Swaziland's Fifth National Report to The Convention on Biological Diversity

2014

Preface

Swaziland's Fifth National Report to the Convention on Biological Diversity has been prepared in accordance with Article 26 of the Convention and COP decision VIII/14. The structure of the report is based on the Guidelines for the Fifth National Report published by the Convention.

The report was prepared with input from relevant stakeholders through interviews, a workshop and written inputs on a draft of the report (see Appendix I for further information on the preparation of the report).

A special thanks go to all those who contributed.

Acronyms and Abbreviations

AEWA	African-Eurasian Migratory Water birds
BCPP	Biodiversity Conservation and Participatory Projects
BGP	Big Game Parks
CBD	Convention on Biological Diversity
CBNRM	Community Base Natural Resource Management
CCA	Community Conservation Areas
CBS	Central Bank of Swaziland
COP-10	Tenth Conference of the Parties
CSO	Central Statistics Office
EMA	Environment Management Act, 2000
FAO	Food and Agricultural Organisation of the United Nations
GDP	Gross Domestic Product
GEF	Global Environment Facility
GMOs	Genetically Modified Organisms
GoS	Government of Swaziland
IUCN	The World Conservation Union
KDDP	Komati Downstream Development Project
LUSIP	Lower Usuthu Smallholder Irrigation Project
MDGs	Millennium Development Goals
MEAs	Multilateral Environmental Agreements
NAPA	National Adaptation Plan of Action
NBSAP	National Biodiversity Strategy and action plan
NDS	National Development Strategy
NEF	National Environment Fund
SABONET	Southern African Botanical Network
SEA	Swaziland Environment Authority
SEC	Swaziland Electricity Company
SIP	Swazi Indigenous Products
SLM	Sustainable Land Management
SNTC	Swaziland national Trust Commission
SPB	Strategic Plan for Biodiversity
SWADE	Swaziland Water and Agricultural Development Enterprise
UEBT	Union for Ethical Bio-Trade
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Project
UNFCCC	United Nations Framework Convention on Climate Change

EXECUTIVE SUMMARY

For a country with a land area of 17,364 km^2, Swaziland is relatively rich in biodiversity with an inordinately large plant and animal diversity. The biodiversity resources of Swaziland have great cultural and economic significance. The presence of indigenous biological resources and their diversity provides a wide range of direct benefits because they generate products which are used for subsistence income and employment purposes. In addition, the diverse flora and fauna of Swaziland has variety of recreational and aesthetic values. The Swazi culture is deeply dependent on biological diversity both for everyday life and for various traditional ceremonies practised annually. Cultural and traditional use of biodiversity includes the reed dance, the Kingship ceremony, traditional attire, traditional hunting, and burial rituals.

The fourth National report gives a detailed description of the status and trends of biodiversity. Since the compilation of the fourth national report, Swaziland has not yet done a comprehensive country assessment of her biodiversity and ecosystems. According to the country's State of Environment Report, 2012, there is a decline and extinction of wild animal species and populations as well as indigenous plant species.

Approximately 25% of each of the terrestrial ecosystem has been lost to some form of other land use. A total of 4,280 km^2 of biodiversity rich ecosystems have been converted to industrial timber plantations, sugarcane plantations and urban areas. Aquatic water systems in particular are under threat from agricultural development as wetlands are drained for development (agriculture, roads and settlements) or are negatively affected by changes within their catchment.

The main pressures on Swaziland's biodiversity include:

- Conversion of natural habitats to others land uses,
- Invasion of habitats by alien species with the country's protected areas not spared,
- Rapid expansion settlements and urbanisation into biodiversity rich areas as well,
- Indiscriminate use of fires destroying ecosystems and altering habitats,
- Climate change and
- Unsustainable use of natural resources.

The underlying drivers of these pressures are the rapid growing population with unsustainable patterns of consumption. The implications of biodiversity loss are particularly severe for a country like Swaziland, where the contribution of biodiversity to the economy is immeasurable and where traditions and culture are heavily dependent on a rich biodiversity base.

Status of the NBSAP and mainstreaming of biodiversity into sectoral and cross sectoral plans.

At the time of compilation of this report, the process of revising the National Biodiversity Strategy and Action Plan to be in-line with the Strategic Plan for

Biodiversity 2011-2020 and its Aichi targets was underway. The revised NBSAP will highlight and seek to maintain the contribution of biodiversity and ecosystem services to human well-being. It will include measures to mainstream biodiversity into sectoral and cross sectoral policies and programmes. The revised NBSAP will be aligned with the country's national development strategy. It will further give direction where the country wants to go, which route it will take to get there and identify the actions to be implemented. Indicators to measure and report on progress towards national targets will be established as well.

Swaziland is making a steady progress towards mainstreaming biodiversity in both the public and private sectors, though there are still challenges. The National Development Strategy (NDS) sets out the framework for sustainable development in a comprehensive manner across all sectors. It is an umbrella strategy for all other policies and strategies. The NDS identifies environmental protection as a cornerstone in the national development process. 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. Furthermore, mainstreaming biodiversity has been done mainly through the use of Environmental Impact Assessments (EIA).

Progress and achievement in implementation of the Convention since the fourth National Report

Major achievements that have taken place since the submission of the fourth national report include:

Relevant Policy, legislation, regulations and strategies

- The **Biosafety Act, 2012** was passed into law by Parliament and received Royal assent in December 2012.
- The **Fresh Water Fisheries and Aquaculture Bill, 2012** being developed by the Ministry of Agriculture.
- **National Climate Change Policy** (being finalised at compilation of this report) which aims to provide a national strategic framework for Swaziland to address the challenges and annex benefits as well as opportunities presented by climate change.
- The **National Trust Commission (Amendment) Bill, 2009.** The Bill was developed to amend the National Trust Commission Act, 1972 to include new protected area categories and governance types.

- **Mining and Biodiversity Guidelines** are under development with various stakeholders to secure Swaziland's biodiversity and mainstreaming biodiversity into the mining sector.
- **National Alien Invasive Plant Species Control and Management Strategy** aims to promote cooperative, coordinated and integrated management and control of alien invasive plant species to reduce their ecological, economic and social impacts on human and natural resources.
- Development of the draft **Comprehensive Agriculture Sector Policy and the National Food Security Policy** that promote sustainable land management practices which include conservation agriculture and community based sustainable range management on rangeland and arable land.

Funding, programmes and surveys

- **Survey and mapping distribution and intensity of infestation of selected category 1 invasive alien plant species** by the department of forestry.
- GEF-UNEP funded project on **Strengthening the National Protected Areas System of Swaziland.** A project preparatory study has been done in preparation for implementation of the project which is envisaged to begin early 2015.
- GEF-IFAD funded **Lower Usuthu Sustainable Land Management Project initiated by the Government of Swaziland in 2011.**

Synergies with other biodiversity related Multilateral Environmental Agreements (MEAs)

- The Government of the Kingdom of Swaziland acceded to the Depositary Agreement on the Conservation of African-Eurasian Migratory Waterbirds (**AEWA**) which is under the auspices of UNEP. **The agreement entered into force for Swaziland on 1 January 2013**
- Although the Kingdom of Swaziland signed the International Treaty on Plant Genetic Resources for Food and Agriculture on 10 June 2002, **the country acceded to become a Contracting Party to the Treaty on 21 January 2013**.

- The country ratified the **Ramsar Convention on Wetlands** and the Conservation of Migratory Species of Wild Animals and this came into force for the country on 15 June 2013.

Progress towards the 2020 Aichi Targets and contribution to the Millennium Development Goals

Implementation of the national biodiversity goals have not been linked to implementation of the Aichi Biodiversity Targets since targets for the national goals were not set and thus pre-date inception of the Aichi Targets. However, the 2001 national biodiversity goals are on-going programmes and activities that contribute to the realisation of the Aichi Targets. Implementation of each of the targets was rated using a simple "traffic light" scheme as follows:

- Green- for achieved
- Yellow- for substantially achieved
- Orange-for achieved to a limited extent
- Red-for not achieved

Of the twenty Aichi targets, 20% have been substantially achieved, 35% achieved to a limited extent and 40% not yet achieved.

The table below further illustrates major national actions taken and achievements in relation to both the Aichi Biodiversity Targets and MDGs.

Millennium Development Goals Indicators and National Actions

Millennium Development Goals Indicators	**National Actions**
7.1 Proportion of land area covered by forests.	Forest cover has contributed to economic development, food security, income generation, water, health, and helps in soil conservation to sustain socioeconomic livelihoods. The demand for forest resources continues to be managed through the development of community woodlots, rural electrification, promotion of energy efficient wood stoves and renewable energy sources. The Forest Bill of 2010 is envisaged to further enforce the management and increase of carbon sinks in the form of forests.
7.2: Carbon dioxide emissions	Swaziland is party to the UNFCCC and its Kyoto Protocol, which seeks to reduce the level of GHG emissions in the atmosphere, with a view to address human induced climate change that has an impact on ecosystems and biodiversity. In partial fulfilment of the country´s commitment to the UNFCCC, GHG inventories were done in 1994 (submitted in 2002) and in 2000 (submitted in 2012). Between 1994 and 2000, large emissions were attributed to industrial processes and the waste sector and, to a lesser extent, land use, land use change and forestry. The development of community woodlots, rural electrification, promotion of energy efficient wood stoves and renewable energy sources with supporting legislation in the revised Forestry Bill (2010) are efforts towards increasing carbon sinks. A draft Climate Change Strategy and Action Plan (2012) provides for managing GHGs in the form of a long term carbon strategy and a further accompanying Nationally Appropriate Mitigation Action (NAMA) strategy. The country is Party to the Stockholm Convention, aimed at protecting human health and the environment from persistent organic pollutants (POPs), adopted in 2001 and entered into force in 2004. Inventories to assess the presence of various POPs have been conducted and implementation plans to safeguard ecosystems have been developed.

7.3: Consumption of ozone-depleting substances.	Swaziland ratified the Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on substances that deplete the ozone Layer in 1992; ODS Regulations were promulgated in 2003 and all the amendments to the Protocol were ratified in 2005. CFCs and carbon tetrachloride were completely phased out in 2007 enabling compliance with the 1st January 2010 target. However, total eradication of HCFCs is targeted for 2030. Agricultural uses of methyl bromide have been entirely replaced by alternatives and only the exempted quarantine and pre- shipment (QPS) uses remain.
7.4: Proportion of total water resources used	Over the years, the country has been able to store 765,000 m^3 per annum, which represents 17 per cent of the available renewable water resources. This water is stored in major dams and reservoirs located in different parts of the country. Currently, consumptive water usage stands at 1.5 million m^3 per annum which represents only 33 per cent of water leaving the country. Water use is dominated by irrigation, which takes about 96 per cent of the surface water resources mostly for growing sugarcane. Agriculture is followed by domestic and industrial uses that take about 2 per cent, respectively. Over the years, water resources management has grown in complexity due to issues that have now become pertinent, such as water quality problems, priority in water allocation, trans-boundary obligations, development of infrastructure, stakeholder participation as well as the introduction of the environment as a water user. New and creative approaches are required to meet the MDGs. These include: reassessment of the allocation criteria, promotion of efficient water use, and promotion of water harvesting technologies and negotiating for greater shares from the trans-boundary rivers.
7.5: Ratio of area protected to maintain biological diversity to surface area	In 2000 the coverage was 3.7 per cent increasing to 4.5 per cent of legally proclaimed conservation area by 2009. If other areas not been legally proclaimed but are protected for various reasons are included, this proportion increases to about 11.3 per cent.
7.6: Proportion of species threatened with extinction	Recently produced red data lists indicate that large numbers of plants and vertebrates are threatened: caused by loss of habitat, over exploitation and the presence of invasive alien species. Habitat destruction is the result of industrial forestry and large scale irrigated agricultural expansions. 11 out of 3441 plant species area threatened with extinction and a total of 132 species of vertebrates are listed, consisting of 11 species of fish, 4 species of amphibians, 14 species of reptiles, 55 species of birds and 48 species of mammals. These threatened species represent between 9-20 per cent

	of the total numbers of fishes, amphibians, reptiles and birds occurring in Swaziland, and 38 per cent of the mammalian fauna.
7.7: Proportion of population using solid fuels	In 2010, about three quarters (77.2 per cent) of the rural population depended on wood and coal for domestic cooking with the urban areas have a low proportion of 12.9 per cent. There has been however, a decline of 8.9 per cent at national level in proportion of households using solid fuels from 62.1 per cent in 1997 to 53.2 per cent in 2010. By 2015, the proportion of the population using solid fuels for cooking is projected to be around 50 per cent. Even though there is no set target for this indicator; there is need to reduce the proportion of households using solid fuels as a main source of cooking energy. The National Energy Policy Implementation Strategy includes activities related to the energy needs of households in rural and peri-urban communities.

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PART 1 - An update on biodiversity status, trends, threats and implications for human well-being

Question 1: Why is biodiversity Important for Swaziland?

Swaziland is relatively rich in biodiversity. For a country with a land area of 17, 364 km^2, Swaziland has an inordinately large plant and animal diversity. More than 14 phyla have been recorded, or suspected to occur. Some groups of fauna found in Swaziland such as the invertebrates have not been completely surveyed. A total of 3678 plant taxa have been recorded in the country and there is great possibility that there may be unidentified species. Twelve endemic plants and a single endemic reptile are known to occur in the country.

The biodiversity resources of Swaziland have great cultural and economic significance. The presence of indigenous biological resources and their diversity provides a wide range of direct benefits because they generate products which are used for subsistence income and employment purposes. In addition, the diverse flora and fauna of Swaziland has variety of recreational and aesthetic values. Therefore, the importance of biodiversity is not confined to functioning ecosystems but to also its contribution to the economy.

A total of 304033 tourists visited Swaziland in 2013 (Swaziland Tourism Authority, 2013). In as much as it is not possible to isolate the proportion of tourists who visited the country specifically for biodiversity related purposes, it was likely that the biodiversity and scenery of the country contributed to attracting them. Tourism contributed about 4% of national GDP in 2011 and directly supported 6000 jobs (1.6% of total formal employment).The main attractions listed for the country are wildlife, culture/people, landscape/scenic, arts and crafts (Swaziland Tourism Authority,2013).

Traditional medicine is widely used in Swaziland. It has been suggested that around 80% of the Swazi population consults the country's 8000 traditional healers (Amusan, 2009) and a range of plant and animal species are used in preparation of traditional medicine. An independent study reported that some households reported to be earning as much as $200 per month from sale of craft made from indigenous plants (Manyatsi *et al*., 2010). The FAO draft report on global forest resources assessment (FAO, 2014a) estimated that cosmetics made from non-wood forest products contributed about $60 000 to the local economy in 2010.

The Swazi culture is deeply dependent on biological diversity both for everyday life and for various traditional ceremonies practised annually. Cultural and traditional use of biodiversity includes the reed dance, Kingship ceremony, traditional attire, traditional hunting, and burial rituals. Every Swazi household should have grass mats which are not only used traditionally as beds but also used when guests are received at home and also used during burial rituals. The reed dance is an annual ceremony where girls cut reeds (*Phragmites mauritianus*) and present them to the Queen Mother. The reeds are used to build wind breaks in traditional residences. In addition to the reed, some of the traditional attire used during the ceremony is collected from the wild. Incwala (Kingship) ceremony involves fetching of Lusekwane (*Dichrostachys cinerea*) bush by unmarried male youths and delivering it at the

Queen Mother's village. The youth males also cut branches of the red bush willow (*Combretum apiculatum*). The branches are used to construct an enclosure in the main kraal.

Males wear loin skin made from selected wild animals. They include leopard (Panthera pardus), grey duiker (*Sylvicapra rotundifolia*) and impala (*Aepyceros melampus*). On the other hand females below the age of 15 years may were skirts made from grass and necklaces made from grass and other parts of plants. The traditional hunting is done at Hlane Royal Park, and the King takes part in it. The surplus common game species such as impala (Aepyceros melampus) is hunted. The branches of Dwaba berry tree (*Monanthotaxis caffra*) are used to weave shrouds for burial of members of the royal family. Coast silver oak branches (*Ziziphus mucronata subsp. mucronata*) are placed on top of fresh grave of a head of family after burial. Umuzi (*Isolepis costata*) is weaved to make mourning attire for widows from the royal household.

Question 2: What major changes have taken place in the status and trends of biodiversity in Swaziland?

The fourth National report gives a detailed description of the status and trends of biodiversity. Since the compilation of the fourth national report, Swaziland has not yet done a comprehensive country assessment of her biodiversity and ecosystems. According to the country's State of Environment Report, 2012, there is a decline and extinction of wild animal species and populations as well as indigenous plant species due to deforestation, poaching, uncontrolled bush fires, encroachment and selective use of species.

State of terrestrial ecosystems

Approximately 25% of each of the terrestrial ecosystem has been lost to some form of other land use (State of Environment Report, 2012). A total of 4,280 km^2 of biodiversity rich ecosystems have been converted to industrial timber plantations, sugarcane plantations and urban areas. Aquatic water systems in particular are under threat from agricultural development as wetlands are drained for development (agriculture, roads and settlements) or are negatively affected by changes within their catchment. Overexploitation of plant genetic resources from wetlands and terrestrial habitat pose a challenge to the natural plant regeneration. This has resulted in diminishing resources and reduced resilience of ecosystems.

The extent and protection status of ecosystems of Swaziland still stands at 3.9% of formally gazetted protected areas, 2.7% of informal or non gazetted areas with approximately 1.7% of community conservation areas. This could be summarised to approximately 8.3% the country being under some form of conservation.

State of aquatic ecosystems

Swaziland is drained by seven major river systems- the Komati, Lomati, Mbuluzi, Usutu, Ngwavuma, Pongola and Lubombo (see figure below: river basins of

Swaziland. Several of these rivers rise in South Africa and all flow eventually to Mozambique.

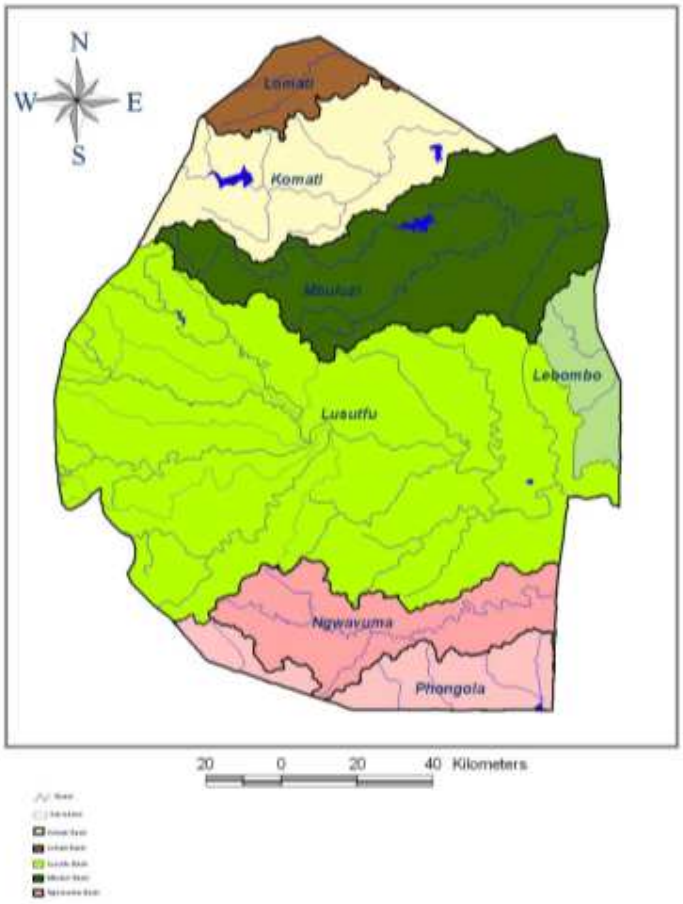

Figure 1 River basins in Swaziland
Source: SoER, 2012

The water use in Swaziland is totally dominated by irrigation, accounting for 96% of all demands. The annual water demand for domestic, industrial, livestock farming and irrigation are 1.7%, 0.9%, 0.8% and 96.6% respectively.

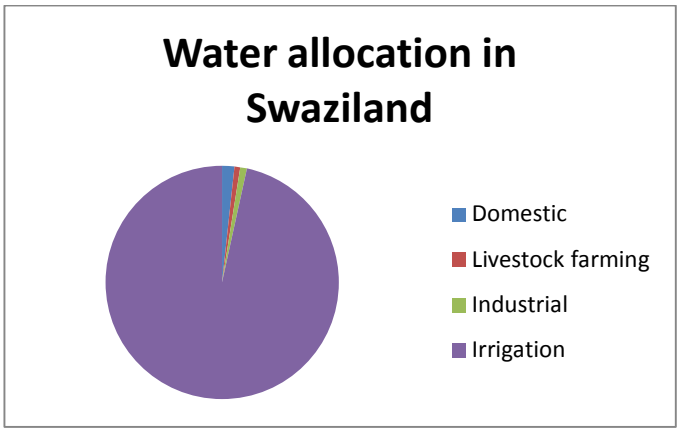

Figure 2 Water allocation in Swaziland

In a situational analysis prepared by the Swaziland Country Water Partnership (2007), it was observed that the quality of water in the country is indicating a general deterioration due to pollution from commercialised agriculture and industries. According to the State of Environment Report (SoER) 2012, intensive agricultural activities especially in the lowveld have contributed to some extent to the poor quality of surface water bodies due to the application of agro-chemicals and poor land use practices which inevitably increase the sediment yield. Another observation has been made that as a result of waste water discharges from industries in the Matsapha industrial area, water of the Usuthu River is frequently of poor quality. It is evident therefore that the quality of these aquatic ecosystems deteriorates around major cities, economic and agricultural hubs where pressure on water resources are highest.

Question 3: What are the main threats to biodiversity?

The main pressures behind the country's changing biodiversity include habitat loss and habitat change for increasing agriculture and for urbanisation and settlements, wild fires, unsustainable resource extraction, alien plant invasion, Living modified organisms (LMOs) and climate change.

Invasive Alien plant Species

Habitats in Swaziland have been increasingly invaded by alien species with the country's protected areas not spared. Based on sum of species distribution model outputs for 16 priority species derived from the most comprehensive aerial survey done in the region covering the whole country within 1km grids, (GOS-MTEA, Forestry Section, 2010), 80% of the country is infested with at-least one plant species (equivalent on a condensed density of 184,995 ha, see figure below).

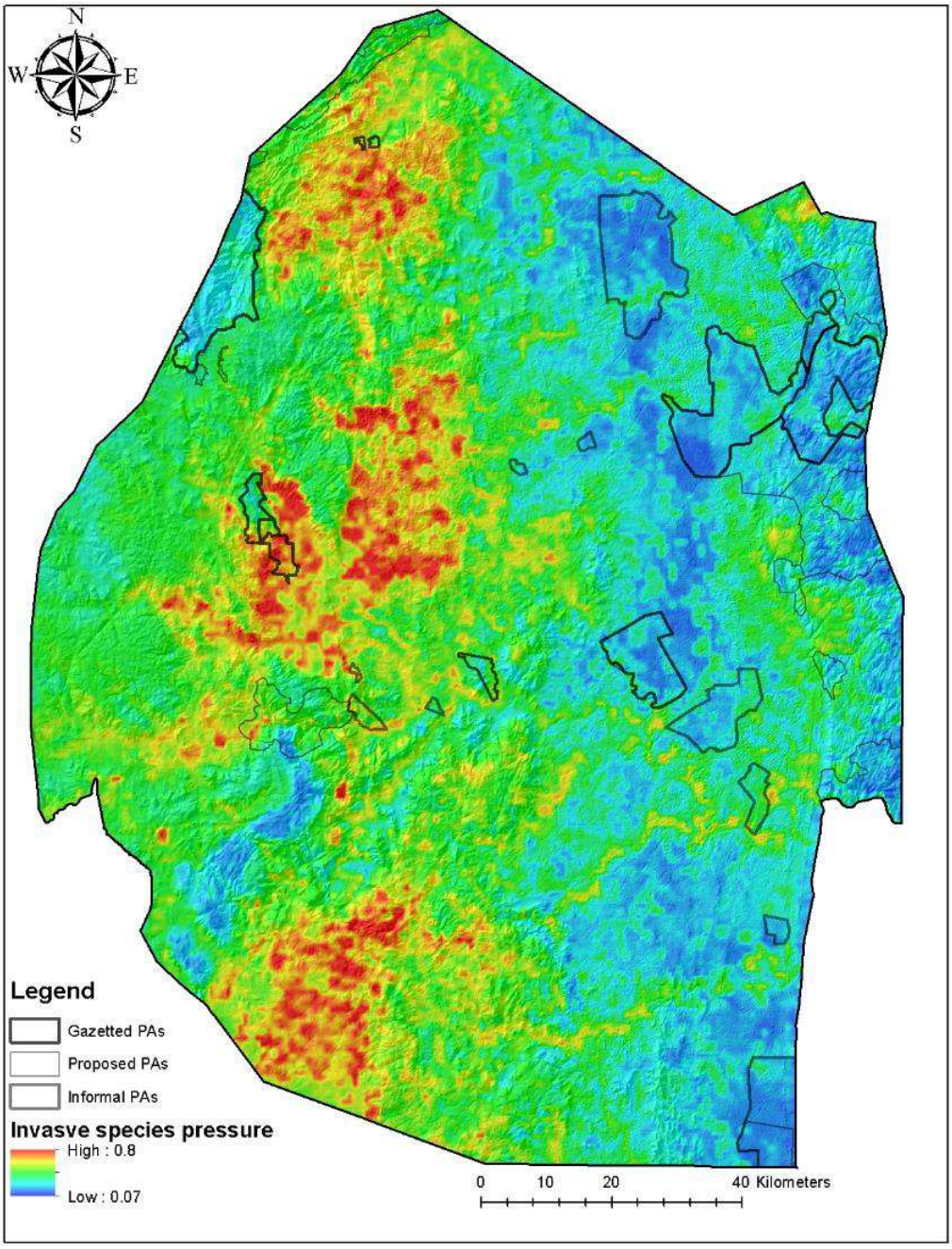

Figure 3: Alien invasive plant species infestation mapping.
Source: Mapped from datasets by Kotzeet al. (2010)

The woody invasive species that have affected biodiversity include *Lantana camara* (Lantana). *Chromoleana odorata* (Triffid) , *Acacia mearnsii* (Wattle) and *Solanum mauritianum* (Bug weed) (Table 1).

Table 1. Total forest area affected by woody invasive species in 2010

Woody invasive species	Area (000 ha)
1. *Lantana camara* (Lantana*)*	819
2. Chromoleana odorata (Triffid)	584
3. *Acacia mearnsii* (Wattle)	452
4. *Solanum mauritianum* (Bug weed)	295
5. *Psidium guajava* (Guava)	186
6. Caselpinia decapetala (*Mauritius thorn)*	143
7. *Ceasalpenea decapitala* (Bramble)	114
8. Senna spp (Senna)	85
9. *Syringa vulgaris* (Lilac)	63
10. Epiphyllum oxypetalum (*Queen of night)*	40
11. *Opuntia spp* (Cactus)	35
12. *Jacaranda spp* (Jacaranda)	16
13. *Poplar spp* (Poplar tree)	16

Source: FAO (2014a)

Urbanisation and settlements

Urbanisation is one form of habitat destruction where settlements, towns and cities are expanded at rapid rates. It is estimated that about 21% of the Swaziland population is urbanised, and the annual rate of urbanisation in 2011 was estimated at 1.19% (CIA, 2013). The amount of wood harvested for fuel wood is increasing over time, and it is proportional to the population increase. In 1990 fuel wood harvest amounted to 716 m^3, and by 2012 it had increased to 1093 m^3, showing an increase of 52% (FAO, 2014b). This is despite the rural electrification programme, being sponsored by government and her partners. At present, 60% of the households in the country have electricity, and the percentage is increasing (SEC, 2013)

Wild fires

The indiscriminate use of fires and wildfires destroy the ecosystem and alters habitat. It is estimated that on average almost 25% of the country is burned annually. Independent counts of fires using remote sensing for 2003 to 2012 showed that in

2008 as much as 96000 ha were burned, with about 21000 ha of forest fires burned (Figure 4).

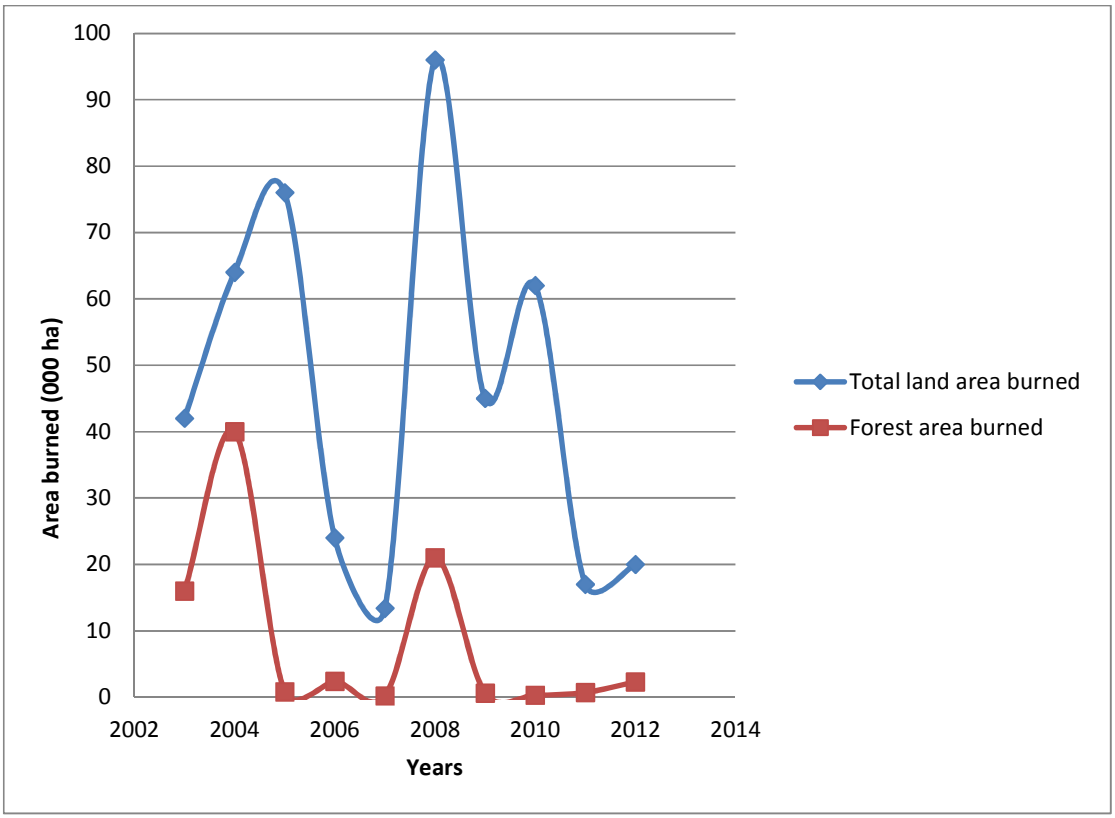

Figure 4: Independent assessment of fires using remote sensing
Source: FAO (2014a)

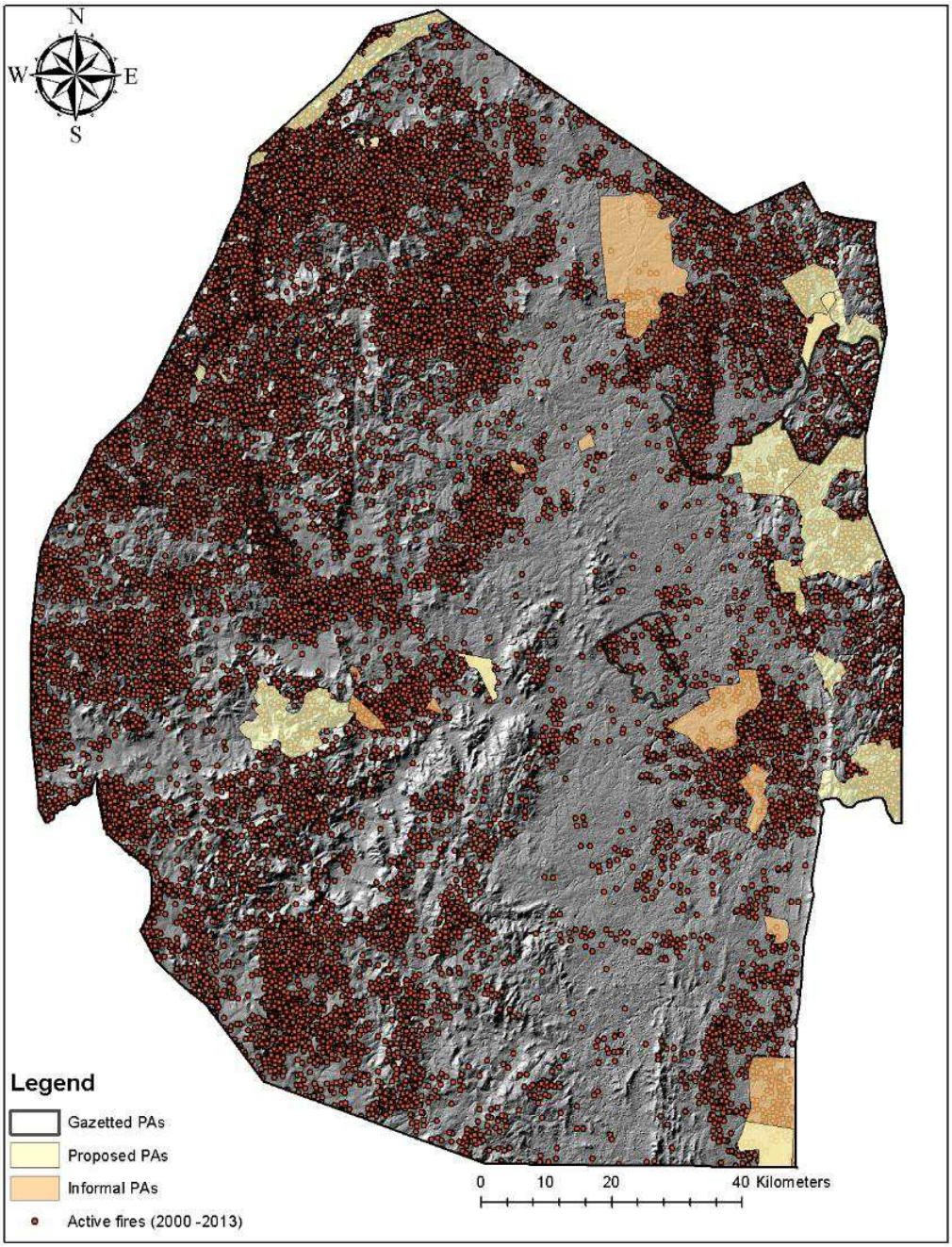

Figure 5 showing active fires in 2000-2013
Source: Dlamini W in press

Habitat change

The conversion of natural habitats to other uses is a significant cause of biodiversity loss on Swaziland. A numbers of industrial and mining ventures within or adjacent to protected areas network are proposed. This does not only pose a threat to the biodiversity within the protected areas but also could reduce the protected area network further. Increases in land grown under sugarcane are also taking place in

biodiversity rich areas or in close proximity to protected areas thus contributing further to the fragmentation of habitats.

Unsustainable resource extraction

Harvesting of biodiversity is increasing to unsustainable levels. Most plant and animal species typically used for medicinal purposes are becoming locally extinct or very rare in many locations. The demand for traditional medicines derived from indigenous plant and animal species has become a big industry with local markets having large stocks traded and exported into the region far exceeding sustainable consumption levels.

Compounding the pressure driven by the illegal trade and export of indigenous flora is the unsustainable extraction of flora for charcoal production and for sale as firewood on the side of the Nation's roads. Large areas of Swazi Nation Land have been cleared of trees, which has drastically reduced the bird life and mammal species composition in these areas. Indigenous plant species are cut for the manufacture of tourists artefacts and as such populations of some species are rapidly depleted which could result in local extinction.

Climate Change

This is an emerging pressure on biodiversity and is expected to drive changes in biodiversity distribution in Swaziland. Projected impacts on ecosystems from selected global climate models show a westward shift and shrinking of both the grassland and savanna ecosystem types 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 (SoER, 2012).

Indirect threats to biodiversity

Indirect threats on the other hand include economic, demographic, social-political, and cultural. The declaration of the government that the Human Development Index should improve so that the country could attain the First World Status by 2022, the emphasis is on economic growth which could put more pressure on biodiversity. Over 40% of the population is below the age of 25, and it is anticipated that the population will double in the near future. The demand of biodiversity resources will increase with increase in population. The increase in consumption per capita, increase in population, and resource intensity is likely to lead to high demand for food and energy. This will lead to over-exploitation of resources, increase in the rate of habitat change, and increased pollution.

Question 4: What are the impacts of the changes in biodiversity for ecosystem services and socio-economic and cultural implications of these impacts?

The loss of biodiversity and the resulting change within the ecosystems will impact upon the provisioning of ecosystem services with serious socio-economic and cultural implications. The rural poor are especially vulnerable as they directly depend on natural resources. A survey of 212 195 households that made up the population of 2007 revealed that 112 890 households (53.2%) relied on firewood as the main source of energy for cooking (CSO, 2010).

The implications of biodiversity loss are particularly severe for a country like Swaziland where the traditions and culture have been preserved and continue to play an important role in the lives of the Nation. The Rich Swazi tradition relies heavily on an equally rich biodiversity base, from harvesting of food and medicinal plants, collection of firewood to building materials, craft-wood, weaving material and traditional attire; the very essence of being Swazi depends on the natural resources.

The contribution of biodiversity to Swaziland's economy is immeasurable although this is often grossly under-valued. Agriculture, the backbone of Swaziland's economy, heavily relies on biodiversity. The sugar sector, 96.6% consumer of fresh water for irrigation in Swaziland, accounts for 59% of Swaziland's agricultural output, equivalent to 18% of the country's GDP (Swaziland Sugar Association, 20011). Furthermore, ecosystems provide pollinators which support the citrus and other important crops. The citrus industry alone produced around $10 million sales in 2009 (Central Bank of Swaziland, 2010).

Optional Question: What are the possible future changes for biodiversity and their impacts?

According to information in the Second National Communication to the UNFCCC (Government of Swaziland, 2010) all species that are endemic to Swaziland together with neighbouring South Africa and Mozambique will be severely impacted or even driven to local extinction as result of the effects of climate change. Those that are most vulnerable to extinction are the ones with small populations, slow rates of dispersal, restrictive elevation and climate requirements, and/or whose habitat is limited or occurs in patches. Examples of plant species are: *Encephalartos lebomboensi (Cycad), Encephalartos aplanatus (Cycad), Encephalartos sentocisus (Cycad), Euphorbia keithii (Umhlonhlo), Celtis mildbraedii (Natal white stinkwood) and Aloe keithii (Aloes) and the vertebrate species are: Platysaurus lebomboensis (Lebombo flat lizard), Leptotyphlops telloi (Tello's thread snake) and Cordylus warreni* (Girdled lizard).

Perhaps the greatest long-term danger from climate change will be the disruption of natural ecosystems, which provide an array of services that ultimately support human health. Biotic systems – whether in forests, Highvelds, Lowvelds, aquatic environments or elsewhere – provide food, materials and medicines; store and release fresh water; absorb and detoxify wastes; and satisfy human needs for recreation and wilderness. These systems will likely undergo major reorganization as global temperatures rise and rainfall patterns change more rapidly than they have in the past 10,000 years. Fragmentation and disturbance of ecosystems and of landscapes will have profound effects on the services provided, since these impacts shift the balance of the kinds of species present – from large, long-lived species to small, short-lived ones. These shifts are likely to lead to loss of biodiversity besides reducing the capacity of the systems to store nutrients, sequester carbon and provide pest protection among other functions.

Besides the threats of climate change, the major biological resources are threatened by a number of factors. Afforestation with exotic plantations in the Highveld is reducing grasslands. Soil erosion if not controlled will reduce grasslands and affect aquatic life. The sugarcane expansion in the Lowveld and Middlveld is having a negative effect on the savannah. Alien invasive plant species and resource harvesting are reducing all the biological resources (grassland, savannah, forest and aquatic).

PART II - STATUS OF NATIONAL BIODIVERSITY STRATEGIES AND ACTION PLANS (NBSAP), THEIR IMPLEMENTATION, AND THE MAINSTREAMING OF BIODIVERSITY

Question 5: What are the Biodiversity Targets set by Swaziland?

At the time of compilation of this report, the process of revising the national biodiversity strategy and action plan to be in-line with the Strategic Plan for Biodiversity 2011-2020 and its Aichi targets was underway. In revising the strategy, Swaziland adopted the seven steps process, which includes the identification and engagement of stakeholders, developing a strategy, developing a plan of action, implementing of the NBSAP, monitoring and evaluating implementation of the NBSAP and reporting. A brief assessment of why biodiversity is important for the country, its contribution to human well-being, and its economic and other values had been done. Drivers of biodiversity and underlying causes of its loss had been assessed as well. Relevant legal and administrative framework, existing institutions had been assessed as well.

The State of Environmental Report suggested some elements proposed to be adopted in the update of the NBSAP and are presented in the table below:

Table 2: Proposed Medium term Conservation Strategy Outline and Targets

Description of strategy	Proposed national target(s)	Potential indicators
Swaziland – Site-level strategy Revise all protected area management plans to include climate adaptation and mitigation activities/strategies	By 2015, at least 75% of all protected areas plans are revised and include climate change response strategies	% of protected areas with revised climate change-responsive management plans
Swaziland – Spatial strategy Increase protected area and transboundary conservation areas coverage across the country to improve/enhance climate change resilience for all major habitats/ecosystems.	By 2020, 11% of the country is protected and at least 10% of each major habitat/ecosystem is protected	% of total land area protected and % of each habitat under protection
Swaziland – Sectoral strategy Increase ecosystem-based approaches and protection-worthy areas	Target 2: By 2015, Swaziland's climate change response	Budget allocation to ecosystem-based approaches to climate

into the National Adaptation Plan of Action (NAPA) and climate change strategy	strategies (e.g. NAPA) fully incorporate ecosystem-based resilience such as establishing carbon sinks and controlling invasive species	change adaptation: amount of carbon stored / captured by different ecosystems & % reduction of total land area under alien plant invasion

Question 6: How has the NBSAP been updated to incorporate these targets and serve as an effective instrument to mainstream biodiversity?

The revised NBSAP will highlight and seek to maintain the contribution of biodiversity and ecosystem services to human-being. It will include measures to mainstream biodiversity into sectoral and cross sectoral policies and programmes. The revised NBSAP will be aligned with the country's national development strategy. It will further give direction where the country wants to go, which route it will take to get there and identify the actions to be implemented. Indicators to measure and report on progress towards national targets will be established as well. The country developed the national biodiversity strategy and action plan in 2001. Although targets were set, the plan was not fully implemented because it was not formally adopted as a national policy instrument. Currently, the NBSAP is under review and targets are being set to be in line with the Aichi targets. It is anticipated that this initiative will serve as an effective instrument to mainstream biodiversity.

Question 7: What Action has Swaziland taken to implement the Convention since the fourth National Report and what has been the outcome of these actions?

Major achievements that have taken place since the submission of the fourth national report are discussed below. The discussion however, does not aim to describe every action taken but highlights the key achievements and their outcomes.

Relevant Policy, legislation, regulations and strategies

- The **Biosafety Act, 2012** was passed into law by Parliament and received Royal assent in December 2012. The Act represents the legal framework for the regulation of biotechnology in the country. At the time of compilation of this report, development of regulations under this Act was being finalised. Following the enactment of the Law, the Minister responsible for environment appointed the National Biosafety Advisory Committee (NBAC) through a government gazette legal notice no. 130 of 2013. It has been shown that stakeholders in Swaziland are interested in adopting modern biotechnology and that because of proximity, interaction and trade of the country with neighbouring state involvement in modern biotechnology is inevitable (Dlamini *et al*., 2008; Dlamini *et al.,* 2010).

- The **Fresh Water Fisheries and Aquaculture Bill, 2012** is being developed by the Ministry of Agriculture. The Act from this Bill will repeal and replace the Protection of Fresh Water Fish Act of 1937. It will provide for the sustainable and regulated utilization of national fish resources. This shall ensure that the citizens of Swaziland have equitable, sustainable and fair access to fish resources. The revised Act will provide for the sustainable and responsible development of aquaculture in Swaziland. It is anticipated that the Bill will be passed into law soon.

- **National Climate Change Policy** (being finalised at compilation of this report) aims to provide a national strategic framework for Swaziland to address the challenges and annex benefits as well as opportunities presented by climate change. The Policy recognizes and promotes ecosystem based adaptation.

- The **National Trust Commission (Amendment) Bill, 2009.** The Bill was developed to amend the National Trust Commission Act, 1972 to include new protected area categories and governance types. The amended Bill is currently in Parliament.

- **Mining and Biodiversity Guidelines** are under development with various stakeholders to secure Swaziland's biodiversity and mainstreaming biodiversity into the mining sector. As the country pursues its development goals in line with sustainable development, the guidelines aims at striking a balance between economic growth and environmental protection.

- **National Invasive Alien Plant Control and Management Strategy** aims to promote cooperative, coordinated and integrated management and control of alien invasive plant species to reduce their ecological, economic and social impacts on human and natural resources.

- Development of the **Comprehensive Agriculture Sector Policy and the National Food Security Policy** that promote sustainable land management practices which include conservation agriculture and community based sustainable range management on rangeland and arable land. Cattle farmers are encouraged nationally to prevent overgrazing by rotating their livestock while arable farmers are legally required to plant contour strips in between their agricultural fields to reduce erosion limiting further land degradation.

Funding, programmes and surveys

- **Survey and mapping distribution and intensity of infestation of selected category 1 invasive alien plant species** by the department of forestry. Sixteen alien invasive plant species were found to have invaded almost 80% of Swaziland. The economic cost of clearing of this large scale invasion was

estimated to be $66.5 million at that time (GOS-MTEA, 2009). The most common species found are described in question 3.

- GEF-UNEP funded project on **Strengthening the National Protected Areas System of Swaziland.** A project preparatory study has been done in preparation for implementation of the project which is envisaged to begin early 2015. The project goal is to strengthen the management effectiveness of the PA system of Swaziland to ensure a viable set of representative samples of the country's full range of natural ecosystems are conserved, through a network of PAs. This will be through expanding and strengthening the PA network. The project will advance a landscape approach that will operationalise clusters of PAs in critical landscapes, under a mixture of State, private and community management, depending on tenure, to ensure Swaziland supports and benefits from conservation and strengthening the management capacity and financial sustainability of the existing and new PAs.

- The **Lower Usuthu Sustainable Land Management Project (LUSLMP**), a government initiated project, coordinated by the Ministry of Agriculture with the collaboration of SWADE. The project is jointly financed by the Global Environment Facility (GEF), the International Fund for Agricultural Development (IFAD), and the Government of Swaziland (GoS). The project was initiated in 2011 and its main objectives are to promote development and mainstreaming of a harmonised, cross-sectoral approach to sustainable land management, to reduce land degradation, biodiversity loss and mitigate climate change in the Lower Usuthu River Basin and to improve the livelihood opportunities,

Synergies with other biodiversity related Multilateral Environmental Agreements (MEAs)

- The Government of the Kingdom of Swaziland acceded to the Depositary Agreement on the Conservation of African-Eurasian Migratory Waterbirds (**AEWA**) which is under the auspices of UNEP. **The agreement entered into force for Swaziland on 1 January 2013**. Owing to altitudinal range and consequent habitat variability, the country is considered to subtend high levels of avifauna with up to 465 different bird species. Out of these, 64 migratory waterbird species are listed under AEWA, including the Vulnerable Wattled Crane (*Bugeranus carunculatus*) and the Endangered Grey-Crowned Crane (*Balearica regolorum*). Swaziland is thus of great importance for migratory waterbirds using the East Atlantic and Black Sea/Mediterranean Flyways and concerted action towards the conservation of these species is therefore essential.

- Although the Kingdom of Swaziland signed the International Treaty on Plant Genetic Resources for Food and Agriculture on 10 June 2002, **the country acceded to become a Contracting Party to the Treaty on 21 January 2013**.

Being a Contracting Party to the International Treaty guarantees the country facilitated access to genetic resources from the global gene pool of the Treaty and an international network of *ex-situ* collections. Furthermore, Swaziland became eligible to submit project proposals to the Benefit-sharing Fund and to participate in other non-monetary initiatives on technology transfer and capacity building under the Treaty.

- The country ratified the **Ramsar Convention on Wetlands** and the Conservation of Migratory Species of Wild Animals and this came into force for the country on 15 June 2013. Both aspects of the Convention are viewed by local conservationists as critical to the protection and management of Swaziland's threatened biodiversity.

Question 8: How effective has biodiversity been mainstreamed into relevant sectoral and cross-sectoral strategies, plans and programmes?

Swaziland is making a steady progress towards mainstreaming biodiversity in both the public and private sectors, though there are still challenges. The National Development Strategy (NDS) sets out the framework for sustainable development in a comprehensive manner across all sectors. It is an umbrella strategy for all other policies and strategies. The NDS identifies environmental protection as a cornerstone in the national development process. 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. Furthermore, mainstreaming biodiversity has been done mainly through the use of Environmental Impact Assessments (EIA).

The Ministry of Tourism and Environmental Affairs, which houses the Swaziland Environment Authority (SEA), the Swaziland National Trust Commission (SNTC) and the Forestry Department, is the primary custodian of biodiversity in Swaziland and governs laws pertaining to environmental management, protected areas and plant resources in and outside of protected areas. Both the SNTC and SEA are parastatal organizations funded by government but operating under independent boards appointed by the Minister of Tourism and Environmental Affairs. The King's Office is also a key custodian of biodiversity and governs laws pertaining to game as well as CITES. The Big Game Parks is a privately owned body which manages three reserves in the country (Mlilwane, Mkhaya and the Hlane Royal National Park, which is held in trust for the Nation by the King). The Big Game Parks therefore, contributes immensely to the management of the country's biodiversity especially with wildlife.

The limited institutional understanding of the role and importance of biodiversity affected by sectoral plans and programmes has led to limited consideration of

biodiversity related impacts that could result from the implementation of the sector policy, programme or plan. The Environmental Management Act, 2002, does provide for a Strategic Environmental Assessment to be carried out on all such initiatives. The SEA provided guidance and assistance to national structures in the formulation of their development plans, however, mainstreaming of biodiversity into national initiatives and developments has not consistently taken place.

Question 9: How fully has Swaziland's NBSAP been implemented?

As stated earlier on in question 5, Swaziland is still in the process of revising her NBSAP and as such, analysis here is done with respect to the previous NBSAP version.

The previous NBSAP had four core goals and two cross cutting goals with a numbers of sub-strategies. Progress in implementation of the previous NBSAP version is presented below.

Progress towards attainment of Goal 1

Goal and Sub-strategies identified		**CBD OBJECTIVE ADDRESSED**	**PROGRESS IN IMPLEMENTATION**
Goal 1: A viable set of representative samples of Swaziland's full range of natural ecosystems are conserved through a network of protected areas.			
Sub-strategy 1	Modify existing protected areas network to protect 10% of the full range of ecosystems	**Conservation**	Limited progress (current Project)
	Challenges in implementation of this sub-strategy as identified by stakeholders are: • Competition with conflicting land uses such as agricultural development, mining, etc. • Inadequate funding support for biodiversity in general and management of protected areas. • Human capacity constraints which make monitoring of reserve difficult. • Poor levels of awareness on the importance and role of protected areas in people • Poor appreciation of the impact of biodiversity on the economy and society at all levels		

Sub-strategy 2	Adequately protect threatened and endemic species	**Conservation**	Red data lists produced for some taxa e.g. higher plants and vertebrates. An atlas has also been produced for trees. This has been mainly through individual-driven effort rather than a defined strategy.
	Challenges in implementation of this sub-strategy include: • Lack of a national strategy for biodiversity research and monitoring • Budgetary constraints to support activities • Overstretched human resources • Inadequate awareness on the importance of elements of biological diversity • Current conservation related legislation does not provide coverage of many species for protection. The Flora Protection Act, 2001 provides coverage for 210 species and various levels whilst the Game Act currently provides for a limited number of reptiles as well as birds and some mammals.		
Sub-strategy 3	Minimise the impact of alien invasive species	**Conservation**	Alien invasive plant species declared as a national disaster in 2005. Commissioning a survey study To map distribution and intensity of infestation. 15 000Hacters of land cleared
	Challenges in implementation of this sub-strategy include: • Government procurement procedures made it impossible to implement the project as per the Parliament's recommendation. • Budget limitations • Re-growth and infestation in previously cleared sites.		
Sub-strategy 4	Assure adequate funding for management of protected areas	**Conservation**	Needs more efforts

	Challenges included: • Absence of an umbrella institution to be responsible for identifying priorities for biodiversity research, source funding and review • Competition between biodiversity and other conflicting needs for government funding • Inadequate mainstreaming of biodiversity issues in national planning		
Sub-strategy 5	Create socio-economic incentives that lead to local community support for protected areas conservation	**Fair & Equitable sharing**	Limited progress. SNTC managed protected areas have made attempts to develop some of these measures through their community outreach programme

The current coverage of Swaziland's protected areas network falls below the international recommended target of 17% of terrestrial ecosystem. At present, the savanna ecosystem has the highest coverage at 5%. Only 2% of each of the other ecosystems is covered (Swaziland Environment Authority 2001; Swaziland Environment Authority 2009). Proclamation of the other protected areas would enhance the coverage of the savannah and aquatic ecosystems by 2% and 1% respectively as shown in Table 3 which also shows the current coverage of the protected areas network.

The NBSAP proposed amongst other actions, a gap assessment. A protection-worthy areas survey undertaken in 2002/2003 revealed an urgent need for a review of legislation to provide for proclaiming different classes of conservation areas and to state associated restrictions on activities (Swaziland Environment Authority, 2001; Swaziland National Trust Commission, 2012). The assessment also showed 15 new priority areas of the country as protection-worthy based on biodiversity and socioeconomic indicators as well as the overall degree of threat (Roques, 2001; Roques *et al*., 2003; Swaziland National Trust Commission, 2012).

Table 3: Ecosystem coverage of the protected areas network

	Grassland	**Savanna**	**Forest**	**Aquatic**	**Total**
Extent of coverage	7990 Km^2 (46%)	8327 Km^2 (48%)	870 Km^2 (5%)	213 Km^2 (1%)	17 400 Km^2

Area under formal protection	190 Km^2 (2%)	426 Km^2 (5%)	20 Km^2 (2%)	4 Km^2 (2%)	640 Km^2 (4%)
Area informally protected	4 Km^2 (0%)	164 Km^2 (2%)	3 Km^2 (0%)	3 Km^2 (1%)	174 Km^2 (1%)

(Source: Remmelzwaal, 2006)

Protected areas under management of SNTC are practicing some elements of providing incentives for community support for conservation but these may need to be strengthened. Examples of such activities include:

1. Through their community outreach programmes, communities have been trained on sustainable harvesting and are allowed to harvest some goods such as firewood and wild fruit sustainably.
2. Support for small-scale sustainability projects such as water supply, sinking of bore holes and grind mills. For example, Ncobola communities have been supplied with water from streams that rise within Malolotja Reserve.

Other developments under this goal include:

1. Red data lists have been compiled and published although there has been limited action to translate these into action through for example, restoration.
1. Creation of an online database of Swaziland's alien/non-indigenous plants, with distribution maps and photographs or illustrations.
1. Preparation of a booklet on alien invasive plant species
2. Training of extension staff on plant identification, eradication and control in rural areas (Swaziland Environment Authority; 2001).
3. Alien plant species management and control in communities and within protected areas (Mlawula and Nkalashane).

Challenges in attainment of this goal as identified by stakeholders are:

1. Competition with conflicting land uses such as mining, agricultural development etc.
2. Budgetary constraints for implementation of activities and,
3. Human capacity constraints which make monitoring of reserves difficult.

Progress towards attainment of goal 2

Goal 2: Biological resources of natural ecosystems outside of the protected areas network are used sustainably	**CBD Objective Addressed**	**Progress to date**

SS1	Test viable CBNRM and develop across all ecosystems	Conservation and sustainable use	Limited progress
SS2	Enact CBNRM-enabling legislation based on results of pilot projects	Conservation and sustainable use	Limited progress
SS3	Develop institutional capacity and human resources to support CBNRM	Conservation and sustainable use	Limited Progress
SS4	Develop laws and support mechanisms to protect intellectual property rights of Swaziland, local communities and individuals	Fair & equitable sharing	Limited progress

Swaziland has adopted Community Based Natural Resource Management (CBNRM) approach both as a means of involving the private sector and local communities in biodiversity conservation as well as providing a mechanism for possible sharing of benefits with local communities. The National Forest Policy (2002) and Action Programme for example encourages community based resource management through the formation of Natural Resource Management Committees at community level. CBRNM recognizes the heavy reliance of rural communities on and their the use of natural resources, the need to enhance the income generation potential of these resources thus contributing towards addressing poverty in line with the PRSAP and the Millennium Development Goals (UNU-IAS, 2008).

In Swaziland, Shewula Nature Reserve located in the east of the country serves as an example for such an initiative. A second project on Community Biodiversity Conservation and Tourism Development is at advanced stages of development. The EMvembili Ecotourism project is part of efforts to enable communities in Protection Worthy Areas to realise benefits of keeping these areas intact by enabling them to derive an income.

Swaziland has also supported capacity-building activities to assist local communities in planning tourism developments. For example, the Swaziland Tourism Authority with financial support of the EU has assisted a local community in establishing two tourist lodges in the Ngwempisi Gorge and Mahamba (Swaziland Environment Authority, 2009).

Gaps in attainment of the goal include:
Development of legislation: Three instruments that have potential for addressing this goal are yet to be finalized into law. These are:

1. The Biodiversity Conservation and Management Bill (2008) as previously discussed,
2. The Access and benefit Sharing Bill (2008) and supporting policy which aims at promoting sharing of benefit acquired from natural resources,

3. The Forestry Bill (2010) which is aimed at regulating access to forestry resources and promoting sustainable harvesting of forests
4. Lack of a Land Policy as this has remained in draft form since 1999 as well as lack of support for sustainable utilization of biological resources on SNL (Swaziland Environment Authority, 2009).

Progress towards attainment of goal 3

Goal and Sub-strategy		CBD objective addressed	Progress made to date
Goal 3: The genetic base of Swaziland's crops and livestock breeds is efficiently conserved		Conservation and sustainable use	Limited Progress
SS1	Conserve, and sustainably use, plant genetic resources	Conservation and sustainable use	The National Plant Genetic Resource Centre currently holds about 960 accessions of cultivated species.
	Challenges in implementation of this strategy include: • Changes in agricultural practices including adoption of hybrids, shift towards monoculture etc. placing pressure on traditional crops • Habitat loss resulting from habitat conversion • Inadequate staffing levels. The gene bank is currently managed by a single official with some technical staff from the general agricultural research pool of technicians on rotating basis		
SS2	Conserve, and sustainably use, farm animal genetic resources	Conservation and sustainable use	Surveys of farm animal genetic resources conducted
	Challenges include: • Indiscriminate breeding between indigenous varieties and exotic breeds • Inbreeding leading to loss of genetic variability in domestic animal breeds		

Swaziland has been trying for some time to develop a botanic garden. Land was set aside and fenced and a water reservoir developed. Consultations with the Department of Forestry revealed that the main challenge has been lack of financial resources to complete the project.

A National Tree Seed Centre was established in 1994 but is also under-resourced and again consultations with the Department of Forestry indicate that it is now almost non-functional which is frustrating efforts by for example, the National Herbarium to collect and multiply some plants. The Animal Breeding Unit under Veterinary & Livestock Production Services is responsible for farm animal genetic related issues in the country. The unit has carried out a number of surveys on animal genetic resources of Swaziland.

Progress towards attainment of goal 4

		CBD Objective Addressed	Progress to date
Goal 4: Risks associated with the use of living, modified organisms (LMOs) in Swaziland are minimized.		Conservation and sustainable use	Biotechnology & Biosafety policy developed and approved. Legislation enacted.
SS1	Identify an institution responsible for overseeing all aspects of the use of LMOs	Conservation and sustainable use	National Competent Authority designated. The position of the Biosafety registrar created and filled within the SEA.
SS2	Develop legal and policy framework for the controlled use of LMOs	Conservation and sustainable use	Biotechnology & Biosafety policy developed and approved. The Biosafety Act enacted. Guidelines and regulations to support implementation of the Act developed. Institutional arrangements for implementation of the Act set and operational. The competent authority currently receiving application on LMOs.
SS3	Develop human expertise in the field of the use of LMOs	Conservation and sustainable use	Some progress but more effort still required.

			Training in various areas in the field through different initiatives done.

Part III - PROGRESS TOWARDS THE 2020 AICHI BIODIVERSITY TARGETS AND CONTRIBUTIONS TO THE MILLENNIUM DEVELOPMENT GOALS

Question 10: What progress towards implementation of the Strategic Plan for Biodiversity 2011- 2020 and its Aichi Biodiversity Targets?

Implementation of the national biodiversity goals have not been linked to implementation of the Aichi Biodiversity Targets since targets for the national goals were not set and thus pre-date inception of the Aichi Targets. However, the 2001 national biodiversity goals are on-going programmes and activities that contribute to the realisation of the Aichi Targets. Implementation of each of the targets was rated using a simple "traffic light" scheme as follows:

- Green- for achieved
- Yellow- for substantially achieved
- Orange-for achieved to a limited extent
- Red-for not achieved

STRATEGIC GOAL A: ADDRESS THE UNDERLYING CAUSES OF BIODIVERSITY LOSS BY MAINSTREAMING BIODIVERSITY ACROSS GOVERNMENT AND SOCIETY
Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
Overall rating: ▪ Substantially achieved.
National action taken: ▪ Introduced biodiversity topics across curricula at all levels including specific school programmes, education projects and extra-curricular activities on biodiversity ▪ Incorporated updated biodiversity topics into ongoing National Environmental Education Programmes (NEEP) including those that are aired on radio and television ▪ Encouraged extra-curricular activities related to biodiversity in schools ▪ Run seminars and workshops for educators, policy makers, media personnel, engineering concerns, the private sector and communities ▪ Community-based awareness programmes initiated by a number of organisations
Outcomes achieved: ▪ Public awareness of and support for, biodiversity conservation in Swaziland has been enhanced. ▪ Chiefs, rural groups taken leadership and action in indigenous forests

management

- Targeted programmes in the NEEP have sought to raise awareness and understanding amongst decision-makers including at Parliament.
- The country has a dedicated stakeholder base that seeks to develop appropriate methods for raising education and awareness.
- Elements of environmental education are now included in primary school curricula and at the tertiary level.
- Journalists and broadcasters are invited (often as participants and not just for publicity) to all biodiversity-related workshops and events (e.g. the World Environment Week commemoration). Consequently, they disseminate the relevant information to the public through the printed press, radio and television.

Example of relevant case:

- The National Environmental Education Programme (under the auspices of the Swaziland National Trust Commission) is mandated by the SNTC Act (no.9, 1972) to co-ordinate and promote Environmental Education in Swaziland. NEEP has the role of co-ordination, promotion and support of environmental awareness projects carried out by other organisations, both governmental and non-governmental. Headline activities undertaken by the NEEP consists but are not limited to the following:
  - Commemorative Days Celebrations - World Environment Day, Wetlands day, etc.
  - Environmental/ nature conservation radio programmes - through the SEA shared radio slot (Yonge Nawe, SNTC, SEA).
  - Academic service to the tertiary institutions (University of Swaziland) – providing access to Nature Reserve public facilities for studies on the biodiversity therein.
  - Rural Communities Training on Issues of Environment/ Nature Conservation - incorporation of indigenous knowledge systems in order to promote 'sustainable 'attitudes
  - Functioning as a support service for both external (EEPAP, Rural Communities, NGO's, CBO's, etc) and internal stakeholders who are in other departments.
  - Appropriate technology incorporation in environmental education – focuses on work projects involving interested and affected stakeholders
  - General environmental education awareness – focuses on the social, economic, political, and biophysical dimensions of Swazi inhabitants.

Production of quarterly environmental newsletter (Swaziland National Environmental Newsletter, or Swaziland National Conservation Newsletter) - to link and keep all environmental awareness groups informed

Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems

Overall rating:

- Not achieved; Value of biodiversity not yet reflecting in national accounts and in

costs of project implemented
National action taken: ▪ Mainstreaming biodiversity in sectoral policies ▪ Integrating biodiversity inclusive assessments into existing EIA regulations
Outcomes achieved: ▪ Several pieces of policy and legislation have been revised and conservation and sustainable use of biodiversity incorporated ▪ Environmental assessments include an assessment of biodiversity impacts.
Examples of relevant cases: ▪ Swaziland has identified management practices, technologies and policies that promote the positive, and mitigate the negative, impacts of agriculture on biodiversity. Specifically the country requires Environmental Impact Assessment carried out on all new medium scaled agricultural development. Under this process mitigation (management practices) are recommended and implemented. Guiding document is the 'Draft environment strategy for the Ministry of Agriculture'.
Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
Overall rating: Achieved to limited extent
National action taken: ▪ Ecosystem management funds supporting rural communities ▪ Support to farmers for conservation agriculture, Agroforestry and climate resilient landrace crop varieties ▪ Taxation, issuance of permits and designation of appropriate sites for fishing (artisanal and sport), hunting, livestock trade and tree extraction ▪ Food for work programmes in the eradication of alien and invasive plant species (AIPS)
Outcomes achieved: ▪ Systems are in place to enable evaluation of effectiveness of incentive schemes tested or employed ▪ Systems are in place to enable effective monitoring of LMOs ▪ Regulations to control pesticides in place ▪ Taxation of livestock business transactions
Target 4: By 2020, governments, business and stakeholders have plans for sustainable production and consumption and keep the impacts resource use within safe ecological limits

Overall rating:
- Achieved to a limited extent

National Action taken:
- ISO Environmental standards continue to be adopted by companies
- Implemented projects that encourage a circular economy: reuse and/or recycling of by-products and organic waste, including renewable energy production.
- Developed, implemented and promoted strategies for natural resources management in different establishments based upon multifunctional and sustainable guidelines

Examples of relevant cases:
- The Forest Policy and the National Forestry Programme provides policy direction on sustainable industrial forestry. The country has developed national criteria and indicators for sustainable forest management based on standard international criteria and indicators and will compel industrial forestry to adopt environmentally sustainable practices in their forest management. Both companies and individuals will have to comply with the national criteria and indicators in order to obtain certification that the products are manufactured in an environmentally sustainable manner.

- Artisanal and large scale mining operations have been mandated to abide by UN conventions on environmental protection during operations and post extraction. These include the planting of vegetation to prevent soil erosion and restoration of terrain after closure of operations.

- Swaziland produces high-grade fermentation, extra-neutral ethanol from sugarcane molasses that is supplied to the region and Europe. In addition, in 2011, the Ubombo Sugar Company and the Royal Swaziland Sugar Corporation invested in electricity generation power stations from sugar processing to the level of self–sufficiency and supply to neighbouring local communities.

STRATEGIC GOAL B: REDUCE THE DIRECT PRESSURES ON BIODIVERSITY AND PROMOTE SUSTAINABLE USE

Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced

Overall rating:
Achieved to a limited extent

National action taken:
- Evaluation of the conservation status of natural habitats
- Monitoring and reporting of pressures through undertaking studies for the State of the Environment Reports
- EIA procedures imposed for development projects; licenses needed for

extractive activities (flora and fauna, hydrological systems, etc.)
- Reduced the fragmentation of biodiversity by creating transfrontier and integrated corridor management

Outcomes achieved:
- Community based natural resources management projects – swamp areas protected
- Reduced destruction of natural habitats and forests resulting from new projects
- Enforcement of Flora Protection Act
- Environmental Impact Assessments

Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Overall rating: achieved to a limited extent

National action taken:
- Preventive education strategies and regular enforcement of laws on fishing gear and limitations by species based on 2002/2003 Fish and Fisheries Survey
- Review of Fisheries Act
- Reversing and preventing river catchment degradation and pollution in order to conserve rivers as breeding habitats for endemic fish stocks
- Surveys on coverage, status and trends of fish and invertebrate stocks

Outcomes achieved:
- Policy document to guide management of fish biodiversity available but there is need for supporting systems in place to measure effectiveness of policy

Examples of relevant cases:
The Fresh Water Fisheries and Aquaculture Policy was developed in 2011. Fish and aquaculture conservation policy measures included in the policy are: extension of surface and numbers of aquaculture farms, development and implementation of site or species specific management plans for fisheries and aquaculture, management agreements with local, commercial, and sport stakeholders, introduction of criteria for sustainable aquaculture and fishery management; legal framework for protection scheme for fisheries and aquaculture, and, development of implementation plans in cooperation with stakeholder groups.

Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Overall rating:
Achieved to a limited extent: the problem is mainly on Swazi Nation Land where

subsistence farming is practised and the land is mismanaged.

National action taken:

- Improvement of rural environment in degraded land and rehabilitation of degraded land.
- Government support for subsistence and small-scale commercial agrarian farmers to expand into pond-based tilapia fish farming
- Management of indigenous forest plantations
- Fencing of grazing land piloted by Ministry of Agriculture

Examples of relevant cases:

- Operationalizing the national fish hatchery to produce fish fingerlings to support the expansion of subsistence and small-scale commercial fish farming projects. Government has provided farmers with 250 tilapia fingerlings and technical extension support services aimed at assisting the farmers to rear fingerlings (ref). 1000 fish farm ponds in Swaziland with many being managed by women. It is further estimated that with an initial stocking of 250 fingerlings, each pond has the capacity to produce no more than 400 kilograms of tilapia annually

- The National Forest Policy and National Forestry Programme recognize the need for lands under production to be managed consistent with the conservation of plant diversity. Commercially managed (private plantations of timber and sugar) are currently managed under a certified environmental management system, either FSC (Forest Stewardship Council) or ISO 14001 both of which promote sustainable management of plantations. Further actions taken include the enforcement of EIA for all new agriculture projects to ensure that the impact of agriculture on biodiversity is assessed and considered in the design of the project. Recognition of the importance of agro-biodiversity is clearly articulated in several key agriculture policies. Adaptive management has been adopted by commercial industrial agricultural estates have in general had a positive impact on minimizing the impacts on biodiversity. For example, within the commercial industrial timber and sugar industries, proactive measures are implemented to avoid impacting upon riverine areas and other specific areas important to biodiversity by keeping land clearing and development away from these areas.

- On rangeland and arable land, respectively, cattle farmers are encouraged nationally to prevent overgrazing by rotating their livestock while arable farmers are legally required to plant contour strips in between their agricultural fields to reduce erosion limiting further land degradation. The Comprehensive Agriculture Sector Policy and the National Food Security Policy promote sustainable land management practices which include conservation agriculture and community based sustainable range management.

Target 8: By 2020, pollution, including from excess nutrients, has been

brought to levels that are not detrimental to ecosystem function and biodiversity.

Overall Rating: Achieved to a limited extent

National action taken:

- Ratification of the Stockholm Convention and the Rotterdam Convention
- Established national forum for the Strategic Approach to International Chemicals Management
- Development of the Persistent Organic Pollutants (POPs) National Implementation Plan
- Phase out of ozone depleting substances (ODS)
- Development of the National Solid Waste Management Strategy – to address chemical and other pollutants

Outcomes achieved:

- Awareness of the ills of pollutants and emergence of actions towards diminution of the problem of pollutants
- National chemicals profile
- Updated and reviewed national inventories on POPs
- Implemented the Terminal Phase-out Management Plan and achieved zero per cent consumption of CFCs.

- Under the framework of a national project for the implementation of the Strategic Approach to International Chemicals Management (SAICM), Swaziland established a National Forum on Government and Priority Setting for SAICM implementation. It is composed of representatives of government, non-governmental organisations (NGOs), academia, and industry. Discussions on national SAICM priorities, strengthening the national governance structure for SAICM implementation, and planning and developing action plans for national SAICM priorities were held 2-3 May 2012 in Mbabane, Swaziland. Infrastructure, coordination mechanism on chemicals management, waste disposal, and awareness-raising were identified as the most important issues. The major output of this exercise has been the compilation of the National Chemicals Profile and the Capacity Assessment Document. Among stakeholders this exercise raised awareness on chemicals management issues. The National Forum is hosted by the Swaziland Environment Authority, Ministry of Tourism and Environmental Affairs, with technical support provided by UNITAR, and financial support provided by SAICM's Quick Start Programme Trust Fund (http://www.unitar.org/swaziland-addresses-chemical-safety-challenges)

Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Overall Rating: Achieved to a limited extent

National action taken:

- Developed AIPS control and management strategy
- On-going eradication exercises within protected areas
- Incorporating control measures for alien invasive fish species into the management plan of water bodies

Outcomes achieved

- Trained personnel and communities, mapped and implemented projects on control and management of invasive species
- Over 4000hectares cleared of AIPS in the country

Examples of relevant cases:

- An integrated programme to control invasive alien plant species was implemented by the Forestry Section with the cooperation of the National Biodiversity Steering Committee (under the Swaziland Environment Authority), the Swaziland National Trust Commission (SNTC) and liaison with Plant Protection and Research Institutes in South Africa.

- The SNTC worked with an international NGO, Quest Overseas, in four national parks to address the devastating proliferation of the alien plant species *Chromolaena odorata*, *Parthenium hysterophorous* and *Lantana camera*. These are all non-indigenous plants to Southern Africa and were most likely brought over from Latin America on the ships arriving in Durban and Maputo harbours. The major problem with having these invasive species in the game reserves is that they are unpalatable to indigenous African animals and quickly dominate overgrazed areas and grow rapidly out of control. If allowed to grow uncontrolled, animals in the parks would simply die of starvation or be forced onto neighbouring farm land, neither is a viable option for the future success of the Conservancy aims. Over the years, Quest Overseas teams surveyed badly affected areas, built up a profile of newly infected regions, and also evaluated different eradication techniques (www.questoverseas.com).

- An online database of Swaziland's alien/non-indigenous plants, with distribution maps and photographs or illustrations was developed in 2003/2004 under the auspices of the Swaziland Environment Authority (3NR). A booklet of the invasive alien plant species was prepared. The Ministry of Agriculture undertook training of extension officers in plant identification, eradication and control in rural areas (http://www.sntc.org.sz/alienplants/index.asp

STRATEGIC GOAL C: IMPROVE THE STATUS OF BIODIVERSITY BY SAFEGUARDING ECOSYSTEMS, SPECIES AND GENETIC DIVERSITY

Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes

Overall rating:
Substantially achieved

National action taken:

- Protection worthy areas survey (2002) identified 44 areas from which to prioritize. Three principles were used to guide the selection of new (potential) areas to be added to the network:
    - be of a sufficient size to represent as much of the variation in biodiversity as possible
    - connectivity;
    - to have the highest likelihood of being sustainable including socio economic importance
- GEF project: Strengthening the National Protected Areas System of Swaziland,
- Reduced the fragmentation of biodiversity by creating transfrontier and integrated corridor management
- Community conservation areas to contribute to socio-economic development through tourism and other ecosystem services.
- Community involvement and participation is improving and positive.
- Private ranches willing to conserve areas through mixed land use models such as tourism, cattle and wildlife ranching – emergence of conservancies
- Amendment of the SNTS Act

Outcome achieved:

- To-date, only 3.7% (64,100 ha) of the country is formally protected as reserves with a small percentage of land being informally conserved and managed by private land owners and communal land users.
- GEF- Project on strengthening of protected area networks envisaged to increase area under formal protection to at least 10%.

Examples of relevant cases:

- Pure forest ecosystem, consisting of afromontane forest and riparian forest, are highly restricted and cover only 5% of Swaziland. 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. 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. (env profile)

- The Biodiveristy Conservation and Participatory Project (BCPD) identified an east-west corridor in the northern part of the country (described as the Northern Biodiversity and Tourism Corridors (BTC) linking the coastal areas of Mozambique and South Africa with the Drakensberg escarpment (Songimvelo, Malolotja, Makhonjwa) and a north-south corridor in the eastern part of the country (described as the Eastern BTC) defined by the entire length of the Swaziland Lubombo plateau and escarpment. It was conceptualised that the biodiversity conservation and management in the corridors will be underpinned by complementary activities maximizing economic benefits to rural communities through sustainable livelihoods, targeted infrastructure interventions and the development of tourism routes capitalizing on existing regional tourism dynamics. Formulation of the project followed Integrated Spatial and Participatory Planning Process and Development of Integrated Corridor Management Plans at three levels to engender intended benefits at different landscape scales:
  - at the regional/national level, the proposed BTCs were placed in the broader context of maintaining large-scale ecological patterns and processes and contributing to the development of multi-national tourism routes and circuits;
  - at the level of each BTC, plans were to ensure connectivity and complementarity of land uses within these broad areas; and
  - at the level of specific land use areas within each Corridor (e.g. developing management plans for conservation areas or tourism development plans for tourism zones).

  The piloting of this integrated approach was intended to result in models with a high potential for replication in the rest of the country (http://www.sntc.org.sz/bcpd/projects.asp)

Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Overall rating: achieved to limited extent

National action taken:

- Identified threatened species and provide endangered species with legal protection

Outcomes achieved:

- *In situ* conservation of a number of threatened species is offered by national parks, nature and game reserves (including one community managed nature reserve), private land owners, commercial ranchers, and royal burial grounds.

Examples of relevant cases:

- 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. (http://eeas.europa.eu)

- The Government of the Kingdom of Swaziland submitted the instrument of accession to the Depositary on the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) which is under the auspices of UNEP. The agreement entered into force for Swaziland on 1 January 2013. Owing to altitudinal range and consequent habitat variability, the country is considered to subtend high levels of avifauna with up to 465 different bird species. Out of these, 64 migratory waterbird species are listed under AEWA, including the Vulnerable Wattled Crane (*Bugeranus carunculatus*) and the Endangered Grey-Crowned Crane (*Balearica regolorum*). Swaziland is thus of great importance for migratory waterbirds using the East Atlantic and Black Sea/Mediterranean Flyways and concerted action towards the conservation of these species is therefore essential.
  (http://www.unep-aewa.org/news/news_elements/2012/swaziland_accession.htm.

- Quest Overseas completed surveys on the rare cycads found in Mlawula which are at potential risk of extinction. Surveys identified and mapped the plants and produced information considered helpful towards efforts to protect the vulnerable and very localised species, *Encephalartos umbeluziensis* (www.questoverseas.com). A similar effort was implemented by a local NGO, All-Out Projects, where threatened plant species were monitored to help determine their conservation status and contribute towards updating the current Plant Red Data checklist.

Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Overall Rating: Achieved to a limited extent

National action taken:

- Characterize, identify special characteristics and database farm animal genetic diversity in Swaziland
- Established the National Herbarium to promote the protection of plant diversity
- Prepared the Swaziland's Tree Atlas providing biodiversity information relevant to forest biodiversity
- Established a National Plant Genetic Resource Centre (NPGRC) at the Malkerns Research Station, Ministry of Agriculture.

Outcomes achieved:

- Major indigenous crops have been collected, characterized, documented and stored in deep freezers at the NPGRC. Special and routine collection missions are on-going.
- Awareness programmes on the paramount importance of sustainable conservation and utilization of crop genetic resources have been attempted.

Examples of relevant cases:

- The Kingdom of Swaziland signed the International Treaty on Plant Genetic Resources for Food and Agriculture on 10 June 2002 and deposited the instrument of ratification to become a Contracting Party to the Treaty on 21 January 2013. Being a Contracting Party to the International Treaty guarantees the country facilitated access to genetic resources from the global gene pool of the Treaty and an international network of ex-situ collections. Furthermore, Swaziland became eligible to submit project proposals to the Benefit-sharing Fund and to participate in other non-monetary initiatives on technology transfer and capacity building under the Treaty.

- The Ministry of Agriculture runs a Nguni cattle farm that is trying to preserve the gene pool of the indigenous cattle of Swaziland. Progress has been limited towards replicating establishment of other refugia for the other domestic species that are indigenous.

STRATEGIC GOAL D: ENHANCE THE BENEFITS TO ALL FROM BIODIVERSITY AND ECOSYSTEM SERVICES.

Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Overall rating: achieved to a limited extent

National action taken:

- Ratification of the RAMSAR Convention
- Wetlands protection and restoration under the environment fund
- Identified preferred sport fishing zones where sport fishing could be undertaken without directly prejudicing the rights of subsistence fishers

Outcomes achieved:

- Restoration of river systems and wetland areas has been achieved through on-going construction of medium-size earth dams (including through rainwater harvesting) with considered benefits for agriculture, aquaculture and other ecosystem services
- Establishment of River Basin Authorities

Examples of relevant cases:

- To better protect existing wetlands and their unique ecosystem, the country ratified the Ramsar Convention on Wetlands and the Conservation of Migratory Species of Wild Animals both of which are viewed by local conservationists as critical to the protection and management of Swaziland's threatened biodiversity. The Convention on Wetlands came into force for Swaziland on 15 June 2013. Swaziland presently has 3 sites designated as Wetlands of International Importance. These are: Hawane Nature Reserve and Dam. *15/02/13;* Hhohoo Region. Ramsar Site no. 2121; Sand River**.** *15/02/13;* Lubombo Region. Ramsar Site no. 2122 and Van Eck**.** *15/02/13;* Lubombo Region. Ramsar Site no. 2123. **(**http://ramsar.wetlands.org/Portals/15/SWAZILAND.pdf)

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification

Overall rating: Achieved to a limited extent

National action taken:

- Preservation and improvement of forestry resources to contribute to the carbon cycle
- Climate smart agriculture utilizing principles and practices of sustainable land management such as conservation agriculture and rangeland management
- Climate change strategy developed being developed.

Outcomes achieved:

- There is limited progress following results of a survey conducted in 2002 to identify protection worthy areas. However, recent ecosystem approaches that have been adopted appear favoured than isolated protection-worthy areas

Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Overall rating: not achieved

National actions taken:

- Capacity needs assessment report on access and benefit sharing
- Development of draft access and benefit sharing legislation.
- Currently developing a communication strategy for ABS
- Prepared a document for ratification
- Awareness raising and capacity development for key institutions and stakeholder groups in preparation for the ratification of the Nagoya Protocol.
- Development of an ABS outreach and information strategy for the broader public on ABS issues

STRATEGIC GOAL E: ENHANCE IMPLEMENTATION THROUGH PARTICIPATORY PLANNING, KNOWLEDGE MANAGEMENT AND CAPACITY BUILDING

Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Overall rating: substantially achieved

National action taken:
Swaziland currently revising her NBSAP and envisaged to be completed and adopted as a policy by 2015.

Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels

Overall rating: not achieved

National action taken:

- Swaziland is a member of ARIPO (African Regional Intellectual property Organisation)
- Intellectual Property policy is under development.

Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Overall rating: achieved to limited extent

National action taken:

- Review of school curricula
- Review and upgrade relevant undergraduate programmes to include biodiversity-related courses
- Establish postgraduate training in biodiversity conservation and development
- Encouraged and promote research for development that is relevant to biodiversity conservation
- Co-operation with tertiary research institutions within and without Swaziland

Outcomes achieved:

- Under the auspices of the TFCA Programme and Peace Parks Foundation, there has been scientific cooperation with regards to geospatial analysis and planning and this involves a lot of scientific analysis of species, landscapes and other socio-economic analysis using biodiversity information from the three countries involved, i.e. Swaziland, South Africa and Mozambique.

- The SEA, SNTC and Big Game Parks have websites on which various articles and links to information, including that on biodiversity, is available and suited for different stakeholders

Examples of relevant cases:

- The Department of Biological Sciences of the Faculty of Science & Engineering at the University of Swaziland established a Master of Science Degree programme in Ecology & Biodiversity Conservation that begun in 2013. The key objectives are to develop human resources both within and regionally in the field of ecology and biodiversity conservation, and to provide a framework for sustainable biodiversity management and utilisation through scientific research and experimentation. The inception of the programme is in addition to a Masters in Environmental Resource Management developed and implemented in 2002 (Institute of Postgraduate Studies, Item No. PGS 2013/19, University of Swaziland).

▪ Local communities and stakeholders such as NGOs, private sector, public sector and academia are involved in many capacity building and training programmes, conduct research, including aspects on knowledge transfer, on biodiversity related issues both with national and international partners. ▪ Research and development on herbal medicines such as that done by the Swaziland Institute for Research in Traditional Medicine, Medicinal and Indigenous Food Plants, University of Swaziland, Kwaluseni, Swaziland could lead to novel pharmaceutical products and mechanisms for monitoring the claims for efficacy and safety of products from traditional medical practice (see Amusani *et al*. 2005)
Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.
Overall Rating; not achieved

The following section illustrates outcomes of NBSAP implementation and progress towards the Aichi Targets in particular those which you have a better rating.

Case study on Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

The National Environmental Education Programme (NEEP), under the auspices of the Swaziland National Trust Commission, is mandated by the SNTC Act (no.9, 1972) to co-ordinate and promote environmental education in Swaziland. The NEEP has the role of co-ordination, promotion and support of environmental awareness projects carried out by other organisations, both governmental and non-governmental. The NEEP also has an environmental awareness radio programme that is aired in the national radio station once every week on Mondays. This radio slot is used to raise awareness on all environmental issues including biodiversity. Other activities done by the NEEP include but not limited to;

- Commemorative days celebrations - World Environment Day, Wetlands day, International Day of Biodiversity etc.
- Environmental or nature conservation radio programmes - through the SEA shared radio slot.
- Academic service to the tertiary institutions (University of Swaziland) – providing access to Nature Reserve public facilities for studies on the biodiversity therein.

- Rural Communities Training on Issues of Environment / Nature Conservation - incorporation of indigenous knowledge systems in order to promote sustainable attitudes.
- Functioning as a support service for both external and internal stakeholders who are in other departments.
- Appropriate technology incorporation in environmental education, focuses on work projects involving interested and affected stakeholders
- General environmental education awareness – focuses on the social, economic, political, and biophysical dimensions of Swazi inhabitants.

Production of quarterly environmental newsletter (Swaziland National Environmental Newsletter, or Swaziland National Conservation Newsletter) - to link and keep all environmental awareness groups informed.

Following the enactment of the Biosafety Act in 2012, there is a need for increased awareness on the value of biodiversity and the risks associated with the use of living modified organisms. One of the primary means of achieving this is through education and empowerment of the nation on this topic. It is in this light that the Swaziland Environment Authority partnered with the education sector through the National Curriculum Centre (NCC) and the University of Swaziland (UNISWA) to mainstream issues of modern biotechnology and Biosafety as well into curricula at both lower and higher education. Through this partnership, the development of a curriculum matrix exercise at lower education has been initiated and currently underway. Development of training materials to support the integration of modern biotechnology and Biosafety issues in the institutions of higher education and training has also been done.

Other exercises to raise awareness on the value of biodiversity have been undertaken by a number of institutions in the environment sector. This includes but not limited to the education and awareness programmes run by conservation parks, workshops conducted at community levels by stakeholders in the environment sector, the environment impact assessment exercise etc.

Case study on Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.

Swaziland has initiated a project, through the GEF V funding resources, to improve sustainability of Protected Area (PA) systems. This will be through expanding and

strengthening the PA network. The project will advance a landscape approach that will operationalise clusters of PAs in critical landscapes, under an admixture of State, private and community management, depending on tenure, to ensure Swaziland supports and benefits from conservation and strengthening the management capacity and financial sustainability of the existing and new PAs.

This initiative follows stakeholders' reiterated urgent call for establishment of a new conservation paradigm that enables the country to utilize its considerable natural endowment to meet its socio-economic and development needs while simultaneously improving the conservation status of its biodiversity. The project is in line with the country's NBSAP, the Programme of Work on Protected Area (PoWPA) the Ministry of Tourism and Environmental Affairs 2010-2015 development strategy and the Swaziland Nature Conservation Trust (SNTC) restructuring and commercialization strategy; as well as its 2011-2015 implementation strategy. All of these strategies call for (amongst other things) increasing financial sustainability, ecological viability and broader participation of private sector and communities in PA management. They jointly aim to achieve these objectives through the development of a sustainable tourism framework; adoption of a business approach in PA management, development of new tourism products, branding and renewed marketing of Swaziland as a tourist destination and improvement of capacities for all the institutions involved in PA management.

Creating sustainable jobs, alleviating poverty and improving the quality of life of all Swazis is amongst the most pressing challenges the country needs to address, using its natural capital endowment more sustainably. As reported by the State of the Environment Report, the country has paid a high social and economic price for the sub-optimal management of its biodiversity; these include accelerated land degradation and biodiversity loss, loss of ecosystem resilience, reduction in water quantity and quality, increased infestation by invasive alien species, decline in land productivity and a shrinking economy. These impacts compromise the quality of life for the Swazi people, but particularly for the rural poor, who depend on biodiversity resources to meet their basic needs.

The project's goal is to strengthen the management effectiveness of the PA system of Swaziland to ensure a viable set of representative samples of the country's full range of natural ecosystems are conserved, through a network of PAs. The project's objective is to effectively expand, manage and develop Swaziland's protected area network in order to adequately protect the biodiversity and landscapes of the country. This will involve devising a system of integrating land and natural resource management that transforms the current PA patchwork into a protected areas network, while creating incentives for all Swazis (land management agencies, conservancies, private landowners and tourism operators) to work together toward conservation and sustainable economic development. In order to achieve the project goal and objective, the project's interventions have been organised in three components and expected to commence in 2015.

Component 1: Knowledge based platform operationalised at the National and regional level to address current and emerging threats to PAs and biodiversity conservation.

1. Under this component, the project will provide the tools, knowledge environment, partnerships and skills required to the expansion of the PA system. Under the project, field surveys will be carried out to fill biodiversity knowledge gaps and to improve information about ecosystem functioning and services. This will feed into a GIS based knowledge and information management system which will be operationalised to support systematic biodiversity planning and management. This leads to improved biodiversity and ecosystem information and decision making and an ecosystem focus in biodiversity conservation, identification of critical biodiversity areas, ecological support areas for maintaining ecosystem processes, biodiversity conservation targets (in line with Aichi targets and national plans), and determination of ecosystem management objectives (within PAs and immediately adjacent lands).

2. The project will also result in the formulation and implementation of landscape-based management plans that integrate biodiversity conservation and sustainable economic development. In addition, the project will support field-based biodiversity monitoring and facilitate the adoption of the systematic biodiversity planning approach as the basis of formulation of the landscape approach to conservation in the target landscapes. The project will result in the development of systematic ecosystem and biodiversity management plans to enable the PA mangers and partnerships to comply with PA management regulations and effectively manage PAs.

Component 2: Landscape approach operationalised and leads to expansion of PA network.

3. Under this component, the project will facilitate the consolidation and expansion of the current PA network and facilitate identification and mobilisation of arrangements such as community PAs, drop-fence agreements between different small PAs with potential for, or necessary for conservation of biodiversity or ecological processes, etc. In this regard, it will support the gazettement, or other appropriate legal designation, of 16 conservation areas based on assessments of their importance as critical ecosystems and biodiversity-rich areas. The project will result in the formalisation of 16 conservation areas under different forms of PA management i.e. those under the SNTC Act, Game Act, Forest Reserves, Conservancies and Community Conservancy Areas (CCAs); based on existing laws and policies for the legal protection of these proposed PAs. It also will facilitate the development of the requisite institutional and organisational support to manage the new PAs

effectively and sustainably. The project will also facilitate the demarcation of boundaries for the different forms of PAs based on stakeholder consultations as part of the formalisation process.

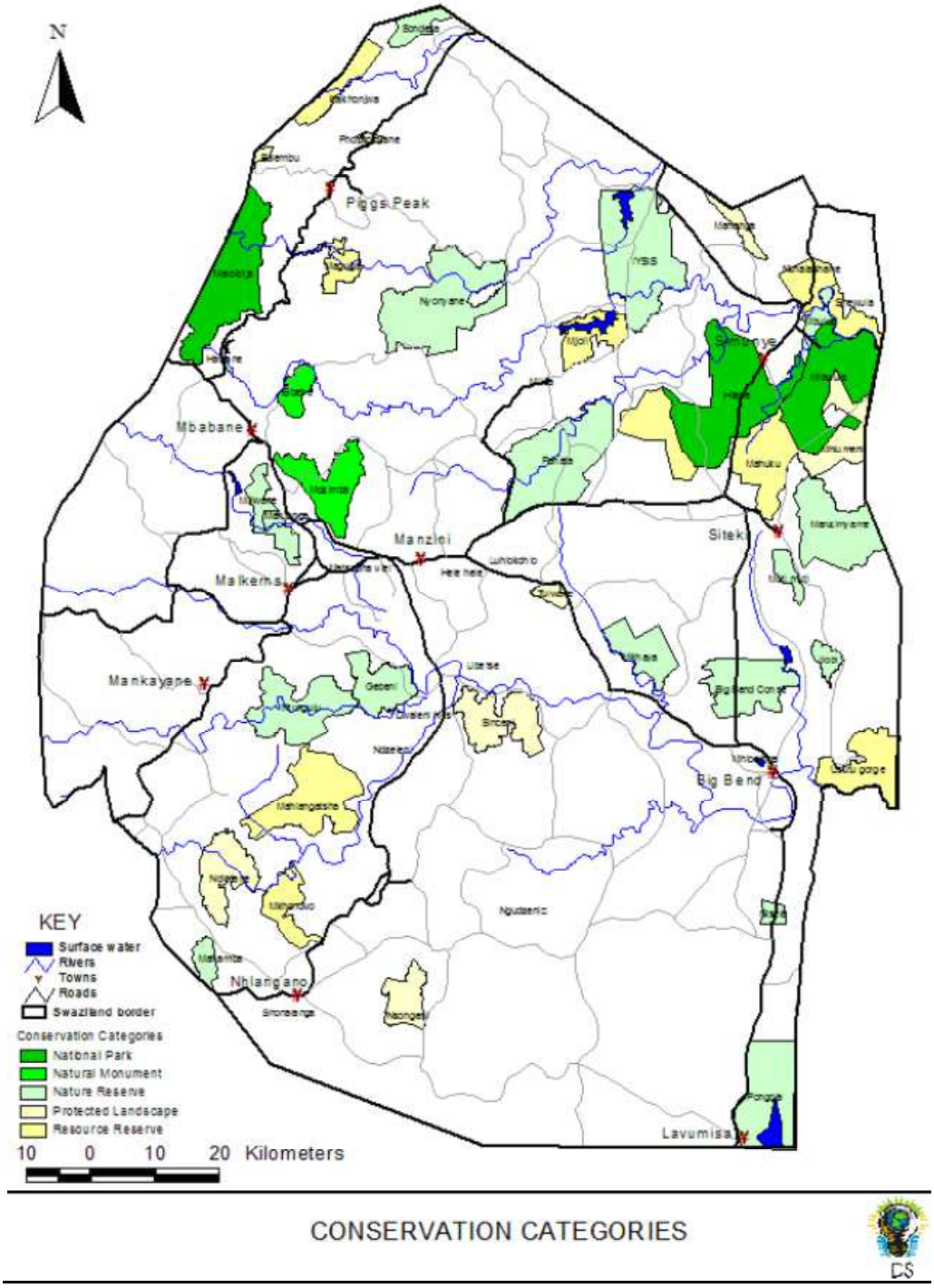

Figure 6: map showing the current conservation areas

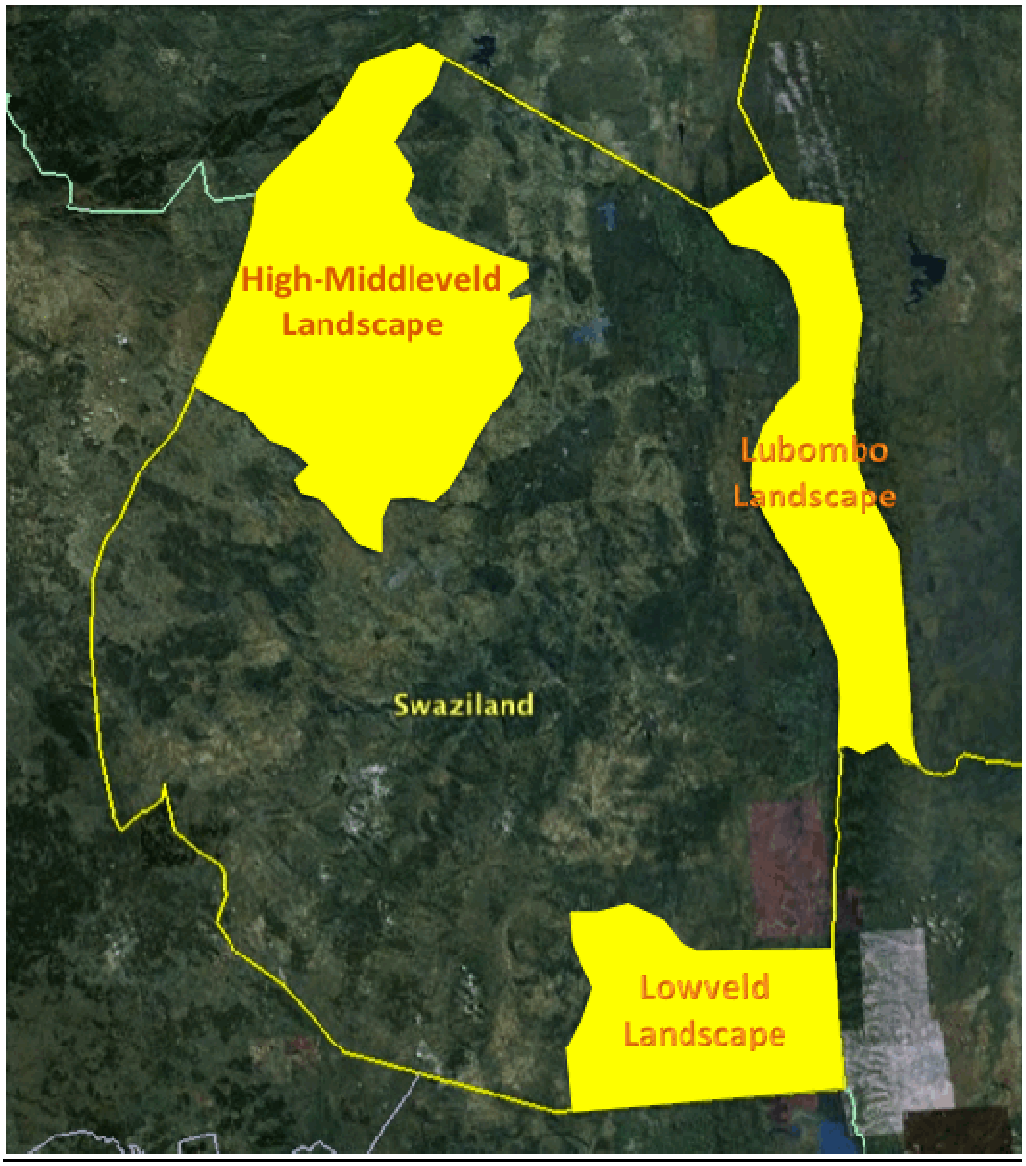

Figure 7: Illustrative map of three target landscapes for the project

Component 3: Strengthening PA functioning through improved Conservation management and Operational support for existing and new PAs, including both formal and informal PAs.

4. Under this component, the project will build the capacity of the SNTC, BGP, Private sector, local communities and PA management in order to boost technical and operational capacity, but most importantly, will increase opportunities for revenue generation and financial sustainability of PA management. The project will also result in the development of control mechanism for invasive alien species to enhance biodiversity conservation, habitat integrity and sustainable economic development. The project will

facilitate capacity development and training for all newly gazetted or created PAs and CBNRM programmes as well as the implementation of ecotourism development and management plans in the CCAs.

5. The project will boost the technical skills of the PA managers and support them in developing, communicating and implementing PA management plans that are in line with the current PA and ecosystems science. In this regard, PA managers will be involved in participatory planning for protected area tourism (including policy, stakeholder involvement, conflict management, development and implementation of plans). The project will establish systematic staff training programmes that cover all aspects of PA operations to ensure rangers, guides and other field staff meet necessary competencies for planning, administration, marketing, customer care, conflict resolution, reporting, monitoring, policing and enforcement in PAs.

6. The project will assist SNTC, BGP, Private PAs and Community PAs in tourism products development and marketing for revenue generation and financial sustainability in PAs. The project will assist developing a joint natural product enterprise development with PAs to increase financial returns from conservation and development of a sustainable tourism framework backed by a viable marketing strategy. In addition, the project will ensure that PA managers have a good understanding and knowledge of contemporary and innovative sustainable financing mechanisms for biodiversity and protected areas, and that they have sound M&E plans and Indicator Tracking Tables which they use to monitor all aspects of the PA management and conservation.

Case study on Target 5 and 15; By 2020, the rate of loss of all natural habitats, including forests, is halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and combating desertification.

In 2011, the Government of Swaziland initiated the Lower Usuthu Sustainable Land Management Project (LUSLMP), coordinated by the Ministry of Agriculture with collaboration with SWADE. The project is jointly financed by the Global Environment Facility (GEF), the International Fund for agriculture Development (IFAD) and the Government of Swaziland (GoS).

The main objectives of the project are:

- To promote development and mainstreaming of a harmonised, cross-sectoral approach to SLM at the National level;
- To reduce land degradation, biodiversity loss and mitigate climate change in the Lower Usuthu River Basin area through the application of sustainable land management practices which will contribute to adaptation to climate change;

- To improve the livelihood opportunities, resilience and food security of rural communities.

In the first four years beginning in 2011, the project is being implemented as a pilot project working with rural communities neighbouring the LUSIP project development area, in farming projects that will restore their land, mitigate against the loss of biodiversity, and provide them with steady food supply through catalysing development of a range of alternative livelihood opportunities. Thereafter, it will be up-scaled nationally to other communal areas of Swaziland with land degradation hotspots. The project emphasises optimal environmental management and community empowerment as critical for a sustained improved quality of life. The project has several main groups of stakeholders who are involved in the implementation of the project.

The LUSLM project is being implemented under four broad categories as follows:

Component 1: Sustainable Land Management Approach at National Level

1. This component promotes the development and mainstreaming of a harmonised, cross-sectoral approach to sustainable land management (SLM) at the national level, to overcome the national level barriers and improving the legal and policy framework for SLM. These national level activities are considered vitally important, as it is acknowledged that the primary drivers of degradation occur at levels beyond the land user.
2. Physical progress made under this component includes the formation of a Land Policy task force to supervise and provide support to the development of sustainable land management. A draft Land Bill has been prepared and now awaits to undergo all the respective channels prior to approval.

Component 2: Land Resources Planned and Managed sustainably

3. This component aims to help local people better plan and manage their land resource; based on the unit of chiefdoms. Activities in this component concentrate on raising SLM awareness, skill and ecological literacy of local people. In order to achieve this, this component includes capacity building for local staff (GoS extension/ NGOs/ private sector). On the ground activities in this component are undertaken using participatory approaches, demonstration farms / plots for field demonstrations, farmer field schools and farmer exchange visits.
4. Under this component, communities are being assisted to implement elements of SLM plans to restore degraded areas/ ecosystem functions, protecting integrated agro-ecosystems, biodiversity, mitigate climate change and contribute to raising communities 'resilience to the impacts of climate change.
5. Physical progress made under this component includes:
    - formulation of chiefdom development plans
    - community training on rangeland management

- community training on afforestation and forest conservation
- community training on permaculture gardening and establishing of backyard gardens
- community training on conservation agriculture and establishment of a communal garden
- community training on water harvesting
- promotion of fuel wood efficiency
- rehabilitation and re-use of degraded land

Component: 3 Alternative Livelihoods

This component complements the LUSIP by supporting communities applying SLM and conservation measures to generate additional sources of income to alleviate poverty and reduce pressure on natural resources. The main activities considered here are enterprises that have limited demand for land and can use water efficiently.

Physical progress made under this component includes training of communities on sustainable and efficient livestock production.

Component 4: Project Management

This component will facilitate operationalization and efficient functioning of the LUSLM project management structures, with a focus on documentation of lessons learnt facilitated through an effective and efficient knowledge management system.

An assessment of baseline data on carbon stocks was undertaken. This assessment had been used to estimate and track the impact of project initiatives on carbon stocks and greenhouse gas emissions.

A knowledge management and learning framework for the project was set up, which not only seeks to ensure the integration of knowledge management and learning into the project implementation process but also focuses on ensuring the involvement of project beneficiaries in the monitoring and evaluation.

Documentation of project activities from the field has continued throughout the implementation of the project. A number of documentations were published in the local and international media platforms. In the local print media stories have been published in the following;

- Agri-business Magazine
- Lima Ngwane
- Swazi Observer
- Times of Swaziland

The international print media are:

- Agrideal

- IFAD Website
- New-Era-Namibia
- Farming Matters.

Case study Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Swaziland's NBSAP was prepared in 2001 through a consultative process involving stakeholders at both national and regional level. Whilst multi-stakeholder team was established to coordinate the NBSAP development process, consultation with key stakeholders revealed a low level of awareness and lack of ownership of the NBSAP and therefore impeding on its implementation. As Swaziland prepared to update her NBSAP a number of lessons were drawn for consideration. This include setting clear targets, measurable indicators and responsibilities, closer alignment of the NBSAP with action plans of other biodiversity related MEAs and approval of the NBSAP document at Policy level as well for greater ownership and commitment.

At the time of compilation of this report, the NBSAP revision process to be in line with the Strategic Plan for Biodiversity 2011-2020 and its Aichi targets was underway. In revising the strategy, Swaziland adopted the seven steps process, which includes the identification and engagement of stakeholders, developing a strategy, developing a plan of action, implementing of the NBSAP, monitoring and evaluating implementation of the NBSAP and reporting. A brief assessment of why biodiversity is important for the country, its contribution to human well-being, and its economic and other values had been done. Drivers of biodiversity and underlying causes of its loss had been assessed as well. Relevant legal and administrative framework, existing institutions had been assessed as well.

Recognising the difficulty to conceive effective action plans without multi-stakeholder commitment to, and "ownership" of, the NBSAP process, the Government of Swaziland through the Ministry of Tourism and Environmental Affairs officially launched the NBSAP revision process at national level bringing in stakeholders into its development as early as possible. The Biodiversity Programme Implementation Committee (BPIC) set by the Environment Action Plan was tasked as the project steering committee. A team of biodiversity experts were appointed at consultants for the project. In publicizing the NBSAP revision exercise, stakeholders, government organs were sensitized, radio slots and print media adverts developed. A number of regional consultation exercises were conducted country wide. A revised NBSAP in-line with the Strategic Plan for Biodiversity 2011-2020 and its Aichi targets is envisaged to be completed by the year end 2014.

Question 11: What has been the contribution of actions to implement the convention towards the achievement of the relevant 2015 targets of the millennium development goals?

National actions on biodiversity in relation to MDG 7 (Ensure Environmental Sustainability)

The attainment of MDGs cannot be realized through singular instruments, such as various national or regional macro- or microeconomic strategies. For example, deterioration of the labour market, triggered by economic crisis of recent years, has resulted in a decline in employment. As jobs are lost, more workers have been forced into vulnerable employment, such as natural resource-based artisanal enterprises or living in extreme poverty. Poverty is one of the root causes of environmental degradation and should be at the core of the government's development agenda for the foreseeable future. Its alleviation is critical to natural resource conservation, protection and sustainable utilization. On the other hand, improving the status of biodiversity by safeguarding ecosystems, species and genetic diversity, and enhancing the benefits to all, remain prime activities toward integrating environmental concerns into national development plans and programmes. The strategic goals of the Aichi Biodiversity Targets, thus, must necessarily be reviewed in light of MDGs targets as well for national and global benefits.

The 7th MDG, 'Ensure Environmental Sustainability' has two targets:

a. Target 7A: Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources
b. Target 7.B: Reduce biodiversity loss, achieving by 2010, a significant reduction in the rate of loss

MDG indicators shown in Table 4 below support these global targets. The table further illustrates major national actions taken and achievements in relation to both the Aichi Biodiversity Targets and MDGs.

Table 4**: Millennium Development Goals Indicators and National Actions**

Millennium Development Goals Indicators	**National Actions**
7.1 Proportion of land area covered by forests.	Forest cover has contributed to economic development, food security, income generation, water, health, and helps in soil conservation to sustain socioeconomic livelihoods. The demand for forest resources continues to be managed through the development of community woodlots, rural electrification, promotion of energy efficient wood stoves and renewable energy sources. The Forest Bill of 2010 is envisaged to further enforce the management and increase of carbon sinks in the form of forests.

7.2: Carbon dioxide emissions	Swaziland is party to the UNFCCC and its Kyoto Protocol, which seeks to reduce the level of GHG emissions in the atmosphere, with a view to address human induced climate change that has an impact on ecosystems and biodiversity. In partial fulfilment of the country´s commitment to the UNFCCC, GHG inventories were done in 1994 (submitted in 2002) and in 2000 (submitted in 2012). Between 1994 and 2000, large emissions were attributed to industrial processes and the waste sector and, to a lesser extent, land use, land use change and forestry. The development of community woodlots, rural electrification, promotion of energy efficient wood stoves and renewable energy sources with supporting legislation in the revised Forestry Bill (2010) are efforts towards increasing carbon sinks. A Climate Change Strategy and Action Plan (2012) provides for managing GHGs in the form of a long term carbon strategy and a further accompanying Nationally Appropriate Mitigation Action (NAMA) strategy. The country is Party to the Stockholm Convention, aimed at protecting human health and the environment from persistent organic pollutants (POPs), adopted in 2001 and entered into force in 2004. Inventories to assess the presence of various POPs have been conducted and implementation plans to safeguard ecosystems have been developed.
7.3: Consumption of ozone-depleting substances.	Swaziland ratified the Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on substances that deplete the ozone Layer in 1992; ODS Regulations were promulgated in 2003 and all the amendments to the Protocol were ratified in 2005. CFCs and carbon tetrachloride were completely phased out in 2007 enabling compliance with the 1st January 2010 target. However, total eradication of HCFCs is targeted for 2030. Agricultural uses of methyl bromide have been entirely replaced by alternatives and only the exempted quarantine and pre- shipment (QPS) uses remain.
7.4: Proportion of total water resources used	Over the years, the country has been able to store 765,000 m^3 per annum, which represents 17 per cent of the available renewable water resources. This water is stored in major dams and reservoirs located in different parts of the country. Currently, consumptive water usage stands at 1.5 million m^3 per annum which represents only 33 per cent of water leaving the country. Water use is dominated by irrigation, which takes about 96 per cent of the surface water resources mostly for growing sugarcane. Agriculture is followed by domestic and industrial uses that take about 2 per cent, respectively. Over the years, water resources management has grown in complexity due to issues that have now become pertinent, such as water quality problems,

	priority in water allocation, trans-boundary obligations, development of infrastructure, stakeholder participation as well as the introduction of the environment as a water user. New and creative approaches are required to meet the MDGs. These include: reassessment of the allocation criteria, promotion of efficient water use, and promotion of water harvesting technologies and negotiating for greater shares from the trans-boundary rivers.
7.5: Ratio of area protected to maintain biological diversity to surface area	In 2000 the coverage was 3.7 per cent increasing to 4.5 per cent of legally proclaimed conservation area by 2009. If other areas not been legally proclaimed but are protected for various reasons are included, this proportion increases to about 11.3 per cent.
7.6: Proportion of species threatened with extinction	Recently produced red data lists indicate that large numbers of plants and vertebrates are threatened: caused by loss of habitat, over exploitation and the presence of invasive alien species. Habitat destruction is the result of industrial forestry and large scale irrigated agricultural expansions. 11 out of 3441 plant species area threatened with extinction and a total of 132 species of vertebrates are listed, consisting of 11 species of fish, 4 species of amphibians, 14 species of reptiles, 55 species of birds and 48 species of mammals. These threatened species represent between 9-20 per cent of the total numbers of fishes, amphibians, reptiles and birds occurring in Swaziland, and 38 per cent of the mammalian fauna.
7.7: Proportion of population using solid fuels	In 2010, about three quarters (77.2 per cent) of the rural population depended on wood and coal for domestic cooking with the urban areas have a low proportion of 12.9 per cent. There has been however, a decline of 8.9 per cent at national level in proportion of households using solid fuels from 62.1 per cent in 1997 to 53.2 per cent in 2010. By 2015, the proportion of the population using solid fuels for cooking is projected to be around 50 per cent. Even though there is no set target for this indicator; there is need to reduce the proportion of households using solid fuels as a main source of cooking energy. The National Energy Policy Implementation Strategy includes activities related to the energy needs of households in rural and peri-urban communities.

Source: Swaziland Millennium Development Goals 2012 Progress Report

Question 12: What lessons have been learned from the implementation of the Convention on Biological Diversity?

The study assessed some key indicators to inform successes and setbacks at national level and to enable draw lessons from implementation of the Convention in Swaziland.

Has the design for interventions allowed space for meaningful participation of beneficiaries and took into account potentially differentiated perspectives and interests?

Swaziland's biophysical and cultural heritage provides key commercial components that differentiate it within the southern African region and has engendered a greater awareness and utilisation of biodiversity. In addition, biodiversity is a key component of the tourism industry in Swaziland, which has likely contributed to emerging greater awareness and subsequent responses. Indeed, the value of Swaziland's biodiversity has long been recognised by Swazis who make use of it on a daily basis for various reasons including: traditional medicine, food, building material and traditional attire. It is therefore argued in this report, that there is evidence to suggest that community involvement and private sector participation have engendered awareness, ownership and afforded tangible benefits to all stakeholders. Further, there is considerable effort by government towards prioritization of and practices for biodiversity conservation at local and national scales.

This report argues however, that there remains significant need for robust national strategy that can coordinate individual and organizational efforts and facilitate the development of capacity appropriate to national needs to address land and range management. There are changing livelihood dynamics owing to contestations amongst traditional proclamation of sacred, royal and hunting lands, formally declared nature reserves, and private sector activities. It is considered that to meet these requirements in a timely and effective manner, significant investment must be made in increasing individual capacity (quantity and quality) and/or the generation of additional processes and practices (local, multi-sectoral, national) to account for these limitations.

Of concern is the fact that more than half of Swaziland is used for extensive grazing. 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. The emphasis on land and range management appears inadequate compared to the effort towards CBNRM and ecotourism. The status of biodiversity of the ecosystems of Swaziland is further threatened by land conversions (to industrial forestry, sugarcane, urban area and others), which are projected to half the area of potential protection worthy ecosystems. From 1985 to 2000, a total of 435 km^2 had been converted representing a conversion rate of 29 km^2 per year. Extrapolation of the same rate indicated that by 2030, this will reduce by 50%, the potential protection worthy ecosystems of the country.

Did the initiatives respect commitments made with partners and beneficiaries and follow-through strategy is defined

Swaziland has an established network of terrestrial protected areas and are either non-gazetted or are gazetted as National Parks or Nature Reserves, and as Game Reserves or Sanctuaries. In addition, the country has made strides through bioregional programmes, to create ecological corridors and link priority biodiversity areas through stewardship programmes. The examples are the Trans-frontier Conservation Areas (TFCAs) established with South Africa and Mozambique, respectively. The unique aspect about these protected areas is the protection of biodiversity in the ecosystems while simultaneously bringing about socio-economic development through promoting sustainable natural resource management and tourism activities in the local communities using legal frameworks and regulations (commercialisation, joint venture partnerships, or co-management) in place for access and benefit sharing.

The National Forest Policy and Action Programme encourages community based resource management of natural resources through the formation of Natural Resource Management Committees at community level. Proactive advocacy with local traditional leaders and community members remains an ongoing initiative for sustenance of co-management practices. With regard to tourism, Swaziland has supported capacity□building activities to assist local communities in planning tourism developments. For example, the Swaziland Tourism Authority with financial support of the EU has assisted a local community in establishing tourist lodges in western Swaziland. Another illustration is the Shewula Community Nature Reserve which is truly a community project “owned and run by the local people”. The project activities are managed by the board of trustees, which consists of nine local residents, elected for five year terms, from different sectors of the community to make sure that as many as possible are represented. The board of trustees hold annual meetings where updates on the activities in Shewula are given and proceeds from natural resources-based enterprises are presented and budgetary decisions are made.

These examples indicate that in addition to making good progress in putting the legal frameworks and regulations for co-management or access and benefiting sharing, the country has promoted application of key tenets of conservation and sustainable use of biodiversity through the involvement and approval of communities and their immediate agents with appropriate follow-through strategies.

Is there good documentation of the methodology/ participatory process/ knowledge transfer process, including the use of tools?

Various components of Swaziland’s biodiversity have been inventoried and researched over the past few decades. It has been argued in earlier reports that not only do these publications demonstrate Swaziland’s commitment to the CBD, but also provide valuable baseline information which could be used to make wise and sensible conservation and environmentally related decisions. In order to avoid reinventing the wheel, it will be critical to assemble the tools and processes used and lessons learnt to be used in subsequent research where need be, and in education and training. Management of any resource requires appropriate research, education and training in order to develop the necessary experience and expertise to make wise decisions. But there is no need to repeat studies and/or importing tools in an

environment where previous such endeavours have generated plausible tools and adequate processes for their adaptation.

Has the analysis of results and reports been shared amongst and between implementers, relevant stakeholders including beneficiaries?

There has been a paucity of literature lamenting that limited public participation and stakeholder involvement in biodiversity issues remains a major obstacle. Bray (2006) argued that government-generated education programmes had been weak and fragmented and only sporadic success had been achieved by NGOs and communities themselves in their environment-education partnerships. Thus, he inferred that local and urban communities know very little about environmental legislation, let alone their rights and obligations in terms of the environment and the essential role they play in managing their natural resources, promoting sustainable use of natural resources and creating a better quality of life for themselves in their communities.

This report finds that the efforts by the Government of Swaziland, together with partners, have been quite effective in the promotion of environmental awareness and education among the people of Swaziland. It is perhaps the general lack of consistent financing and adequate human resources to spearhead decisive projects and activities that has limited comprehensive participation. Financial infusions into CBD through currently isolated public-private partnerships or national and international NGOs under the guise of financial sustainability and autonomy of conservation areas may not be sufficient to provide and support the enabling environment required. There still needs to be a sustainable and comprehensive financial framework to support biodiversity initiatives. The prerequisite to this is a need to share and demonstrate to government and granting partners, the potential of and current practices in CBD value-chains.

A large number of reports, documents and data have been produced over the last several decades; however, their availability and functionality may be limited by organizational constraints to package relevant messages for the attention of decision and policy makers to engender the much needed budgetary (facilitation) support. In any case, the Biodiversity Conservation and Participatory Project (BCPD) a Swaziland Government project managed by the Ministry of Tourism, Environment and Communications, illustrates government commitment to mobilize financial resources to effectively implement national strategic initiatives. UNEP-GEF proposed the most promising mechanisms available to finance conservation of protected areas in Swaziland. Financing mechanisms were assessed using a rapid feasibility assessment, considering issues such as the legal and political feasibility, the complexity of implementing the mechanism, as well as, the potential financial return. Some of the listed mechanisms were either being implemented in Swaziland but needed improvement, or have been implemented elsewhere in the region.

4. CONCLUSION

This report observed that the emphasis on land and range management appears inadequate compared to the effort towards CBNRM and ecotourism towards biodiversity conservation. It should be noted that often, owing to low productivity on land-based investments (crops and livestock), communities resort to extraction of goods and services from biodiversity. The emphasis on aesthetic goods and services that benefit from ecotourism, for example, allows members of the community or even middlemen, who can access and convert resources for the appeal of affluent-linked tourism. This may crowd out the relevant members of the community living adjacent to resources and dependent on 'low value' goods and services. It is therefore important to develop a framework that shows that even when biodiversity conservation can be shown to make a contribution to rural incomes, different members of the community are part of a value-chain intended to reduce poverty.

Second, poverty also reflects a deprivation of requirements to meet basic human needs. Goods and services from biodiversity conservation should be linked with improvements in land-based crop and livestock investments. Cash and other in-kind benefits from biodiversity should directly or indirectly go toward investing in land investments. Such investments may for example include improved biomass productivity for food, feed and fuel, ecosystem preservation, or land/soil improvement efforts.

The above observations call concerted efforts for innovative institutional arrangements effective in supporting and encouraging sustainable biodiversity management. Models developed at local and national levels need to be shared and used by proponents of biodiversity conservation to build future programmes and projects. Research that is field-based is wanting yet this is cornerstone to address substantive technical and policy-relevant challenges facing practitioners and policymakers. Current formal and in-service education and training in biodiversity programmes are commendable but there needs to be established a forum for sharing training and knowledge materials adapted for use at community, technical and professional levels. Such a forum could further enable identification of funding needs and windows noting that grants have been limited in scope to satisfy in-depth field analysis in representative zones important for scaling up and out innovations in biodiversity conservation and management.

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APPENDIX I: REPORT PREPARATION

The Fifth National Report to the Convention of Biological Diversity was prepared during the period March- July, 2014. The Swaziland Environment Authority (SEA) led the process of drafting the report, with close assistance and co-operation from the Swaziland National Trust Commission. An independent team of consultants lead by Prof. A.M Dlamini were appointed to draft the report, with the following methods used to gather the information:

- A review of relevant legislation, strategies, reports and other documents;
- Information gathering by way of semi-structured interviews with key government and non-government stakeholders and informants;

Key documents used as sources during the preparation of the report were:

- National Biodiversity Strategy and Action Plan (NBSAP)
- Swaziland's fourth National Report to the CBD
- Country Assessment report; Phase 1 of the NBSAP revision process
- Swaziland's State of Environment Report of 2012.

The report was validated in a workshop by all key stakeholders.

APPENDIX II: CONCORDANCE OF THE AICHI TARGETS WITH BIODIVERSITY 2020, UPDATE OF SWAZILAND'S NATIONAL STRATEGY

Aichi Biodiversity Targets 2011 - 2020 ▪ **5 Strategic Goals** ▪ **20 Targets**	**Biodiversity 2020, Update of Swaziland's National Strategy** ▪ **Strategic Goals** ▪ **Targets**
Possible means, milestones and CBD indicators for the Aichi targets of the Strategic Plan 2011-2020 are contained in document UNEP/CBD/COP/27/Add1 (19/12/2010) (p. 11-20) http://www.cbd.int/doc/meetings/cop/cop-10/official/cop-10-27-add1-en.pdf	Milestones and strategic indicators are contained in the Strategy document
Vision The vision of this Strategic Plan is a world of "Living in harmony with nature" where "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people."	
Mission The mission of the Strategic Plan is to "take effective and urgent action to halt the loss of biodiversity in order to ensure that **by 2020** ecosystems are resilient and continue to provide essential services, thereby securing the planet's variety of life, and contributing to human well-being, and poverty eradication. To ensure this, pressures on biodiversity are reduced, ecosystems are restored, biological resources are sustainably used and benefits arising out of utilization of genetic resources are shared in a fair and equitable manner; adequate financial resources are provided, capacities are enhanced, biodiversity issues and values mainstreamed, appropriate policies are effectively implemented, and decision-making is based on sound science and the precautionary approach."	**Mission** **Principal objectives** 1. To conserve the biodiversity of Swaziland. 2. To encourage the sustainable use of biodiversity in Swaziland. 3. To ensure that benefits accrued from the utilisation of Swaziland's biodiversity are shared equitably. **Guiding principles for interpretation and implementation:** 1. The components of the biodiversity of Swaziland should continue to be identified, monitored and researched for the purposes of conservation, education, sustainable use, commercial use and leisure. 2. The close link between the traditional Swazi way of life and biodiversity needs to be recognised and promoted in line

	with conservation principles. 3. Participation and involvement at all levels is necessary for the conservation of biodiversity in Swaziland. 4. Benefits derived from technological advances based on the use of indigenous knowledge and genetic resources should be shared equitably. 5. Biodiversity is best conserved in-situ (both within and outside of protected areas), but where necessary ex-situ methods should be developed to support in-situ efforts. 6. Threats to biodiversity should be addressed through an appropriate multi-disciplinary forum. 7. Access to genetic resources rests with the State.
Strategic Goals of the Aichi Biodiversity Targets 2011 – 2020: 1. Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society 2. Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use 3. Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity 4. Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services **5.** Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building Operational objectives listed in ascending order of their international dimension; no	**Goals of the National Strategy and Action Plan 2001:** 1. A viable set of representative samples of Swaziland's full range of natural ecosystems are conserved through a network of protected areas. 2. Biological resources of natural ecosystems outside of the protected areas network are used sustainably. 3. The genetic base of Swaziland's crops and livestock breeds is efficiently conserved. 4. Risks associated with the use of living, modified organisms (LMOs) in Swaziland are minimized. 5. The institutional, policy and legal frameworks, as well as the human resources needed to

priority ranking.	implement the Biodiversity Strategy and Action Plan, are developed. 6. Public awareness of, and support for, biodiversity conservation is enhanced. Operational objectives are elaborated below under each of the six goals in ascending order of their national dimension; no priority ranking.
Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	
Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	4.1.6 Create socio-economic incentives that lead to local community support for protected areas conservation 4.1.2 Adequately protect threatened and endemic species 4.2.1 Test viable community based natural resources management (CBNRM) and develop across all ecosystems 4.2.4 Develop laws and support mechanisms to protect intellectual property rights of Swaziland, local communities and individuals 4.2.5 Identify biodiversity components that can be marketable on a nation-wide scale 4.5.2 Identify institutions responsible for developing CBNRM 4.5.5 Provide easily accessible and up-to-date biodiversity information through storage of information in a central facility 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement 4.6.1 Raise public awareness on biodiversity issues
Target 2: By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning	4.1.2 Adequately protect threatened and endemic species 4.1.4 Improve the coordination and cooperation between all protected

processes and are being incorporated into national accounting, as appropriate, and reporting systems	areas managers 4.1.5 Assure adequate funding for management of protected areas 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.2.3 Develop institutional capacity and human resources to support CBNRM 4.2.4 Develop laws and support mechanisms to protect intellectual property rights of Swaziland, local communities and individuals 4.2.5 Identify biodiversity components that can be marketable on a nation-wide scale 4.4.2 Develop legal and policy framework for the controlled use of LMOs 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.2 Identify institutions responsible for developing CBNRM 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity 4.5.5 Provide easily accessible and up-to-date biodiversity information through storage of information in a central facility 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement
Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	4.1.2 Adequately protect threatened and endemic species 4.1.5 Assure adequate funding for management of protected areas 4.1.6 Create socio-economic incentives that lead to local community support for protected areas conservation 4.2.1 Test viable CBNRM and develop across all ecosystems 4.2.2 Enact CBNRM-enabling

	legislation based on results of pilot projects 4.2.4 Develop laws and support mechanisms to protect intellectual property rights of Swaziland, local communities and individuals 4.2.5 Identify biodiversity components that can be marketable on a nation-wide scale 4.5.1 Strengthen legislation pertaining to biodiversity conservation
Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.2.3 Develop institutional capacity and human resources to support CBNRM 4.2.5 Identify biodiversity components that can be marketable on a nation-wide scale 4.4.1 Identify an institution responsible for overseeing all aspects of the use of LMOs 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity 4.5.4 Develop human resources to deal with all aspects of biodiversity, by the promotion of higher levels of training in relevant fields
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use	
Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	4.1.2 Adequately protect threatened and endemic species 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity

	conservation 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement
Target 6: By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	4.1.2 Adequately protect threatened and endemic species 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement
Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	4.1.1 Modify existing protected areas network to protect 10% of the full range of ecosystems 4.1.4 Improve the coordination and cooperation between all protected areas managers 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity
Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	4.1.1 Modify existing protected areas network to protect 10% of the full range of ecosystems 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation

	pertaining to biodiversity conservation
Target 9: By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	4.1.3 Minimise the impact of alien invasive species 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity conservation
Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	4.1.1 Modify existing protected areas network to protect 10% of the full range of ecosystems 4.2.1 Test viable CBNRM and develop across all ecosystems
Strategic Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	
Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.	4.1.1 Modify existing protected areas network to protect 10% of the full range of ecosystems 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement
Target 12: By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	4.1.2 Adequately protect threatened and endemic species 4.2.1 Test viable CBNRM and develop across all ecosystems 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies

	responsible for the management of biodiversity 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement
Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	4.1.2 Adequately protect threatened and endemic species 4.2.1 Test viable CBNRM and develop across all ecosystems 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.4.2 Develop legal and policy framework for the controlled use of LMOs 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services.	
Target 14: By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	4.2.1 Test viable CBNRM and develop across all ecosystems 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity

Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity
Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.5 Provide easily accessible and up-to-date biodiversity information through storage of information in a central facility 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building	
Target 17: By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	4.1.4 Improve the coordination and cooperation between all protected areas managers 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.4.2 Develop legal and policy framework for the controlled use of LMOs 4.5.2 Identify institutions responsible for developing CBNRM 4.5.5 Provide easily accessible and up-to-date biodiversity information through storage of information in a central facility 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies

	responsible for the management of biodiversity 4.5.4 Develop human resources to deal with all aspects of biodiversity, by the promotion of higher levels of training in relevant fields
Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	4.2.1 Test viable CBNRM and develop across all ecosystems 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.2.4 Develop laws and support mechanisms to protect intellectual property rights of Swaziland, local communities and individuals 4.2.5 Identify biodiversity components that can be marketable on a nation-wide scale 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.2 Identify institutions responsible for developing CBNRM 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity 4.5.5 Provide easily accessible and up-to-date biodiversity information through storage of information in a central facility 4.5.6 Control illegal harvesting of biological resources through enhanced law-enforcement
Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	4.2.1 Test viable CBNRM and develop across all ecosystems 4.2.3 Develop institutional capacity and human resources to support CBNRM 4.2.4 Develop laws and support mechanisms to protect intellectual property rights of Swaziland, local communities and individuals. 4.2.5 Identify biodiversity

	components that can be marketable on a nation-wide scale 4.4.3 Develop human expertise in the field of the use of LMOs 4.4.4 Research into vital actions necessary to minimize risk of LMOs 4.5.4 Develop human resources to deal with all aspects of biodiversity, by the promotion of higher levels of training in relevant fields 4.5.5 Provide easily accessible and up-to-date biodiversity information through storage of information in a central facility 4.6.1 Raise public awareness on biodiversity issues
Target 20: By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.	4.1.5 Assure adequate funding for management of protected areas 4.2.2 Enact CBNRM-enabling legislation based on results of pilot projects 4.2.3 Develop institutional capacity and human resources to support CBNRM 4.4.3 Develop human expertise in the field of the use of LMOs 4.4.4 Research into vital actions necessary to minimize risk of LMOs 4.5.1 Strengthen legislation pertaining to biodiversity conservation 4.5.3 Clearly define the roles and responsibilities of the various government institutions, NGOs, parastatals and private bodies responsible for the management of biodiversity 4.5.4 Develop human resources to deal with all aspects of biodiversity, by the promotion of higher levels of training in relevant fields