



South Sudan

First State of Environment
and Outlook Report 2018

SUMMARY FOR POLICYMAKERS



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There can be no sustainable development without peace
and no peace without sustainable development.

THE UNITED NATIONS GENERAL ASSEMBLY, 2015



South Sudan

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Background

The Republic of South Sudan's natural environment provides abundant environmental goods and services that offer multiple opportunities for economic development and improved livelihoods. It is a fragile endowment, however, that must be managed sustainably to support the livelihoods of present and future generations of South Sudanese. Sustainable management requires current and accurate information about the state of the environment. Environmental assessments, for example, can support policymakers in making decisions about how to both use and protect natural resources.

The last detailed environmental assessment of South Sudan was carried out by UN Environment in 2007, when Sudan and South Sudan were one country, in the form of the Sudan Post-Conflict Environmental Assessment. Since independence, South Sudan continues to suffer environmental degradation due to internal conflict and the unsustainable use of its natural resources. Given the pace of environmental change in South Sudan, the Ministry of the Environment and Forestry requested that UN Environment facilitate a study on the state of the environment in the country to identify and prioritise key environmental challenges for South Sudan and to develop actions to address these challenges.

The production process

UN Environment, in collaboration with the Ministry, selected the Environmental Pulse Institute, United States, to provide technical assistance in developing the State of Environment and Outlook Report for South Sudan through funding from UKAID through Concern Worldwide / BRACED consortium, South Sudan. UN Environment and the Ministry supported the Environmental Pulse Institute in organising an inception workshop to launch the report process and discuss the table of contents, as well as validation workshops to peer-review the draft chapters.

Fields trips to Bor, Aweil, Nyamile, Kapoeta and Juba were undertaken, and sources in government and non-governmental organisations gave anecdotal information to provide on-the-ground stories about the local environment from resident stakeholders.

In addition, extensive research was undertaken to compile and analyse information from various databases, global, regional and national reports, and websites. Historical and current satellite images of places indicative of environmental change were selected and analysed using Geographic Information System technology. The publication went through an intensive review process to ensure quality control and scientific validity of the report, and a national workshop was held to validate the findings.

This material has been funded by UK Aid from the UK Government; however the views expressed do not necessarily reflect the UK Government's official policy.

Scope of the State of Environment and Outlook Report

The full State of the Environment and Outlook Report consists of 11 chapters. Chapter 1 provides the overall context, Chapter 2 deals with climate change impacts and Chapter 3 on natural hazards. They describe the country in general terms, covering the historical and geographical context and the socioeconomic and natural drivers of environmental change. Chapters 4 to 10 analyse the pressures, status and impacts and responses of agriculture, forestry, biological diversity, water resources, the urban environment, energy and petroleum, and mining and industry. Finally, Chapter 11 provides the outlook and recommendations for achieving the Sustainable Development Goals in South Sudan.



A community leader is informing the UN Environment team about the effects of prolonged drought in Kapoeta. Photo credit: Arshad Khan, UN Environment

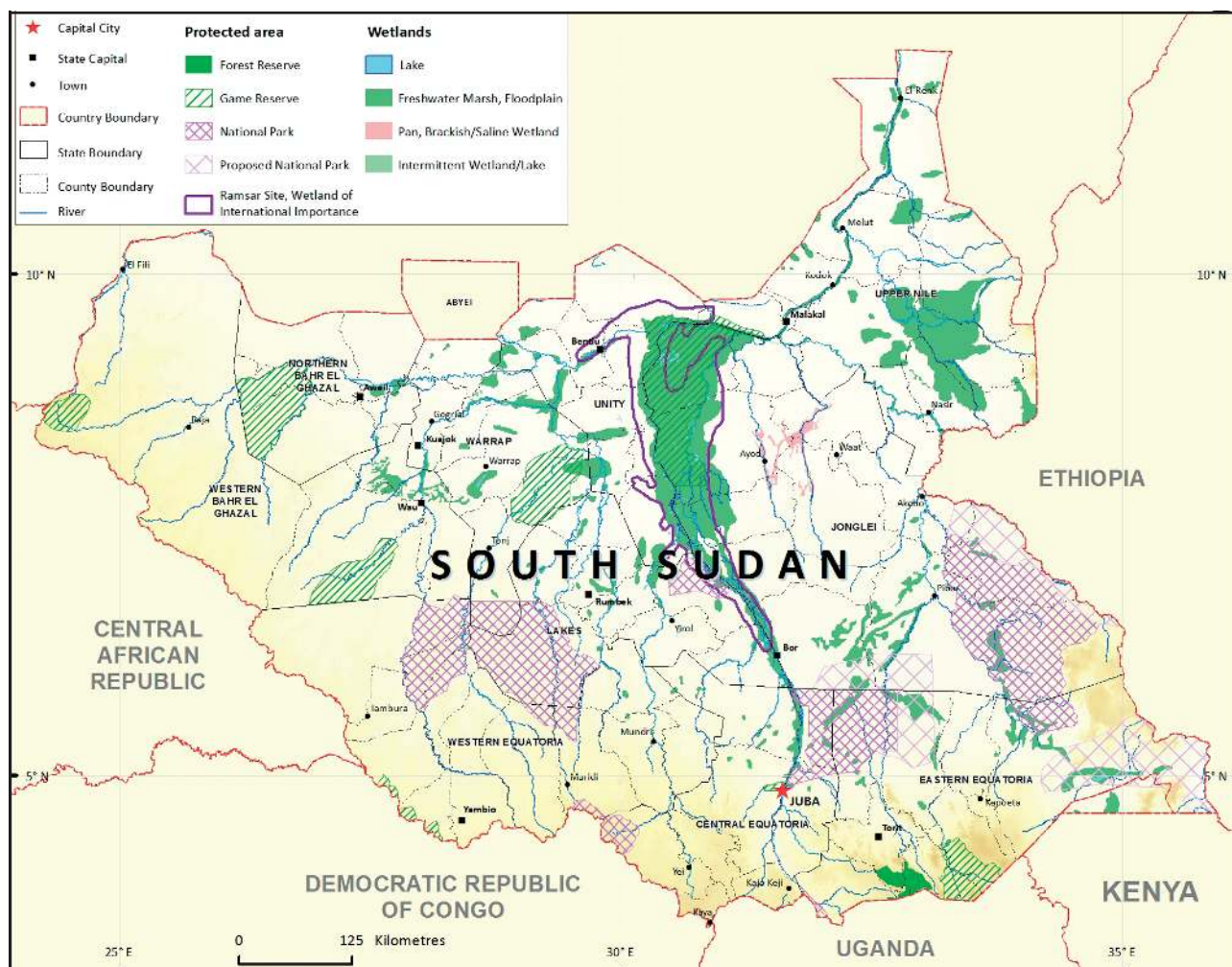


Inception Workshop 2016, Juba, South Sudan. Photo credit: Martin Dramani, UN Environment

Context

The state of the environment in a given area depends on and is influenced by a number of factors. First, existing geological, ecological and climatic features are the foundational environmental characteristics of a place. Environmental change occurs when natural forces, such as tectonic activity and meteorological events, as well as human activities alter or affect those conditions.

FIGURE 1: PHYSICAL GEOGRAPHY, PROTECTED AREAS AND WETLANDS OF SOUTH SUDAN



Data sources: For protected areas: UNEP-WCMC (2016). World Database on Protected Areas User Manual 1.4. UNEP-WCMC: Cambridge, UK. Available at: http://wcmc.io/WDPA_Manual. For Wetlands: Lehner, B. and Döll, P. (2004): Development and validation of a global database of lakes, reservoirs and wetlands. *Journal of Hydrology* 296/1-4: 1-22. s:

The geographical context

While the White Nile River flows through the entire length of South Sudan, it is a landlocked country that falls almost entirely (96 per cent) within the Nile River Basin in East-Central Africa. It is bordered in the north by Sudan, by Ethiopia and Kenya in the east, by Uganda and the Democratic Republic of the Congo in the south, and in the west by the Central African Republic.

It occupies an area of 658,842 km². The country is covered by extensive grasslands, wetlands and trop-

ical forests. Its natural assets include significant agricultural, mineral, timber and energy resources. The climate is mostly hot and dry, with seasonal rains that allow for two or three harvests a year in the country's green belt. Apart from oil, however, its natural resources are largely unexploited and only 4.5 per cent of its potential arable land is cultivated.

Over 60 different ethnic groups inhabit South Sudan, the largest of which is the Dinka, a traditionally pastoralist

people. Other groups include the Zande, the Bari, the Shilluk, Anyuak, Mundari, Toposa, and many others. There is a small Arab population in South Sudan.

With fewer than 13 people per square kilometre, population density in the country is one of the lowest in sub-Saharan Africa. Livelihoods in the northern dry areas are dominated by seasonal agriculture, pastora-

lism, fishing and hunting. Livelihood opportunities vary in the low woodland savannahs in the country's centre.

The country is divided into three regions (the former historic provinces): Bahr el Ghazal in the northwest, Equatoria (in the south) and Greater Upper Nile in the northeast. The 32 states of South Sudan are divided into 180 counties. The original 10 states of the country contained 79 counties.



The sun sets over the Sudd in Leer County. Photo credit: UNMISS

The socioeconomic drivers of environmental change

Socioeconomic factors and dynamics, such as economics, demographics, technology, cultural norms, governance and conflict, are the root causes that drive physical pressures on the environment. Pressures range from extractive and land use activities such as forestry, agriculture, to fishing and mining.

The state of ongoing strife in South Sudan is the major impediment to good governance that would ensure the productive use of its natural resources and the protection of its environmental assets. Indeed, the lack of strong, effective institutions for peacefully managing competing claims to local power and control and ownership of livestock and natural resources is an important factor in the ongoing conflict. The proliferation of small arms, the politicisation of ethnicity, a legacy of weak property rights, the lack of economic diversification and overreliance on oil are other important contributing drivers.

The influx of refugees and internally displaced people since 2005 has also been an important driver of inappropriate land use and overexploitation of natural resources. The increase in numbers has put more pressure on

the already scarce environmental and financial resources in the country's towns and cities, especially through the cutting of wood for building purposes and fuel.

Environmental degradation is both a result of and a contributing factor to the protracted conflict and insecurity in South Sudan. For example, decades of war have made the country's economy extremely fragile, leading to a state of hyperinflation. A large proportion of the population depends on purchased food and is vulnerable to market-related shocks. When fighting resumed in July 2016, local-level, intertribal conflict disrupted the traditional migration routes of pastoralists. This often forced them to compete with established farming communities, leading to livestock mortality, declines in the amount and viability of land those farmers can cultivate, and reduced harvests. Along with disrupted market access, the loss of natural resources that people need to survive has badly affected many other livelihood activities. Thus, conflict, poverty and environmental degradation are significant interlinking factors in the crisis of severe food insecurity and famine affecting the country at the time of writing.



Clearing vegetation. Photo credit: UNMISS/Flickr.com/CC BY-NC-ND 2.0



IDP camp in Bentiu. Photo credit: UNMISS



Buses bring South Sudanese back to home regions. Photo credit: ENOUGH Project/Flickr.com/ CC BY-NC-ND 2.0.

Key Messages and Recommendations

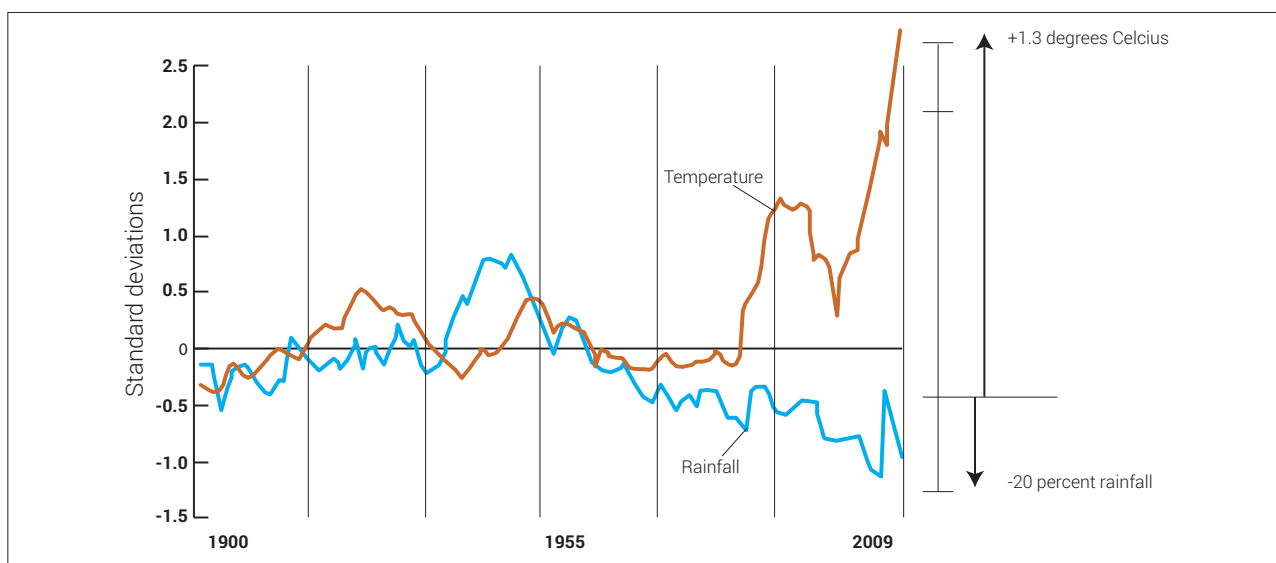
1. At the country's formation in 2011, formal governing institutions were created, but given the years of conflict and the breakdown of former structures, they commenced from a generally low foundation. The new government's capacity to formulate policy and implement programmes is still limited, but is developing and evolving. It should be further strengthened.
2. The foundational document guiding South Sudan's future is the draft "South Sudan Vision 2040: Towards freedom, equality, justice, peace and prosperity for all". It is recommended that the Government adopt and implement the draft Vision 2040 as soon as possible. It should also strengthen environmental governance by increasing the capacity and financing for the Ministry of the Environment and Forestry, which would help to ensure that the country's natural resources are both protected and used sustainably.
3. South Sudan is signatory to the Montreal Protocol to the Vienna Convention on Substances that Deplete the Ozone Layer, the United Nations Framework Convention on Climate Change, the Convention on Biological Diversity, the United Nations Convention to Combat Desertification and the Ramsar Convention on Wetlands. The institutional frameworks to accomplish environmental and climate-change commitments, however, are still at the nascent stage in South Sudan due to the low priority given them in the context of the ongoing situation of conflict, as well as the lack of technical capacity and financial resources. The Government of South Sudan would do well to prioritise institutional strengthening and financing.
4. The long years of conflict have affected technological advancement in South Sudan, which lags behind other African countries. For example, in 2010, the number of Internet users per 100 people was only 7, a proportion that rose to about 16 by 2014. Investment in technological infrastructure building should be boosted.

Climate change and Natural hazards

The impacts of global climate change and natural hazards are conspiring with all these socioeconomic drivers to form a complex dynamic of causes contributing to environmental change in South Sudan. Already, the country's climate is characterised by extremes and it regularly experiences drought, torrential rains and seasonal flooding. Since the mid-1970s, South Sudan has experienced a decline of between 10 to 20 per cent in average precipitation as well as increased variability in the amount and timing of rainfall from year to year.

South Sudan is susceptible to natural hazards, especially drought and floods. Given the population's dependence on seasonal rains to support their livelihoods, the severe disruption of rainfall patterns combined with increased vulnerability will jeopardise the capacity of huge numbers of people to sustain themselves, a situation that is already occurring in several parts of the country.

FIGURE 3. TREND IN TEMPERATURE AND RAINFALL, 1900-2009



CLIMATE PROJECTIONS



Increase of 1°C temperature
on average by 2060



Increased unpredictability of
seasonal rains and increased
intensity of rainfall events



Increased incidence
of drought

KEY CLIMATE IMPACTS



AGRICULTURE

Increased crop losses/failure
Loss of pasture lands and
water resources for livestock



ECOSYSTEMS

Reduction of critical habitats
for biodiversity in wetlands
and forests



WATER RESOURCES

Reduced river flows
Reduction
of key habitats in wetland
ecosystems



Bentiu IDP Camp. Photo Credit: UNMISS

Key Messages and Recommendations

1. Climate change is expected to increase the risk of insufficient access to safe water and improved sanitation and food insecurity, as well as the population's vulnerability to certain climate-related health issues, including increases in illness and outbreaks of pests and disease.
2. Increased drought and flood and a more unpredictable climate, when combined with rapid population growth and the expansion of farming, are likely to see a rise in clashes over natural resources, reflecting how climate change can contribute to conflict.
3. A flourishing agriculture sector, which depends on the viability of land and water resources, is crucial to long-term peace and development.
4. Adopting and implementing Vision 2040 and strengthening environmental governance by increasing the capacity and financing for the Ministry of the Environment and Forestry would help to ensure that the country's natural resources are both protected and used sustainably.
5. It is recommended that the Government implement measures towards the implementation of the United Nations Sendai Framework on disaster risk reduction and climate change adaptation and mitigation

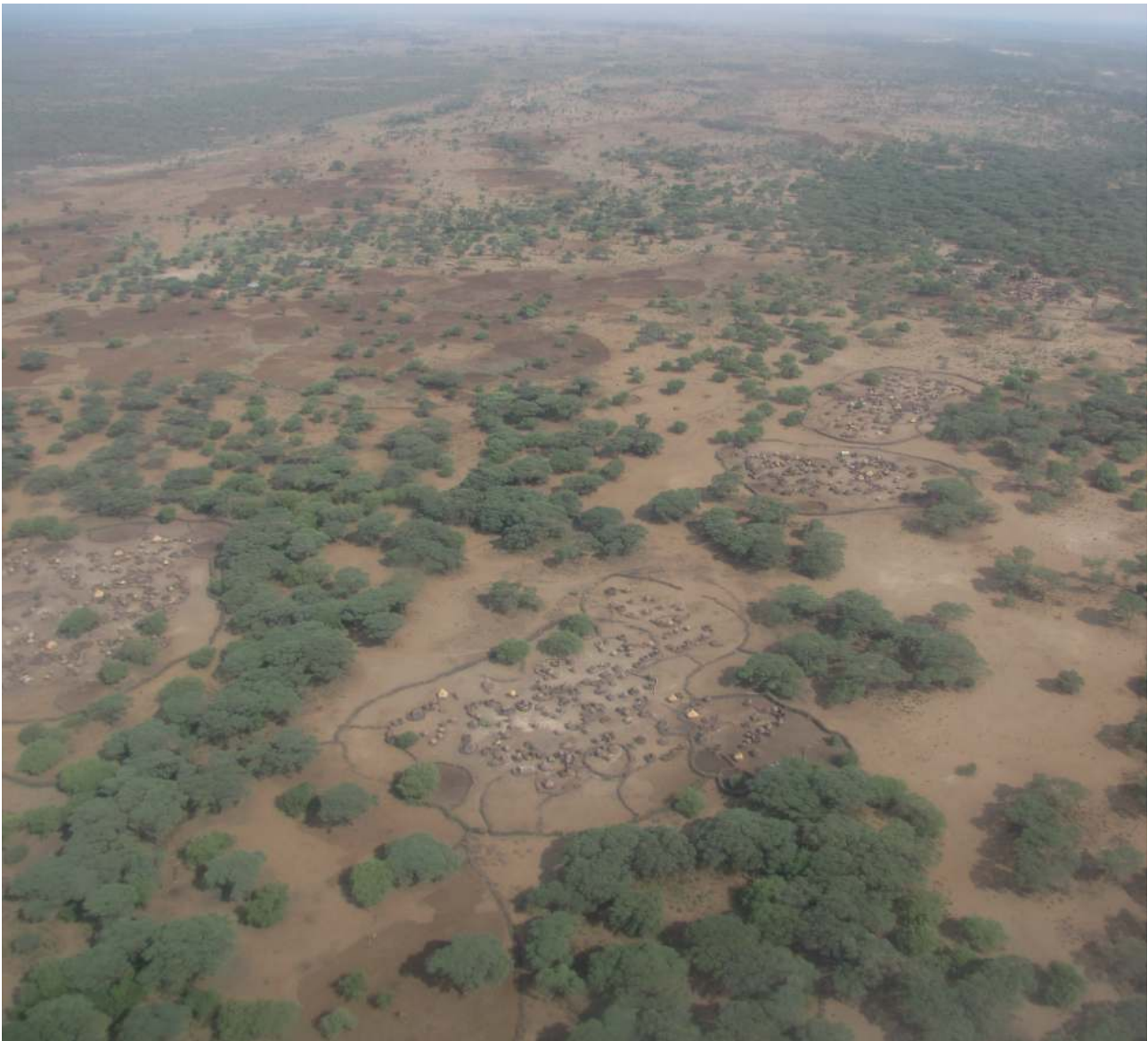
Pressures, Status, Impacts and Responses

Within the full report, thematic chapters focus on describing the major pressures on the environment in South Sudan and assessing their impacts on ecosystem goods and services and human well-being. “Ecosystem goods and services” refers to the benefits people obtain from ecosystems. These include goods, such as food, water, timber and fibre; different kinds of services, such as regulation of climate, disease, waste and water; soil degradation, photosynthesis and nutrient cycling; and other aesthetic and spiritual benefits from nature.

These chapters, whose key messages are summarised here, provide data and information on the status of the country’s environmental assets; showing their present distribution, and noting and assessing the trends in their quantity and quality over time. They make a major contribution to building a baseline of information about the state of South Sudan’s environment against which to measure future change. The information they contain provides the foundational environmental knowledge upon which to build as the country increasingly develops the infrastructure and capacity to monitor and measure the state of its natural resources.



Black cotton soil with the rain makes roads and airstrips unusable. Photo credit: Amy the Nurse/Flickr.com/CC BY-NC



Aerial view of Kapoeta surroundings showing extensive agriculture patterns and rural settlements. Photo Credit: Peter Gilruth, Environmental Pulse Institute

Agriculture

About 80 per cent of the population lives in rural areas where subsistence agriculture is the mainstay of people's livelihoods. The agriculture sector is characterised by small, hand-cultivating household units belonging to larger family aggregations practicing different combinations of rain-fed agriculture, livestock grazing and pastoralism, wild food harvesting, and fishing. About 81 per cent of households cultivate land, 74 per cent own livestock, and 22 per cent engage in fishing.

Although agriculture is the backbone of South Sudan's subsistence economy, production is very low. A scenario exercise by the World Bank illustrates the great potential for agriculture to increase the country's revenues. It showed that modestly increasing cropland from the current 4 per cent of total land area

(2.7 million hectares [ha]) to 10 per cent of total land area (6.3 million ha) would increase the value of total agricultural output by 2.4 times compared with the current level (in other words, from the current US\$ 808 million to approximately US\$ 2 billion). If per capita yields were to simultaneously increase by 50 per cent, the value of total agriculture output would increase by 3.5 times or to US\$ 2.8 billion. The per hectare value of crop production would also increase from US\$ 227 to US\$ 340. If per capita yields doubled in this modest cropland expansion scenario, the value of total agriculture production would increase to US\$ 3.7 billion and would exceed the current value of agricultural production in neighbouring Uganda. Increasing productivity threefold would increase the value of agricultural production to US\$ 5.5 billion.



Fishing for Subsistence in Bentui, South Sudan.

Key Messages

1. There is a huge potential for expanding irrigation, improving yields through seed selection and provision, developing aquaculture and taking advantage of agroforestry opportunities.

2. The lack of access to land and land-tenure regulation is a limitation to agricultural production.

3. Increasing climate variability has significant impacts on agriculture, including declines in groundwater and the degradation of croplands and rangelands, which disrupt food production and markets and contribute to cycles of violence, food insecurity and malnutrition.

4. The Comprehensive Agriculture Master Plan 2015 reported a general trend in parts of the country towards the conversion of forested land to permanent agriculture, with resulting land degradation and a loss of biological diversity and wildlife habitat.

5. Livestock production for food and commercial markets is hampered by cultural norms that value cattle for prestige and social transactions and place taboos on sales. In addition, endemic diseases undermine livestock production.

6. The political crisis has led to extreme rivalries among military and tribal groups, blocking the access of large numbers of pastoralists and their livestock to traditional water, pasture and market sources and forcing them to change their migration patterns and flee to other areas or into other states. This migration increases incidences of livestock-farmers conflicts.

7. Currently, the situation of conflict is the key threat to food production; it forces farmers and pastoralists to move away at times of the year that are crucial for planting and grazing, disrupts markets and reduces herd sizes, among other impacts. Furthermore, the ongoing conflict is the key threat to marketing food products along with the poor state of roads and lack of transportation and refrigeration.

8. Fishing in South Sudan is generally a subsistence or artisanal activity; the commercial fishery industry is almost non-existent.

9. Another important contributing factor to the lack of progress in the country's agriculture sector is the discrimination and inequalities women and girls face, including sexual and gender-based violence.



Cattle in Bor County, Jonglei. Photo credit: The Speaker/Flickr.com/CC BY 2.0

10. Further development of the agriculture sector could lead to greater production and exports; waged jobs; improved food security, livelihoods and income; and significant increases in gross domestic product.

11. The following policies, strategies and plans have been put in place to guide agriculture and fisheries development in the country and ensure their sustainability. Their implementation is currently stalled or hampered by a situation of ongoing conflict:

- South Sudan Development Plan, 2011-2016
- Ministry of Animal Resources and Fisheries Policy Framework and Strategic Plan 2012-2016
- Agriculture Sector Policy Framework 2012-2017
- Fisheries Policy for South Sudan 2012-2016
- Comprehensive Agricultural Master Plan
- Irrigation Development Master Plan
- National Agriculture and Livestock Extension Policy



Cultivation near Yambio. Photo credit: BBC World Service/Flickr.com/CC BY-NC 2.0

Forest

Forests and woodlands of various types cover a large proportion of South Sudan's vast territory including natural and plantation forests. Its natural forests have high levels of biodiversity and wildlife habitat and generate important ecosystem goods and services. These include provision of services (timber, fuel, food, etc.), carbon sequestration, hydrological cycling, soil stabilisation and cultural services. More than 90 per cent of the country's population directly depends on forests for fuelwood and charcoal production, timber for construction and non-timber forest products for

food and nutrition security, but this resource is under pressure and fast disappearing.

On the other hand, large areas of the country's forests and woodlands have remained untouched for decades. These natural forests, as well as current and future plantations, could play much more significant roles in South Sudan's economic development, but they will need to be managed sustainably so they maintain their valuable ecological attributes and do not continue to degrade and disappear.



Use of Mahoghany wood for bricks making in Aweil. Photo Credit: Arshad Khan, UN Environment.

Key Messages

1. Fuelwood and charcoal account for over 80 per cent of all wood used in South Sudan, with an annual deforestation rate likely between 1.5 per cent and 2 per cent. There are no reliable data on the extent, cover and destruction of forests, however, since a detailed forest survey and inventory has never been carried out.
2. There are no data on the amount of land that is devoted to agroforestry in South Sudan.
3. The continuous use of wood as fuel for cooking and the seasonal burning of forests by pastoralists, farmers, hunters, etc. to regenerate pastures for their herds have degraded or deforested parts of the county's natural forest areas and woodlands.
4. Harvesting and managing its forest resources offers South Sudan the opportunity to provide jobs and income and to maintain the ecological goods and services they provide; however, ongoing conflicts prevent the forests from being developed and sustainably managed to provide goods and services for current and future generations.

Biodiversity

South Sudan is endowed with a natural environment rich in biological resources. These include a large variety of ecosystems, a vast array of globally important species of flora and fauna and an unknown lode of genetic diversity. It is the home to the Sudd wetland, one of the world's largest tropical wetlands, and to one of the greatest circular migrations of wildlife on the planet.

Most of the population lives close to the natural environment, directly depending on forests and woodlands for fuel and food products, local soils in which to grow their crops, pastures for their livestock and nearby water sources for household needs. These ecosystem goods and services constitute the foundation of South Sudan's socioeconomic development.



The Sudd swamp, one of the world's largest wetlands. *Photo Credit Peter Gilruth*



Migration of kobs in Boma National Park. Photo credit: Wildlife Conservation Society

Key Messages

1. Biodiversity is of extreme national importance, since the country's ecosystem goods and services are the foundation of South Sudan's socioeconomic development.
2. The Sudd wetland is one of the world's largest tropical wetlands.
3. South Sudan has 14 national parks or protected areas and the world's second-largest animal migration after the great Serengeti-Masai Mara wildebeest migration; this epic migration of kob antelopes offers tremendous opportunity for the development of ecotourism.
4. The country harbours an immense diversity of wildlife species, many of which face threats from human activities, including wildlife poaching and trafficking; deforestation; settlements, cropland and livestock expansion; road building; mining and oil development; and climate change impacts.
5. The Wildlife Conservation Society and the South Sudan Wildlife Service reportedly estimated an elephant population of some 2,300 in the country prior to the civil war, which began in December 1983, down from about 79,000 in the 1970s.
6. At the international level, the country joined the United Nations Convention on Biological Diversity in 2014. In addition, the Sudd wetlands has been declared a wetland of international importance under the Ramsar Convention on Wetlands.
7. Unless conservation efforts are strengthened and enforced, the ecosystem goods and services and potential economic value of South Sudan's biodiversity will continue to deteriorate.



Elephant population in South Sudan. *Photo credit: Wildlife Conservation Society*



Nile lechwe. *Photo credit: Wildlife Conservation Society*

Water Resources

South Sudan's substantial water resources are unevenly distributed both spatially across the country and temporally, since water quantities vary substantially between years depending on periodic major flood and drought events. The Nile River hydrological basin covers most of the country. Water is held in perennial rivers and wetland areas; in seasonal pools, ponds, rivers, torrents, streams and extensive floodplains (the latter known locally as toich); and in cataracts, waterfalls and rapids upstream from the rivers. Water demand is still low given the country's relatively small population numbers

and density and the lack of industrial development, but it is expected to increase rapidly in the future with projected population growth and economic development. In 2007, the Ministry of Water Resources and Irrigation reported that the impact of human activities on the availability and quality of water resources was already evident and a growing concern. There is increased pollution, reduced river flows and declining water tables in urban areas, and both surface water and groundwater are becoming contaminated.



Women travel several miles each day to collect water in the drought hit area of Kopeata. Photo Credit: Arshad Khan, UN Environment.

Key Messages

1. There is little information on the distribution and hydrology of underground waters, or about the rates of water extraction and the impacts of human activities, such as potential over-abstraction and pollution.
2. Water availability in upstream and downstream areas of transboundary river basins is an extremely sensitive issue.
3. Water quantity and quality in South Sudan have declined in the past two decades. Rising urbanisation is associated with municipal wastewater, sewage and effluent from hotels and other service industries running straight into water sources, since most towns have no wastewater treatment facilities and lack adequate sanitation and sewage management systems. Similarly, water sources are also subject to the run-off of agrochemical fertilizers and fertilisers, which adversely affect water quality.
4. South Sudan's Ministry of the Environment and Forestry is seeking support for the construction of large hydro-electric dams and other related development schemes within the Nile Basin to be the most significant environmental threats to South Sudan's surface and subsurface water resources.
5. Although the Government is gradually instituting water management policies and regulations, the state of conflict, capacity and funding shortages, low population densities and widely scattered villages and towns present formidable challenges to providing water facilities, services and infrastructure in a cost-effective way.

Petroleum, Mining and Industry

The government has been making efforts to diversify its revenue sources, especially by developing its mining and industry sectors. Generally speaking, the industry sector is grossly under-developed in South Sudan, with the only modern primary industrial sector being the oil industry, which is dominated by foreign, mainly Chinese, Malaysian and Indian, investors. All oil produced in the country is exported. Gold is the other main natural resource contributing to the primary sector, but it is mainly mined at an artisanal level. The secondary or manufacturing industry is virtually non-existent and almost all intermediate and consumer goods are imported. The most prominent service-based industries (tertiary sector) include construction and metal fabrication.



An artisanal gold miner in Kapoeta North. Photo credit: Arshad Khan, UN Environment

Key Messages

1. South Sudan is endowed with abundant mineral resources and the potential for secondary and tertiary industries, but the only modern industrial sector is the oil industry. In fact, oil is currently the backbone of South Sudan's economy. Available data indicate that oil alone accounts for 98 per cent of the Government budget and in the recent past, it contributed 60-80 per cent of gross domestic product.
2. The impacts of oil exploration include deforestation and loss of habitat and biodiversity; the loss of grazing land and traditional livelihood opportunities; soil and water contamination, especially of critical wetlands due to oil spills; the eviction of communities and resulting mistrust between local communities and oil companies; and emerging health problems related to exposure to oil contaminants, including gas.
3. Pollutants from the oil extractive industry are likely to have led to emerging health problems, including rising rates of female infertility and increases in the number of miscarriages, birth defects and eye and skin problems.
4. The limitations to industrial development include the lack of geological exploration in non-hydrocarbon minerals, the dearth of investments, the shortage of trained human resources, the lack of basic infrastructure, power shortages and the state of conflict and insecurity.
5. The Government has instituted policies and set up ministries to oversee petroleum, mining and industrial development and help prevent negative impacts on the environment and society. The policy and legal framework include:
 - The Petroleum Act 2012
 - The Mining Act 2012
 - Mining (Mineral Title) Regulations 2015
 - The draft Environment Bill 2014 Implementation has not kept up with the need to protect ecosystem and human health.
6. A comprehensive Environmental and Social Impact Assessment (ESIA) should be made mandatory in the petroleum, oil and mining sector in order to ensure that socio-economic, environmental and climate change factors, including gender aspects, are appropriately integrated and operationalised.

The Urban Environment

While there is a migration of people from the rural areas to the urban environment for economic reasons, the extent of urbanisation is currently much smaller than the African average. For example, of South Sudan's population of 12.3 million, less than 20 per cent live

in urban areas, compared with the African average of 50 per cent. Nevertheless, Juba is one of the world's fastest-growing cities. Its population is about 350,000-400,000 and South Sudan's urban population is expected to grow fourfold from 2014 to 2050.



Juba landfill site: open dumping of waste and associated air pollution. Photo Credit: Peter Gilruth, Environmental Pulse Institute.

Key Messages

1. The most significant driver of urbanisation is the natural increase in population (births less deaths) due to the high fertility rate. Another driver is the influx of refugees, internally displaced people, immigrants and returnees to urban settlements. For example, in early 2017, there were 260,868 refugees in South Sudan, and the country was the site of Africa's largest refugee crisis.
2. The collection, transportation and final disposal of both solid and liquid waste are inefficient or non-existent in most of South Sudan. As much as half of urban waste is either dumped openly or burned, resulting in the proliferation of vectors, flies, rodents, pathogens and foul odours, soil pollution, the destruction of wildlife habitat, and air pollution that results in respiratory illnesses among the population. Because of poor or absent municipal waste collection, households dispose of their waste, much of which is composed of plastics, in unsightly informal dumps, on roadsides and in other public spaces. Furthermore, the lack of proper sewage systems and water treatment means human waste contaminates the water people use for household purposes, leading to the risk of waterborne illnesses such as cholera, malaria, etc.
3. The rural-to-urban migration and urbanisation have been accompanied by major environmental damage, particularly in areas with fragile ecosystems. Irreversible impacts on the environment, e.g. deforestation, water pollution and poor sanitation, are related to large concentrations of people and the creation of informal settlements in the urban centres. Also, large areas in most towns and municipalities have been gazetted for predominantly residential purposes with little or no space protected as parks and public recreational spaces.
4. Address the challenges of rapid urban growth in Juba City and the environmental impacts, the municipal government prepared a Juba City Sanitation Reform and Investment Plan, which lays out an integrated strategic approach for dealing with sanitation issues. Implementation of this plan will require substantial investments to strengthen the human and operational capacities of Government ministries and municipal-level departments.

Energy

Energy is one of the most important sectors of any country's economy, providing power to support economic development and human well-being. Since independence in 2011, the Government of South Sudan has taken steps to prepare for sustained economic growth. As a very young country, there are massive opportunities for growth in all sectors, especially in industry and public infrastructure services, such as education, health and water. Developments in these areas all require an affordable and reliable electricity supply.

South Sudan has abundant energy resources, much of them unexploited, except for oil, which accounts for almost all of its exports and for around 80 per cent of gross domestic product; this makes South Sudan the most oil-dependent country in the world. Oil revenues provided 98 per cent of the country's national budget in 2011. Prior to independence, South Sudan produced nearly 80 per cent of the whole Sudanese (Republic of Sudan and South Sudan) oil output. The literature forecasts that South Sudan's oil reserves will decrease because of the natural decline in mature fields. If new production comes on-stream, there is no guarantee that the volumes will be large enough to offset declines.

Current reserves are projected to last only until 2035. Given this scenario, the Government of South Sudan needs to strategically consider other primary energy sources with which to generate electricity.

Although South Sudan is known for its oil reserves, numerous renewable energy sources are available, including solar, wind and hydro. Given the country's low level of development, however, biomass is the chief source of fuel for domestic purposes, with 96 per cent of the population using some form of biomass for cooking. This over-dependence on biomass for fuel places enormous pressure on the country's forest and woodland resources.

In South Sudan, electricity, a secondary energy source, is primarily generated from thermal sources. Electricity is a much more efficient and cleaner form of energy than oil, which is the primary energy source currently utilised. Electricity use is extremely low: in 2015, final consumption of electricity was 16 tonnes of oil equivalent (ktoe) and total electricity generated was 28 ktoe. Of this, about 94% (26 ktoe) was generated from fossil fuels while 2 ktoe was generated from hydro sources.



Charcoal production to meet Juba energy needs. Photo Credit: Peter Gilruth, Environmental Pulse Institute



Phone charging in Konyo Konyo market. Peter Gilruth, Environmental Pulse Institute

Key Messages

1. Most of South Sudan's energy is produced from oil, and its oil dependence has been increasing. Most of the country's needed oil products are imported, however, because as yet there are no working refineries, and current reserves are projected to last only until 2035.

2. There are huge biomass resources in the country, including forests, animal wastes, agricultural residues and grass with a total energy content of about 32 million gigajoules.

3. The future of the country's electricity generation could be dominated by hydropower, since it has the capacity for up to 5,583 megawatts.

4. Wind power generation is not developed, but it is a key growth industry. Meanwhile, the country's solar potential is estimated at 436 watts per square metre per year.

5. The long-running civil war, internal conflict and continuing instability since 2013, poor infrastructure, and a lack of technical, financial and human resources capacity, especially at the South Sudan Electricity Corporation, have been major factors limiting the country's electrification and hindering achievements of some health, education and other social development goals.

6. The use of wood fuel and charcoal are causing deforestation and polluting emissions that are responsible for respiratory diseases. With the support of international research organisations, South Sudan should investigate rotational charcoal systems that could protect the environment while waiting for other energy solutions to come online.

7. The Government aims to expand the transmission and distribution grid to other state capitals and to allow interconnections with Ethiopia, Kenya and Uganda. By 2025, it intends to have 75 per cent of the urban population connected to electricity, up from 5 per cent in 2012.

8. There are a number of legal provisions in the energy sector. Some of the relevant laws include:
 - The National Electricity Bill 2015
 - National Electricity Sector Policy 2007
 - Petroleum Act 2012
 - Draft South Sudan Petroleum Policy Paper 2010
 - National Electricity Sector Policy 2007
 - Draft Environment Bill 2014

Outlook and recommendations for achieving the Sustainable Development Goals

The context for achieving sustainable development in South Sudan is captured in major vision documents that range from the global-level Sustainable Development Goals 2030 to those emanating from regional platforms (the African Union's Agenda 2063, the Intergovernmental Authority on Development's Article 7 and Regional Strategy 2016-2020), to the national level in the draft South Sudan Vision 2040.

However, ongoing conflict prevents the country from sustainably using and maintaining its natural resources for the population's well-being. The prevailing conflict and violence have an undeniable impact on the environment, both directly and indirectly. Examples of direct environmental impacts of the ongoing conflict as observed in 2017 include the following:

AGRICULTURAL PRODUCTION:

Due to the ongoing conflict, many farmers in affected areas do not plant for fear of having their crops stolen by the combatants or destroyed by livestock migration through agricultural areas. Farmers are forced to accelerate charcoal production to survive, thereby further triggering environmental degradation.

2-3 metres is continuous and unremitting, and the resident community living off the dump site inhale the toxic fumes from burning plastics. The field visit team noted reports of marginalised ethnic groups and poor citizens being forced to move onto the landfill site to survive, further exacerbating their poverty and desperation.

URBAN AREAS:

The ongoing conflict has destroyed infrastructure (tractors, diggers, shovels, fencing, housing, etc.) around municipal landfills, so the normal processing of solid waste is no longer possible. At the Juba municipal waste dump, spontaneous combustion at a depth of

FAMILY AND COMMUNITY:

In some areas, mature male family members were absent, leaving women and children, and sometimes only children, to fend for themselves. Male members were either hiding in the bush or conscripted into militias fighting in the conflict.



Aweil Community Meeting - note how few adult male members are present. Photo credit: Rodrigo Mena / Project When Disasters meet Conflict, ISS-EUR (2017)

WILDLIFE:

Populations of antelope (white-eared kob, for example) have been culled for meat to feed the population, as other sources of protein (beef, small ruminants) have either become more expensive or unavailable due to forced changes in migration patterns. Elephant tusks and rhino horns are sold for cash into a ready market. The Wildlife Conservation Society estimates that 30 per cent of the South Sudanese elephant population has been lost due to poaching.

FORESTS AND DEFORESTATION:

During times of conflict, people naturally avoid insecure areas, thereby concentrating charcoal production in accessible places and further intensifying land degradation around urban centres. Although accurate data were not readily available, it was reported that teak and mahogany are mined selectively for conversion to cash to support the conflict. In Jebel Lado County, the field visit team interviewed a charcoal burner who noted that poles are no longer available, probably due to the intensification of charcoal production and the consequent lack of tree vitality.

PETROLEUM:

The urgency to produce income to support the economy creates a situation in which shortcuts are made in production that do not fully protect the environment from pollution. Produced water (water that is brought to the surface along with oil or gas) and oil spills are exacerbated due to flooding in the rainy season and become the norm, as well as weak implementation of environmental management plans by the oil industry.

LIVESTOCK PRODUCTION:

As herders are no longer able to follow traditional and preferred migration routes due to conflict, cattle are either concentrated on non-productive land causing overgrazing or forced onto pasture where there are no pre-existing relationships between farmers and herders, leading to new sources of conflict. Livestock disease outbreaks associated with non-traditional migration routes have been documented.



Thousands herds of cattle roaming along Juba-Yei road destroyed crops and displaced the local communities around Kagwada and Ganji.

Indirect impacts of conflict are evident throughout the country, demonstrating the complex and deleterious nature of wartime economies. For example, as commodity prices increase, the rural population experiences aggravated poverty, which in turn affects how they manage their natural resources; examples include the increase in charcoal production, artisanal mining and the selling of livestock herds.

Peacebuilding through natural resources

South Sudan's natural resources — its land, water, grasslands, forests and mineral deposits — are critical to the country's prospects for a peaceful and prosperous future. The majority of South Sudan's people rely on these resources for their daily survival. The country needs to harness these assets to create jobs, generate revenue to fund basic Government services and lift the country from its position near the bottom of the Human Development Index. The effective management of South Sudan's natural resources could greatly improve the country's prospects for peace and stability. Essential elements of an effective natural resource management strategy include:

- Improving resource governance and sustainability
- Providing better accountability
- Involving more community participation
- Providing stronger mechanisms for dispute resolution, reduced competition for resources and improved transboundary resource management for resources, and improved transboundary resource management.

LAND

Resolving land tenure issues and successful land management is a necessity.

- ▶ Prepare for and manage the growing demand for land. Rapid population growth, internally displaced people, and environmental degradation are simultaneously constraining the amount of productive land available and increasing competition over land both in rural areas (for livestock and agriculture) and in urban centres (for infrastructure).
- ▶ Halt land grabbing. Weak and inconsistent land management and insecurity have permitted opportunistic land grabs by powerful elites, which undermine the rule of law and breed resentment among local people.
- ▶ Establish the structures to resolve land disputes. Develop more effective mechanisms to resolve land disputes, which are inhibiting development and poisoning community relations.
- ▶ Launch a major initiative to secure land rights of people.

FORESTS

Woodlands are a source of fuel and timber, the exploitation of which can lead to deforestation and land degradation.

- ▶ Implement a forest inventory and monitoring programme.
- ▶ Reduce the rate of deforestation for firewood by planting woodlots and involving communities more closely in the management of their local forests.
- ▶ Combat the illegal trade in high-value timber by raising the awareness of the impacts of the trade.
- ▶ Establish a certification scheme that provides a market for sustainably produced, conflict-free timber.
- ▶ Provide alternative sources of domestic energy.

GRASSLAND

There are nearly 12 million cattle in South Sudan. Yet the country faces famine and continues to import most of its meat from neighbouring countries, losing hundreds of millions of dollars every year without exports in return.

Cattle are an important source of rural livelihoods and play important roles in defining social status. Cows are considered a walking wealth, especially among herding communities. A large cattle herd increases an individual's importance in the community. Because of this, the nation's huge livestock wealth has not been utilised or introduced into the economic development of the country. Should South Sudan develop the livestock industry and to avoid possible conflicts, it should:

- ▶ Create a rangeland policy
- ▶ Establish formal grazing rights
- ▶ Have well-defined property rights that are enforced and transferable
- ▶ Promote responsible rangeland management
- ▶ Enhance the understanding of the importance of survival of pastoralism as livelihood among non-pastoral groups
- ▶ Negotiate and build peacebuilding among the users of communal grazing lands.



Huge herd of cattle on road to Bor, guarded by armed men. Photo credit: BBC World Service/Flickr.com/ CC BY-NC 2.0

In many parts of the country, cattle are the only path to marriage. The bride price is typically 20 to 40 animals, each worth up to US\$500. A girl who is perceived as beautiful, fertile and of high social rank can fetch as many as 200 cattle or more. This is a significant incentive for young men to steal livestock. Cattle theft is a common occurrence and stolen animals are a source of meat, milk and dowry. These thefts exacerbate existing conflicts. According to some estimates, more than 5,000 civilians have been killed in cattle raids since South Sudan gained independence in 2011. If currency were used instead of cattle, it could help to solve the theft problem and reduce conflict.

EXTRACTIVES

South Sudan contains rich underground resources including valuable reserves of oil.

- ▶ Make the country's mineral resources a strategic priority. This is the best hope for country to become financially self-sufficient.
- ▶ Develop an extractives sector that does not create or exacerbate conflict.
- ▶ Minimise the negative social and environmental impacts of extraction operations.
- ▶ Strengthen transparency and accountability in the mining sector to improve governance and tackle corruption.
- ▶ Provide responsible security around active sites.

WATER

Water management systems have to tackle inter-related challenges.

- ▶ Prepare for and manage the increased demand for water.
- ▶ Mitigate the risk of climate-related disasters.
- ▶ Build and/or rebuild water infrastructure without exacerbating regional tensions.
- ▶ Reduce competition over scarce water resources through more efficient irrigation systems, drought-resistant crops and public awareness campaigns.
- ▶ Increase the supply of water through water harvesting and infrastructure investments.
- ▶ Improve water governance by addressing the inequitable access to water for marginalised groups (including women), reducing corruption in the sector, supporting the community management of water and building capacity for dispute resolution.
- ▶ Prepare for the impact of climate and other human-driven change that will impact South Sudan's water security.
- ▶ Improve transboundary water management.



Solar powered mini water-yard facility in Gormoyok Village in Juba County, Central Equatoria State. Photo credit: UN Photo/JC McIlwaine

WEALTH SHARING:

Wealth-sharing arrangements among warring parties could be part of the peacebuilding process. There are many ways such arrangements could be reached, for example:

- ▶ Revenue from natural resources is shared between the central Government and subnational governments based on an amicably agreed-upon formula.
- ▶ Direct payments to citizens, which is rather difficult to implement.
- ▶ A mechanism for income sharing is devised in line with tax-based compensation (i.e., subnational governments receive the amount of revenue they would otherwise have received as income from natural resources).

Recommendations for achieving the Sustainable Development Goals

In September 2015, the international community agreed upon a new set of Sustainable Development Goals. The Sustainable Development Goals 2030 directly related to environment include:

GOAL 6

Ensure availability and sustainable management of water and sanitation for all

GOAL 7

Ensure access to affordable, reliable, sustainable and modern energy for all

GOAL 11

Make cities and human settlements inclusive, safe, resilient and sustainable

GOAL 12

Ensure sustainable consumption and production patterns

GOAL 13

Take urgent action to combat climate change and its impacts

GOAL 15

Protect, restore and promote sustainable use of terrestrial eco-systems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

GOAL 17

Strengthen the means of implementation and revitalise the global partnership for sustainable development

IN ORDER TO ACHIEVE AND MAINTAIN SUSTAINABLE DEVELOPMENT, SOUTH SUDAN MUST:

- ▶ Attain and uphold peace and security
- ▶ Manage the internal migration of people
- ▶ Develop agriculture and fishery sectors
- ▶ Develop an industrial base to create income-generating activities and employment
- ▶ Attract investments for infrastructure financing and tourism
- ▶ Strengthen institutional capacity to manage natural resources
- ▶ Develop policy and legislative frameworks for the sustainable development, management and conservation of natural resources
- ▶ Establish effective enforcement mechanisms for protecting wetlands, forests and wildlife
- ▶ Enhance the capacity to conserve and sustainably use natural resources for commercial and domestic purposes and to control their illegal use
- ▶ Build the capacity of environmental institutions by providing resources, training and tools
- ▶ Adopt to the impacts of climate change
- ▶ Negotiate transboundary issues, such as Nile River water sharing

South Sudan's main challenges related to SDGs implementation include: institutional arrangements, adequacy of financing and means of implementation, domestic and external resources, mobilisation and partnership with stakeholders and the private sector. The Government needs to undertake a thorough review and analysis of these and other related challenges and opportunities at the highest level.

SUSTAINABLE DEVELOPMENT GOALS



- Protecting the rights of refugees and migrants to save lives is another major challenge. South Sudan has now become the world's fastest-growing refugee crisis, with more than 1.8 million refugees – including 1 million children – having sought safety in Uganda, Sudan, Ethiopia, Kenya, Democratic Republic of the Congo and Central African Republic. Around 2 million people are displaced internally in South Sudan. The main drivers of food insecurity are the lack of livelihood opportunities, limited access to cooking fuel, restriction of movement in some areas, high prices on local commodities and limited access to land for farming. Furthermore, for these refugees, access to safe drinking water, sanitation and energy is usually inadequate and refugees frequently need to compete for dwindling resources, triggering tensions with host communities. Implementing environmentally sound refugee site planning is critical.
- South Sudan will need massive investment in building infrastructure and job creation towards long-term sustainable development. Adapting and implementing the Sustainable Development Goals to a South Sudanese context would require that relevant ministries review the targets and indicators and prioritise and incorporate them into national policy documents that in turn serve as a basis for short- and medium-term planning at the sectoral level.
- It is incumbent on the Government to create an environment to allow the following stakeholder groups to fully play their roles. Governance structures may need to be adjusted for these stakeholders to participate. Particularly important will be the interplay among the various ethnic groups who are critical for peacebuilding, and as South Sudan moves through the transition, for environmentally sustainable development.

TABLE 1. STAKEHOLDER FAITH-BASED GROUPS FOR POLICY IMPLEMENTATION

Category	Examples
Government of South Sudan	Professional staff in National Ministries
Civil society	National NGOs, Faith-based groups, etc.
Businesses and trade partners	Business leaders, Lion's Club, Banks, Manufacturers, Market goers
Academic institutions	University of Juba, Sudd research, secondary and primary schools
Development partners	UN agencies, multi-laterals (EU), bi-lateral aid agencies (DFID)
Sub-national governments	Professional staff in Payam, County, and State Governments; City Council workers, etc.
Local authorities	Village elders, Village chiefs, water providers, etc.

- Since independence in 2011, there has been considerable progress in drafting policies and laws applicable to sustainable development in South Sudan. If the current state of the environment is to improve in the near to medium term, South Sudan will need to invest significant resources in finalising, approving and then implementing these policies. UN Environment and other international organisations can assist by providing targeted and relevant technical expertise to move the process forward. The Government should reconfirm national priorities with the donor community and influence funding streams to favour their implementation. In summary, policy elements exist, but either they are not yet approved or they are not being implemented due to insecurity and lack of human and financial resources.
- To attain environmental sustainability in the long term, South Sudan must address shortcomings in the land tenure system that causes much harm in the country. Land tenure and conflict often have a “chicken and egg” relationship in Africa, and the report recommends that the Government review case studies on how to best solve the situation, and propose and implement legislation as needed.
- In the future, South Sudan has a huge potential to develop wildlife tourism, so sustainable tourism strategies or policies also need to be in place.
- For combating climate change, South Sudan should take steps toward implementing the National Adaptation Programme of Actions and meeting its Nationally Determined Contributions, and to seek donor support in so doing. It should plan for future Nationally Determined Contribution rounds beginning in 2020, including institutionalising processes and updating long-term strategies. Within this context, for example, South Sudan should link energy development plans to the overall climate change vulnerability situation. In revising current Intended Nationally Determined Contributions to Nationally Determined Contributions, South Sudan should plan adaptation targets and include them in the Nationally Determined Contributions during the five-year revision cycle. If this is attained, energy policies and projects will include adaptation actions and will inform the energy resources to be developed sustainably to meet demands, accelerate growth and adapt to extreme climate events.
- With the growing impact of climate change, water scarcity is a mounting concern. The bulk of South Sudan lies within the Nile Basin, which is shared by 11 countries. South Sudan should strengthen its knowledge base and diplomatic skills to prevent and resolve potential transboundary disputes over water resources, so water serves as a “catalyst” for cooperation among the Nile Basin countries.

- ▶ Climate change adaptation measures are needed in South Sudan to cope with the adverse impacts and to avoid further clashes over declining natural resources.
- ▶ International organisations should provide support and build capacity for sustainably managing South Sudan's natural resources, including community participation and benefits, to meet the growing demand for goods and services.
- ▶ Given South Sudan's great natural resource wealth, existing human capacity and opportunity for support from the international community, the initial need is to make steps toward peace and internal security to put it on firm ground to commence sustainable development.
- ▶ Whether at the national or local level, or across any of the environmental sectors, errors in data will negatively impact any planning, monitoring or evaluation activity. Clearly, it will be important for the National Statistical Office, Metrological Department and others with the Government to work from agreed, high-quality data sets in order to monitor and evaluate the country's progress toward sustainable development. This fundamental requirement cuts across all sectors.
- ▶ There is a need to build national capacity to collect, manage and share environmental data and information to track environmental change and assess how programmatic goals are being implemented.



A woman wades through contaminated flood water in Bentiu South Sudan 2014. Photo credit: BRACED Consortium, South Sudan.

Using the environment as an investment platform in South Sudan

It is proposed that this report, through its various findings and recommendations, can serve as a platform for guiding investments in sustainable development in South Sudan. The report has provided ample evidence that access to natural resources is an important source of the current conflict, and hence it must be addressed when solutions for a sustainable peace are negotiated.

The investment platform could consist of a combination of short-term activities and longer-term initiatives that when implemented would set a foundation for an improved and growing role for environment and natural resources in South Sudan's future. It is suggested that the Government of South Sudan, led by the Ministry of the Environment and Forestry, prepare a portfolio of opportunities to attract partner interest.



Aerial view of Juba. Photo credit: Peter Gilruth/Environmental Pulse Institute

PORTFOLIO ELEMENTS COULD INCLUDE, INTER ALIA:

EXAMPLES OF SHORT-TERM ACTIVITIES:

1. Seeking technical assistance in developing a medium-term plan and proposal for donor support for improving the role that environmental information will play in the implementation of the draft Vision 2040. The proposal should include:
 - Training;
 - Development, approval and implementation of data and statistic standards;
 - Support for the strengthening the National Statistical System and spatial data structures to play their role within a data and information network; including confirming agreements on roles, responsibilities and deliverables for creating and sharing core data sets;
 - Software and hardware acquisition.
2. Seeking technical assistance for preparing proposals to multi-lateral donors (the Green Climate Fund, Global Environment Facility) as well as bi-lateral donors for thematic issues related to climate change, Forestry, Wild life protection, water resources management and urban infrastructure)
3. Seeking technical assistance in finalising environmental policy documents that may still be pending.
4. Seeking technical assistance in using environmental principles and resource sharing as a means to assist conflict mediation, particularly at local levels, for example between pastoralist and farmer communities.

LINKED TO THE ABOVE, EXAMPLES OF LONGER TERM INITIATIVES WHICH SHOULD BE DEVELOPED INTO LARGER FUNDING PROPOSALS INCLUDE:

1. Stabilising conservation sites at Nimule National Park, Badingilo National Park, and Boma National Park through training of staff, including with the involvement of indigenous peoples. In time, these sites could serve as a nucleus for a growing tourism industry.
2. Strengthening environmental principles within the education sector by developing curricula, building resource materials (literature, videos, etc), and conducting tours to promote awareness of South Sudan's natural wealth.
3. Promoting agroforestry in both the short and long term by introducing or expanding current community forest initiatives to zones not experiencing active conflict. The intent would be to increase soil fertility in the short term, and to provide options for farmers to increase fodder, timber, and fruit production in the long term. Such an approach will create job opportunities in the medium term, and lessen pressure on forest resources in the long term.
4. Building capacity and entering into international agreements for the utilisation and marketing of timber and other forest products, while strengthening enforcement mechanisms to stop illegal logging.

The above lists are indicative of projects which could interest partners. It is suggested that Government set up a donor round table, inviting those stakeholders most interested in establishing a sustainable peace through the lens of the Environment. MOEF should prepare a series of project briefs (two pages each) to capture the essence of the proposed initiative which would then serve as a basis for cultivating donor interest and negotiate further support.

Conclusions

This initial assessment of South Sudan's environment and natural resources provides compelling evidence that the newly founded nation has extensive oil and minerals, forests, rangeland, agricultural land, water resources and abundant wildlife. However, the ongoing conflict prevents the country from sustainably using and maintaining its natural resources for the wellbeing of the population. Indeed, the conflict has touched each sector of the environment, and in turn, the population that depends on it. Whether the impact is a lack of poles for home construction, due to deforestation in areas surrounding major towns and Protection of Civilian sites, or an increase in livestock disease due to herders' inability to follow traditional migration patterns, or a decline in human health due to inadequate attention to environmental monitoring and control in the petroleum industry, all South Sudanese are living the consequences of conflict and the deflated economy.

South Sudan must take action to maintain peace and security, manage internal migration and settlement of people. Then, the main tasks are to create income and employment generating activities by promoting agriculture and industrial development, attracting investments, building infrastructure, developing tourism industry, formulating policy and legislative frameworks, establishing implementation mechanisms for protection and sustainable use of natural resources, and developing climate resilient communities. By taking these actions, South Sudan has the opportunity to develop as a prosperous nation once peace and normalcy return.

The international community can support these peacebuilding activities. It can assist by offering platforms for the various parties to negotiate, and by contributing scientifically credible environmental information to make the process more transparent. The community can also better link humanitarian assistance to a sustainable environment by ensuring that their interventions not only do no harm, but plant the seeds of growth so that South Sudan can re-enter its path to sustainable development and regain lost time. Energy infrastructure and knowledge systems such as data repositories should be designed in such a way that future generations of South Sudanese are able to discern change in their environment and adjust policies and actions as needed.

South Sudan should be able to provide its citizens an environment for the livelihoods they deserve, and thereafter play its full role within the global community. Despite the environmental challenges the country faces, South Sudan's potential is evidenced in this State of Environment and Outlook Report. Given that petroleum resources will have a limited time frame as the sole income source for the Government, and that most of the population derives their livelihoods from the natural resources of the country (agriculture, fishing, forestry, etc.), South Sudan must protect its environmental heritage for current and future generations. This report provides the context and direction for this transition to occur. The post-conflict South Sudan provides a rare opportunity to truly embed the principles of sustainable development into the governance architecture in the country. Given its inherent wealth in natural and human resources, South Sudan could become one of Africa's greatest success stories.



