MOAC)
- Land Development Section (MOAC)
- Land Use Planning Section (MOAC)
- Animal Production Division (MOAC)
- National Plant Genetic Resources Centre (MOAC)
- Water Resources Branch (MNRE)
- Agricultural Research Division (MOAC)
- Community Development Section (MOAC)
- Meteorology Dept. (MPWT)
- Energy Section (MNRE)
- Environmental Health Unit (MHSW)
- Rural Water Supply Branch (MNRE)
- Geological Surveys and Mines (MNRE)

### NGOs

- African Cooperative Action Trust
- Yonge Nawe Environmental Action Group
- University of Swaziland
- National Biodiversity Database Unit (UNISWA)
- Swaziland Teachers Association
- Natural History Society
- Shewula Trust
- Nisela Safaris

- Lubombo Conservancy
- Big Bend / Mhlosinga Conservancy
- Mhlosinga Wildlife Producers Association
- Conservation Trust
- Swaziland Farmer Development Foundation
- Swaziland Institute for Research in Traditional Medicine, Medicinal and Indigenous Food Plants (UNISWA)
- Swazi Trails
- Big Game Parks
- Sappi Forest
- Mondi Forest
- Royal Swaziland Sugar Cooperation
- Micro Projects (MEPD)
- Shiselweni Forestry Company
- UNISWA Geography Department
- UNISWA Land and Mechanisation
- Swaziland Electricity Board (MNRE)
- Swaziland Water and Agriculture Development Enterprise (MNRE)
- Ubombo (Ilovo) Sugar
- Renewable Energy Association of Swaziland
- Cooperation for the Development of Emerging Countries

### Agencies

- United Nations Development Program
- Food and Agriculture Organization
- United Nations Children Fund
- United Nations Environmental Programme
- European Union

## 8 ADMINISTRATIVE APPENDICES

### 8.1 STUDY METHODOLOGY – WORK PLAN

The study methodology is based on the following components:

- (1) Identification and consultation of key local partners and stakeholders.
- (2) Review of environmental baseline information and issues, appraisals, evaluations, policies, strategies, legislation, monitoring etc.
- (3) Field visits of sites of key environmental concern (if necessary).
- (4) Facilitation of stakeholder validation workshop.

The work plan for the period of the assignment (30 days continuous) is scheduled as follows:

DATE	ACTIVITY
Mo 22 May	08.30 Briefing at EC Delegation - Mr. Jorge Nieto Rey
Tu 23 May	Identify key local partners (relevant ministries, institutions, international donors, NGOs) to obtain baseline information, documents, reports, assessments, etc. Extract relevant information from these documents and materials.
We 24 May	
Th 25 May	
Fr 26 May	Conduct interviews with key informants where data/information is missing.
Sa 27 May	Report writing
Su 28 May	Report writing
Mo 29 May	08.00 Progress Meeting at EC Delegation - Mr. Jorge Nieto Rey
Tu 30 May	Collect and review relevant baseline information, notably environmental policy and legislative framework, environmental institutions, regulations and enforcement, etc.
We 31 May	
Th 1 June	Conduct interviews with key informants and stakeholders.
Fr 2 June	Eventual field visits / Report writing.
Sa 3 June	Report writing
Su 4 June	Report writing
Mo 5 June	08.00 Progress Meeting at EC Delegation - Mr. Jorge Nieto Rey
Tu 6 June	Collect and review relevant baseline information, notably on the environmental policy and legislative framework, environmental regulations and enforcement, etc.
We 7 June	
Th 8 June	Conduct interviews with key informants and stakeholders. Report writing.
Fr 9 June	Preparation of first Draft Profile
Sa 10 June	Preparation of first Draft Profile
Su 11 June	Preparation of workshop presentation
Mo 12 June	National Stakeholders Validation WORKSHOP (1/2d) – present first Draft Profile
Tu 13 June	Incorporation workshop comments/additions into first Draft Profile
We 14 June	Incorporation workshop comments/additions into first Draft Profile
Th 15 June	SUBMISSION Draft Profile to EC
Fr 16 June	Incorporation EC Delegation comments/additions into Draft Profile
Sa 17 June	Incorporation EC Delegation comments/additions into Draft Profile
Su 18 June	Incorporation EC Delegation comments/additions into Draft Profile
Mo 19 June	SUBMISSION Draft Final Profile to EC
Tu 20 June	Debriefing at EC Delegation (Final Profile)

## 8.2 CONSULTANTS ITINERARY

All activities took place in Swaziland.

DATE	ACTIVITY
Mo 22 May	Briefing at EC Delegation - Mr. Jorge Nieto Rey Collection and review of relevant baseline information
Tu 23 May	Meetings at Swaziland Environment Authority Collection and review of relevant baseline information
We 24 May	Meetings at Ministry of Agriculture and Co-operatives Collection and review of relevant baseline information; Report writing
Th 25 May	Report writing
Fr 26 May	Meetings at Swaziland Environment Authority Collection and review of relevant baseline information; Report writing
Sa 27 May	Report writing
Su 28 May	Report writing
Mo 29 May	Progress Meeting at EC Delegation - Mr. Jorge Nieto Rey Meetings FAO, Ministry of Agriculture and Co-operatives; Report writing
Tu 30 May	Collection and review of relevant baseline information; Report writing Meeting Environmental Consulting Services
We 31 May	Collection and review of relevant baseline information; Report writing Meeting Ministry of Agriculture and Co-operatives
Th 1 June	Collection and review of relevant baseline information; Report writing
Fr 2 June	Report writing
Sa 3 June	Report writing
Su 4 June	Report writing
Mo 5 June	Progress Meeting at EC Delegation - Mr. Jorge Nieto Rey Meetings at Swaziland Environment Authority; Report writing
Tu 6 June	Meetings at UNDP, WFP, SWADE Meeting Environmental Consulting Services; Report writing
We 7 June	Preparation of first Draft Profile Meeting with REASWA
Th 8 June	Submission of draft report for workshop to EC Delegation for review Report photocopied and distributed to stakeholders
Fr 9 June	Meeting at Geological Survey and Mines Workshop preparation
Sa 10 June	Report writing
Su 11 June	Preparation of workshop presentation
Mo 12 June	National Stakeholders Consultation/Validation Workshop
Tu 13 June	Incorporation workshop comments/additions into first Draft Profile
We 14 June	Incorporation workshop comments/additions into first Draft Profile
Th 15 June	SUBMISSION Draft Profile to EC Delegation
Fr 16 June	Incorporation EC Delegation comments/additions into Draft Profile
Sa 17 June	Incorporation EC Delegation comments/additions into Draft Profile
Su 18 June	Incorporation EC Delegation comments/additions into Draft Profile
Mo 19 June	SUBMISSION Draft Final Profile to EC
Tu 20 June	Debriefing at EC Delegation (Final Profile)

### 8.3 LIST OF PERSONS AND ORGANISATIONS CONSULTED

List of persons and organisations consulted with affiliation and contact details, including participants of the consultation/validation workshop (marked \*).

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#### **8.4 LIST OF DOCUMENTATION CONSULTED**

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## 8.5 CURRICULUM VITAE

Abbreviated CV:

1. Family name: REMMELZWAAL
2. First names: Arie
3. Date of birth: 5-7-43
4. Nationality: Netherlands
5. Civil status: married
6. Education:

Institution	Degree(s) or Diploma(s) obtained:
1974-1978	PhD Faculty Mathematics and Natural Sciences, University of Amsterdam
1970-1973	MSc Physical Geography, University of Amsterdam
1965-1969	BSc Physical Geography, University of Amsterdam.

7. Language skills: English excellent (1)
8. Membership of professional bodies: International Union of Soil Science
9. Other skills: Computer literacy
10. Present position: Independent Consultant
11. Years within the firm: n/a

12. Key qualifications: Land Use Planner, Soil Scientist and Natural Resources Specialist with more than 20 years of professional experience in Southern Africa; Specific experience in Policy Formulation and Strategy Development for Agricultural, Land Resource and Participatory Environmental Management, Project Formulation and Evaluation, Agro-ecological Zoning, Erosion and Land Degradation Assessment, Resource Information Systems and Remote Sensing Data Interpretation.

13. Specific experience in the region: Swaziland 1992-2006 (interrupted); Botswana 1979-1988; other Southern Africa 1995-2002 (occasional).

14. Professional experience

Date/Location	Company/{Position	Description
1999-2006, Southern Africa mainly	Independent Consultant with various companies	Independent Consultant or Consultant with various companies, including Agrotec (Italy) and Agriconsulting Europe (Belgium) for EU, Darudec (Denmark) for DANCED and Kokusai Kogyo (Japan) for JICA, and Environmental Consulting Services (Swaziland) for FAO, UNDP, WorldBank.
1979-1998 Southern Africa and other	Food and Agriculture Organization CTA, Team Leader, Expert, Associate Expert	FAO staff member on fixed term contracts, with two short periods as FAO consultant
1969-1978 The Netherlands	University of Amsterdam Research Assistant	Research Assistant and Assistant to Professor :Lecturing, Training and Supervision of Students; Soil and Archeology Research in Italy

## 8.6 TERMS OF REFERENCE FOR THE COUNTRY ENVIRONMENTAL PROFILE

EUROPEAID/ 119860/C/SV/multi

Lot 6: Environment. Request of Service: 116781

### **SPECIFIC TERMS OF REFERENCE for the preparation of the Country Environmental Profile of Swaziland**

#### **1. BACKGROUND**

In Swaziland, historical patterns of economic development, including industrialisation, agricultural intensification, forest exploitation and poor water management and draught have resulted in significant environmental degradation. This in turn has serious repercussions for the poor who are most dependent on natural resources for survival. Failure to give proper attention to the environment is also a threat to achievement of sustainable economic growth because the country relies on its natural resources for big percentage of its Gross Domestic Product.

Swaziland's environmental resources suffer from the effect of global phenomena such as deforestation, climate change and widespread use of fertilizers and chemicals. At the same time, some of the major environmental concerns relate to the direct effects of human (such as poor farming practices, bush fires, inadequate waste management) and economic activities driving the economy.

#### **2. DESCRIPTION OF THE ASSIGNMENT**

##### **a. Global Objective**

The main objective of the Country Environmental Profile is to identify and assess environmental issues to be considered during the preparation of a Country Strategy Paper, which will directly or indirectly influence EC co-operation activities. The Country Environmental Profile will provide decision-makers in the partner country 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 the Country. 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 the Country on key areas of concern including sustainable development as well as raising awareness among policy-makers.

##### **b. Specific Objective**

The profile will deliver the following results:

- An assessment of the state of the environment and key environmental factors and trends influencing the Country'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.

### c. Requested Services

The following issues should be assessed:

#### i) 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
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 (savannahs, 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)

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 7<sup>1</sup> 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.

## ii) 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	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). Policy response to global issues, sustainability issues (depletion of natural resources), and specific environmental issues identified above. Consistency between policies. Environmental integration in sectoral and macro-economic policies and existence of SEA of policies or strategies (especially the PRSP if relevant). Important measures taken by the Government to solve environmental concerns. Effectiveness in achieving targets.

<sup>1</sup> See <http://www.undp.org/mdg/>

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> <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.

### iii) 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 (SEA 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.

### iv) 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 Environmental Impact Assessment (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. 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.

#### **v) 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.

#### **vi) 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 - EUEF).

(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).

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.

#### **d. Methodological Aspects**

The methodology 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 previous Country Environmental Profiles (EC and others); 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 the organization of a national workshop that national authorities, donors, experts and representatives of the civil society should be invited to participate with the aim of clarifying and validating key environment 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.

### 3. EXPERT PROFILE

The proposed mission shall be conducted by an expert who should have the following profile:

- Expert level II 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.

In addition:

- Previous working experience in Swaziland or the region is appreciated;
- Expert should have an understanding of the EU environment and development policies;
- Experience in undertaking environmental analyses and preparation of development programmes would be an asset;
- 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.

The expert should have excellent skills in English. English will be the working language and the final report must be presented in English

### 4. LOCATION AND DURATION

#### Starting period

Second half May 2006

The expert will have a total time of 30 calendar days to complete the assignment including travel to and from Swaziland for non-locally based experts.

The finishing period is expected to be June 2006. A briefing and debriefing session is envisaged at the start and end of the assignment, respectively, at the offices of the European Commission in Mbabane.

The Mission will take place primarily in **Swaziland**, under the guidance of the National Authorising Officer's office in conjunction with the EC Delegation. **Mbabane** is expected to be the primary venue for the missions, although short trips of 1-2 days each may be required to key locations as deemed necessary by the expert.

Expert will have to provide for his own office space.

### 5. REPORTING

The results of the study should be presented in the Country Environmental Profile in the format given below. The draft profile, in 5 hard copies and electronic version (Microsoft Word), should be presented to the EC Delegation at the end of the mission. Within three 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 and 15 copies is to be submitted then with an electronic copy.

#### 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 Authorising Officer and the European Commission. It does not necessarily reflect the opinion of the National Authorising Officer 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 consultant (1 page)

VI. Terms of Reference for the Country Environmental Profile

## **6. ADMINISTRATIVE INFORMATION**

*Other authorised items to be foreseen under "Reimbursable"*

The consultant will make a presentation in Mbabane of the draft profile to relevant national stakeholders, experts, civil society, donors in one single workshop. A maximum of 30 participants are expected for the workshop of half day duration. The consultancy will have to provide for the organisation and all costs of the workshop. The organisation includes such issues as secretarial support, invitation of participants, securing the venue, provision of auxiliary (presentation) equipment and providing for facilitation (if any) whilst costs will include full lunch and tea for the participants and the payment for any equipment (e.g. projectors) that will be needed. No per diems, transport or accommodation claims will be paid to participants.