



**THE REPUBLIC OF SOUTH SUDAN**

**FIFTH NATIONAL REPORT TO THE CONVENTION ON  
BIOLOGICAL DIVERSITY**

**MINISTRY OF ENVIRONMENT**



**DECEMBER 2015**



## **FORWARD**

South Sudan acceded to the United Nations Convention on Biological Diversity since 17 February 2014; it has been accepted to join the international community in the global task of protecting biodiversity, achieving the Aichi targets and working towards building a future of life in harmony with nature and in line with the global biodiversity strategic plan 2011-2020, National Policies, Plans and programs.

As a commitment to meet its obligations under the Convention on Biological Diversity for better implementation of the CBD activities in the Country, South Sudan developed this fifth (5<sup>th</sup>) National Report and the first (1<sup>st</sup>) of its kind to be submitted to the Convention of Biodiversity to facilitate the preparation of the 4th edition of the Global Biodiversity Outlook, other analyses, syntheses and evaluate progress made towards achieving the global Biodiversity target.

The Ministry of Environment as the focal institution charged with the responsibility of managing and conserving Biodiversity and conscious of the dateline set by the CBD Secretariat was able to mobilize resources needed for the task from the Global Environment Facility (GEF) through United Nations Environment Programme (UNEPs) office in South Sudan.

The taskforce drawn from various institutions contributed positively in the preparation process of the Fifth National Report through a number of workshops and face to face interviews and meetings prior to validating the report.

Since it is the first report for South Sudan to develop, there were a lot of challenges in pulling the biodiversity data and information together to be use for developing the National Report. Developing the report before the National Biodiversity Strategy and Action Plan (NBSAP) poses another challenge. Nevertheless, the Ministry has double its effort to have a report that represents the actual Biodiversity status, trends, challenges and issues at present.

The Ministry of Environment extends its sincere thanks and gratitude to UNEP, the Consultant, all government and non-governmental institutions and individuals, who participated in this exercise, or have provided technical know-how, data or information to make this consolidated report available to decision makers, CBD secretariat, academicians and all stakeholders.



**Hon. Deng Deng Hoc Yai**

The Minister of Environment  
Republic of South Sudan, Juba  
December, 2015

## **ACKNOWLEDGEMENT**

The Ministry of Environment, Republic of South Sudan, coordinated the preparation of this Fifth National Report. Financial support for this activity was obtained from the Global Environment Facility (GEF) through the United Nations Environment Programme (UNEP). The Ministry of Environment is grateful to the GEF and UNEP for this financial support.

The Ministry of Environment is also grateful to Dr. Bob Humphrey Ogwang, a regional consultant, who helped in putting together the information required for the Fifth National Report. Dr. Ogwang worked tirelessly to deliver this report.

The Ministry further extends its appreciation to the task force who contributed immensely to the preparation of this report through a number of workshops (e.g. Annex 3) and face to face interviews and meetings prior to validating the report in a final workshop (Annex 4). The task force comprised of technical officers drawn from various Government Ministries, departments, agencies and academia as well as NGOs involved in biodiversity management. Their inputs were critical in ensuring quality report from South Sudan.

The preparation of the report required effective coordination and guidance on the COP decisions for preparation of the Fifth National Report. This task was ably carried out by Paul Lado Demetry, Deputy Director for Biodiversity in the Ministry who also doubles as the CBD Focal Point for South Sudan.

## ACRONYMNS

CAMP	Comprehensive Agricultural Development Master Plan
CAR	Central African Republic
CBD	Convention on Biological Diversity
CFRs	Central Forest Reserves
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species
COP	Conference of the Parties to the CBD
CPA	Comprehensive Peace Agreement
DG	Director General
DRC	Democratic Republic of Congo
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
GDP	Gross Domestic Product
GEF	Global Environment Facility
GMOs	Genetically Modified Organisms
GOSS	Government of South Sudan
MAFRD	Ministry of Agriculture, Forestry and Rural Development
MARF	Ministry for Animal Resources and Fisheries
MDG	Millenium Development Goals
MEAs	Multilateral Environmental Agreements
MoE	Ministry of Environment
MWCT	Ministry of Wildlife Conservation and Tourism
NAPA	National Adaptation Programmes of Action
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non Governmental Organization
PAs	Protected Areas
PFRs	Provincial Forest Reserves
PGR	Plant Genetic Resources
REDD	Reduced Emissions from Deforestation and Forest Degradation
RSS	Republic of South Sudan
SFRs	State Forest Reserves
SPLA	Sudan People's Liberation Army
SSFC	South Sudan Forest Commission
SSWS	South Sudan Wildlife Service
UNCCD	UN Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	UN Framework Convention on Climate Change
WCS	Wildlife Conservation Society

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## EXECUTIVE SUMMARY

The report is divided into three parts. Part I covers the status, trends, threats to biodiversity and its implications for human well-being. Part II deals with the status of the National Biodiversity Strategy and Action Plan in South Sudan including its implementation and mainstreaming of biodiversity while Part III presents progress that South Sudan has made towards achievement of the 2011-2020 Aichi Biodiversity targets and its contribution to the relevant 2015 Targets of the Millennium Development Goals (MDGs).

South Sudan is the newest member of the Convention on Biological Diversity, having acceded to it only on 17 February 2014. It is also the youngest nation politically having gained its independence in 2011. Its effort to conserve biodiversity must be looked at in this light. It has also gone through a long period of war and insecurity which has had a very negative impact on biodiversity in a manner that has not been experienced by many countries around the world.

However, in spite of this setback, the country is still very rich in biodiversity and has an immense potential for contribution significantly for the well-being of its people as well as humanity at large.

The country has a wide range of habitats including: Lowland Forest, Montane Forest, Savannah woodland, Grassland Savannah, Floodplain, Sudd Swamps and other wetlands and the Semi-arid Region in the north.

South Sudan's Protected Areas include wildlife, forest and Ramsar sites. The country has an extensive system of game reserves and national parks some of which date back to the 1930's. In total the protected area estate covers about 87,030 km<sup>2</sup> of South Sudan, which is about 13% of the land surface. National parks are estimated to cover an area of 51,760 km<sup>2</sup>, game reserves 34,110 km<sup>2</sup> and forest reserves 1,160 km<sup>2</sup>. In addition to this present protected area estate, South Sudan also contains one Ramsar site, the Sudd, recognized under the Ramsar Convention as a Wetland of International Importance.

The country's wide range of habitats supports a very rich diversity of both animals and plant species. Some of the endemic fauna species in the country include the Nile lechwe, Hoogstral's Striped Grass Mouse, Nile Sitatunga and a recently discovered African climbing mouse *Dendromusruppi*. South Sudan is known to be the only country in Africa with both species of eland - the common eland (*Taurotragus oryx*) and the Derby's (Giant) Eland (*Taurotragus derbianus*).

A particular highlight for South Sudan is the wildlife migrations across the eastern grassland savannahs and floodplains of Jonglei and Eastern Equatoria States that stretch into the neighbouring Gambela region of Ethiopia. The white-eared kob,



tiang, Mongalla gazelle and Bohor reedbuck represent one of the greatest animal migrations and wildlife spectacles of the world. This is an invaluable natural resource for South Sudan and the rest of the world and could in future be a major tourist attraction once stability returns to the country.

The world's population stronghold of the shoebill and black-crowned crane occur in the Sudd wetland. While South Sudan shares many of its fauna species with her neighbours to the south and west, other species like the Nile lechwe and the white-eared kob are endemic to South Sudan and Ethiopia. South Sudan is also thought to be the centre of giraffe evolution.

Reptiles endemic to South Sudan include the Torit Gracile Blind Snake *Letheobatoritensis* and the Mount Kinyeti Chameleon. Freshwater fish known exclusively from South Sudan include *Barbustongaensis* and *Labeotongaensis*.

For plant species, Imatong Forest is a major biodiversity hotspot supporting over 2,000 vascular plant and 500 bird species, and is one of the largest intact *Podocarpus* forest in Africa. Endemic flora of South Sudan includes *Barbustongaensis*, *Chloroselastaposana*, and *Lepidochrysopsnigritia*. Among the vascular plant species restricted to South Sudan are *Aloe diolii*, *Aloe macleayi*, a cycad *Encephalartosmackenziei*, *Chlorophytumsuperpositum*, *Scillachlorantha*, and *Panicumbambusiculme*. Wild Arabica coffee grows in the forests of the Boma Plateau and Imatong Forest.

### **The key threats to biodiversity in South Sudan include the following:**

#### Direct threats

1. **Wildlife** poaching and trafficking: Poaching is a serious problem and is largely attributed to the demand for products from wild animals for bush meat, cash and game trophies.
2. **Deforestation; Growth in charcoal production is driving growing loss of woodlands. Illegal logging of hardwoods is also a growing issue.**
3. **Livestock and agricultural expansion:** Expansion of the agricultural land may result in the destruction of ecosystems and biodiversity unless well managed
4. **Habitat fragmentation caused by road network expansion and the expansion of extractive industries (such as minerals mining and oil industry development)**
5. **Adverse climate change impacts** including increasing desertification and the delaying and shortening of rainy seasons
6. **Human-wildlife conflicts** especially with communities living near Protected Areas

## Indirect threats

1. **Past and continuing armed conflicts**, and the resulting IDP crisis and proliferation of firearms, which facilitates crimes against the wildlife. "Forest elephants are Critically Endangered, and have declined dramatically over the last two decades. Finding them in South Sudan expands their known range — something that urgently needs further study because forest elephants, like their savannah cousins, are facing intense poaching pressure." Experience has shown that wildlife and ecosystems often suffer enormously during and after conflict, and in periods of political instability, and this depletion of natural resources affects some of the poorest and most vulnerable sectors of society," says Adrian Garside of Fauna and Flora International

**Inadequate and therefore ineffective legal, institutional and administration capacities** for biodiversity management as well as limited government budgetary allocation  
**Inadequate coordination** amongst institutions and other stakeholders with respect to biodiversity management, laws, policies and programmes  
**Negative impacts of development and increasing population growth** with resulting agricultural expansion, overgrazing and deforestation, increased poverty and huge infrastructure and developmental activities can significantly cause biodiversity loss e.g. roads crossing wildlife corridors and migratory routes

**Inadequate land use planning** - resulting in environmental degradation as manifested in widespread pollution by unmanaged oil and extractive industries exploitation and exploration activities; and increasing loss of biodiversity due to over-exploitation of natural forests and inadequate environmental sanitation in urban environment

2. **Inadequate public awareness** on environmental policies, laws and environmental protection and management in general and failure to recognise the value and importance of fragile ecosystems and protected areas
3. **Inadequate decentralization and devolution of biodiversity management** to the lowest levels of government within the framework of the decentralised governance system
4. **Emerging threats** including oil exploration and production, spread of invasive species, and genetically modified organisms (GMOs), oil exploration and production.
5. **Insufficiency of data** – all the biodiversity institutions have noted the lack of sufficient data on South Sudan biodiversity. Most of the available data is limited on the larger animals, but even more deficient on plant, avifauna, reptiles, and fisheries
6. **Replacement of local crop varieties with introduced commercial varieties** leading to neglect of traditional varieties including crop relatives and landraces

Any efforts locally, nationally or internationally to support biodiversity conservation in South Sudan must address the above threats.

In terms of biodiversity value, it is fair to assert that there are not yet easily available data and information that describe the extent to which biodiversity impacts on the socio-economic development of South Sudan or its contribution to the citizens' livelihood. This points to an urgent need to undertake biodiversity valuation to rationalize the need for its protection. In the forest sector for instance, opportunities include timber, saw-logs, poles, bamboos, and woody lianas from natural and plantation forests. In the recent past, a limited number of logging concessions were given out to companies with business interest for teak timber export for ship building, which fetch a price of US\$300 to 400 per cubic metre on the international market.

Once security returns, wildlife's significance in South Sudan could be the prospective foundation for a new national tourism industry built upon the great migrations and vast wildernesses of the country, as well as a source of protein to rural communities, many of whom have hunted wildlife for many years. Neighboring countries such as Kenya and Tanzania have capitalized on the abundance and diversity of large mammals to develop tourism industries that generate hundreds of thousands of jobs and more than \$1 billion in annual national income.

The potential sustainable yield from wild fisheries is estimated in the order of 200,000 tonnes/year worth about US\$800 million at 2013 Juba prices. But this potential has not yet been exploited.

South Sudan is located in a region with the greatest concentration of livestock resources in Africa. No livestock census has been carried out recently in South Sudan, but the population of livestock including cattle, sheep, goats, and donkeys, is estimated to exceed 20 million. This livestock industry is largely poorly developed in modern production terms. However, there is great potential for this industry to improve food security, livelihood and income generation, economic transformation with industrial growth, exports and job creation leading to significant increases in GDP.

In order to exploit the above productive sectors, there is need to strengthen the enabling environment for their commercialization. These will include examination of the current and planned policies, laws and institutions.

Because of the need to conform to the new Constitutional dispensation, many of the country's laws including biodiversity related laws are currently under review. Most of the biodiversity related laws are at various stages of development. Some have been finalized awaiting Parliamentary approval and Cabinet approval. These are referred to as Bills and Draft Policies in this report. Some are still being developed

at the ministerial/sectoral level. These are referred to as Draft Bills and Discussion Drafts in this report and indicated as such.

Nevertheless, biodiversity and its utility are generally recognized and protected through a number of government existing policies and legislations and relevant institutions. These include:

- Biodiversity laws and policies – Environmental management, Wildlife conservation and protection, Forestry and Water Resources
- Sector policies and laws – Agriculture, Animal Resources, Fisheries, Petroleum and Mining
- Land use management policies and law

However, because the majority of policies and laws have not been approved, they remain generally ineffective to support biodiversity conservation and any attempts to expedite their approval processes should be applauded.

For institutions, their performance could be significantly enhanced if the following challenges are addressed:

- Inadequate legal and regulatory frameworks as mentioned above
- Low capacity among staff as well as the necessary infrastructure and equipment
- Inadequate financial resources
- Insecurity which is a general problem throughout the country
- Inadequate inter-institutional coordination on biodiversity matters

Part II of this report looks at the guidelines on the National Biodiversity Strategy and action Plan. The Republic of South Sudan signed the Convention on Biological Diversity in May 2014 thus becoming the newest member of the COP. Although South Sudan requested for and received financial support from the Global Environment Facility (GEF) through the United Nations Environment Programme (UNEP), to undertake the preparation of its first NBSAP, it is still only at the inception stage of preparing the strategy.

As such, the country has not yet made progress in setting the national biodiversity targets as required by the COP. Although the CBD Secretariat requested South Sudan to prepare this Fifth National Report, the country did not prepare a first, second, third or fourth National Report. The country is therefore not in a position to provide key actions and outcomes since the fourth national report as required by COP.

In terms of mainstreaming biodiversity, most of the relevant Policies, laws and plans have acknowledged the importance of biodiversity and have therefore adequately integrated it in their plans and programmes. In theory this should make it easy for Government sectors to attract funding for biodiversity conservation. However, most

of the policies, laws and plans are not being implemented for a variety of reasons including inadequate funding and lack of capacity.

**Financing for biodiversity conservation:** The Government of South Sudan depends almost exclusively on petroleum revenues to fund its operational and development budgets. Given the volatile fluctuations in international prices of petroleum products, it is easy to see that Government operates with a very stringent budget concentrating on more urgent priorities. The biodiversity sectors need to begin to look at alternative sources for financing their activities.

A number of bilateral donors are supporting South Sudan in the field of sustainable natural resources management (including water management) and livelihood security. Details of these are included in Part III of this report. Climate change and environment are considered as cross-cutting issues by some of them. Apart from these examples other governments such as Norway (sustainable forestry, hydro power, and oil), Germany (through GIZ), Sweden, Switzerland and Denmark are active or will be active in this broader sense to support biodiversity programmes. All these sources of funding should be explored for supporting NBSAP recommended activities.

**In terms of progress towards the Millenium Development Goals,** there has been very slow progress on the second part of 7A (reverse loss of environmental resources). Loss of forest cover for instance, is on-going and only minimal effort is being devoted to reversing deforestation.

Target &B: reduce biodiversity loss- is facing a similar challenge and progress in achieving progress is very slow because of a number of bottlenecks. Poverty and rapid population growth are still the primary causes of biodiversity loss, threatening the existence of species, ecosystems and eco-regions throughout South Sudan.

**On progress towards implementing the Aichi and national targets,** South Sudan is still unable to set national targets because it is still a very new member of the Convention and it still lacks relevant data especially for determining the baseline status of each target. However, even without national targets, this report shows that South Sudan has made some progress although small in some of the global Aichi targets such as target 1,2,5,11,16 and 17.

# PART I: STATUS, TRENDS, THREATS AND IMPLICATIONS OF BIODIVERSITY LOSS FOR HUMAN-WELL BEING

## 1.0 INTRODUCTION

### 1.1 Country Profile

South Sudan is the world's newest nation having attained independence in 2011. It covers approximately 640,000 km<sup>2</sup> (UNDP, 2012) in the centre of Sub-Saharan Africa, and lies within the tropical zone between latitude 3.5° and 12° North and longitude 25° to 36° East (Draft South Sudan Wildlife Conservation and Protected Area Policy, 2012).

South Sudan borders Ethiopia in the East, Kenya, Uganda and the Democratic Republic of Congo in the South and Central African Republic in the West and North Sudan in the North. Administratively, South Sudan is divided into ten States namely Central Equatoria, Eastern Equatoria, Jonglei, Unity, Upper Nile, Western Equatoria, Lakes, Northern Bahr El Ghazal, Warrap and Western Bahr El Ghazal (**Figure 1**).

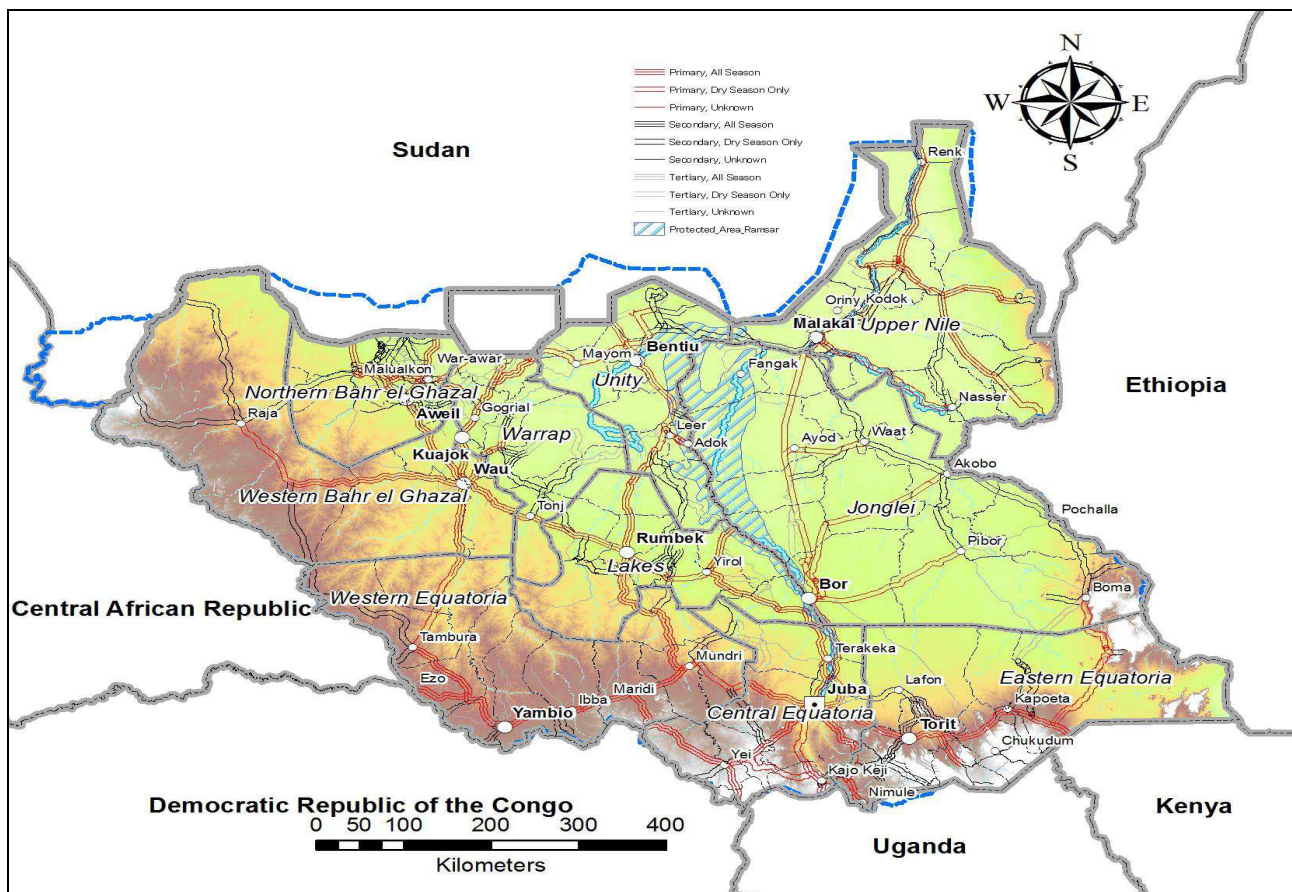


Figure 1: Map of South Sudan

Given its recent emergence from decades long war, the country is undergoing major transitions with respect to political, legal, economic social, cultural and administrative systems and structures. The provision of and access to basic services for the citizenry is a priority for the government that unfortunately is currently being hampered by renewed violent conflict in the country.

South Sudan has a population of approximately 11,296,000 in 2013 (World Bank, 2014). An earlier census (SSCCSE 2011) breaks this down to 4.29 million males, and 3.97 million females. Of this, 72% is under the age of 30. Jonglei is the most populous State at 1,358,602 people - 16% of the total population and the least populous State is Western Bahr El Ghazal, with 333,431 - 4% of total. This population is largely rural - 83% residing in rural areas with 92% of the population in Northern Bahr El Ghazal classified as rural and 57% in Western Bahr El Ghazal. 27% of the 15 years and above population is literate.

## **1.2 Economic and Environment Profile**

The country's economy is fragile having only recently emerged from decades of a long war. The country's main exports are natural resources - oil and petroleum products, timber, metals (gold and silver) and foodstuffs. Oil exports account for virtually all the exports, and for around 80% of GDP (World Bank, 2014). The country GDP per capita in 2013 = US\$1,000. However, 51% of the pop lives below the poverty line with 55% of the pop in rural areas classified as poor and 24% in urban areas. Northern Bahr el Ghazal has the highest poverty incident of 76% while Upper Nile has the lowest at 26%.

The livelihoods are concentrated in low-productivity, subsistence rain-fed agriculture and pastoralists work which accounts for just around 15% of GDP. The other 85% of the working population is engaged in non-wage work, mainly also in agriculture (World Bank, 2014). About 12% to 15% of the population relies on fisheries as a primary source of livelihood. Thus the vast majority of products sold in South Sudan are imported. More than 96% of the population use firewood or charcoal and only 55% has access to improved sources of drinking water. About 80% of the population has no access to any toilet facility.

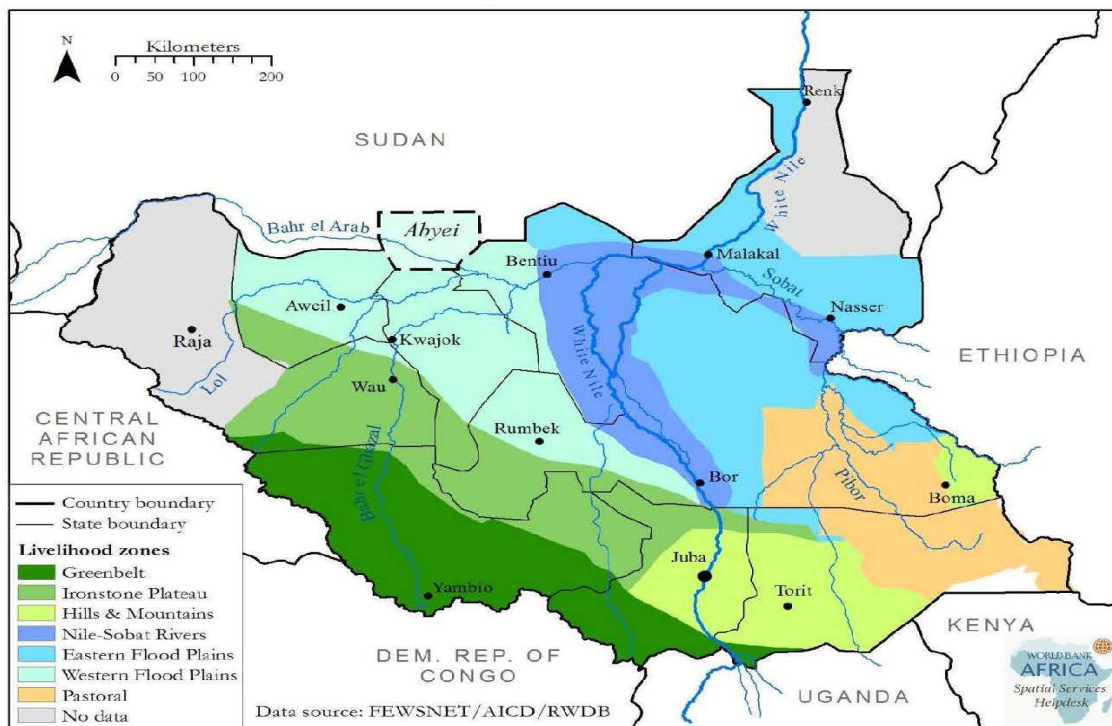
## **1.3 Climate and Topography**

South Sudan has a tropical wet and dry climate with two rainy seasons and high humidity. The rainfall pattern varies according to agro-ecological zones. In the Green belt it ranges from 800 mm to 2,500 mm, while in the Arid Zone it may be as low as 300 mm per year. Temperatures range from 25 to 40°C. The growing season is generally between 100 to 250 days depending on the agro-ecological zone. Most parts of the country have two cropping seasons, April-June and July-December.

The northern dry areas have seasonal agriculturalists, pastoralist, fishermen's and hunters. The central part of the country with low woodland savannahs has varied livelihood sources and includes the transboundary wildlife migration.

### 1.4 Agro-Ecology of South Sudan

Ecologically, South Sudan is divided into six agro-ecological zones: the Greenbelt, Ironstone Plateau, Hills and Mountains, Flood Plains, the Nile/Sobat Rivers and the arid and pastoral zone. **Figure 2** below provides an overview of the country's ecological zones. The Nile and its tributaries flow down from the highlands of Ethiopia, Uganda and Central African Republic into the low clay basin to form one of the world's largest wetlands, the Sudd, averaging 57,000 square km but can cover an area of up to 130,000 square km depending on the discharge from the Albert Nile.



**Figure 2: Livelihood or Agro-ecological zones in South Sudan (Source: Rapid Water Sector Needs Assessment)**

Potential arable land in South Sudan covers 30% of the total land surface, while grazing land covers 40 %, forests 23 % and swamps and open water 7% (Wongo, 1984).



Of the total arable land of 30%, currently less than five per cent of the total land area is utilized for crop production (Agriculture Sector Policy Framework, 2012). **Table 1** below gives the land use pattern.

**Table 1: Area and share of aggregated land uses in total National Land Area**

<b>Land Use</b>	<b>Area (Ha)</b>	<b>Share of Total Land (%)</b>
Cropland	2477,700	3.8
Grass with crops	325,100	0.5
Trees with crops	1,707,300	2.6
Grassland	9,663,800	14.9
Tree land	40,526,900	62.6
Flood land	9,497,600	14.7
Water and rock	482,700	0.7
Urban	37,000	0.1
<b>Total</b>	<b>64,718,100</b>	<b>100</b>

Source: Aggregated Land Cover Data Base, FAO, 2009  
(From Agriculture Sector Policy Framework, 2012)

As indicated in **Table 1**, only 3.8% of the total land is under crops, while tree land or Savannah grassland covers the greatest area (62.6%).

The diverse soil and climatic conditions provide multiple options to grow different crops. Some of the world's rare and indigenous crop varieties such as finger millet and sorghum are an important part of the traditional farming system. Apart from cereals such as sorghum, finger millet and maize, roots and tubers (mainly cassava, sweet potato and yams), oilseeds (e.g. groundnut, sesame, soybean and sunflower), pulses (e.g. beans, cowpea and pigeon pea), fruits (mainly mangoes, citrus and avocados) and vegetables are grown. Coffee, tea, cotton and sugarcane are also grown in South Sudan. Both the forest and non-timber products are also important in supporting the livelihoods of the rural population.

## **1.5 Ecosystem Diversity**

The variety of species and the complex ecosystems constitutes the country's biological diversity, the foundation of its socio-economic development. The diversity of biological resources in South Sudan associate and interact with one another and the physical environment to form a wide range of ecosystems which are categorized into ecological zones, namely, the savannah, flood/swamps, montane forest, semi-deserts and low land forest.

The Draft South Sudan Wildlife Conservation and Protected Area Policy, 2012 categorizes the ecosystems in South Sudan as follows:

- a) Lowland Forest
- b) Montane Forest
- c) Savannah woodland
- d) Grassland Savannah
- e) Floodplain
- f) Sudd Swamps and other wetlands
- g) Semi-arid Region

A brief description of some of the above ecosystems and their biodiversity significance follows.

### **a) Lowland Forest**

South Sudan's tropical lowland moist forest is confined to a few scattered small localities in the southwest near its borders with the Central African Republic (CAR), the Democratic Republic of Congo (DRC) and Uganda as well as the foothills of the Imotong Mountains. This habitat type represents the very northernmost of the Congo Basin forests including small areas on the Aloma Plateau in Yei County, Azza Forest in Maridi County, and the Yambio area. With its Congo Basin biogeographic affinity, this habitat type has some fauna and flora similar to that of Central Africa. It is home to threatened species like the eastern chimpanzee (*Pan troglodytes schweinfurthii*), elephants (*Loxondota africana africana* and *Loxondota africana cyclotis*) as well as diverse forest communities. The lowland bongo (*Tragelaphus eurycerus eurycerus*), forest buffalo (*Syncerus caffer nanus*), giant forest hog (*Hylochoerus meinertzhageni*), red river hog (*Potamochoerus porcus*), and a number of forest monkeys occur in these areas. Other lowland forests also occur in the Loti, Talanga and Lobone areas in the State of Eastern Equatoria.

### **b) Montane Forest**

South Sudan's montane forests occur in the Imotong mountains of Eastern Equatoria. Other areas where montane forests are found in South Sudan include the Didinga and Dongotono mountains (Simon *et al* 1990). This ecological region is about 960 km<sup>2</sup>. Rainfall increases with altitude reaching about 2,500 mm per annum at 2,600 meters above sea level. The montane vegetation is dominated by species of *Vernonia*, *Hagenia*, *Albizia*, *Podocarpus* and *Erica* forming zones from the grasslands (Afro-Montane), to the Afro-Alpine dominated by *Erica* shrub thicket (Sommerlatte and Sommerlatte 1990). Common large mammals include forest ungulates such as bushpig (*Potamochoerus larvatus*), bushbuck, Harvey's duiker (*Cephalophus harveyi*), blue duiker (*Cephalophus monticola*), buffalo, primates like black and white colobus (*Colobus guereza*) and others also occur.

The Imotong Mountains have very rich birdlife including a number of species not found elsewhere in South Sudan (Nikolaus 1989, Grossmann *et al.* 2009) some of which are endemic to this habitat type. It is known that there is a large diversity of plant life, several of which are endemic to the region. More than 50% of recorded plant species of South Sudan occur in this region (Caldecott and Miles 2005). Because of its bio-geographical isolation from similar African montane forests, the Imotong Mountains present an opportunity for plant and animal endemism. The only PA in this habitat type is the Imotong Forest Reserve.

### **c) Savannah Woodland**

South Sudan's savannah woodland forms the largest ecological region in South Sudan where it stretches diagonally from the northwestern borders of South Sudan with Northern Sudan along the CAR, DRC and Ugandan borders in Western and Central Equatoria to Magwi County in Eastern Equatoria. This region forms ecotones between the patches of lowland forest to the west and grassland savannah and floodplains to the east, and sits primarily on the Ironstone Plateau of South Sudan. Common large mammals of the wooded savannah include the elephant, hippopotamus (*Hippopotamus amphibius*), waterbuck (*Kobus ellipsiprymnus*), giraffe, bushbuck (*Tragelaphus scriptus*), Oribi (*Ourebia ourebi*), duikers (*Cephalophus* sp.), Uganda Kob (*Kobus kob thomasi*), warthogs (*Phacochoerus africanus africanus*), hartebeest (*Alcelaphus buselaphus leweli*), giant eland (*Taurotragus derbianus*), buffalo, various species of primates and carnivores. Representative PAs found in this habitat are: Southern, Nimule and Lantoto National Parks, and Ashana, Chelkou, Boro, Juba and Numatina Game Reserves.

### **d) Savannah Grassland**

The grassland savannah habitat is a contiguous area covering northern, eastern and southeastern parts of South Sudan's floodplains habitat. This area is characterized by open short grasslands with scattered trees and shrubs. Dominant woody vegetation here includes species of *Acacia*, *Balanites* and *Combretum*. Dominant perennial grasses include *Hyperrhenia*, *Andropogon*, *Panicum* and several other species. Various species of mammals inhabiting this region include some globally threatened ones such as the cheetah (*Acynonix jubatus*), wild dog (*Lycaon pictus*), lion (*Panthera leo*), elephant and leopard (*Panthera pardus*). Some of South Sudan's ungulate migrations also, at least partially, occur here. This includes the white-eared kob (*Kobus kob leucotis*) and the tiang (*Damaliscus lunatus tiang*) migrations which cover part of the grasslands and floodplains habitats. Protected Areas (PAs) in this habitat type include Boma National Park, Badingilo National Park and Kidepo Game Reserve.

## e) Floodplain

The floodplain ecological region covering an estimated area of 112,700 km<sup>2</sup> in central South Sudan is made up of seasonally flooded plains which extend around the Sudd swamps and on both sides of the White Nile. Among the most abundant species of large mammals found here are the tiang, Nile lechwe and Mongalla gazelle (*Gazella rufifrons albonotata*). These antelope species use the relatively undisturbed habitat of the floodplains, the grasslands and the Sudd swamps. Areas designated for protection within the floodplain ecological region include Shambe National Park and Mushra Game Reserve.

## f) Sudd Swamps and other wetlands

The Sudd swamps, with an estimated area of about 57,000 km<sup>2</sup> represent some of the most extensive wetlands in Africa with a complex of channels and open water bodies. The size of the swamps varies according to whether it is a wet or dry season. The central core of the Sudd swamps is formed by *Cyperus papyrus*. This is bordered by *Typha dominguensis*, the dominant vegetation which covers about three quarters of the total swamp. The Sudd swamps have been shown to support a wealth of small and juvenile fish (Hickley and Bailey 1986) with rich and diverse macro-invertebrate fauna. However, with the infestation of invasive alien plant species, this wealth and diversity could be affected. Water hyacinth (*Eichornia crassipes*) now forms an almost ubiquitous floating fringe to river channels and lakes in the Sudd swamps.

Major mammalian species inhabiting the region include threatened species like hippopotamus, near-threatened species like sitatunga (*Tragelaphus spekei*) and mostly endemic species like the Nile lechwe. It is frequented by elephants, buffalos and several other species of mammals. The region is rich with resident and migratory birdlife, many of which feed on submerged vegetation in shallow waters, invertebrates and on fish or their fry (Hickley and Bailey 1986). However, the future of the Sudd wetland as well as local livelihoods would be negatively affected should the Government of South Sudan renew efforts to construct the Jonglei Canal.

Sudd ecosystems also harbor Nile crocodile (*Crocodylus niloticus*), African rock python (*Python sebae*), other species of snakes and amphibians. Birds of international and regional conservation importance inhabit the Sudd, such as the endangered white pelican (*Pelecanus onocrotalus*), which flies over 2000 km from Eastern Europe and Asia to reach the Sudd's floodplains. The black-crowned crane (*Balearica pavonina*) designated "vulnerable" by IUCN is also found there. The Sudd floodplains support the largest population of shoebill stork (*Balaeniceps rex*) in Africa, with an estimated population of 5000 ([http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0905\\_full.html](http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0905_full.html)). Also,

the white stork (*Ciconia ciconia*), black tern (*Chlidonias nigra*), and saddlebill stork (*Ephippiorhynchus senegalensis*) are found there.

*Toic* are areas subject to seasonal flooding by spill-water from rivers and watercourses where the soil retains sufficient moisture throughout the dry season to support grasses. The dominant species of grass depends on the soils and hydrological conditions. *Toic*, although not a separate ecological zone, is of special importance for dry season grazing by both livestock and wildlife, and is critical in the lives of Southern Sudan's pastoralists.

Areas designated for protection in this habitat type are: Fanyikang and Zeraf Game Reserves, the newly gazetted Ramsar Site, Lake No and Lake Ambadi conservation areas.

**Water resources** –The ecosystem of the White Nile is critical to both the wildlife and local pastoralists and fishing communities of South Sudan. In addition, the Sudd is an important source of surface water and is in need of protection to safeguard the ecosystem and sustainable livelihoods.

#### **g) Semi-arid Region**

The Semi-arid region occupies the extreme southeastern parts of Eastern Equatoria in and around the *Elemi* Triangle and around Renk in the north where the average annual rainfall ranges from 300 mm to 500 mm and the soils are generally shallow and infertile. The vegetation of this area is characterized by patches of open short grasslands and *Acacia* bush land (Nikolaus 1989). Depending on the annual rainfall, which is unpredictable, the groundcover is generally poor. The area, being an extension of the northeastern Kenyan semi-arid zone, shares the same biogeographical affinities in reference to its fauna and flora. Larger mammals of the area include Beisa oryx (*Oryx beisa*), Grant's gazelle (*Gazella granti*), dik dik (*Madoqua guentheri*), Lesser kudu (*Tragelaphus imberbis*), ostrich and seasonal elephant visitation (Grossmann et al. 2008). The Loelle area has been proposed for the creation of a new protected area to conserve these unique species.

#### **h) Protected Areas in South Sudan**

South Sudan's Protected Areas include wildlife, forest and Ramsar sites. The country has an extensive system of game reserves and national parks some of which date back to the 1930's. According to Schedule IV of the *Wildlife Conservation and National Parks Act, 2003*, South Sudan has 19 wildlife protected areas, comprising six national parks (including Badingilo, Boma, Nimule and Southern national parks) and 13 game reserves (including Bangangai, Bire Kpatous, Fanyikang, Kidepo, Mushra, Numatina and Zeraf game reserves). In total the protected area estate covers about 87,030 km<sup>2</sup> of South Sudan, which is about 13% of the land surface. National

parks are estimated to cover an area of 51,760 km<sup>2</sup>, game reserves 34,110 km<sup>2</sup> and forest reserves 1,160 km<sup>2</sup>. **Figure 3 below** shows these protected areas. In addition to this present protected area estate, South Sudan also contains one Ramsar site, the Sudd, recognized under the Ramsar Convention on Wetlands of International Importance. The boundaries of some of the protected areas need to be reassessed, clarified and demarcated, and some may need to be adjusted based on such assessments.



**Figure 3: South Sudan protected areas and proposed extensions (WCS, 2015) South Sudan country office**

**Table 2** below shows trends in wildlife populations in one National Park. Table 2 shows that the wildlife populations recorded in 2001 had dropped dramatically, but there were still significant numbers of most species, with the exception of the elephant, giraffe, zebra, and buffalo. In scientific terms, the two surveys are not directly comparable. Nonetheless, the fact that viable populations of several species of wildlife still existed in Boma in 2001 is important for the future of wildlife and protected areas in South Sudan. A key figure to note is the cattle count, which portrays the level of encroachment into the park by pastoralists.

**Table 2: Comparison of population estimates of larger ungulates in the years 1980 and 2001 in Boma National Park UNEP, 2007 and Fay et al, 2007.**

Species	1980 count (wet season)	1980 Count (dry season)	2001 Count (wet season)	2007 Count ( Dry Season)
White-eared kob	680,716	849,355	176,120	753,373
Lesser eland	2,612	7,839	21,000	395
Roan antelope	2,059	3,085	1,960	864
Mongalla gazelle	5,933	2,167	280	278,633
Tiang	116,373	25,442	Not seen	155,460
Lelwel hartebeest	8,556	47,148	5,600	1185
Zebra	24,078	29,460	Not seen	Not seen( 3 seen on reccee)
Buffalo	2,965	11,179	Not seen	10,178
Giraffe	4,605	9,028	Not seen	404
Waterbuck	620	2,462	Not seen	177
Grant's gazelle	1,222	1,811	Not seen	2,540
Elephant	1,763	2,179	Not seen	6,850
Lesser kudu	654	170	Not seen	318
Oryx	1,534	396	Not seen	664
Cattle	7,056	93,815	7,980	989,889
Choats				149,451

Fay et al, 2007

Species	Dry Season 1980	Wet season 1980	Early Dry Season 2007
Buffalo	11,179	2,965	
Common eland	7,839	2,612	231
Elephant	2,179	1,763	606
Giraffe	9,028	4,605	404
Lelwel hartebeest	47,148	8,556	115
White-eared kob	849,365	680,716	695,940
Lesser kudu	170	654	318
Grant's gazelle	1,811	1,222	2,540
Mongalla gazelle	21,678	5,933	22,430
Beisa oryx	396	1,534	664
Bohor reedbuck	29,857	1,191	2,050
Roan antelope	3,085	2,059	
Tiang	25,442	116,373 or 16,782	404
Waterbuck	2,462	620	
Common zebra	29,460	24,078	
Cattle	93,815	7,056	197,166
Sheep & Goats	54,817	1,404	56,580

In terms of management, the level of protection provided to game reserves and national parks between the 1980s and 2000s was minimal. Evidence from aerial surveys conducted in 2007 points to declines in the numbers of some large wildlife due to poaching (Table 5). Many species however, still remain in large numbers, notably white-eared kob, tiang, roan, gazelle, reedbuck and oryx. The most reliable evidence comes from Boma National Park, which was surveyed three times, twice in 1980 (in the dry and wet seasons) and once in 2007 (Fay et al, 2007). As shown in Table 5, the wildlife populations recorded in 2007 had dropped dramatically, but there were still significant numbers of most species, with the exception of the elephant, giraffe, zebra, and buffalo. In scientific terms, the two surveys are not directly comparable. Nonetheless, the fact that viable populations of several species of wildlife still existed in Boma in 2007 is important for the future of wildlife and protected areas in South Sudan. A key figure to note is the cattle count, which portrays the level of encroachment into the park by pastoralists.

## 1.6 Species Diversity

The country's wide range of habitats supports a very rich diversity of both animals and plant species. Some of the endemic fauna species in the country include the Nile lechwe, Hoogstral's Striped Grass Mouse, Nile Sitatunga and a recently discovered African climbing mouse *Dendromus ruppi*. South Sudan is known to be the only country in Africa with both species of eland - the common eland (*Taurotragus oryx*) and the Derby's (Giant) Eland (*Taurotragus derbianus*).

A particular highlight for South Sudan is the wildlife migrations across the eastern grassland savannahs and floodplains of Jonglei and Eastern Equatoria States that stretch into the neighbouring Gambela region of Ethiopia. The white-eared kob, tiang, Mongalla gazelle and Bohor reedbuck represent one of the greatest animal migrations and wildlife spectacles of the world. This is an invaluable natural resource for South Sudan and the rest of the world and could in future be a major tourist attraction once stability returns to the country. The world's population stronghold of the shoebill and black-crowned crane occur in the Sudd wetland. While South Sudan shares many of its fauna species with her neighbours to the south and west, other species like the Nile lechwe and the white-eared kob are endemic to South Sudan and Ethiopia. South Sudan is also thought to be the centre of giraffe evolution.

Reptiles endemic to South Sudan include the Torit Gracile Blind Snake *Letheobiatoritensis* and the Mount Kinyeti Chameleon. Freshwater fish known exclusively from South Sudan include *Barbustongaensis* and *Labeotongaensis*.

For plant species, Imatong Forest is a major biodiversity hotspot supporting over 2,000 vascular plant and 500 bird species, and is one of the largest intact *Podocarpus* forest in Africa. Endemic flora of South Sudan includes, *Chloroselast aposana*, and *Lepidochrysops nigritia*. Among the vascular plant species restricted



to South Sudan are *Aloe diolii*, *Aloe macleayi*, a cycad *Encephalartos mackenziei*, *Chlorophytum superpositum*, *Scilla chlorantha*, and *Panicumbambusiculme*. Wild Arabica coffee grows in the forests of the Boma Plateau and Imatong Forest.

## **1.7 Genetic Diversity**

Genetic characterization of populations in South Sudan for both wild and domestic species is currently almost non-existent. Plant genetic resources range from little known indigenous wild fruits and vegetables pastures and forages, medicinal plants, indigenous staples like millet and sorghum to introduced crops such as maize.

The loss of genetic diversity may be rapid in South Sudan and many species may be declining particularly for plant variety even if they are not yet extinct without any documented information. Some of the world's rare and indigenous crop varieties such as finger millet and sorghum are important part of the traditional farming systems. Of more immediate importance is the loss of genetic diversity within domestic crop species, which South Sudan may prioritize in its effort to combat food insecurity in the country. With the expansion of agriculture, genetic erosion brought about by genetic uniformity (higher yields but increased vulnerability to pests and adverse climatic conditions) in commercial crops largely driven by market forces is likely to be the next problem facing the country.

## **2.0 THREATS TO ECOSYSTEMS AND BIOLOGICAL RESOURCES IN SOUTH SUDAN**

South Sudan has immense natural resources that remain virtually untapped. This provides potential for government to address pressing developmental challenges if well and sustainably managed. Given the fact that the country has experience more conflict than peace since Sudan attained independence in 1956, the country's biological diversity is under threat from a number of sources, man-made and natural. For specific ecosystems and biodiversity, some of the threats are briefly described below.

### **2.1 Threats to Forests**

South Sudan faces many challenges to developing and sustainably managing its forestry sector as described below:

#### **Deforestation and forest degradation**

Although they look luxurious, forests in South Sudan are fragile ecosystems which suffer varying levels of degradation through uncontrolled fires, uncontrolled grazing, and over harvesting. In arid zones, uncontrolled fire destroys trees and their regeneration capacity is severely limited by the harshness of the environment. Even the biodiversity-rich tropical moist forests, found in areas of high rainfall along the southern border and Nile – Congo watershed, are very vulnerable to degradation. Currently, the level of degradation is high in all states and there is urgent need to reverse the trend. The International Centre for Research in Agro-forestry (ICRAF) concluded that between 1973 and 2006, on average South Sudan lost 2% of its forests to deforestation every year, which (if it continues) could lead to a near total loss of forest cover within 50 years (South Sudan Forest Policy, 2012).

#### **Poor forest governance and lack of agreement regarding ownership of forest resources**

Forest resources were plundered by armies from the north and, later on, were exploited to support war efforts. Through the war periods, there was total disregard for good forest governance. Although the new government has made commendable efforts to restore order in exploitation of forest resources throughout the country, illegal exploitation is still common. In some cases, forests are still being destroyed by militia groups.

Under the decentralization system of governance, overlaps exist among central government institutions in the states.

Illegal forest cutting is still on-going despite the end of the war. It is usually done by individuals and some groups under the eyes of the Government Agency responsible.

## **Weak and Inadequate Coordination Mechanisms between the Central Government and States Governments**

Weak and inadequate coordination mechanisms between South Sudan Government and the State Governments of programme implementation, resource allocation, and accountability are significant challenges to institutional capacity and forest governance. The State Director General of Agriculture who is responsible for forestry services, reports only to the State Minister of Agriculture without a copy to the South Sudan Director General of Forestry. Under the decentralized system of governance, overlaps exist among responsible officers at the center and in the States. Communication and accountability between South Sudan institution and the State institutions also constitute another challenge. For example, the Minister of Agriculture at the State level is answerable to the Governor who reports directly to the President.

Some forestry programmes are implemented by NGOs and local communities with the financial support of development partners, but the linkage and coordination between the Ministry of Agriculture and Forestry and the former, are not well integrated. In addition, the private sector also participates in the forestry industry activities through establishment of plantations, timber processing and sales. However, poor communication and inadequate consultations on levies and taxes among stakeholders negatively impact on forest management and investment.

Prior to the CPA, ownership and management of plantation forest resources were clearly defined. The gazetted natural forests were owned by both the Central Government and Provincial Governments. By 2007, the Forest Policy Framework<sup>1</sup> for Southern Sudan provided that Central Forest Reserves (CFRs) were to be owned by the Central Government (GOSS), while Provincial Forest Reserves (PFRs) were to be owned by the State Governments. Currently, RSS has taken ownership of CFRs on behalf of all the people of South Sudan, and manage them in partnership with State Governments and other stakeholders. The State Governments will take ownership of PFRs on behalf of all people of the State.

## **Forest Fires**

Traditional use of bush fires is a major threat to forests and tree growing throughout South Sudan. The fires are used for land preparation under shifting cultivation, for hunting, and for rejuvenation of grazing areas. Forest fires also originate from lightning, smokers, and honey collectors. Sometimes, communities deliberately set

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<sup>1</sup>Forestry Policy Framework, Southern Sudan (2007).

forest fires out of discontent with policies and regulations. Prevention and control of bush fires therefore requires full engagement of local communities.

### **Charcoal and Fuel Wood**

Fuel wood and charcoal make up approximately 80% of the country's energy supply due lack of alternative sources of energy such as electricity, wind and solar power, and gas. As a result, charcoal making is an attractive economic activity as more people become involved in charcoal production, accelerating the depletion of trees. There is also growing demand for fuel wood for brick making.

### **Limited Investment and Technology**

Forest-based industries (saw milling, wood-based panels, furniture, and joinery manufacture) are significant sources of off-farm employment. Consequently, South Sudan's forestry sector can support a significant and sustainable wealth-creating export industry if well managed.

Currently, investment in the forestry and timber trade is limited. Major constraints limiting investment in the forestry industry include lack of access to capital and high taxation rates, fees, and transport charges. It is estimated that timber-related taxes, fees, and transport costs constitute 71% of the total costs of production and processing of timber, and teak in particular. In addition, there are market barriers which discourage investment in the industry. These include poor road networks and transport infrastructure and poor access to international markets. Other constraints include obsolete machinery and equipment, shortage of skilled labour, and landmines that have yet to be cleared.

Improvement of forestry and forest products requires adoption of improved technology. Currently, there is a low level of technology in South Sudan's forestry sector. For example, availability of harvesting and processing equipment and machinery to convert logs into high value-added products is limited. Research capacity for developing forest technologies such as tree species, timber, and wood and non-wood forest products is also limited. Technologies for low energy use for cooking in brick making are still not widespread.

### **Linkages with Land**

Administration and management of the forestry sector require coordination with the policies, laws, and institutions governing land. The 2009 Land Act provides for community lands to be designated for, among other reasons, forestry purposes. Land ownership in the new country of South Sudan remains to be resolved, and it calls for fresh common understanding between RSS, State Governments, local governments, and communities, particularly as it relates to CFRs and SFRs.

The ongoing development of a new land policy and law creates uncertainty around forest and land ownership; hence this will cause serious limitation to any investment in forestry development. Land reforms are particularly critical to forest sector development strategies and plans. In some cases, like the planned large-scale forest land concessions, land reform becomes a prerequisite. The effect of the ambiguity regarding the current policy and legal framework governing land is that NFRs and other public forests have been under siege of claims by various stakeholders.

## **Gender Inequality**

While degradation of the forest ecosystem has had an impact on communities in general, women have suffered more than their male counterparts. In traditional African households, women are usually the primary food providers for their families. Women fetch forest products such as fire wood, leafy vegetables, fruits, roots, and tubers. Despite their critical role in the management of natural resources, women have limited property rights that ensure their access to land and forests. Women have comparatively few employment opportunities in the collection, production, and sale of timber, wood, charcoal, and other forest products. This gender disparity in access to and utilization of natural resources from forests and elsewhere is a major contributor to the rising poverty among women.

## **2.2 Threats to Wildlife**

### **Extended Periods of War promoted illegal activities**

South Sudan has experienced about 40 years of war between the 1955-1972 and 1983-2005 struggle during which significant shifts in sources of livelihoods occurred. Civilian communities and combatants alike fed on wildlife and other natural resources for survival, which in several areas resulted in uncontrolled hunting and over-exploitation during the extended periods of war. Many of the wildlife personnel fought alongside the army while others sought refuge. During this period, there was lack of conservation law enforcement in government controlled areas while in areas controlled by SPLA there was some law enforcement. The extended periods of war also resulted in the proliferation of small arms and extensive trade in bush meat.

During the war combatants on all sides left anti-personnel and land mines and other unexploded ordinances within some of South Sudan's protected areas. This presents a hindrance for rehabilitation, research, tourism and other wildlife management activities. Despite the ongoing disarmament process, there are still firearms in the hands of local communities. Furthermore, the availability of small arms is leading to the accelerated poaching of wildlife populations and poses a threat to security. In

order to progress with significant conservation and management activities, there is need to remove all illegal arms and unexploded ordinances.

### **Deterioration of Management Capacity**

The Government body charged with the responsibility for wildlife management deteriorated during the war, which in effect meant that there was no protected area management. Furthermore, the little existing infrastructure that was there before the war in wildlife protected areas was left in ruins. Conservation personnel were not trained and there was total lack of conservation education programs. Management capacity has slowly started to recover in the six years since the CPA but remains in its early stages of recovery. There is need for strong support to improve this management capacity and development of management plans for the protected areas.

### **Habitat Destruction and Fragmentation**

Habitat destruction and fragmentation from farming and deforestation is the root cause of most biodiversity loss in South Sudan. The intensification of shifting agriculture is causing large-scale land use changes across the region particularly in the savannah. An additional issue is the impact of ongoing and planned development like creation or rehabilitation of rural trunk roads. This is a particular concern for Jonglei state, where the new road cuts directly across the migration route of the white-eared kob.

### **Park Encroachment and Degradation**

Livestock is present in most of the legally protected areas irrespective of their legal status. Keeping livestock in the Parks create competition for water and fodder, leading to land degradation through burning and overgrazing and facilitating poaching. Another risk is the confrontation between the pastoralists and poachers with the wildlife forces that may be heavily armed. In addition, the presence of livestock in the protected areas may facilitate the spread of diseases and disease vectors, currently there is an outbreak of foot and mouth disease among the worthhogs. Modern non-confrontational approaches entailing the community engagement will be required if the wildlife sector in South Sudan is to avoid gun battles between locals and rangers.

### **Commercial Poaching and Bush Meat**

The readily available firearms have been the most significant factor in the reduction of wildlife in South Sudan. Uncontrolled and unsustainable levels of hunting have devastated wildlife populations and caused the local eradication of many of the ranger's species including the elephant, rhino, buffalo, giraffe, eland and zebra.

Commercially oriented poaching for non-meat products such as ivory, skins and live animals for pets was historically a major industry but is now reduced although still high due to a steep drop in the targeted wildlife populations.

Bush meat is common in South Sudan as often it is a fall back source of food in times of crop and livestock failure and also during arm conflict.

### **Wildlife Tourism**

The main problem with wildlife tourism in South Sudan is that it does not exist on a commercial scale. Protected areas are therefore not commercially self-sustaining and need constant subsidy. There is currently no wildlife tourism industry in South Sudan and the prospects for rapid growth are slight due to insecurity and a lack of infrastructure. Nevertheless, small scale tourism activities are being undertaken in Nimule National Park (Joel, 2015).

### **Viability and Rehabilitation of PAs**

The viability and condition of South Sudan's wildlife PAs needs to be assessed and where necessary changes in the status of these areas undertaken. While the current PA network is very expansive, certain PA designations and extents do not adequately protect some key wildlife areas, examples include the Sudd wetlands and the Boma-Badingilo-Sudd antelope migration corridors. Other areas have been entirely settled or altered by people during the intervening years of war and no longer provide significant conservation value. Yet other important areas are unprotected and should be proposed as new PAs, such as the Loelle Zone in Eastern Equatoria. Therefore, in general, MWCT needs to rationalize its wildlife PA system based on adequate assessments of the current status of different areas and management and conservation priorities.

### **Poaching (illegal hunting) and Wildlife Law Enforcement**

Poaching is currently widespread in the Parks. The target animals range from large to medium sized mammals. The prime species are elephants targeted for bush meat and ivory while, hippos, Uganda kob, oribi and bushbuck are targeted mainly for bush meat. Poaching is rampant due to limited wildlife law enforcement capacity, lack of awareness of wildlife law among the public and enforcement bodies, continuing insecurity in some areas, abundance of firearms, history of open access wildlife use, and generally limited application of the rule of law at this point in time. In addition, a growing commercial bush meat trade represents an escalating threat to wildlife. Bringing wildlife use under control through collaboration with different enforcement bodies, including police, judiciary, and military, will be critical to laying the basis for sustainable management measures in South Sudan.

## **Human-Wildlife Conflict**

Human Wildlife Conflict is widespread in National Parks in South Sudan. The common animals in conflict with local people are mostly elephants, hippos and crocodiles. There are incidences of crocodiles killing people cattle and goats, and hippos and elephants raiding on people's food crops especially maize

## **Community Participation**

Wildlife in South Sudan is found both inside and outside of PAs, especially for migratory species. During the war, communities and soldiers alike used wildlife as a source of subsistence. Communities still consider wildlife as an 'open access' or 'free-for-all' resource, which inevitably results in over-exploitation. There is a need for management to account for local communities' livelihoods, cultural and economic interests and create incentives that enable conservation to take place outside of protected areas. Management strategies that address the issue of wildlife outside PAs such as community-based conservation and collaboration with state and local governments need to be developed and implemented.

**Cattle raiding:** The scourge of cattle raiding contributes to the destruction of biodiversity and ecosystems by hampering institutions from carrying out their mandate especially the Wildlife Service.

## **Land Use Planning**

Previously there have never been integrated land use plans for South Sudan. Following independence, it is now important to consider wildlife resources in the overall land use planning process in order to maintain biodiversity of wildlife resources for the establishment of a tourism industry and the broader economic growth of the country.

At present there is a range of existing and planned land allocations and natural resource concessions for activities such as petroleum development, mining, and agriculture. As wildlife resources also occur outside of PAs there is an urgent need to work together with other Government authorities, including those in extractive resource sectors as well as authorities governing land, environment, forestry and agriculture, and animal resources, to develop harmonized approaches to natural resource management that mitigate negative impacts of other sectors, particularly extractive industries. Concession arrangements will need to be harmonized with wildlife conservation requirements if sustainable wildlife management measures are to be effectively planned and implemented.



## **Government Planning and Budgeting**

Policy and decision-makers need to recognize the importance of wildlife to the people and the economy of South Sudan and its financial implications. While expenditures for sectors such as health, education and defense command more attention and higher priority in budget allocation, there is a need to include the wildlife sector as one of the key sectors justifying adequate budget allocations in order for conservation activities to be undertaken. A well protected wildlife resource is essential for developing the eco-tourism sector.

## **Conservation Financing**

Funding based on annual budgets presented to the Ministry of Finance is inadequate and not sustainable. Alternative financing strategies that provide sustainable sources of funding for the Wildlife Authority are required to assist towards the path of sustainable conservation financing.

## **Insufficient Resources**

Infrastructure and equipment needed to manage a Park is either absent or dilapidated. Most Parks generally lack roads and have no vehicles and equipment (GPS, binoculars, cameras, compasses) needed for Park management or patrols

Proper environmental and socio-economic impact assessments need to be carried out prior to implementation of major projects such as hydropower development, road construction, activities that alter natural wetlands, and so forth. There is need to ensure that adverse impacts on wildlife populations and habitats are adequately evaluated and mitigated. It is important for the wildlife sector to work with other sectors, and relevant environmental authorities (e.g. the Ministry of Environment, Ministry of Water and Irrigation and academic institutions), to ensure adequate safeguards are put in place, for example the construction of Jonglei Canal, which would adversely affect migratory wildlife species.

## **Human Resource Capacity**

Management of National Parks is inadequate due to several factors chief among them being adequately trained staff. Most of the current staff have a strong military background as most of them were transferred from SPLA with limited skills in Park management.

The MWCT SSWS faces an acute shortage of trained personnel in the field of wildlife science/management, ecotourism and environmental management. Some of the trained South Sudanese are still in the Diaspora. Other trained personnel have sought engagements with sectors other than wildlife and many wildlife and forestry graduate are without work. Thus, there is need to train the existing personnel and

encourage other qualified people to return and join the MWCT. MWCT has made some progress in recruiting a few graduates. The wildlife training centers (e.g. Boma Wildlife Training Center and Nimule Training Center) and southern universities, especially the University of Juba which has a Department of Wildlife Science, should be actively involved in the training of wildlife personnel in all relevant fields. The capacity development effort should also be extended to communities (pastoralists, farmers and anglers) living in or around protected areas to improve their skills in the protection of wildlife and poverty alleviation.

## **Climate change**

Key among the threats to National Parks is climate variability, and its longer-term cousin global warming. The future is difficult to predict but there may be significant changes in the rainfall and river flow patterns that will affect the vegetation and wildlife. Climate change may increase phenomena such as fire, drought and flood severity and/or aggravate the already existing threats to the ecosystems or individual species

## **Integrating Livestock and Wildlife**

Because of the preponderance of pastoralist land use in parts of South Sudan, integrating livestock and wildlife is an important issue for the wildlife sector. Activities in the livestock industry can have adverse effects on wildlife, particularly where intensive livestock development involves landscape modifications such as construction of fences or modification of water sources. Over-grazing has already occurred in certain locales of South Sudan, resulting in habitat degradation, and impairment of water quality and destruction of aquatic habitats. Aggregation of livestock and wildlife in areas with shared resources greatly enhances the chance of disease transmission between them.

## **People Living in Protected Areas**

There are communities living in enclaves within some gazetted and other proposed PAs. In some cases these communities existed before the gazettelement of the PAs, hence the residence is legal and ought to be respected. However, since such communities live in close proximity with wildlife and within PAs, there is needed to forge a special relationship between wildlife authorities and the communities. Further, the populations of such communities living within PAs or critical migratory corridors are expected to increase over time, which may increase impacts on the environment. Human-wildlife conflicts are likely to increase with such growth in human populations and their activities within PAs, if adequate planning and mitigation measures are not put in place in advance. Accordingly, the Government of South Sudan intends to issue guidelines for appropriate action and develop specific policy approaches for managing certain PAs as multiple-use areas with

resident communities participating in conservation of such areas. There are some communities in PAs who are willing to be resettled outside the PAs. The Government should facilitate the resettlement and provision of basic services for such resettled communities.

### **Information and Research**

Before the war a number of surveys and studies were done in different protected areas and on certain wildlife species. Between 2000 and 2004 with USAID/USDA support, the Secretariat for Wildlife Conservation, Environment and Tourism undertook integrated ground surveys to assess the status of wildlife in three protected areas – Nimule, Boma and Southern National Parks (Deng *et al.* 2001). After the war the Ministry, in cooperation with Wildlife Conservation Society, has undertaken a number of large-scale wildlife surveys generating important information (Fay *et al.* 2007, Grossmann *et al.* 2008, Grossmann *et al.* 2010). These ongoing surveys are forming a knowledge base that is informing strategic planning. Research on key species (e.g. lion, giraffe, and migratory antelopes) is essential for management purposes. However, most of these studies were done using aerial surveys which requires ground truthing when total peace returns.

There is already good data on wildlife distributions but there remains a need for focusing on applied research that will provide guidance to wildlife managers in addressing key threats, such as the growing commercial bush meat trade. In this regard, there will be an opportunity to collaborate with a wide range of South Sudanese universities (e.g. University of Juba) and other research institutions. It is also important to emphasize that the recruitment of wildlife biologists and other science graduates will go a long way towards strengthening the research and monitoring skills of the MWCT.

### **International Cooperation**

The Convention on Biological Diversity (CBD), the UN Convention to Combat Desertification (UNCCD), the UN Framework Convention on Climate Change (UNFCCC), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Migratory Species (CMS) and others including regional and bilateral agreements, are relevant to the national wildlife policy. Following independence, there is a need for South Sudan to seek membership of the relevant treaties and protocols and integrate their provisions into both policy and implementation strategies. International cooperation also provides opportunities for South Sudan to obtain various forms of support from other countries in its efforts to develop its wildlife management capacity.

## **Transboundary Wildlife Management**

A number of South Sudan's wildlife PAs lie at the borders with neighboring countries. Wildlife also migrates across those borders. South Sudan has signed a memorandum of understanding with Uganda for transboundary or 'peace park' management in four protected areas. There are plans to undertake measures to reach similar agreements with Ethiopia, Kenya, CAR and the DRC. Transboundary wildlife management efforts are an important mechanism to build trust and cooperation between South Sudan and its neighbours, for preventing conflicts over natural resources, sharing skills and resources, learning from different countries' experiences, and managing wildlife at the landscape-scale where it crosses international boundaries.

## **Cultural Heritage and Traditional Knowledge**

Cultural beliefs among the Zande of Western Equatoria and the Shilluk of Upper Nile have helped in the preservation of the bongo and Nile lechwe, respectively. Among certain communities in South Sudan, it is considered taboo to kill certain animal species and this of course helps in their conservation and sustainable use. Thus it is valuable to retain the cultural value of wildlife and create an awareness of past and traditional knowledge in the general public.

## **Participation of Women**

Women in South Sudanese societies take a very active role in activities such as fishing, collection of wild fruits and vegetables and ensuring food security at the household level. Consequently, the involvement of women in development is very important and therefore women should be encouraged to take a more active role in conservation activities at all levels.

## **Oil Exploration and Wildlife**

Large-scale developments such as petroleum and mining may also have a significant impact on wildlife, both through direct impacts such as pollution of water sources and destruction of habitats (in the case of large-scale mineral extraction), as well as through corollary impacts such as the development of roads, pipelines, and mining camps and settlements. All of these impacts need to be carefully reviewed, planned, and mitigated, with clear monitoring and enforcement mechanism put in place, if mining and petroleum development are not to threaten South Sudan's unique wildlife.

## **Unregulated Large Scale Bush Fires**

As mentioned above, unregulated fires are common in forest and National Parks and they usually originate from lightning, smokers, and honey collectors. Sometimes, communities deliberately set forest fires out of discontent with policies and regulations. These can be very detrimental to wildlife.

## **Post Conflict Infrastructure Development e.g. Roads through the Park**

Developments such as roads are being constructed as peace returns to South Sudan; some of which pass through National Parks while other cross important wildlife corridors. These if not controlled e.g. by undertaking environmental and social impact assessments could in future negatively affect wildlife protection in the country.

### **2.3 Threats to Wetlands and other Water Sources**

Principal wetlands in South Sudan are the Sudd and Machar swamps which offer considerable socio-economic livelihood opportunities for agricultural, pastoral and fishing communities. The Sudd flood plains are a rich habitat for flora and fauna such as fish, mammals, birds, reptiles, amphibians and other rare species. Hydrological and ecological functions of these wetlands such as water quality improvement and food provision both contribute to ensuring ecological and socio-cultural stability in the region. In addition, the inaccessibility of the Sudd provide protection for several species of wildlife. The Sudd is the largest wetland in Africa and second largest in the world. It was designated as a Ramsar Site in 2006. Interestingly, there are three protected areas in the Sudd wetlands: the Shambe National Park, the Zeraf Game Reserve and Fanyikang Game Reserve.

The most important environmental issues that would affect wetland biodiversity in South Sudan would be the construction of large hydroelectric power dams and other related development schemes like construction of the Jonglei Canal or dykes along the River Nile. Such schemes would divert and effect changes in the water flow regime and irreversibly or partially destroy downstream ecosystems. Contamination of river or subsurface water by discharged pollutants, wastewater and oil spilled from the wrecked or sunken river transport ferries is also inevitable.

The Sudd wetlands are also threatened with pollution and eutrophication as a result of either oil spillage during oil exploration or overuse of agrochemicals during agricultural production. All these would severely affect wetland biodiversity including fish which is a critical resource for the communities living in the area.

## 2.4 Threats to Agricultural Biodiversity in South Sudan

South Sudan farming communities grow a wide range of crops. The main crops cultivated are sorghum, maize, cassava, groundnuts, sesame, pearl and finger millets, beans, peas, sweet potato and rice. Sorghum is the staple food and is widely grown in the whole country. Modern agriculture enforces use of improved cultivars but some farmers have retained their varieties and this form of in-situ on-farm conservation needs to be strengthened. The local communities are custodians of a lot of indigenous knowledge on plant genetic resources (PGR) but documentation of this knowledge as well as inventories of the under exploited plants and location maps for further exploration are poorly developed in the country. Potential threats to PGR in South Sudan include the following:

- Replacement of local crop varieties by introduced commercial varieties;
- Loss or neglect of traditional varieties, including crop wild relatives and landraces e.g. millet, wild medicinal plants and local fruits and vegetables
- Loss of other indigenous species found in cultivated areas as well as increasing problems of invasive crop weeds
- Introduction of new varieties in preference to indigenous species;
- Genetic erosion of indigenous plant genetic resources due to changes in land use;
- Climatic change, leading to drought, diseases, pests, famine;

Two emerging threats deserve special mention namely: large scale agriculture and introduction of genetically modified crops.

The emerging large, mechanized monoculture has the potential to adversely affect agricultural biodiversity, ecosystem functions and traditional farming cultures. Traditional indigenous crops may be replaced by exotic crops which may not be continuously adapted to South conditions. Contamination from overuse of agro-chemicals, such as N-fertilizers and polychlorinated biphenyl (PCB) based-pesticides, may directly affect food and water quality as well as accelerate the production of nitrous oxide, which is one of the greenhouse gases. Improper land preparation and crop cultivation may increase the rate of soil erosion, causing silting of aquatic ecosystems and would affect the reproduction functions of some species of plants and animals. Horizontal expansion of the agricultural land, meanwhile, may destroy the natural habitat of some species of flora and fauna.

Genetically modified organisms (GMOs), which include genetically modified seeds and other planting material, are globally promoted by Multinational Corporations with promises of enhancing productivity and therefore solving food insecurity and also increasing the competitiveness of some cash crops and forestry products. The biggest fear, however, is the introduction of terminator seeds, which compels the user of such improved seeds to perpetually depend on the company holding the license for seed production. It will therefore be important to constantly weigh carefully the merits and demerits of crop, animal or forest product adoption of this

genetically modified material. South Sudan has a wealth of diverse genetic resources that are important for maintaining an efficient and a sustainable farming industry, as these allow development of varieties and breeds to cope with new demand and climate changes. This genetic diversity has been maintained in South Sudan thanks to the long tradition of conserving seeds. Any hasty move towards modernization could result in genetic erosion. Local landraces/species can be replaced by new varieties/species and lost through environmental degradation and desertification.

## 2.5 Threats to Livestock and Animal Resources

Cattle are extremely important culturally and economically to the semi-nomadic cultures of South Sudan such as the Dinka, Nuer, and Mundari. No livestock census has been carried out recently in South Sudan, but the population of livestock including cattle, sheep, goats, and donkeys, may exceed 20 million (**Table 3**).

**Table 3: Livestock numbers in South Sudan States (UNDP, 2012)**

State	Cattle	Goats	Sheep	Total
Upper Nile	990,024	650,503	447,097	2,087,624
Unity	1,188,824	1,511,319	1,784,172	4,484,315
Jonglei	1,475,096	1,423,281	1,227,409	4,125,786
Northern Bahr el Ghazal	1,590,400	1,305,897	1,657,635	4,553,932
Western Bahr el Ghazal	1,256,416	1,183,622	1,138,833	3,578,871
Lakes	1,320,032	1,252,096	1,488,919	4,061,047
Warrap	1,538,712	3,130,788	1,391,907	6,061,407
Central Equatoria	882,672	1,286,333	1,172,576	3,341,581
Eastern Equatoria	894,600	1,041,783	1,151,487	3,087,870
Western Equatoria	679,896	1,188,513	1,151,487	3,019,896
<b>Total</b>	<b>11,816,672</b>	<b>13,974,135</b>	<b>12,611,522</b>	<b>38,402,329</b>

The majority of livestock kept in South Sudan are largely indigenous breeds. In the long term these breeds could be negatively impacted on in a number of ways including:

### Poverty

Large proportions of South Sudanese live below the poverty line and are ignorant of the importance of conserving biodiversity. With such communities, it is usually the best animals that are sold off for slaughter or sacrificed during difficult times thus leaving inferior ones to form the economic base. The ability of the owners to cope with the socio-economic demands keeps on dwindling as they dispose of more animals without replenishment capacity.

## **Introduction of New Breeds/Varieties**

The long-term viability of animal agriculture in South Sudan will depend on the genetic variability of the indigenous animals being reared. If this genetic base is eroded as breeds developed for intensive management regimes replace the indigenous breeds, then viability of the livestock sector will be negatively affected.

## **Threats from Oil Exploration and Development**

Much of South Sudan's immediate future and prospects as an independent nation will be determined by the policies and management practices put in place in its petroleum sector. Oil has been a key resource underlying the long years of civil war, and petroleum currently provides 98% of GoSS revenue. Petroleum development thus is positioned to provide much of the financing that the Government requires to invest in infrastructure, social services and development activities in general.

But petroleum is an industry with a poor development track record, particularly in sub-Saharan Africa. There is no country in sub-Saharan Africa that has used oil wealth to catalyze wider social and economic transformation, and in fact most countries in Africa with oil wealth have been case studies in civil conflict, authoritarian or corrupt governance, and widespread underdevelopment. South Sudan is further disadvantaged by its reliance on the North for infrastructure needed to export oil to the coast and by the potential for future instability around control of oilfields in border regions. The management of the petroleum sector will be amongst the foremost challenges facing the Government and will be a test for policy and implementation.

Petroleum impacts on nearly all other environmental and natural resource sectors by virtue of the potential for petroleum exploitation to result in some, and often a great deal of, pollution of land and waterways. This can impact forests, water bodies and fisheries, agriculture and livestock and wildlife and tourism. If not carefully managed through mitigative measures at the design stage, and high-caliber monitoring and enforcement efforts at all scales throughout the production process, there is a high potential for petroleum development in South Sudan to have negative impacts on other natural resource sectors and on rural livelihoods and development opportunities, irrespective of the macro-economic potential of the petroleum industry.



## Summary of threats to biodiversity in South Sudan

These include but are not limited to the following:

### Direct threats

1. **Wildlife** poaching and trafficking. Poaching is a serious problem and is largely attributed to the demand for products from wild animals for bush meat, cash and game trophies.
2. **Deforestation; growth in charcoal production is driving the loss of woodlands. Illegal logging of hardwoods is also a growing issue.**
3. **Livestock and agricultural expansion;** expansion of the agricultural land may result in the destruction of ecosystems and biodiversity unless well managed
4. **Habitat fragmentation caused by road network expansion and the expansion of extractive industries (such as minerals mining and oil industry development)**
5. **Adverse climate change impacts** including increasing desertification and the delaying and shortening of rainy seasons
6. **Human-wildlife conflicts** especially with communities living near Protected Areas

### Indirect threats

1. **Past and continuing armed conflicts**, and the resulting IDP crisis and proliferation of firearms, which facilitates crimes against the wildlife. "Forest elephants are Critically Endangered, and have declined dramatically over the last two decades. Finding them in South Sudan expands their known range — something that urgently needs further study because forest elephants, like their savannah cousins, are facing intense poaching pressure." Experience has shown that wildlife and ecosystems often suffer enormously during and after conflict, and in periods of political instability, and this depletion of natural resources affects some of the poorest and most vulnerable sectors of society," says Adrian Garside of Fauna and Flora International
2. **Inadequate and therefore ineffective legal, institutional and administration capacities** for biodiversity management as well as limited government budgetary allocation **Inadequate coordination** amongst institutions and other stakeholders with respect to biodiversity management, laws, policies and programmes
3. **Negative impacts of development and increasing population growth** with resulting agricultural expansion, overgrazing and deforestation, increased poverty and huge infrastructure and developmental activities can significantly cause biodiversity loss e.g. roads crossing wildlife corridors and migratory routes

4. **Inadequate land use planning** - resulting in environmental degradation as manifested in widespread pollution by unmanaged oil and extractive industries exploitation and exploration activities; and increasing loss of biodiversity due to over-exploitation of natural forests and inadequate environmental sanitation in urban environment
5. **Inadequate public awareness** on environmental policies, laws and environmental protection and management in general and failure to recognise the value and importance of fragile ecosystems and protected areas
6. **Inadequate decentralization and devolution of biodiversity management** to the lowest levels of government within the framework of the decentralised governance system
7. **Emerging threats** including oil exploration and production, spread of invasive species, and genetically modified organisms (GMOs), oil exploration and production
8. **Insufficiency of data** – all the biodiversity institutions have noted the lack of sufficient data on South Sudan biodiversity. Most of the available data is limited on the larger animals, but even more deficient on plant, avifauna, reptiles, and fisheries
9. **Replacement of local crop varieties with introduced commercial varieties** leading to neglect of traditional varieties including crop relatives and landraces

## **2.7 Implications of Biodiversity Loss to Human Well-being**

There are not yet easily available data and information that describe the extent to which biodiversity impacts on the socio-economic development of South Sudan or its contribution to the citizens' livelihood. A brief description of its contribution is described below.

### **2.7.1 Forest Resource Base**

Forests are a source of significant income for people, communities, State Governments, and the Central Government. However, like in other countries, the full contribution of forest resources to the national economy is usually undervalued. For example, the contribution of forest resources to the country's GDP remains low because many important services which forests provide are not valued and because many forest products such as charcoal are traded in the informal sector. Furthermore, corruption leads to further revenue losses.

Despite its undervalued contribution to the country's GDP, South Sudan is well endowed with a diverse natural forest and woodlands with an estimated total area of 191,667 km<sup>2</sup>, or about 30% of total land area. Along the southern border, the tropical moist forests on the hills, mountains, and Nile – Congo watershed represent

some of the richest concentrations of biodiversity in the continent. These moist forests, which exist in the Imotong and Acholi Ranges, Didinga and Dongotono mountains, spread over an area of some 25,000 km<sup>2</sup> and contain valuable commercial products including cabinet-grade timber trees (Forest Policy, 2012)

Forest plantation development has been pursued for various purposes - stabilization of soil erosion, production of commercial wood, etc. Before the war, it was estimated that South Sudan had plantations covering 187,850 hectares. These comprised irrigated *Acacia nilotica* (Sunt) plantations along the banks of River Nile, plantations of high commercial value, indigenous species such as *Khaya senegalensis*, and *Khaya grandiflora* (concentrated in the greater Bahr-el-Ghazal area), eucalyptus plantations, and teak (*Tectona grandis*) plantations spreading over most States.

Some of the opportunities in the forestry sector include timber, saw-logs, poles, bamboos, and woody lianas from natural and plantation forests. In the recent past, a limited number of logging concessions were given out to companies with business interest for teak timber export for ship building, which fetch a price of US\$300 to 400 per cubic metre on the international market.

The tropical moist forests, lying in areas of high rainfall along the southern border and Nile–Congo watershed, represent some of the richest concentrations of biodiversity in the country and contain valuable commercial products, including cabinet-grade timber species.

There are substantial teak plantations, established from 1930s onward, which have matured and reached the age to deliver significant production. Based on high demand for premium quality timber, such as teak and mahogany, improved management and production is likely to generate substantial additional foreign exchange to supplement oil revenue for the country, providing an important source of economic diversification. According to some conservative estimates, less than 2,500 m<sup>3</sup> of teak has been exported annually in recent years. It is estimated that teak plantations alone can generate over US\$100 million per year, and mahogany in natural forest reserves could be a source of substantial hard currency as well.

Non-wood forest products include sheanut (locally known as lulu), fruits, fibers, grasses, honey, oils, resins, gums, sand, gravel, and forest soils. Many non-timber forest products are harvested for local use and to some extent for commercial trade. This includes lulu which grows abundantly in South Sudan. Currently, sheanut butter oil is in high demand worldwide, although only about 0.2% of South Sudan's total sheanut production is currently exported, the majority is consumed locally (Forest Policy, 2012).

Gum acacia could also constitute a major export product for South Sudan. Many local villagers in the country are unaware of the economic value. In 2008, South

Sudan was the fourth largest producer of gum acacia in the world after Sudan, Chad, and Nigeria.

Honey is another forest product which has high potential for export, providing another business opportunity to local communities. During the war, honey was exported to various destinations including neighboring countries, and such exports should be supported and expanded.

At the local community level, forests provide critical resources – and often safety nets – for rural communities, as they rely heavily on forests and trees for shelter, food, medicine, and income. Forests also have religious, social, and cultural significance.

### **2.7.2 Wildlife and Tourism**

Wildlife's significance in South Sudan is as the prospective foundation for a new national tourism industry built upon the great migrations and vast wildernesses of the country, as well as a source of protein to rural communities, many of whom have hunted wildlife for many years. Neighboring countries such as Kenya and Tanzania have capitalized on the abundance and diversity of large mammals to develop tourism industries that generate hundreds of thousands of jobs and more than \$1 billion in annual national income. Wildlife tourism may be a key economic option at national as well as local scales, and will depend upon the stewardship and recovery of South Sudan's wildlife resources. Wildlife also contributes to other values such as bush meat for local communities especially during drought and war, trophies (although related activities are usually illegal), aesthetic value which is also very important and others including game sporting.

### **2.7.3 Fisheries**

Fisheries in South Sudan are concentrated on the country's large river systems including River Nile and its tributaries as well as the vast wetland complex of the Sudd besides several lakes. Relatively few current data is available regarding the status of fisheries in South Sudan, and many local groups of fishermen were displaced and trade disrupted during the civil war, although the Fisheries Policy describes a large number (~60) of commercially exploitable species from areas such as the Sudd.

In South Sudan 1.7 million people depend directly on fisheries for their livelihood, food security or income. The fishery produces about 140,000 tonnes/year. The majority (56%) of this fish is dried or smoked whilst the rest is eaten fresh, either in the fishing communities where it is caught or sent to the nearby towns. The potential sustainable yield from wild fisheries is estimated in the order of 200,000 tonnes/year (Annex V. Situation Analysis Report 2013. Section 13.5.2) worth about US\$800 million at 2013 Juba prices. Consumption of fish in South Sudan is about 17kg/person/year.

The numbers of fishermen is around 220,000, most of these subsistence, with possibly 12,000 "commercial" fishermen, though nearly all of the "commercial" fishermen have alternative sources of income (Annex V. Situation Analysis Report 2013. Section 13.5.3)

Currently there is no management of the wild fishery, no routine data collection, the biology of many of the target fish in the catch is unknown, there is no control on gears used or destructive fishing methods, and the fishery is an open entry one. This combination is most undesirable and unless changed will lead to over fishing in a relatively short time; this will result in declining catches, lower incomes in rural areas, reduction of protein in the diet of the population and increased imports. Already significant areas near the larger towns and some lakes are over fished.

There is little value addition. Fish is processed in fishing camps and villages by smoking or drying (56% of the catch), or sold fresh whole. Opportunities for increasing the value of the catch exist, simply by shifting from smoking and drying fish to producing fish chilled on ice, which receives a higher price. There is a limited opportunity for producing value added fish products for local consumption and perhaps for export in the future.

There is no room for large scale industrialization of capture fisheries, or for an emphasis on greatly increasing production. The fishery will expand naturally, as all unregulated fisheries do with time, beyond the maximum sustainable yield (MSY), unless controlled.

The emphasis of development of the capture fisheries will have to be to: protect nutrition, employment and incomes through co-management of the resources with the users of the resources so as to ensure the fishery is exploited sustainably, and increase incomes and employment from the fishery by increasing the value of the catch by improvements in processing and marketing.

**In terms of aquaculture**, it should be emphasized that despite several years of efforts by FAO, NGOs and other donors, aquaculture is still undeveloped. There are technical problems with site selection, skills, feeds, fingerlings for stocking, harvesting and general husbandry (Annex V. Situation Analysis Report 2013. Section 13.5.7). The potential however is great. The climate is very suitable in the Greenbelt Livelihood Zone which has gravity fed streams, many suitable sites with clay soils, year round surface water and strong local markets for the products of aquaculture.

Subsistence ponds could improve local nutrition; small scale commercial fish farming in clusters around towns promises to improve nutrition as well as employment and incomes; and large scale intensive commercial fish farming has the potential to transform the economic landscape in large areas of the country.<sup>61</sup>

There may also be potential for cage culture in some areas in the Nile-Sobat Rivers Livelihood Zone.

#### **2.7.4 Water Resources**

Water is linked in fundamental and critical ways to agriculture, livestock, wildlife conservation, and fisheries- all of those sectors rely on water resources and changes in the availability and distribution of water can have profound ecological and economic implications. Water is a key component of broader environmental quality, which shapes and impacts human health and livelihoods in basic ways. Water quality can be impacted severely by industrial sectors such as mining and petroleum development, as well as both mechanized and small-scale agriculture, livestock, and tourism developments.

Fisheries are inherently closely linked to the use and management of water, as well as land-based or industrial activities which impact water quality, including agriculture (through pesticides and fertilizer run-off), livestock, and petroleum and mining developments. Environmental measures that safeguard water quality are critical to sustainable fisheries development, including the safety and quality of fish in a given body of water.

Water is a key determinant of land use patterns including the spatial distribution of agriculture, livestock and wildlife, and provision of water supplies can quickly alter the balance between these overlapping or competing resource uses in ways that change ecosystems and potentially lead to conflict.

Water is also an important source of renewable energy (hydropower) and recreational benefits such as sports (swimming pools) and for aquaculture development.

#### **2.7.5 Agriculture**

As indicated in Table 1 above, only 3.8% of the total land in South Sudan is under crops, while tree land or Savannah grassland covers the greatest area (62.6%). Main crops cultivated are sorghum, maize, cassava, groundnuts, sesame, pearl and finger millets, beans, peas, sweet potato and rice. Sorghum is the staple food and is widely grown in the whole country. Usually sorghum is grown with other crops, like groundnuts, sesame, cowpeas, beans, and pumpkins. Maize is grown mainly in the Greater Equatoria Region, especially in the Greenbelt Zone. Farmers in the northern part of the country have also recently began to grow maize since sorghum, their main crop, is increasingly being severely damaged by birds; farmers choose maize because it suffers less damage by birds. Cassava is mainly grown in the Greater Equatoria Region, especially in Western Equatoria State. Groundnuts are a very important crop for farmers as both food and cash crops and are widely grown.

Currently, over 70% of South Sudan's raw agricultural and processed food products are imported from the neighbouring countries of Uganda, Kenya, Sudan and Ethiopia. South Sudan's national food security is at risk and is to a larger extent vulnerable to external dynamics and imperatives. In the absence of its own food producing capacity, shortcomings prompted by political, climatological and economic factors in these countries may have grave consequences on the food situation in South Sudan. However, with favourable policies, sufficient investment, and the application of appropriate technology, South Sudan's large areas of arable land could support competitive, productive rain-fed and irrigated agriculture, producing food for local consumption and export and thereby contributing to economic growth and prosperity. This would, to a greater extent, improve the socio-economic conditions of most South Sudanese.

### **2.7.6 Livestock and Animal Resources**

South Sudan is located in a region with the greatest concentration of livestock resources in Africa. No livestock census has been carried out recently in South Sudan, but the population of livestock including cattle, sheep, goats, and donkeys, may exceed 20 million (National Environment Protection and Sustainable Development policy 2014). Livestock is thus a critical pillar of the rural economy and food security of the population, as well as presenting a range of opportunities for economic growth and development through commercial opportunities and investments. Moreover, this region is a gate way to the Middle East and northern Africa which are home to the largest live animal trade in the world. The trade is composed of both formal and informal markets that find livestock moving through South Sudan into surrounding countries. The sector is predominately comprised of pastoral and agro-pastoral livestock production systems, whose contribution to the economy is significant but challenging to measure since it contributes both socially and economically.

The livestock industry is largely poorly developed in modern production terms. However, there is great potential for this industry to improve food security, livelihood and income generation, economic transformation with industrial growth, exports and job creation leading to significant increases in GDP.

Currently most hides and skins are not collected and are treated as a waste product; with minimal intervention the value can be obtained and revenue generated. In poultry due to the short generation times, simple interventions can lead to improved nutrition status and fast income generation. Likewise, the adoption of new technology in the honey industry can significantly improve.

Livestock also play an important role in agriculture in South Sudan in from of ox-ploughing which enables farmers to cultivate larger acreages than with hand

cultivation. Other traditional values of livestock include for prestige, traditional marriage and compensations when needed.



### **3.0 LEGAL, POLICY AND INSTITUTIONAL FRAMEWORKS FOR BIODIVERSITY MANAGEMENT IN SOUTH SUDAN:**

#### **3.1 National Biodiversity Legislation**

The key national legislations for biodiversity management in South Sudan are the Transitional Constitution and the *Environmental Protection Bill 2013*.

##### **a. The Constitution of South Sudan**

The current Transitional Constitution, which came into force in 2011, under article 198 provides that all the then current laws of the former Southern Sudan shall remain in force and all current institutions shall continue to perform their functions and duties, unless new laws and institutions are established to replace them in accordance with the Constitution. A review process is underway with a view to establishing a permanent national Constitution.

Before the enactment of the 2011 Constitution, the Government of Southern Sudan (GOSS) under the Interim Constitution of Southern Sudan 2005 governed Southern Sudan. GOSS was formed in 2005 with the signing of the Comprehensive Peace Agreement (CPA) that granted Southern Sudan regional autonomy. Therefore, there are differently constituted laws, policies and institutions currently in operation in South Sudan. These are: -

1. Post 2011 (post independence) laws, policies and institutions enacted and established by the Republic of South Sudan Government.
2. 2000-2011 (New Sudan) laws, policies and institutions legislated and established by GOSS and the Sudan People's Liberation Movement/Army (SPLM/A) administration.
3. Pre-2011 (pre-independence) laws, policies and institutions enacted and established while South Sudan was still part of Sudan provided they are not based on the Sharia.

The Transitional Constitution commits all levels of government in the Republic of South Sudan to sustainable development in order to ensure that the environment is protected for the benefit of both present and future generations, through reasonable legislative action and other measures.

It is worth noting that in addition to the above instruments, customary law is important in the country's legal system (see Jok et al. 2004 & USIP 2014). One of the objectives of the local government under the Constitution (a.166) is to acknowledge and incorporate the role of customary law in the local government system. With regard to land and natural resources ownership and management, and dispute resolution, customary laws plays a critical role. However, due to the

fact that these laws and practices are either not documented or easily available, the study was unable to assess them vis-à-vis biodiversity conservation, protection and management.

Because of the need to conform to the new Constitutional dispensation, many of the country's laws including biodiversity related laws are currently under review. Most of the biodiversity related laws are at various stages of development. Some have been finalized awaiting Parliamentary approval and Cabinet approval. These are referred to as Bills and Draft Policies in this report. Some are still being developed at the ministerial/sectoral level. These are referred to as Draft Bills and Discussion Drafts in this report and indicated as such.

Nevertheless, the country's biodiversity and its utility is recognized and protected through a number of government existing policies and legislations and relevant institutions.

### ***b. The Environmental Protection Bill 2013***

The major pending legislation is the ***Environmental Protection Bill 2013*** that aims to protect the Environment in South Sudan and to promote ecologically sustainable development that improves the quality of life. It grants the right to a decent environment to every person and the concomitant right to bring an action to enforce that right if it is threatened as a result of an activity or an omission.

It empowers the Ministry of Environment to supervise and co-ordinate all matters relating to the environment and to be the principal instrument of government in the implementation of all policies relating to the environment including biodiversity. This will include stock taking of the natural resources in the country and their utilization and conservation; examining land use patterns to determine their impact on the quality and quantity of natural resources, and; carrying out surveys which will assist in the proper management and conservation of the environment. That means establishing an Environmental Information Centre that will undertake an inventory of South Sudan's biological diversity and ecosystems as a priority for the Ministry.

Environmental easement can be granted through an application to further the principles of sound environment management through the imposition of one or more obligations with respect to the use of land in the vicinity of the dominant environment. This is done to preserve the flora and fauna, preserve the quality and the flow of water, preserve any outstanding geological, ecological or physiographical features of the burdened land; or restrict the scope of any activity on the burdened land; or restrict the scope of any activity on the burdened land which has as its object the mining and working of minerals, agricultural activity, and create or maintain migration corridors for wildlife.

The bill also provides for the preparation of a National Environmental Action Plan; and designation of Environmentally Sensitive Areas (ESAs) for the actual or prospective habitat of any environmentally sensitive species required to be protected for the purpose of meeting the government's international obligations under any of the Multilateral Agreements (MEAs).

The Bill provides for freedom to access environmental information and this will facilitate education and public awareness on biodiversity (section 66).

Finally, the Bill is key to addressing pollution prevention, control and waste management currently a major source of biodiversity loss and ecosystem degradation particularly by the oil and extractive industries. Coordination provisions include the management of forests offences and enforcement and conservation of biological resources *ex-Situ* in consultation with the Lead Agency (sections 33 & 39).

The Bill enacted in its current form would meet South Sudan's international obligations since it creates a framework for implementing the CBD. Nonetheless, it would have been better to include SSEMA's powers, functions and responsibilities in the *Environmental Protection Bill*. This would ensure that it is consistent with the provisions of the Bill and that the powers and autonomy granted to the Authority's would enable it to discharge its functions. The possibility of delaying the SSEMA's bill as experienced with the Environmental Bill would also affect the latter's implementation after its enactment. The Ministry has also been hindered in developing an Environmental Information Centre because of lack of capacity. This is one of the proposed strategies in the South Sudan Development Plan 2011–13.

### **3.2 Sectoral Biodiversity Legislation**

***The Wildlife Conservation and Protected Areas Bill 2015:*** The Bill cover all matters concerned with Wildlife Conservation, the establishment and management of protected areas and the sustainable management and conservation of South Sudan's natural heritage and wildlife for the benefit of its citizens.

The Bill allows local communities around PAs to manage wildlife in collaboration with the South Sudan Wildlife Service (SSWS). It also permits other organizations to manage any PA on behalf of Government.

The Draft *Wildlife Bill 2013* establishes an autonomous South Sudan Wildlife Service (SSWS) as proposed by the Constitution with a board of trustees and headed by a Director-General both appointed by the President. One of its key functions will be coordination with other relevant authorities of all issues affecting wildlife management including issues of security, infrastructure, private investment and land use planning. This will be done by ensuring the enforcement and implementation of the law with respect to the use of wildlife, the management of protected areas and other uses of natural resources.

The SSWS officers will be granted similar enforcement and prosecutorial powers as the police officers under the *Code of Criminal Procedure Act 2008* – arrest, inspection, seizure and forfeiture. SSWS will coordinate and cooperate with the local communities and facilitate their participation in wildlife management in their areas including overseeing the appropriate allocation of rights and responsibilities.

Significantly, the *Draft Wildlife Bill* increases the number of wildlife offences as well as explicitly providing for the crime of wildlife trafficking. These include illegal hunting, capture and trafficking of animals in the protected list (see **Table 4 below**). There are also offences relating to pollution, management plans, flying aircrafts in protected areas, offences committed by SSWS officers and falsification and forgery of documents issue by the SSWS.

The Bill also provides for the protection of wetlands which could potentially be in conflict with the Ministry of Environment's role (section 60). It proposes that the Ministry of Wildlife Conservation and Tourism (MWCT) be the Competent Authority with responsibility for ensuring sustainable management and protection of wetlands in coordination with the Ministry of Environment. This includes issuing regulations for the better management and protection of wetlands. It also establishes a Veterinary Services Unit to be responsible for all matters relating to wildlife disease and work in cooperation with the Ministry for Animal Resources and Fisheries (MARF). The *Wildlife Bill* also outlaws the allocation of tourism concession agreements for protected areas that have not developed general management plans.

The Bill shows serious commitment to conserve biodiversity by providing a list of wildlife species to be protected as shown in **Table 4** below:

**Table 4: A list of completely protected wildlife species in South Sudan (Draft Wildlife Conservation & Protected Areas Bill 2015)**

Completely Protected Species Schedule I		
	<b><u>Mammalia (Mammals)</u></b>	<b><u>AVIAN (Birds)</u></b>
1	Aardwolf	Birds Of Prey (All Species)
2	Beisa Oryx	Bustards (All Species)
3	Black & White Colobus Monkey	Crane (All Species)
4	Bongo	Eagles (All Species)
5	Zebra	Great Blue Turaco
6	Buffalo (All Species)	Greater Flamingo
7	Caracal (African Lynx).	Hornbills (All Species)
8	Cheetah	Ibis (All Species)
9	Chimpanzee	Night Heron
10	Eland (All Species).	Ostrich
11	Elephant	Parrots (All Species)
12	Giant Bush-Buck	Pelicans (All Species)
13	Giraffe	Saddle Bill Stork
14	Grant's Gazelle	Secretary Bird
15	Hippopotamus	Yellow Billed Stork

16	Hyrax (All Species).	Shoe Bill
17	Kudu (All Species).	Spoon Bill (All Species)
18	Lelwel Hartebeest	Vultures (All Species)
19	Leopard	White Stork
20	Lion	
21	Nile Lechwe	
22	Orynx (All Species)	<b><u>Reptiles</u></b>
23	Pangolin (All Species).	Leopard Tortoise
24	Rhinoceros (All Species).	Pancake Tortoise
25	Roan Antelope	Nile Crocodile
26	Sitatunga	Nile Turtle
27	Striped Hyena	Puff Adder
28	Water Buck	Python (All Species)
29	Wild Dog (Hunting Dog)	

The Wildlife Bill is a discussion draft whose shortcomings will have to be addressed including the need to define the nature, tenure and authority of Service (both civilian and disciplined components), the SSWS general duties and responsibilities and its overlapping responsibilities with other Ministries. Further changes will be necessitated once the country accedes to and has to domesticate the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) requirements.

**The Forests Bill 2009** is meant to operationalize the *Forestry Policy* covering all matters concerned with all forests and woodlands and all forest reserves in the country. The *Forests Bill* provides for a governance structure for all the forests in the country, national sustainable forest management standards, certification systems and schemes, and private and voluntary standards; procedures and decision-making processes, and; complaint and appeal mechanisms.

The Bill establishes the South Sudan Forest Commission (SSFC) to function as semi-autonomous body which is business oriented. The SSFC will have regulatory and administrative responsibilities relating to the management of forests on public and private lands. It makes provisions for the effective forest protection, penalties for illegal forest activities and institutions needed for sustainable management of forests. The Bill provides for the arming of the disciplined force of SSFC to carry out its functions.

The Bill also establishes a National Forest Fund (NFF) to be managed semi-autonomously to support forestry research, education and protection of forest biodiversity and heritage. It devolves forest management by making provisions for structured community participation in forests associations; and for effective protection by armed forest guards. The enactment of the Bill will ensure that the existing shortcomings in the current forest regime are addressed and more significantly will firmly establish the SSFC. Finally, to address the question of locus

standi, the Bill provides for any citizen or resident of South Sudan to petition the Court for remedy if the Bill's provisions are being violated such as failure by government agencies to undertake biodiversity and ecosystems conservation actions (section 60).

**The Timber Utilization and Management Act 2003** regulates the harvesting of forest produce by establishing a licensing and compliance regime.

**The Water Bill 2013:** provides for the protection of water sources from pollution, erosion or any other adverse effects by creating Protected Zones within a catchment draining to, or above any water facility forming part of a water supply or any catchment, lake, reservoir, aquifer, wetland, spring, or any other source of water (section 34). The Bill aims to develop procedures for prioritizing allocation of water resources for different social, economic and environmental uses, efficiency, system reliability and environmental sustainability principles. It also aims to conserve available water resources, to manage water quality and to prevent pollution of ground and surface waters; manage floods and droughts and mitigate water-related disasters, and; establish appropriate management structures including mechanisms for inter-sectoral coordination and stakeholder participation.

**The Petroleum Act:** The oil and other extractive industry activities in South Sudan is developing into one of the major culprits of biodiversity loss, ecosystem destruction in the country and adversely impacting the local community livelihoods (**see Table 5** below). Oil exploration is carried out mainly in the central flood plains of Jonglei, Lakes and Upper Nile States which are also endowed with vast natural resources including forests, livestock, wildlife and aquatic resources. The *Petroleum Act* provides that a SEIA to be undertaken by that the oil contractor or licensee in compliance with international standards to determine any present environmental and social damage, establish the costs of repair and compensation and determine any other areas of concern.

**Table 5: Oil industry activities with Potential Risks to the Environment and Biodiversity**

	<b>Prospecting (campsite, grid net clearance, access road, sounding survey)</b>	<b>Exploration (accommodation, transportation, site preparations/pads; drilling, well &amp; reservoir testing, plugging &amp; abandonment)</b>	<b>Production (infrastructure, industrial oil activities, well field development, pipelines/pumping stations, treatment facility, maintenance)</b>
<b>National parks, sensitive areas and habitats</b>	High potential risk	High potential risk	High potential risk
<b>River system</b>	Medium potential	Medium potential	Medium potential
<b>Wetlands</b>	High potential risk	High potential risk	High potential risk
<b>Soils</b>	Medium potential	Medium potential	Medium potential
<b>Ground water</b>	Medium potential risk	Medium/High potential risk	Medium/High potential risk
<b>Wilderness, key and rare species</b>	Medium potential	Medium/High potential risk	High potential risk
<b>Natural Food Resource</b>	Low potential risk	Medium potential risk	High potential risk
<b>Communities (new and existing)</b>	Medium potential risk	High potential risk	High potential risk

*Source: Repairing the Oil Legacy (Dessel 2013)*

The Ministry of Petroleum and Mining is also developing policies and measures to safeguards the environment and govern the oil and mining sector to include EIA, environmental sensitivity atlas, multi-institutional monitoring, hazardous waste management, restoration of drilling and campsites, and oil spill contingency plans. Instruments under development by the Ministry include:

- Draft Policy Framework For The Minerals and Mining Sector 2013
- Draft Petroleum Policy 2013.
- Regulations to Govern Licensing 2013
- Community Development Agreements

**The Mining Act of 2012** provides a framework for the management of the mining sector consistent with international standards, including licensing, environmental protection guidelines and the use of technology to ensure as much mineral resources as possible are recovered from the ground. It also provides for Community Development Agreements for Mining Licenses and environment and social provisions.

### **3.3 National Biodiversity Policies**

#### **The Draft National Environment Policy 2013**

The **South Sudan Environment Policy 2013** states that the country's wealth of biodiversity constitutes the foundation for South Sudan's socio-economic

development. Most South Sudanese depend on biological diversity for goods and services either directly or indirectly for their basic and development needs. The Republic of South Sudan (RSS) has a lot of biological resources that are of considerable economic, social and intrinsic value. On the one hand, there is a wealth of general information from literature on how to protect, conserve and manage the biodiversity. On the other hand, there is a paucity of essential information and capacities to facilitate the implementation based on the scientific data. In particular, the lack of an inventory of South Sudan biological diversity is critical as it impacts on the ability of the country to provide the most appropriate framework for conservation.

The goal of the South Sudan *National Environment Policy 2013* is to ensure the protection, conservation and sustainable use of the natural resources of South Sudan without compromising the tenets of inter-generational equity. This includes maintaining the balance between the environment and development needs through sustainable use of the natural resource base; creating public awareness of the importance of protecting the environment; and providing the basis for formulation of biodiversity and ecosystem protection and management policies, laws and guidelines.

On the conservation of biological diversity, the policy calls for the development and implementation of a National Strategy and Biodiversity Action Plan for South Sudan. It also urges for:

- Promoting coordination, cooperation and participation of all relevant stakeholders in conservation and sustainable use of biodiversity across all sectors of the economy;
- Encouraging a Green economy initiative to enhance low carbon and resource efficient economy as well as promoting carbon sequestration;
- Promoting national integrated approaches for conservation and sustainable use of biodiversity and protection of aquatic ecosystems and life;
- Implementing the Multilateral Environmental Agreements (MEAs) related to biodiversity;
- Supporting communication, education and public awareness programmes on the importance and benefits of conserving the biodiversity to the citizens and their livelihoods;
- Sharing the benefits of biodiversity conservation and sustainable use with local communities and stakeholders;
- Discouraging introduction of invasive and alien species and where such species are available manage and control properly to avoid adverse impacts on local environment;
- Promoting ex-situ conservation of biodiversity; and
- Encourage conservation and cultivation of herbal, medicinal and economic plants.



The Policy also provides for the establishment of an autonomous South Sudan National Environmental Management Authority (NEMA) to act as the watchdog on all public institutions, private companies and individuals defaulting against the stipulated environmental laws and regulations.

The Policy calls for developing a national strategy and mechanisms for climate change adaptation and mitigation; and formulating a climate change policy for South Sudan. It encourages the formulation and enactment of laws that maintain and preserve ecological functions, integrity of forests, conserve biological diversity, water and soil resources of fragile ecosystems, and; promoting passive and non-invasive forest management activities as alternative sources for income generation (livelihood improvement) e.g. honey, gum, silk etc. harvesting.

### 3.4 Sectoral Biodiversity Policies

There are many policies in South Sudan which are at various stages development while others were developed before and after independence. Some of the policies and laws referred to in this report are listed in **Table 6** below:

**Table 6: Some of the policies and laws reviewed in this report**

Sector	Document	Year
Overarching	The Interim Constitution of Southern Sudan	2005
Agriculture	The Food & Agriculture Policy Framework	2006
Animal Resources	Animal Resources Sector Policy & Strategic Plan 2006-2011	2006
Environment	Environmental Protection Bill	2010
Environment	Southern Sudan Environmental Management Action Plan, (SSEMAP) (2007-2016)	2007
Environment	Southern Sudan National Environment Policy	2010
Environment	Draft National Environment Policy	2015
Environment	Environment Protection Bill	2015
Fisheries	Fisheries Sector Policy & Strategic Plan 2006-2011	2006
Forests	The Forest Policy Framework	2007
Forests	The Forest Bill	2009
Land	Draft Land Policy	2010
Land	The Land Act	2009
Local Government	The Local Government Act	2009
Mining	Mining Bill	2010
Mining	Mining Act	2012
Petroleum	Draft Petroleum Policy	2010
Water	Water Policy	2007
Wildlife	Wildlife Conservation & Protected Areas Bill	2015
Forestry	Timber Utilization and Management Act	2003
Water	Water Bill	2013

**The South Sudan Wildlife Conservation and Protected Area Policy (Draft of June 2012):**

Envisions an effective and professional Wildlife Service that will guide the sustainable management and utilization of natural resources, including land, water, fauna and flora for the benefit and enjoyment of the people of South Sudan. It provides for the formulation of legal frameworks for rationalizing the protected area system and wildlife utilization and benefit sharing. It also recognizes and addresses the following:

**Security** – effective security of both people and wildlife is essential for the successful restoration and management of wildlife and protected areas in the country. It sets out strategies including removal of mines, disarmament especially around protected areas; maintaining appropriate disciplinary code; sensitization and awareness raising initiatives on the value of wildlife, and establishment and maintenance mechanisms for inter-agency cooperation in enforcement of wildlife laws and supporting local, national and international law enforcement agencies in combating wildlife related crimes, and; developing conservation security partnerships with key communities around protected area to improve security, mitigate conflict, reduce poaching and generate local benefits.

**Landscape management** – recognizes that conservation and management at landscape level is required to maintain the integrity of ecosystems, habitats, species and genetic diversity, and the health of environmental services. Strategies include: integrated planning to ensure that wildlife conservation is adequately integrated into wider economic, development and infrastructure planning processes that shape landscape and habitats in critical ways; land-use planning especially important in maintaining wildlife habitats in areas outside protected areas, and tourism development to enhance the use and value of wildlife and protected areas.

**The Forest Policy 2014:** lays down a clear institutional and governance framework for forests at all levels across the country. It recognizes the importance of forests for commerce, communities, and conservation, and sets forth a series of implementation and institutional measures. It introduces strict measures to protect the permanent forest estate and to prevent changes in forest boundaries without legislative approval. The policy provides clarity on ownership and management responsibilities for forest reserves throughout South Sudan e.g. the national government is to take ownership of all previous Central Forest Reserves (CFRs) and ensure their effective management and protection as National Forest Reserves (NFRs). In addition, the Ministry is to delineate and gazette other forests as NFRs toward achievement of the country's development goal of 20% of land area being covered by forests.

The Policy provides for the establishment of the South Sudan Forest Corporation (SSFC) whose primary role will be to provide regulation and operational standards

for a vibrant forest sector, as well as administration and implementation of NFRs; the Ministry will provide oversight. The primary role of State Governments will be for implementation of forestry programmes and plans on State Forest Reserves (SFRs); they may also assist in the administration of forests managed by sub-State authorities and private individuals. In addition, SSFC will enter into partnerships with State Governments, communities, and the private sector in implementation of national and state forest plans.

Development of institutional mechanisms for local communities to formalize tenure and management rights over forests on community lands is required under the Policy as well the delegation of rights enabling co-management of forests across different levels of government under the Policy. The rights and responsibilities of national government, States, and Counties over key matters such as revenue collection, revenue distribution and benefit sharing issues are clarified. Additionally, it develops a basic policy approach to key forest resources such as charcoal.

The Policy also strengthens provisions and guiding principles on forest product regulation, utilization, and marketing. It includes a clear description and policy approach to forest concessions. It also incorporates consideration of Reduced Emissions from Deforestation and Forest Degradation (REDD) as a new opportunity for financing forest management and strengthening both local forest benefits and resources for conservation.

***The Agriculture Sector Policy Framework for 2012-2017*** aims at enhancing measures to mitigate the adverse effects and impacts from climate change in the medium and long-term. The Ministry of agriculture in collaboration with the Ministry of Environment is developing a National Adaptation Programmes of Action (NAPA) to identify priority activities that respond to South Sudan's immediate needs to adapt to climate change and to formulate a Climate Change Country strategy. The Ministry of Agriculture has also outlined a green agriculture policy (adopting agricultural practices that minimize environmental pollution and promoting agro-forestry practices) as well as mainstreaming gender in agricultural activities. It also intends to prepare a Dry Land Initiative and an Irrigation and Drainage policy, which will further enhance the country's biodiversity and ecosystem conservation.

*The Agriculture Sector Policy Framework for 2012-2017* also provides for the protection of plants, seed management, and development of plant genetic resources conservation programme and a biosafety framework. Biosafety regulations seek to reduce and eliminate the potential risks resulting from GMOs. The Ministry of Agriculture will use these measures to ensure the conservation and protection of South Sudan's genetic resources from GMOs.

The Agriculture Policy recommends a well-managed GMOs policy to ensure stability and diversity of South Sudan's indigenous genetic resources for enhancing agricultural development. This will include preparation of a GMO policy that ensures

biosafety of the GMOs and their environmental appropriateness where proven to contribute to food security or commercial interests of the country, and the enactment of appropriate legislation.

The Agriculture Policy Framework also recommends formulation of a law to regulate importation and use of GMOs in South Sudan. The *Agriculture Policy* also calls for the promotion and support for research in germplasm utilization, and to enhance information exchange.

The Agriculture Ministry will also develop a sustainable programme for the conservation and judicious utilization of plant genetic resources to enhance agricultural development. This will include promoting in-situ and community conservation and management of plant genetic resources and creating awareness on plant genetic resources. It will also establish a plant genetic resource centre for indigenous plants.

In order to ensure the protection of crops from pests and diseases, the Agriculture Ministry will enhance the institutional framework for promotion of sustainable crop pest and disease management and ensuring accessibility of organic and inorganic pesticides by farmers. In addition, the Ministry will enhance seed management in the country by adopting EAC and internationally accepted protocols for seed testing, multiplication and distribution. The formulation and adoption of a Plant Protection Policy and a Seed Policy will constitute the backbone of this conservation and protection strategy.

***The Ministry of Animal Resources and Fisheries (MARF) Policy Framework and Strategic Plan 2012 -2016:*** aims at promoting best animal husbandry practices to reduce environmental degradation; and promote sustainable management of rangelands and pastures through integrated range management practices. The Department of Range Management collaborates with relevant agencies in range and livestock research, wildlife activities and water development for livestock use. Some of the Strategic objectives include improving the utilization and conservation of rangelands and water resources by mapping livestock migratory routes and grazing areas, and establishing water catchments. Activities include developing mechanisms for drought preparedness and Undertaking efforts to institutionalize community involvement in natural resources management.

Similarly, the scourge of cattle raiding contributes to the destruction of biodiversity and ecosystems by hampering institutions from carrying out their mandate especially the Wildlife Service. The Ministry will promote the criminalization of cattle rustling and sensitize and train communities on issues related to risks of cattle rustling.

***The Fisheries Policy for South Sudan 2012–2016:*** provides for a framework to manage fisheries resources of the country so as to maximize production and avoid over fishing and to prevent destruction of wetlands and promote their conservation. One

specific objective of the policy is to maintain a healthy environment and ecosystems by adopting measures to prevent environmental damage to aquatic systems through pollution and environmental degradation; ensuring that compulsory Environmental and Social Impact Assessments are undertaken for all developments that affect fisheries, including large scale aquaculture developments, and; observe all international treaties and protocols on the environment and biodiversity. Among other things, it seeks to protect the 'flyways' of migratory birds; and protect fishing communities and fish habitats against both encroachment and pollution. The current legislation (*Freshwater Fisheries Act 1954*) is too out of date to be effective and a new *Fisheries Bill 2012* that seeks to implement the policy goals is under development.

**The Mining Policy** recognizes the need to ensure that mining operations are conducted in a socially and environmentally responsible manner by minimizing harmful impacts of mining and that the interests of local communities are fully considered and protected.

### **3.5 Institutional Framework for Biodiversity Conservation and Management**

Biodiversity management in South Sudan is a shared responsibility between Central and regional Governments. Management arrangements emphasize participation by stakeholders. Overall, the institutional arrangements appear to be adequate at Central Government level. However, there are challenges concerning institutional mandates, capacities and institutional collaboration. Arrangements for international cooperation also face challenges of legal recognition, coordination as well as capacities to perform at international arena. National arrangements for biodiversity management are described below:

#### **The Transitional Constitution**

The Transitional Constitution of the Republic of South Sudan (2011) under articles 41&46 provide that every person shall have the obligation to protect the environment; and the right to have the environment protected for the benefit of present and future generations, through appropriate legislative action and other measures that:

- prevent pollution and ecological degradation;
- promote conservation; and
- secure ecologically sustainable development and use of natural resources while promoting rational economic and social development so as to protect genetic stability and biodiversity.

Therefore, environmental management, conservation and protection are a national, state and local government responsibility as well as an obligation for every South Sudanese. Biodiversity conservation, management and protection is a shared competence between the National and State governments having legislative and

executive competences. Local communities through their administrative structures and representatives are granted certain rights and powers of decision-making over biological resources in their land by the Constitution and the customary law system described below (see annex 5 for division of powers and responsibilities relating directly or indirectly to environmental governance). In addition, various biodiversity related laws are in existence or under development to operationalize the constitutional imperatives.

South Sudan government is structured into the following organs; executive, the legislature and the judiciary. The country has a federal governance structure with the following administrative units:

- National Government
- State Government
- Local Government
- Traditional Authority

South Sudan is divided into ten States – Central Equatoria, Western Equatoria, Eastern Equatoria, Jonglei, Upper Nile, Northern Bahr el Ghazal, Western Bahr El Ghazal, Warrap, Lakes and Unity states (refer to Map 1). The Interim Constitution of Southern Sudan 2005 increased the number of States from the previous 3 regions of Upper Nile, Equatoria and Bahr el Ghazal to create the 10 states. There are 89 counties. Within the Counties, there are the Payam and the Boma administrative units. These administrative divisions, which have been in existence before independence, form the Local Government.

Traditional Authorities are institutions of traditional system of governance. They are semi-autonomous authorities at the State and local government levels which administer customary law and justice in the customary law courts; and exercise deconcentrated powers in the performance of executive functions at the local government levels within their respective jurisdictions. Two types are recognized under the *Local Government Act 2009* (section 113): (a) Kingdoms with centralized monarchical systems of rule covering the territorial areas of one or more counties, and (b) Chiefdoms with decentralized system of rule, which perform traditional and local government functions covering the territorial area of counties where the traditional authorities are organized on the basis of lineages and clans.

The South Sudan legislative branch is bicameral consisting of the National Legislative Assembly (332 seats) and the Council of States (50 seats).

### 3.6 National Institutions

The lead ministries that specifically provide biodiversity and ecosystem protection, conservation and management are the **Ministry of Environment (MoE)**, **Ministry of Wildlife Conservation and Tourism (MWCT)** and **Ministry of Agriculture, Forestry and Rural Development (MAFRD)**. Besides, in the *South Sudan Development Plan 2011–13*, environment is one of the seven crosscutting issues addressed throughout the Plan with various sectoral obligations towards the environment. The Plan is the country's recent framework for development outlining the Government's key priorities in the areas of governance, economic growth, social and human development, conflict prevention and security. The Plan also recognizes the need to protect and sustainably manage natural resources and environment through development of environmental, wildlife and protected area policies, laws and environmental process; anti-poaching and law enforcement; raising environmental awareness; conducting surveys, research, monitoring, development of protected areas infrastructure, and; the development of an Environmental Information Centre. These are to be implemented by the relevant ministries concerned with biodiversity as discussed below.

However, despite these challenges, a Wetlands and Biodiversity Working Group has been established by MoE comprising of members from biodiversity sectors including wildlife, land, water, forestry, agriculture, and animal resources. This Working Group is under the Ministry though membership overlaps with the NRMG members.

#### 3.6.1 Ministry of Environment

The Ministry is the lead institution for environment and biodiversity protection in South Sudan. Its priority work programme includes the development of a policy and regulatory framework for wetlands and biodiversity management, capacity building and strengthening of partnership with stakeholders (particularly for the justice and legislative institutions that contribute to delay legal and policy reviews, acceding to and implementing MEAs and environmental audit and assessment.

The Ministry of Environment has established various Directorates including **Directorate of Wetlands and Biodiversity** whose main functions is to ensure that the wetlands, biodiversity and any natural features in South Sudan are protected and ensure their sustainable use.

**The Directorate of Climate Change and Meteorology** that develops and implement programmes to address issues of climate change and coordinate the implementation of South Sudan's obligations under the United Nations Framework Convention on Climate Change (UNFCCC).

The Draft *National Environment Policy* stresses that the institutional framework for implementation should reflect the federal character of the country and establishes environmental governance institutions at the national, state and local levels of government. The institutional structures and mandates for implementing the Policy comprise of the National Government of RSS, the ten State governments and the local governments, which includes the County, Payam, Boma and Town Councils in the states. These structures are all assigned roles and responsibilities for biodiversity and ecosystem protection and management.

Importantly, the *National Environment Policy* calls for strengthening of local community's role in environmental management. These include the establishment of community based organizations which are expected to play a pivotal role in advocacy on sustainable management of biodiversity and ecosystems through mobilizing and sensitizing local people; supporting local group participation in biodiversity management; and ensuring that the concerns of the underprivileged are integrated in to the national development plans.

Finally, the Ministry, as the lead agency for environment, is expected to monitor and ensure compliance with environmental laws in the country. One such law is the *Investment Promotion Act 2009*, which provides for the promotion and facilitation of investment in the country. It requires investors to observe and implement environment friendly corporate rules and regulations to preserve the water and river banks, flora and fauna and ecosystem biodiversity; redeem or repair the land to the natural status after use or expiry of mining activities; be responsible for solid waste management and disposal of waste and toxic substances, and; ensure responsible management of clean air and clean water (ponds, rivers, streams and swamps/wetlands). Failure to design and implement environmentally friendly rules and regulations is an offence inviting fines, damages payment and removal of waste where applicable. But as stated earlier, the Ministry has been hampered in discharging its obligations by among others lack of capacity and inadequate legislative foundation.

### **3.6.2 Ministry of Wildlife Conservation and Tourism**

A protected area is an area of land or water in South Sudan specifically protected for the maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means including national parks and game reserves. The wildlife and forestry departments manage and oversee most of the protected area system in the country. The Ministry of Wildlife Conservation and Tourism (MWCT) protected area system includes national parks and game reserves (**Table 7**).



**Table 7: Protected areas under the Ministry of wildlife Conservation and Tourism**

Protected Areas under MWCT			
	National Parks	Game Reserves	Others and Proposed
1	Badingilo National Park (1986)	Ashana Game Reserve (1939)	The Sudd (Ramsar Site 2006)
2	Boma National Park (1986)	Bangangai Game Reserve (1939)	Imatong Mountains (NCA)
3	Lantonto National Park (1986)	BireKpatous Game Reserve (1939)	Lake Ambadi (NCA)
4	Nimule National Park (1952)	Boro Game Reserve	Lake No (NCA)
5	Shambe National Park (1985)	Chelkou Game Reserve (1939)	Imatong FR (1952)
6	Southern National Park (1939)	Fanyikang Game Reserve (1939)	
7		Juba Game Reserve (1939)	
8		Kidepo Game Reserve (1975)	
9		Mbarizunga Game Reserve (1939)	
10		Mushra Game Reserve.	
11		Numatina Game Reserve(1939)	
12		Zeraf Game Reserve (1939)	

**Source: Wildlife Conservation and Protected Areas Bill 2015**

MWCT is the lead agency whose main role is the protection, conservation and management of wildlife resources in South Sudan through the Wildlife Service. The Service core mandate under the Constitution is to protect the country's wildlife and to preserve and conserve the natural habitat of flora and fauna. All protected areas and the wild animals therein remain the property of government on behalf of the people. The Wildlife Department is well established in the country with offices in each state and localities where protected areas are located. The *Wildlife Forces Act 2003* established a decentralized system with the following organizational structures of the wildlife forces (section 5):

- a) At headquarters which includes the Director-General of Wildlife Forces; Deputy DG, Assistant DG, Directors for Administration, Wildlife Management, Law Enforcement (Anti-poaching), Tourism, Fisheries and Production, Training and Planning, and Wildlife Conservation College and Research
- b) In the Regions - Wildlife Conservation Regional Directors
- c) At County level - Senior Inspector
- d) At Payam level - Senior Wildlife Officer
- e) In the National Parks: Senior Park Warden, Assistant Park Warden, and Warden.

The recently constituted Wildlife Service derives its authority from the Constitution (articles 152&157) and subject to the enactment of a new law, still derives its functional systems from the *Wildlife Forces Act 2003* and the *Wildlife Protection and Conservation Act of 2003*. The Constitution provides that the Wildlife Service shall be organized at the National and the state levels headed by a Director-General of Wildlife. The Service must coordinate and cooperate with the local communities on

the protection and management of wildlife within their areas. The Service guiding principles are:

The Service also manages wildlife outside protected areas albeit with difficulty. This is particularly acute in the protection of migratory species, which takes place outside protected areas and are impacted by anything along their path. When there is water and grazing shortage, MWCT power to intervene is limited to providing water to the animals. Due to capacity and resource constraints, they are unable to even provide fodder. Another major challenge facing the Ministry is the irregular granting of concessions in or near protected areas to businesses such as oil companies, airstrips and eco-tourism companies.

Some organizations such as Wildlife Conservation Society (WCS) have been supporting MWCT to build infrastructure in the protected areas, offices and ranger posts in Badingilo, Boma and Southern National Parks.

The secretariat referred to the then Secretariat of Wildlife Conservation, Environment Protection and Tourism, headed by the Director General. The *Wildlife Forces Act 2003* provides for the Wildlife Forces to be deployed for the protection, preservation, conservation, management of Wildlife and Environment, detection, apprehension and prosecution of poachers, protection of clients, visitors and tourists, custody of exhibits on behalf of the Secretariat (section 10).

#### **a. Wildlife Service**

The Wildlife Service's mandate under the *Wildlife Service Act 2011* is to:

- (a) conserve, manage and administer national parks, wildlife reserves or other protected areas according to law and in a manner consistent with the agricultural and pastoral activities of nearby settled communities;
- (b) develop, in collaboration with other competent authorities, tourism based on wildlife which contributes to the social and economic welfare of South Sudan and the communities proximate to the National parks or game reserves;
- (c) combat illegal hunting, trade in protected animals and trophies, by detecting, apprehending and causing to be prosecuted illegal hunters, poachers or illicit traders in animal trophies;
- (d) conduct research and monitor wildlife resources with a view to their optimization, preservation, conservation, management, and protection;
- (e) promote education and the dissemination of information about wildlife resources in Southern Sudan;
- (f) undertake any administrative and technical tasks to ensure that the Wildlife Service is sustainably managed in Southern Sudan; and
- (g) perform any other function or duty assigned to it under this Act or any other law.

The Act applies to all officers and other ranks in the Wildlife Service in South Sudan. The Service is headed by a Director General (DG) who is in charge of the superintendence, administration and discipline of the Service, which is decentralized as required by the Constitution. The regional and other units of the wildlife forces are under the command of the DG who delegates his powers to the officer in charge of any unit. Central government is in charge of national parks while the states oversee game reserves and wildlife outside protected areas. However, the Wildlife Service is subject to military law (section 15). In the current institutional framework and political environment, this could make it the Service ineffective having to respond to conflicting exigencies thus the need to formulate new laws.

## **b. Challenges for Wildlife Service**

The SS Wildlife Service currently faces a number of challenges in discharging its functions. These include:

- *Lack of Legal and Regulatory Framework* – The laws are inadequate for the Service to undertake its functions effectively in the new constitutional environment and the new challenges facing the country's wildlife. For instance the laws that created the buffers for the protected zones are untraceable. The proposed law (discussed below) has a provisional clause to protect the parks while the government seeks the original documents to facilitate their re-gazettement.
- *Low Capacity at SSWS.* Wildlife Service personnel lack technical know-how and training, are ignorant of wildlife and related laws and there are high levels of illiteracy. The Service is bloated with most of the staff being former soldiers. Literacy and knowledge of wildlife is even less in state and field offices. Further, decision makers are old and militarized, which hampers the work of the technocrats to implement policy. There is need to retrain the staff, and strengthen the ecology side of MWCT. There is also widespread interference from government officials allowing offenders to avoid the law. The criminal justice system (prosecutors and courts) also needs to be capacitated as most do not know how to conduct and effectively determine wildlife cases. (Under utilize capacity, personnel with technical know how are not assigned duties)
- *Limited Community Engagement by the Service.* There is also inadequate interaction between the Wildlife Service and communities. There is a lack of awareness amongst local communities about importance of wildlife and the sustainable and legal use of natural resources. Hence, the widespread incidents of bush meat hunting and charcoal burning. MWCT has failed to air essential programmes on conservation and wildlife laws in the country. Meanwhile human-wildlife conflict is on the increase. In Badingilo NP, hippos and crocodiles have been attacking humans in their search for food while

birds eating the farmers' grain in the field another source of conflict. The potential for diseases transmission across wild and domestic animals and humans is high as well. There is also competition for pastures for the wildlife with the pastoral communities, e.g. during drought period, Boma National Park is invaded by communities which increases insecurity in the protected areas.

- *Financial and resources commitment* - Government must allocate financial resources to the conservation efforts and initiatives. Currently, SSSWS lacks adequate personnel, equipment and facilities – offices, vehicles and communication equipment. Research suffers due to the lack of adequate finance and staff. The long war meant that many NGOs who could have supplemented government efforts shied away.
- *Enforcement Shortcomings* - including the need too create penalties that have a more deterrent effect and distribution, dissemination and sharing information of on biodiversity conservation in South Sudan. Effective intelligence collection by SSWS and law enforcement is also lacking. There is need to develop information databases and monitoring systems to guide focused, effective, and adaptive wildlife protection interventions.
- *Poor infrastructure* – lack of roads, facilities and equipment, and communities isolated.
- *Insecurity* - Influx of firearms associated with war and greater deployment of armed forces; and conflict with cattle rustlers who engage in child kidnapping (Murule of Kibor County) in exchange of cattle.

### **3.6.3 Ministry of Agriculture, Forestry and Rural Development**

The Ministry is charged with the responsibility of increasing agricultural productivity in order to improve food security and contribute to economic growth, environmental sustainability and to facilitate and encourage equitable and sustainable development towards improved livelihood through sensitization, mobilization, capacity building and direct involvement of rural communities in their own development. South Sudan is currently under-utilizing its potential agricultural resources (See Table). This means that more than 70% of the country's raw agricultural and processed food products are imported from neighbouring countries putting its food security at risk. Expansion of the agricultural land in turn may result in the destruction of ecosystems and biodiversity unless well managed.

**Directorate of Agriculture:** South Sudan has a wealth of diverse genetic resources that are important for maintaining an efficient and sustainable farming industry. These allow development of varieties and breeds to cope with new demand and

climate changes. The Ministry observes that the genetic diversity has been maintained in South Sudan through the long tradition of conserving seeds. But that unregulated introduction of invasive alien and GMO species could result in genetic erosion, and local landraces and species could be replaced by new varieties and species and lost through environmental degradation and desertification. Therefore there is need to put in place measures to protect and conserve the country's genetic and biological resources by managing the introduction and impact of these alien species.

The Ministry, which is responsible for water hyacinth control (and other invasive plant species) is only monitoring infestations and lacks capacity to respond to the spread of the species.

**Directorate of Forestry:** Forest reserves are also managed under the Ministry of Agriculture, Forestry and Rural Development. Forests provide the main locus for biodiversity and are the main habitat for wildlife in South Sudan in an estimated total area of 191,667 km<sup>2</sup>, about 30% of total land area. The Ministry is mandated to develop and implement policies, objectives and strategies for development of agricultural sector in the area of Forestry in South Sudan. To protect the country's forest resources, sanctuaries for forestry biodiversity shall be established and a system for delineation of various types of natural woody vegetation as required for conservation of biodiversity be set up as prescribed by the *Forest Policy 2014*. This system should conserve and manage unique forest areas, wetlands, and biodiversity to implement relevant international conventions, including the World Heritage Convention, Ramsar Convention, and the Convention on Biological Diversity (CBD).

Sawn timber accounts for the bulk of timber removal from natural forests and is one of the major industrial forest products consumed in the country (both local and imported woods). The lack of adequate and regular electricity energy supply in the country means that firewood or charcoal for cooking is the main source of energy for most South Sudanese. Though it is an environmentally friendly source of energy, the extensive use of firewood and charcoal has been unsustainable resulting in forest degradation.

Forests in South Sudan are categorized for management by the Directorate of Forestry in the Ministry of Agriculture, Forestry and Rural development as:

- **Commercial forests** – intensively managed plantation and natural woodlands that provide timber for commercial purposes. Subdivisions include industrial and non-industrial plantations, reserved natural forests and those managed for other purposes e.g. gum-arabic, tannins, fuel wood, etc. silviculture is practiced here

- **Protection forests** - these are plantation and natural forests managed for protection against winds, windbreaks, creeping sands, soil erosion and water conservation replenishment of soil fertility. E.g. planting along Jonglei canal
- **Community forests** - These are plantation in or around major settlements areas for productive functions e.g. fuel wood and poles for local communities
- **Recreational forests** - Plantations established purely for recreation or aesthetic purposes e.g. shade trees, zoos and national parks.

### 3.6.4 Ministry for Electricity, Dams, Irrigation and Water Resources

Much of South Sudan lies within the watershed and sub-basins of the River Nile, a fact that makes the sustainable use and management of water resources critical. The Ministry manages water resources according to the following principles:

- Water is commonly owned by all riparian people
- Water is an economic and social good. The criteria for optimal allocation shall include social equity, economic efficiency, system reliability, and environmental sustainability
- Water resources planning and development shall be undertaken at the lowest appropriate administrative level with the active participation of water users and stakeholders

Effective water resources management requires an integrated approach. The relevant Ministry Policy documents that impact on biodiversity and ecosystems include:

- *Water Policy 2007*
- *Water Bill 2013*
- *Water, Sanitation and Hygiene (WASH) Sector Strategic Framework 2011*

The Water, Sanitation and Hygiene (WASH) Sector Strategic Framework 2011 provides outlines of optimized water allocation measures on an equitable and sustainable basis. One of the identified strategies is monitoring the social and environmental impacts of water resources management, and also generating and adapting complementary knowledge. This is to be done within the environmental and social management framework.

### 3.6.5 Ministry of Animal Resources and Fisheries

**Directorate of Animal Resources:** South Sudan has a large human population whose major livelihood activity is pastoralism though animal production on a commercial scale only minimally exists. The population of livestock including cattle, sheep, goats

and camels is thought to exceed 20 million (UNDP, 2012). But there is no readily available data on the animal population or the rangeland areas in South Sudan. Nonetheless, it is believed overgrazing; recurrent droughts and depletion of forest cover are depleting the rangelands and their biodiversity. The Ministry has developed *The Ministry of Animal Resources and Fisheries (MARF) Policy Framework and Strategic Plan 2012 -2016* to stem the tide. The plan will be implemented by the Department of Range Management in collaboration with relevant agencies in range and livestock research, wildlife activities and water development for livestock use.

The scourge of cattle raiding contributes to the destruction of biodiversity and ecosystems by hampering institutions from carrying out their mandate especially the Wildlife Service. The Ministry will promote the criminalization of cattle rustling and sensitize and train communities on issues related to risks of cattle rustling.

**Directorate of Fisheries** - One major environmental impact due to improper fishing and over exploitation would be the gradual decline in fish stocks and loss of species biodiversity. The *Fisheries Policy for South Sudan 2012–2016* provides for a framework to manage the fisheries resources of the country.

**Directorate of Veterinary Services:** The Directorate of Veterinary Services in the Ministry of Animal Resources and Fisheries is responsible for preparing and enforcing laws governing livestock diseases control/eradication and the safety of food of animal origin. This includes safeguarding public health by tracking animal diseases transmissible to humans as well as domestic animal disease control.

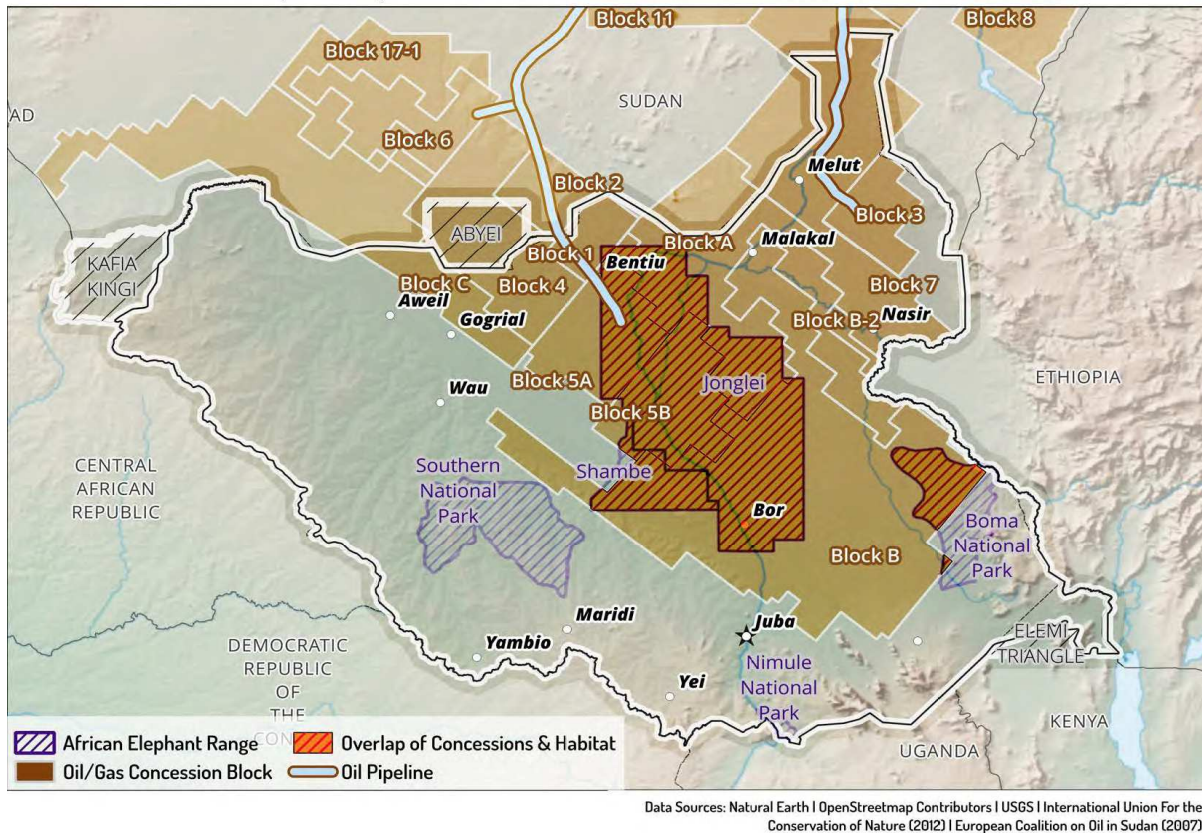
### **3.6.6 Ministry of Petroleum and Mining**

The oil and other extractive industry activities in South Sudan is developing into one of the major culprits of biodiversity loss, ecosystem destruction in the country and adversely impacting the local community livelihoods. Oil exploration is carried out mainly in the central flood plains of Jonglei, Lakes and Upper Nile States which are also endowed with vast natural resources including forests, livestock, wildlife and aquatic resources. **Figure 4 below** shows concessions for oil and gas granted in Jonglei-Boma landscape, which constitute one of the largest elephant range in the country.

The extractive companies clear vast amounts of land to explore without providing adequate compensations to cure the land despite the Constitution requiring all levels of government to develop energy policies that ensure that the basic needs of the people are met while protecting and preserving the environment. In fact, the explorations contaminate aquatic life and poison the soil and vegetation, which if consumed by livestock transmit carcinogenic minerals. The Ministry of Environment and other relevant agencies do not properly monitor EIA and environmental

auditing. This is occurring despite the fact that policies and laws that govern these industries are already in existence.

### 6 - Overlap of Elephant Habitat & oil/Gas Concessions in South Sudan



**Figure 4: Overlap of elephant habitat and oil/gas concessions in South Sudan (WCS, 2015)**  
South Sudan Office

### 3.7 Key Observations on the Legal, Policy and Institutional Frameworks in South Sudan

Generally environment and biological resources are protected and managed by a number of government departments and institutions. Most of the biodiversity and ecosystem protection and management powers are shared across sectors and governance levels from national to community level.

The biodiversity management frameworks in South Sudan include:

1. Institutional and Policy Framework for land use planning and management
2. Institutional and Policy Framework specific to biodiversity and ecosystem protection and management



### 3. Institutional and Policy Framework related to biodiversity and natural resources use

One of the main obstacles to biodiversity conservation and management in South Sudan is policy and legislative development. This process has been slowed by the lack of capacity in the biodiversity ministries and relevant supporting institutions particular the Ministry of Justice and Parliament. It has also been adversely affected by a lack of clarity in the mandate of the ministries in relation to specific biodiversity issues.

**Policy and legislative formulation process:** At present a government Ministry formulates laws that have to be submitted to parliament for enactment, but they have to pass through the Ministry of Justice before being tabled in parliament. Considering that South Sudan's institutional and policy framework for biodiversity are undergoing major changes, the Ministry's role is particularly essential because of the number of new legal documents being developed. Though the Ministry of Justice does not play a substantive role in the development of biodiversity laws and policies, it is a key actor in terms of ensuring that proposed biodiversity laws and policies are compatible with the Constitution and not in conflict with other existing laws.

The Ministry of Justice needs sensitization on the importance and urgency of enacting biodiversity related laws although the Ministry does not have the resources to implement such an activity. Also, for MEA accession, the treaty access process is a challenging concept for most of the Ministry staff. For instance, the biodiversity related Ministries are constantly explaining the difference between accession and domestication (national ratification) for an MEA and the need for each. Like most of the government institutions, the Justice Ministry faces the same capacity challenges that biodiversity ministries (responsible for environment, wildlife, water, animal resources, forestry, land) are experiencing. The situation is dire to the extent that the Ministry does not even publish legal documents in hard copies. Yet the Ministry's support is crucial to fast tracking the pending biodiversity draft policies and bills and the MEA accession instruments.

The implementation of many of the proposed biodiversity and ecosystem management programmes is currently hampered by a lack of effective legislative framework since the enactment of the *Environmental Protection Bill* of 2013 has been pending for number of years. Lack of resources and human capacity is another major hindrance to implementing the Ministry's current Strategic framework. Therefore priority activities essential to the conservation and management of the biodiversity and ecosystems such as inventorying the country's biological diversity, legal frameworks development, management plans, developing NBSAP and ratifying pending key MEAs, and establishing management bodies at the community level, have not been achieved.

There is also the need to demystify biodiversity and emphasize its importance to the country's policy makers.

Outside the Ministry of Justice and parliament, the main challenge currently experienced in the policy and legal development is infighting among Ministries particularly in MEA accession and attendant domestication of the same. For instance, the assignment of certain biodiversity issues such as developing the law on the Nagoya Protocol being assigned to wildlife rather than to the Environment Ministry. There is also the language and communication barrier – i.e. the scientist v. the administrator; or technical personnel v. political supervisors. This is primarily a case of a lack appropriate capacity and deployment of personnel, a problem that is not unique to the biodiversity sector but is prevalent in most government institutions in South Sudan.

## **PART II: IMPLEMENTATION OF THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN**

### **1.0 INTRODUCTION**

#### **1.1 Brief Background to NBSAPs**

The legal basis for the National Biodiversity Strategy and Action Plan (NBSAP) is Article 6 of the Convention on Biological Diversity (CBD) which requires Parties to the Convention to develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt for this purpose existing strategies, plans or programmes which shall reflect, *inter alia*, the measures set out in the CBD relevant to the Party concerned. Article 6 further calls upon Parties to integrate, as far as possible and appropriate, the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programmes and policies.

NBSAPs are key implementation tools of the CBD and hence help to address all its three objectives namely the conservation of biological diversity, sustainable use of the components of biological diversity and the fair and equitable sharing of benefits arising from utilization of genetic resources. Through the NBSAP actions are identified and prioritized in order to meet the objectives of the CBD at the national level and to devise a plan on how to align it to the Strategic Plan Biodiversity 2011-2020 and other emerging issues such as climate change, oil and gas, among others.

#### **1.2 The Strategic Plan for Biodiversity 2011-2020**

The Strategic Plan for Biodiversity 2011-2020 was adopted by Parties to the CBD during the 10<sup>th</sup> meeting of the Conference of the Parties (COP) to the CBD in October 2010 in Nagoya, Japan. The Vision of the Strategic Plan is “By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people”. The Mission is to “take effective and urgent action to halt the loss of biodiversity by 2020. In order for the Mission to be achieved, pressures on biodiversity have to be reduced, ecosystems have to be restored, sustainable use of biodiversity has to be promoted, benefits arising out of the utilization of genetic resources have to be shared in a fair and equitable manner; adequate financial resources have to be provided, capacity to be enhanced, biodiversity issues and values should be mainstreamed. The Strategic Plan has five strategic goals namely:

- a) Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- b) Reduce direct pressures on biodiversity and promote sustainable use
- c) Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

- d) Enhance the benefits to all from biodiversity and ecosystems services
- e) Enhance implementation through participatory planning, knowledge management and capacity building

Each of the above strategic goals has global targets referred to as the Aichi Targets. In total there are 20 targets. COP10 urged Parties to the CBD to implement the Strategic Plan for Biodiversity 2011-2020 and in particular to develop national targets, using the Strategic Plan and its Aichi targets, as flexible framework, in accordance with national priorities and capacities taking into account both global targets and the status and trends of biological diversity in the country.

COP10 further urged Parties to review, as appropriate update and revise their NBSAPs in line with the Strategic Plan and to integrate their national targets into their NBSAPs to be adopted as a policy instrument, and report thereon to the COP at its eleventh or twelfth meeting. COP 10 also urged Parties to:

Use the revised and updated NBSAP as an effective instrument for the integration of biodiversity targets into national development and poverty reduction policies and strategies, national accounting, as appropriate, economic sectors and spatial planning processes, by Government and the private sector at all levels

Monitor and review the implementation of their NBSAPs in accordance with the Strategic Plan and their national targets making use of the set of indicators developed for the Strategic Plan as a flexible framework and to report to the COP through their fifth and sixth national reports and any other means to be decided by the COP.

### **1.3 Progress of Updating the NBSAP in South Sudan**

The Republic of South Sudan signed and ratified the Convention on Biological Diversity in May 2014 thus becoming the newest member of the COP. Although South Sudan requested for and received financial support from the Global Environment Facility (GEF) through the United Nations Environment Programme (UNEP), to undertake the preparation of its first NBSAP, it is still only at the inception stage of preparing the strategy.

As such, the country has not yet made progress in setting the national biodiversity targets as required by the COP. Although the CBD Secretariat requested South Sudan to prepare this fifth National Report, the country did not prepare a first, second, third or fourth National Report. The country is therefore not in a position to provide key actions and outcomes since the fourth national report as required by COP. In the remaining years to 2020, the COP will be reviewing and updating progress towards achieving the targets to the Strategic Plan 2011-2020 based on outcomes of National Reports. It is probably in this light that South Sudan had to

“catch up” with other Parties by preparing the Fifth National Report whose outcome will be used in the Mid-term Review of the

#### **1.4 Mainstreaming Biodiversity in National Policies, Plans and Programmes**

As mentioned throughout this 5<sup>th</sup> National report, most of the relevant Policies, laws and plans have acknowledged the importance of biodiversity and have therefore adequately integrated it in their plans and programmes. In theory this should make it easy for Government sectors to attract funding for biodiversity conservation. In practice, most of the policies, laws and plans are not being implemented for a variety of reasons including inadequate funding and lack of capacity.

#### **1.5 Financing for Biodiversity Conservation**

To make Government operations sustainable their functions must be funded through current Government budgets as much as possible. Taxes on revenues are normally indirectly used as they are absorbed in the country's treasury at the different administrative levels. In several African countries, mechanisms have been developed to collect and spend revenues locally to enable direct support and protection and to address livelihood issues. Similar systems could be considered for South Sudan. Supplementary funding from other sources may help to bring about change and enhancement of common practices, improving effectiveness and efficiency of operational and managerial systems. Typically, donor funding is used for this purpose and can be sourced from multilateral and bilateral sources that are earmarked for specific purposes such as climate change or sustainable forest management, or through a framework for budget support.

A number of bilateral donors are supporting South Sudan in the field of sustainable natural resources management (including water management) and livelihood security. Details of these are included in Part III of this report. Climate change and environment are considered as cross-cutting issues by some of them. Apart from these examples other governments such as Norway (sustainable forestry, hydro power, and oil), Germany (through GIZ), Sweden, Switzerland and Denmark are active or will be active in this broader sense to support biodiversity programmes. All these sources of funding should be explored for supporting NBSAP recommended activities.

The Global Environment Facility (GEF) has since the inception of the Convention been very supportive of funding projects and programmes in least developed countries especially those that have direct linkages to the objectives of the Convention. It derives its funds from voluntary contributions especially from developed countries. It is a source that needs to be closely monitored for any opportunities by the South Sudan Government. Presently, it is already providing funds for the development of this 5<sup>th</sup> National Report as well as the upcoming National Biodiversity Strategy and Action Plan and the Clearing House Mechanism.

## **PART III: PROGRESS TOWARDS ACHIEVING THE MDG TARGETS AND AICHI TARGETS**

### **1.1 Progress in the Implementation of the Millenium Development Goals**

The Millenium Development Goals (MDGs) are eight international development goals that were officially established following the Millenium Summit of the United Nations in 2000 after adoption of the United Nations Millenium Declaration. All the 193 United Nations member states at the time and at least 23 international organizations agreed to achieve these goals by 2015. The goals were:

1. Eradicating extreme poverty and hunger
2. Achieving universal primary education
3. Promoting gender equality and empowering women
4. Reducing child mortality rates
5. Improving maternal health
6. Combating HIV/AIDS, malaria and other diseases
7. Ensuring environmental sustainability and
8. Developing global partnerships

The aim of the MDGs is to encourage sustainable development by improving social and economic conditions in the world's poorest countries. Each of the goals has specific stated targets and dates for achieving those targets. With regard to goal 7 on ensuring environmental sustainability, there are two targets that are relevant to biodiversity namely:

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

#### **Target 7A: Integrate the Principles of Sustainable Development into the country's Policies and Programmes; Reverse Loss of Environmental Resources**

Although the Republic of South Sudan is only 4 years old, the country has strong commitment and should therefore make significant progress in the next few years through integration of sustainable development objectives into the country's policies and programmes.

Progress on the second part of 7A (reverse loss of environmental resources) is still slow due to inadequate funds and lack of capacity.

## **Target 7B: Reduce Biodiversity Loss, Achieving by 2010, a Significant Reduction in the Rate of Loss**

There appears to be slow progress in attaining the target of reducing biodiversity loss because of a number of constraints poverty and the rapid population growth being the underlying causes of biodiversity loss. Besides forestry and wildlife, biodiversity loss has also stretched to wetland ecosystems in the country.

### **1.2 Progress in the Implementation of the Strategic Plan for Biodiversity and Aichi targets**

In decision X/2 para 3(e), Parties to the CBD were urged to monitor and review the implementation of their NBSAPs in accordance with the Strategic Plan 2011-2020 and their national targets making use of the set of indicators developed for the Strategic Plan as a flexible framework and to report to the Conference of the Parties through their fifth and sixth national reports and any other means to be decided by the Conference of the Parties. As mentioned above, South Sudan has not yet prepared its NBSAP but as it starts preparing it, the NBSAP will be aligned to the five goals of the Strategic Plan for Biodiversity 2011-2020. At the same time, South Sudan will also develop national targets taking into account the framework of the Aichi targets.

Even though South Sudan has not yet prepared its NBSAP and consequently it does not have national biodiversity targets, the country, new as it is, has made commendable progress in some areas which could significantly contribute to achieving some of the Aichi targets. These are described briefly below indicating the constraints the country faces in trying to achieve the targets.

#### **Aichi 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. This target falls under Strategic Goal A of the Strategic Plan for Biodiversity which aims at addressing the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society. Although a national target will be developed during NBSAP formulation, the country can make substantial progress in implementing the global target.

It is generally understood that many people in South Sudan are not aware of the value of biodiversity. This holds true for key decision makers and those responsible for the day-to-day management of natural resources. This despite the fact that a number of policies, laws and guidelines have mainstreamed biodiversity awareness raising in them. There are also programs on national radios and television on awareness of the importance of biodiversity. For this reason the major activity in South Sudan should be to develop and implement a comprehensive Communication, Education and public Awareness (CEPA) strategy that reach

target sectors, local communities and the general public to facilitate the conservation and sustainable use of biodiversity. If the key constraints limiting the implementation of such a CEPA strategy including financial and human capacity bottlenecks are addressed, South Sudan can substantially progress to address Aichi target 1.

**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.

South Sudan has achieved a modest level of mainstreaming biodiversity into its policies, laws and plans. In some sectors, there is some revenue accrued to government accounts from biodiversity use. While opportunities exist for maximizing the contribution of biodiversity to national development, these are constrained by many natural resource policies and laws which are presently ineffective because they have not been passed by Parliament. It is therefore imperative that every effort is made to expedite the approval process of such enabling instruments. It will also be necessary to develop human resource capacity but more importantly undertake valuation studies of protected areas and other potentially important income generating biodiversity hotspots.

**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 are developed and applied

South Sudan may not have achieved much so far under this target. However, as the country moves out of insecurity and instability, there will be need to test various schemes of incentives in order to identify and promote best practices which are suitable for the country. Projects on payments for ecosystem services (PES), for example, could be tried by supporting in kind or in cash local communities to protect local forests. The private sector could also be encouraged to implement corporate social responsibility strategies where they derive benefits from biodiversity services.

South Sudan is already implementing a system of sharing revenue between National and sub-national levels of the government. This concept could be extended to the management of natural resources including biodiversity. As of now, the biggest bottlenecks include lack of knowledge, appropriate technology and human capacity to promote such incentive measures.



**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**

Fulfilling this target will require dialogue among sectors and stakeholders in order to develop plans for sustainable consumption and production which are effective. While a general overall plan could be developed it is likely that different and more detailed plans would be required for each sector given their specific characteristics.

Early action would involve each production- and consumption-related sector developing and implementing plans for this purpose. In order to contribute to the target, South Sudan would have to again test and try various models to identify which works best for the country. Support to indigenous and local communities for the development and implementation of community-based sustainable management plans would contribute to the achievement of the target. Reducing total demand and increasing resource use and energy efficiency, which can be pursued through government regulations and/or incentives, education and research, and social and corporate responsibility, would contribute to the target.

As with target 3, the biggest bottlenecks for testing various models include lack of knowledge, appropriate technology and human capacity to promote such incentive measures.

**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. This target (together with targets 6, 7, 8) falls under Strategic goal B of Strategic Plan for Biodiversity which aims at reducing the direct pressures on biodiversity and promoting its sustainable use.

South Sudan has undertaken a number of activities to address this target. The country has a Draft Policy in place, awareness campaigns to local communities and stakeholders have been undertaken to help in controlling and protection of natural habitats. Capacity building for the forest sector has been supported.

The key Constraints include:

- Absence of a legal framework
- Poor coordination among relevant institutions such as forest and wetlands
- Low capacity for natural resource management.
- Financial limitations and
- Insecurity(civil war)

Implementation of steps to address the target could be enhanced through speed up the policy approval process, improved coordination among natural resource

institutions, more funding of the sector and strict application of environmental impact assessments for large scale developments that impact significantly on natural habitats such as the Jonglei canal project.

**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 over fishing is avoided, recovery plans and measures are in place for all depleted species.

The Muntai Fisheries Training Centre based in Padak in Jonglei state is a positive example of sustainable development tied to better use of natural resources. The centre which focuses on the transfer of skills to local artisanal fishermen is part of an agricultural development project funded by USAID.

The wide variety of species and the large size of many fish indicate that the fishery potential of the White Nile is probably underexploited. No catch surveys have been. Fish Policy is in the offing to be followed by capacity building.

Substantial progress towards this target could be achieved by South Sudan given that fisheries in the country are not yet facing a severe threat. This is also complemented by the country having a draft policy for fisheries which is in place, and also a training and research institute and the general use of standard fishing gears/nets.

The key constraints for sustainable use of fish and aquatic plants in South Sudan presently include the delay in policy approval by Parliament, financial limitations, inadequate capacity in terms of training and equipment and oil exploration especially around the Sudd wetlands.

Urgent solutions to these constraints include the finalization of policy approval process, sustainable management of the important rivers and wetlands and associated watersheds.

**Target 7:**

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

In general, agriculture, forestry and aquaculture are all reflected in the South Sudan National Development Plan for 2014 -2040 which augurs well for the achievement of this target.

The major constraints affecting the sustainable management of agriculture, forestry and aquaculture include the general slow passage of laws and policies,

inadequate coordination among stakeholders and inadequate financial resources and human capacity.

The solution to these constraints lie in the speed of approval of relevant policies and laws, improvement in the coordination mechanisms among institutions and increasing funding for the three production systems.

Possible solutions

- Speed up the policy making.
- Improve coordination and studies.
- Funding.
- Reintroduce extension services.
- Improve coordination among the stakeholders

**Target 8:**

By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

While water pollution is clearly a significant issue in South Sudan, it has not been adequately quantified. The lack of information makes it difficult to adequately assess water quality and the likely changes that take place in the future. In terms of biological water pollution from sewage and waterborne infectious agents, there is very limited laboratory data for South Sudan but the waterborne diseases statistics clearly show that it is a major problem.

Pollution has been only minimally investigated in South Sudan mainly with respect awareness creation to address the problem of pollution, ddevelopment of an urban Sanitation Policy/Act.

The key constraints revolve around Lack of adequately trained personnel, llow capacity for detecting pollution, inadequate funding and lack of regulations and guidelines

Solutions to improve the contribution to target 8 includes improvement of coordination among relevant institutions, enhance capacity in management, increase funding to support pollution research and control and putting in place appropriate regulations and guidelines.

**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. This target (together with targets 10, 11, 12) falls under Strategic goal C of the Strategic Plan for Biodiversity

which aims at improving biodiversity status by safeguarding ecosystems, species and genetic diversity.

The watercourses of South Sudan especially River Nile and the Sudd zone are afflicted with the water hyacinth which threatens especially the Nile basin water courses. The water hyacinth (*Eichornia crassipes*), a native plant of South America forms dense mats which degrade water quality by lowering light penetration and dissolved oxygen levels, with direct consequences for primary aquatic life. The weed also leads to increased water loss through evapotranspiration, interferes with navigation and fishing activities, and provides breeding ground for disease vectors such as mosquitoes and the snails of schistosomiasis.

There are no control measures presently. The impact of water hyacinth on the Sudd is unknown, although it is anticipated to be considerable given that these wetlands comprise a large number of oxbow lakes and slow moving channels which are ideal conditions for weed growth.

South Sudan has carried out a survey and a feasibility study along the Nile on the water hyacinth. The major constraints to implementation of this target relates to inadequate financial resources, inadequate human resource capacity, limited awareness on the dangers of the water hyacinth and lack of technology for its control.

Contribution to the achievement of the target can be brought about by sensitization and increased public awareness, initiation of projects to control or eradicate this alien species as well as capacity building in the relevant institutions.

**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**

The key ecosystems in South Sudan which are most vulnerable to climate change are agricultural systems, rangelands, forests and wetlands. Agricultural systems, forests and wetlands are particularly important for biodiversity. Forests and wetlands contribute significantly to ecosystem services but all four ecosystems contribute significantly to human wellbeing. Being a new nation, South Sudan has not yet embarked on the key anthropogenic pressures which are having the greatest impact on these ecosystems.

However, South Sudan has just completed the development of its National Adaptation Programme of Action (NAPA) for climate change to address vulnerability and variability in the above ecosystems.

Implementation of the NAPA could be constrained by inadequate awareness of the consequences of climate change, limited financial resources as well as inadequate capacity and technical expertise.

**Target 11:**

By 2020, **at least 17% of terrestrial and inland water areas**, important for biodiversity and ecosystem services, are conserved through effectively managed, ecologically representative and well connected systems of protected areas

By 2020, **at least 17% of terrestrial and inland water areas**, important for biodiversity and ecosystem services, are conserved through effectively managed, ecologically representative and well connected systems of protected areas

The main ecosystems affected are wetlands, forests and savannah ecosystems. South Sudan has a protected area coverage of 13% (82,632 km<sup>2</sup>) of the country's total area (6 national parks, 12 game reserves and 1 central forest reserve). South Sudan intends to gazette more wetlands to increase protected areas to 17% in the near future. Given that the legally protected areas of South Sudan were in conflict zone for over two decades, they have not been well managed nor wildlife effectively protected.

The principle threats to the kob and other wildlife ungulates are seasonal droughts, excessive hunting pressure and now the development of a new aid funded rural road network cutting across their migratory routes. The sustainable solution to excessive hunting is considered to be its containment and formalization rather than its outright prohibition, a measure which is both unachievable and unenforceable. The spectacular nature of the kob migration may support some wildlife tourism in the future but it is unrealistic to expect tourism revenue to provide an acceptable substitute for all of the livelihoods currently supported by hunting. Since 2008, significant investments in law enforcement infrastructure and protected area management capacity have been made. This has included the construction of permanent park headquarters and ranger posts in Boma, Badingilo and Southern National Parks. As well as expanded operational presence around Lantoto National Park and Bangangai Game Reserve. This has been supported through the implementation of various site based training exercises in conservation law enforcement, ranger-based monitoring and investigation procedures. Extensive aerial surveillance coverage to monitor threats and wildlife across the national parks has also been undertaken. Up to 2013, measurable progress was achieved with numerous arrests and wildlife product seizures made in and around protected areas. Progress towards increased wildlife protection at these sites and across the Sudd has however been hindered by ongoing armed conflict.

A National Park management plan has been completed and approved for Nimule National Park and plans are currently under finalization for Badingilo and Boma National Parks. When implemented, these plans will function to significantly increase

the performance of park management institutions, park operations, law enforcement activities and community conservation as well as building tourism facilities.

Numerous large scale wildlife and human activity surveys aimed at producing a nationwide protected areas gap assessment have been conducted since 2007. These have included systematic aerial surveys across an total area of 183,000 km<sup>2</sup>. These have included Boma, Badingilo, Southern and Nimule National Parks, the Sudd, Kidepo Game Reserve and the Loelle Zone (Fay *et al.* 2007, Grossmann *et al.* 2008, Grossmann *et al.* 2010). As well as ground surveys in the Imatong mountains and Bangangai Game Reserve (Grossmann *et al.* 2009, FFI 2015). These surveys found that many large mammal populations were still intact while some had reduced significantly since the 1980s. Notable findings included populations of 1 million white-eared kob, 2,500 elephants, 180,000 tiang, 11,000 Nile lechwe, 7,000 shoebill and 900 giraffe. GPS collars have also been deployed on elephants, tiang, white-eared kob and giant eland. These have produced important data on wildlife occupancy and home ranges.

Ecological research to date has demonstrated that wildlife populations are distributed both within and outside of current protected areas, therefore proposals have been made to upgrade game reserves, create new national parks and expand those already existing. In 2013, information on wildlife distributions and habitat use was supporting Jonglei and Eastern Equatoria state government land use planning activities. These were subsequently put on hold due to the ongoing armed conflict. Aerial survey efforts are currently underway to assess the impact of the recent conflict on wildlife populations, the findings of these will be published in 2016. Constraints that limit effectiveness of protected areas includes inadequate funding, vast size of the country which makes surveillance difficult, limited public awareness of the value of protected areas, inadequate human resource capacity and technical experts.

To ensure more effective protected area management across South Sudan future efforts will need to focus on professionalizing the wildlife service and developing strong national park management structures. This will be dependent on significant government and donor investment as well as a viable security and humanitarian environment.

Protected areas can be made more effective if it gets increased funding, the number of rangers is significantly increased, if they are provided with better and adequate equipment in addition to improving the capacity of the staff.

**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.

The major large animals threatened in south Sudan include rhinos, elephants, chimpanzees, water buck, Roan antelope, Zebra etc. All the species are found in the protected areas of S Sudan.

**The Major Threats to these Species include Poaching Trafficking Habitat Loss**

With respect to protecting wildlife, the South Sudan Government is currently engaged in updating laws and regulations e.g., proposing more areas under protection, staff capacity building, increased awareness of the value of protected areas and animal surveys and research.

The major constraints to supporting Protected areas include inadequate financial resources; inadequate capacity Vastness of the country makes it difficult to carry ground surveys.

For adequate progress in achieving the target, there would be need for more funding, increased awareness at all levels, recruitment of more rangers to strengthen law enforcement and identification of alternative livelihoods for local communities living inside and around the Protected areas.

**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**. This target (together with targets 14, 15, 16) falls under Strategic goal C of the Strategic Plan for Biodiversity which aims at improving biodiversity status by safeguarding ecosystems, species and genetic diversity.

The Ministry of Agriculture, Forestry and Rural Development observes that the genetic diversity has been maintained in South Sudan through the long tradition of conserving seeds. But that unregulated introduction of Genetically Modified Organisms (GMO) species could result in genetic erosion, and local landraces and species could be replaced by new varieties and species and lost through environmental degradation and desertification. Therefore there is need to put in place measures to protect and conserve the country's genetic and biological resources by managing the introduction and impact of these alien species.

The Ministry recognizes that GMOs, which include genetically modified seeds and other planting material and animal species, may enhance productivity and food

insecurity and also increase the competitiveness of some cash crops and forestry products. However, it is concerned about the introduction of for instance, the terminator seeds that compels the user of such improved seeds to perpetually depend on the company holding the license for seed production. Thus the Directorate of Agriculture is considering carefully the merits and demerits of crop, animal or forest product adoption of such a genetically modified material. The Ministry is planning to develop policies and laws dealing with GMOs for the agriculture and forestry sectors.

The key constraints limiting effective conservation of genetic diversity in cultivated plants and domesticated animals include the following:

- Lack of information because of weak inventory of plant and animal genetic resources
- Inadequate capacity of the GIS personnel in the institutions
- Pressure from population density and wild fires
- Free range grazing (domestic animals grazing together with wildlife)
- Frequent incidents of disease and natural disasters
- Infrastructural development within Protected areas without undertaking environmental impact assessments
- Poaching
- Neglect of indigenous knowledge and practices

In order to address the above constraints to contribute to achieving the target, the following should be done:

- Mapping potential Genetic Resources sites and classification of endangered species
- Participatory gender research development on genetic resources
- Sensitization and awareness raising for critical policies and laws governing the utilization of genetic business
- Establishing a National institute for Genetic Resource development
- Designing community roles/responsibilities to improve on production of traditional medicines, Non Timber Forest products, animal breeding for both economic and cultural interest
- Developing a comprehensive programme to revive traditional genetic resources utility
- Fostering and enhancing local resources development- efficient and effective utilization for socio-economic, cultural benefits compatible with livelihood on a sustainable basis
- Advancing and diversifying indigenous knowledge on multiple use of genetic resources for improved well being and sustainable management
- Supporting community based genetic resources development for equitable benefit sharing of output and income
- Establishing institutional coordination and control mechanisms



- Fostering collaboration between Government Agencies and Academia in research on potential genetic resources in South Sudan

**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.

All ecosystems provide goods and services. However some ecosystems are particularly important for human wellbeing because of the services they provide. Ecosystems which provide services related to the provision of food, fibre, medicines and fresh water, pollination of crops, filtration of pollutants, and protection from natural disasters are among those ecosystem services provided by biodiversity which are essential for human wellbeing. South Sudan has not done much with respect to capitalizing on this aspect although it is well endowed with many such biodiversity resources. Proposed plans include the following:

- Developing a convergence plan for sustainable management of environment
- Use of participatory action research designed for gainful information at the local community level
- Developing a policy guide and a poverty, reduction action programme (PRAP) for sustainable development
- Setting up a forum for full and effective participation with gender sensitivity for interaction in informed decision-making.
- Strengthening institutional deliverance effort (policies stricture laws and societal change)

Such efforts could be frustrated by the following constraints:

- Policy gap
- Frustrating financial support for sustainable management and conservation of biodiversity
- Inadequate knowledge of the subject at national and local levels.

**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

The climate of South Sudan is semi-arid at the northern parts of the country bordering the Sudan and tropical around the equatorial region in the south. It has distinct wet and dry seasons with minor spatial and temporal variability across the

whole region. Over the past few decades, there have been significant changes in weather patterns and the climate in South Sudan at large. Although climate change is a global phenomenon, South Sudan is equally affected and vulnerable to its effects. In the absence of any coping strategies and mechanisms, this may adversely impact on the environment and livelihoods of most South Sudanese.

South Sudan is already experiencing the impacts of climate change and more is anticipated if the current trend of global warming continues. Some of the direct impacts include changes in weather patterns as manifested in decreasing rainfall, increased temperatures and higher evapotranspiration rates, especially at the Sudd wetlands. On the other hand, the indirect impacts of climate change may include health problems triggered by weather pattern variability and environmental change, increased incidences of climate-related disasters in terms of localized flooding in some parts of South Sudan. Climate change may also exacerbate food insecurity, biodiversity loss, water shortages and conflicts due to scarcity of water resources.

South Sudan is probably among the least prepared and most vulnerable countries to climate change as it neighbours desert conditions in the north of the country. Frequent incidences of droughts have had their consequences on natural resources, agriculture, food security and livelihoods.

South Sudan recently completed the development of its National Adaptation Programme of Action (NAPA) for climate change which could address vulnerability and variability in its degraded ecosystems.

Efforts to restore degraded ecosystems for enhancing biodiversity and carbon stocks could face a number of challenges which include the following:

- Impact of poverty on deforestation, degradation and loss of bio diversity
- Capacity, equity and knowledge of watershed resource and climate change are very low.
- Agricultural land expansion and land tenure issues in the face of a growing population
- Inadequate laws and policies for enforcement to minimize expansion of degraded areas

These challenges can be addressed through:

- Recognition of UNFCCC principles and supporting climate change adaptation and mitigation strategies
- Soliciting funding for strategies to enhance carbon stocks and community based Agro forestry practices
- Collaborative control and management of wild fires
- Promoting a CEPA programme for restoration, reforestation and biodiversity conservation including water shed management

- Improved wetlands management and livelihood development In wetlands

**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.

Although 2015 is almost gone, the South Sudan Government is presently undergoing a process of signing and ratifying the protocol. A Nagoya Protocol Focal Point has already been identified.

**Target 17:**

By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated NBSAP. This target (together with targets 18, 19, 20) falls under Strategic goal E of Strategic Plan for Biodiversity which aims at enhancing implementation through participatory planning, knowledge management and capacity building.

Although South Sudan has not yet embarked on preparation of its NBSAP, the NBSAP itself, as a project, was launched in July 2015, two months after acceding to the Convention on Biological Diversity. This is commendable for a country that acceded to the Convention only one year ago having got its independence as late as July 2011.

**Target 18:**

By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity are respected, and their customary use of biological resources are respected and fully integrated in the implementation of the Convention with full participation of local communities at all levels

Although the Government has developed laws to protect traditional and customary practices, no case studies are available yet to demonstrate how indigenous knowledge, innovations and practices could be used to support the objectives of the Convention. For instance, guidelines could be prepared and supported by Government regarding community use of medicinal plants to foster quality of the medicine and to promote sustainable harvesting techniques for the plants that are used to produce the medicine.

Promotion of such case studies could face certain challenges such as lack of awareness of the need to standardize the products, General insecurity in the country making plant collection risky, lack of accessibility of community areas, lack of funds and inadequate mapping of the natural resources and land use practices

The conservation and protection of traditional knowledge supported by a legal framework could go a long way in achieving this target.

Other key steps that need to be undertaken include the following:

- Development of a comprehensive programme to revive traditional genetic resources utility
- Advancing and diversifying indigenous knowledge on multiple use of genetic resources for improved well being and sustainable management
- Supporting community based genetic resources development for equitable benefit sharing of output and income
- Establishing an intuitional coordination and control mechanism
- Improving collaboration between Government and academic institutions to undertake research involving local communities and their indigenous knowledge and practices

**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.

This is a relatively new area which South Sudan has not yet embarked on given its numerous challenges and priorities. Coming up with science based approaches to generate new ideas that can be shared by others requires technical; expertise, adequate funds and up to date equipment in various natural resource institutions. South Sudan will take a slow pace in addressing this target as it battles with other more pressing needs linked to other targets.

**Target 20:**

By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from **all sources**, should increase substantially from the current levels.

In many African countries, it usually not easy to obtain information on the financial resource allocation by Government to biodiversity conservation and management as well as bi-lateral and multi-lateral support for biodiversity conservation. This could present a challenge when trying to monitor progress towards the above target. The situation seems to be the same in South Sudan.

Traditional financing for biodiversity conservation revolves around the use of Government expenditure and overseas development assistance (ODA) for biodiversity conservation. As South Sudan matures as an independent nation, there is need to begin monitoring and recording the level of Central Government support to biodiversity conservation related activities in the various sectors.

Another component of public sector investment to biodiversity conservation is through donor projects. This budget support through donors can be substantial and should be monitored and recorded.

There are a number of other innovative financing mechanisms that the country can use to monitor progress in achieving the above target. Some of these are briefly mentioned below.

**Payment for Ecosystem Services (PES):** Payments for carbon sequestration (e.g. tree planting by farmers), biodiversity conservation (protection of wildlife in a National Park), watershed protection services (water bottling company paying communities for protecting the watershed) etc are emerging mechanisms that offer future streams of financing for biodiversity conservation for rural communities.

**Environmental Fiscal Reforms:** Fiscal policy has also been used in the management of the environment. The environmental levy is charged on used vehicles, environmental tax on polythene bags and plastic containers could lead to switching to the use of paper bags and decomposable local materials. But one must have the enabling legal and policy framework for implementation of environmental fiscal reform such as the environment act?

Every relevant Government Ministry can also come up with innovative biodiversity funding mechanisms provided there is a legal backing.

**Climate Finance:** Under the Trees for Global Benefits Programme, farmers undertake afforestation and reforestation activities aimed at restoring or replenishing indigenous trees within the community in turn farmers earn payments on their verified emissions reduction. South Sudan could develop a series of Nationally Appropriate Mitigation Actions (NAMAs). Some of the NAMAs such as in agriculture and waste water management could be deal directly with biodiversity conservation.

**Environmental conservation trusts:** This could come in various forms such as the Environment fund, Tree fund etc but again they must have legal backing. A tree fund could be set up to promote tree planting and growing at local and national level and to support tree planting and growing efforts of non-commercial nature which are of benefit to the public.

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## ANNEXES

### **Annex 1: PROCESS USED TO PREPARE THE 5TH NATIONAL REPORT FOR SOUTH SUDAN**

Decision X/10 of the CBD decided that Parties to the Convention should submit their Fifth National Report by 31<sup>st</sup> March 2014. In this regard, guidelines for the preparation of the Fifth National Report were adopted. Because South Sudan acceded to the United National Convention on Biological Diversity (UNCBD) on 17 February 2014, it did not have enough time to meet the 31<sup>st</sup> March 2014 deadline. The Secretariat to the CBD then extended the deadline for South Sudan to complete preparation of the Fifth National report by 31<sup>st</sup> December 2015 due to its special circumstances. Although this was the first national report from South Sudan as the newest member to the Convention, it was tasked to prepare the Fifth National Report to be in tandem with the other Parties in order to be able to monitor its progress against the five goals of the Strategic Plan for Biodiversity 2011-2020.

Consequently, South Sudan received financial support from the GEF through UNEP to develop its Fifth National Report. The process was coordinated by the CBD Focal Point for South Sudan. A regional consultant was hired to spearhead the process of data and information gathering for the report. Initially this involved extensive review of biodiversity policy, legislation and related literature from South Sudan. Key informant interviews were conducted with discussants including government stakeholders in biodiversity management and conservation including environment, natural resources, enforcement sector and agriculture. The consultant collected data and generated information that resulted in the production of a preliminary draft report which was presented to a team of stakeholders who studied sections of the draft report according to their area of interest and specialization.

In order to ensure that the team or task force carried out their review work properly, the CBD Focal Point and the regional consultant first made presentations to the team covering the following topics:

- Guidelines for preparation of the Fifth National report which was adopted in decision X/10,
- Draft Road Map for preparation of the Fifth National Report
- Proposed content of the draft Fifth National Report
- The Convention on Biological Diversity as part of capacity building
- The Strategic Plan for biodiversity 2011-2020 and its Aichi targets

The task force, divided into groups, then made contributions to the report to come up with an updated draft. The updated Draft National Report was then presented by the consultant to a National Stakeholders' Validation workshop on 17<sup>th</sup> December 2015. Comments received from the validation workshop were addressed by the consultant and the revised report is what is being presented here.





Plate 1: Participants in the technical group discussions of the Draft Fifth National Report



Plate 2: Participants at the validation workshop

## **Annex 2: OTHER NATIONAL REPORT WEBSITE LINKAGES**

<http://www.animalinfo.org/country/sudan.htm>  
<http://www.ecosonline.org>  
<http://www.fao.org/docrep/004/x0388e/x0388e00.htm#E61E1>  
<http://www.gurtong.com>  
[http://www.photius.com/countries/sudan/economy/sudan\\_economy\\_fisheries.html](http://www.photius.com/countries/sudan/economy/sudan_economy_fisheries.html)  
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<http://www.sudan.net>  
<http://www.sudmer.com>  
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[http://www.usaid.gov/locations/sub-sahara\\_africa/sudan](http://www.usaid.gov/locations/sub-sahara_africa/sudan)  
[http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0905\\_full.html](http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0905_full.html)  
([http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0905\\_full.html](http://www.worldwildlife.org/wildworld/profiles/terrestrial/at/at0905_full.html)).

### Annex 3: CONSULTATIVE TECHNICAL WORKSHOP FOR PREPARATION OF SOUTH SUDAN'S FIFTH NATIONAL BIODIVERSITY REPORT ATTENDANCE LIST

**DATE: 10 December 2015**

S/N	NAME	ORGANIZATION	POSITION/ TITLE
1.	Beda Diing Amoi	Ministry Of Environment (MoE)	Director for Biodiversity
2.	Rosa Moyou John	MoE	Inspector
3.	David Deng Adol	South Sudan National Wildlife Service	Chief Park Warden, Nimule National Park
4.	Dr. Malik Doka	MWCT South Sudan National Wildlife Service	Director for Training
5.	Martha Biong	MOE	Senior Inspector
6.	Paul Gore	MOE	Inspector
7.	Felix Ayume H.	SSSID	Research Officer
8.	Emmanuel Lado . Z	MWCT-SSWS- South Sudan National Wildlife Service	Research Officer
9.	Ogwang Bob	UGANDA / UNEP	Consultant
10.	Samuel Thou	Meteorology Dept.	Forecaster
11.	Agok Peter Agok	MOE	Assistant Inspector For Public Awareness
12.	Minasona Lero	MITWC South Sudan National Wildlife Service	Director
13.	Victus Silsawo	MAFCRD	Director
14.	Koang Muoch	AMA	Asst. Director Finance
15.	Francis Gale	MOE	Director
16.	Joseph Kulang	MOE	Deputy Director
17.	John Ater	MOE	Director for Wetlands
18.	Paul Peter	WCS	Ass. Project Manager
19.	Nyasigin Deng	MEDI & WR	Acting Director
20.	Joseph Alphonse	MoE	Assistant Inspector
21.	Peter MajaK	UNEP	Admin and finance Assistant
22.	Arshad Khan	UNEP	Country Programme Manager
23.	Ekingston	Concern Worldwide	Braced Director
24.	Patrick Taban	MAFC & RD	Deputy Director
25.	Morris Lomodong	MLH& PP	Director General
26.	Samuel Buwor	Upper Nile University	Head Department Wildlife
27.	Capt. Samuel Kenyi	MIWC South Sudan National Wildlife Service	Wildlife Management
28.	Seme Manas	MWC & T Tourism	Assitant Inspector
29.	Isaac Wai	MWC & T Tourism	Assitant Director
30.	Aloch Akuein	MOE	Deputy Inspector
31.	Wani Nelson	MOE	Deputy Inspector
32.	Idro Mark Dradi	MOE	Assistant Inspector
33.	Paul L. Demetry	MOE	Deputy Director for Biodiversity/ CBD – FocalPoint
34.	Boum Pal Jual	MAF	Inspector Crop
35.	Emmanuel Gridea	MAF	Assistant Inspector – Crop
36.	Daniel Ksembo	UPPER NILE University	Lecturer
37.	Martin Dramani	UNEP	Programme Specialist
38.	Rick Diang Chaol	MOE	Pollution Control
39.	Laboroko Charles Oyue	MOE	Education and Information
40.	Christiric Alwon	MWC & T	Inspector Marketing
41.	Kenyi Bullen Baggu	MAFCRD	Director
42.	John Pangeun	MAFCRD	Director General
43.	Francis Wajo	MEDIWR	Deputy Policy & Planning
44.	David Batali	MOE	Acting Director General

45.	Dr. John Leju	UNIVERSITY OF JUBA	Assistant Professor
46.	Kasirovu Christopher	MILLENNIUM ECOPRACTER	Assistant Manager
47.	Samuel Baraba	MOE	Deputy Director for Forest Conservation
48.	Mindo Odrande James	MAFCRD	Director For Afforestation And National Forest Conservation

#### **Annex 4: NATIONAL VALIDATION WORKSHOP FOR PREPARATION OF SOUTH SUDAN'S FIFTH NATIONAL BIODIVERSITY REPORT ATTENDANCE LIST**

**DATE: 17 December 2015**

<b>S/N</b>	<b>NAME</b>	<b>ORGANIZATION</b>	<b>POSITION/ TITLE</b>
49.	Charles Celians	(PMT) NITRS	Environmental Officer
50.	Mike Mayen Mangok	SSGID	Education Assistant
51.	Paul Gore	MOE	Inspector
52.	Ogwang Bob	UGANDA/UNEP	Consultant
53.	Lwanga Tiba	MOE	Inspector
54.	David Dang Adol		Pw.Nimule National Park
55.	James Ninrew	AMA	Director
56.	James Gajack	SSYDA	Director
57.	Dut .F. Daw Dut	MOE	A2/M N.H
58.	Samuel Thon	SSMD	Forecaster
59.	Joseph Kulang	MOE	D/Director
60.	Kenyi Bullen Baggu	MAFCRD	Director
61.	Boum Pal Jucie	MAFCRD	Inspector
62.	Emmanuel Dajo Samuel	National Bureau of Statistics	Statistician
63.	Joseph Alphonse	M O E	A/Inspector
64.	Emmanuel Gideon	MAFCRD	A/Inspector
65.	Ambrose Hathims	CIFP	Representative
66.	Mindo Odrande James	MAFCRD	Director
67.	Victor Silsano	MAFCRD	Director
68.	Paul L. Demetry	MOE	Deputy director for Biodiversity / CBD – Focal Point
69.	Hon. Dr. James	THUCH ASEIL	Council of States
70.	Dr. Yohannes Suhugut	UNESCO	Program Specialist
71.	Samuel Kenyi Christopher	MIPWC South Sudan National Wildlife Service	Wildlife Officer
72.	Charles .Y. Acire	UNDER SECRETARY	Min. Tourism & Wildlife Conservation
73.	Bismark George	Tourism	A/Director
74.	Franeis Gale	M.O.E	Director Re
75.	Martin Dramani	UNEP	Programme Specialist
76.	Peter Majak	UNEP	AFA
77.	Baya Philip	SSWS South Sudan National Wildlife Service	Research Officer
78.	Agok Peter Agok	MOE	A/Inspector for Public Awareness
79.	Daniel Kisembo Peter	UPPER NILE UNIVERSITY	Lecturer
80.	David Batali	MOE	Ag/Undersecretary
81.	James Deng	SSTV	Logistics
82.	Joseph Agrab	SS RADIO	Programmer
83.	Jackson Lagu	SS T.V	Reporter
84.	Paul Peter	WCS	Ass. Project Manager

85.	Morris Lomodong	MLH&PP	Director General
86.	Tong Majij	MOE	Assistant Inspector Climate Change
87.	Nyasigin Deng Bar	MEDI & WR	Assistant Director WLM
88.	Meneya Ahmed	MLFI	Technical Officer
89.	Samuel Baraba	MOE	D/Director Finance and Ct
90.	Betty Kiclen .E.	MGCSW	Deputy Inspector
91.	Regina Zakaria	MOE	Inspector for Policy
92.	Okurut Andrew	SPIDO	M & E
93.	Minasona Lero	MIWC	Director
94.	Atoch Akuein	MOE	Assistant Inspector /Ecological Zone
95.	Kiya Masahiko	EMBASSY OF JAPAN	Japanese Ambassador
96.	Chutiy Anyor	NATRON MOSES	Respecter
97.	Dr. Malik Doka	MWCT South Sudan National Wildlife Service	Director/Training
98.	Mathew Udo	MAFERD	Undersecretary
99.	Rick Diceng	MOE	Director
100.	Thomas Francis Lado	UNIVERSITY OF JUBA	Assistant Professor
101.	Eviana Achan	SSTV	Reporter
102.	Patrick Taban Abdullai	MAFC &RS	Deputy Director
103.	Kim Peter Dak	UPPER NILE UNIVERSITY	Lecturer
104.	Opio Jackson Alex	JUBA MONITOR	Journalist
105.	Dr. John Lejir Celistins	UNIVERSITY OF JUBA	Assistant Professor
106.	Peter B.S. Gama	CNRES UNIVERSITY OF JUBA	Assistant Professor
107.	Jadan Jorgim Embros	MAFERD	Under Secretary
108.	Dr. Oyor Moses Ayul	UPPER NILE UNIVERSITY	Assistant Professor
109.	Kapuki Tongun	MOE	Senior Inspestor, Waste Management
110.	Rosa Moyou John	MOE	Inspector
111.	Census Lolyong	AGURE CONSULTING	Director
112.	Joseph Njoroge	KAD/ UNDP MCICSW	Gender Officer
113.	Oketayot Sauto	THE JUBA TELEGRAPH	Reporter
114.	Patricia H. Gibril	MINISTRY OF TRANSPORT	Head Of Environment & Social Unit
115.	Arshad Khan	UNEP	Country Programme Manager