

Situation Report
**Nature and extent
of environmental
crime in Sudan**



Abdel HA Hamid, Donald A. Mwiturubani and Deborah Osiro
November 2009



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Contents

Acknowledgements	iii
Acronyms and abbreviations	iv
Executive summary	v
The state of the environment in Sudan	v
Objectives of the study	v
Study approach and methodology	v
The nature and extent of environmental crimes	vi
Legal and institutional frameworks	vi
Training capacity needs for environmental law enforcement agencies and officials	vii
Conclusion and recommendations	vii
Introduction	1
The state of the environment in Sudan	3
An overview of Sudan's forest resources	4
An overview of wildlife resources	8
Water resources	9
Range and pastureland	9
Inland fisheries	9
Coastal and marine environment	9
Objectives of the study	11
Study approach and methodology	13
The nature and extent of environmental crime in Sudan	15
Environmental crime related to the forestry sector	16
Environmental crime in the wildlife sector	16
Environmental crime in the water sector	17
Environmental crime in the fishing sector	17
Environmental crime related to the coastal and marine environment	17
Pollution in the industrial sector	18
Dumping of wastes	18
Legal and institutional framework related to the environment	19
Legal framework	19
Environmental Protection Act of 2001	19
Legislation related to forestry	20
Legislation related to wildlife	21
Freshwater fisheries legislation	21
Marine fisheries legislation	21
Other legislation affecting the environment	22
Institutional framework	22

Non-governmental organisations	27
The Sudanese Society for Environment Protection	27
The Sudanese Social Forestry Society	27
The Environmental Union	27
Capacities of institutions to combat environmental crimes	29
Regional and international environmental treaties	31
Pre-Stockholm Conference, 1972	31
Post-Stockholm Conference, 1972	31
Post-Rio Conference and Agenda 21	31
The training capacity needs of environmental law enforcement officers and institutions	33
Environmental Protection Department in the CID	33
Directorate of Environment Affairs	33
Forests National Cooperation and the Forests Department	33
Water resources	33
Wildlife Conservation Department	33
Conclusions and recommendations	35
Notes	37

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Acronyms and abbreviations

CPA	Comprehensive Peace Agreement
CID	Criminal Investigation Department
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EAPCCO	East African Police Chiefs Cooperation Organisation
ECP	Environmental Crime Project
EIA	Environmental Impact Assessment
ESP	Environmental Security Programme
FAO	Food and Agriculture Organisation of the United Nations
FNC	Forests National Cooperation
FRA	Forest Resources Association
GDP	Gross Domestic Product
GNU	Government of National Unit
GOSS	Government of Southern Sudan
HCENR	Higher Council for Environment and Natural Resources
IDP	Internally displaced person
Interpol	International Police
ISS	Institute for Security Studies
MEA	Multilateral Environmental Agreement
NCB	National Central Bureau, Khartoum, Sudan
NGOs	Non-governmental organisations
NWFP	Non-wood forestry products
POP	Persistent Organic Pollutant
SSFS	Sudanese Social Forestry Society
SPLM	Sudan People's Liberation Movement
TOR	Terms of reference
UN	United Nations
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development

Executive summary

This report analyses the nature and extent of environmental crime in Sudan. It is based on a study commissioned by the Environmental Crimes Project (ECP) that is implemented jointly by the Institute for Security Studies (ISS) and the East African Police Chiefs Cooperation Organisation (EAPCCO). The main objective of the ECP is to enhance human security by improving regional law enforcement and policy-making aimed at fighting environmental crime in East Africa.

‘Environment’ is the combination and interaction of all the physical factors that constitute the surroundings of human beings, including land, water, the atmosphere, sound, odour, taste, climate and other life such as animals and plants. The environment also covers social and cultural factors, both in the natural and built environment.

An environmental crime can be defined as an act against the environment that contravenes legislated laws, thereby infringing on the right of citizens to benefit from their surrounding environment. The laws in question may be local by-laws, national laws or international laws.

Most of the environmental statutes currently in force in Sudan were enacted during the colonial period. These laws either determine the management of the country’s natural resources, such as forests and woodlands, wildlife, inland and marine fisheries, and land tenure, or human and animal health. All this legislation is of a sectoral nature. Only in 2001 was a framework environmental law adopted.

Environmental crime is of growing concern in Sudan, in particular because of the proliferation of illegal firearms as a result of recent civil wars. Environmental crimes are committed in the wildlife, forest, land and water sectors, and include the poaching and killing of wild animals, the illegal logging and trading of timber, the pollution of water resources, and the haphazard dumping of wastes along highways.

THE STATE OF THE ENVIRONMENT IN SUDAN

Sudan is rich in both underground and surface natural resources that have remained undeveloped because

of political and economic constraints. The country’s important natural resources include forests, wildlife, water, pasture and rangelands, coastal and marine resources, and arable lands. The country is reported to be endowed with petroleum and a range of metallic and non-metallic minerals, including gold, silver, copper, iron ore, manganese, zinc, gypsum, salt, marble and granite.

The country suffers from serious environmental problems caused by the over-exploitation of resources and from natural factors. Desertification, deforestation, depletion of wildlife populations, soil erosion, dust storms and periodic persistent drought head the list of environmental problems encountered in the country.

OBJECTIVES OF THE STUDY

The aim of the study was to collect data and generate information that would result in the publication of a comprehensive report on the nature and extent of environmental crime in Sudan. The study was carried out between October 2008 and March 2009 with two main objectives, namely to assess the nature and extent of environmental crime, and to determine the capacity needs of the environmental law enforcement agencies in the country.

STUDY APPROACH AND METHODOLOGY

Researchers carried out an extensive literature review as well as interviews at the major agencies involved with the environment to identify the nature of environmental crimes, laws related to the environment, the development of the legal framework and its effectiveness. Data and information were collected from various institutions and organisations in Khartoum, Juba and Port Sudan. Interviews were conducted with key personnel, experts and scientists at these organisations. The departments visited included wildlife management, water resources management, forests, fisheries and environment in Khartoum and Juba, sanitation in Juba, the National Central Bureau and the Criminal Investigation Department (CID) in Khartoum, and Equatoria State in Juba.

THE NATURE AND EXTENT OF ENVIRONMENTAL CRIMES

The main environmental crimes stipulated in article 20 of Sudan's Environmental Protection Act of 2001 include pollution in different forms, including the pollution of water, air, soil, food and the atmosphere, as well as epidemic, radio-active, photo and acoustic or noise pollution. Other serious environmental crimes are illegal hunting, the removal and felling of trees, changes in the natural water flow, the dispersal of genetically modified organisms without compliance to regulatory measures, the illegal manufacture of products and the abuse of soils. Encroachment on forest land for cultivation, grazing and fuel-wood collection, and the use of forest as war zones and for defence are also considered serious environmental crimes.

Crimes in the forestry sector

The main environmental crimes in the forestry sector include the propagation of bush fires, the setting of fires, illegal entry into forest reserves, the illegal logging and/or sawing of round wood, the cutting, collecting, destroying or converting of any forest produce for private benefit without permit, the transport or attempt to transport any forest produce without permit, the grazing of livestock in forest reserves and charcoal-making.

Crimes in the wildlife sector

Crimes in the wildlife sector include poaching, illegal hunting, the violation of hunting permits in terms of the hunting season, the area of hunting, the approved species, quantities and means of hunting, and the smuggling of wildlife and/or their products. Other crimes are encroachment on wildlife reserves for agriculture and grazing purposes, the lighting of fires and/or the illegal cutting of trees.

Crimes in the water sector

The main crimes relating to water resources include pollution by wastes generated by households, industries and urban centres owing to absence of proper sewage systems, the illegal application of herbicides and insecticides, and poison fishing. Water pollution may be trans-boundary in nature. Other causes of water pollution are indiscriminate waste disposal because of an absence of land fill sites, cultivation along river banks and the location of hotels with poor sewage systems along the Nile. The deforestation of catchment areas that result in increased surface runoff and river siltation, illegal connections to treated

water, the illegal pumping of water, and the destruction of water systems and pipes are also considered crimes in the water sector.

Crimes in the fisheries sector

Crimes in the fisheries sector include the use of destructive fishing methods, such as poisonous chemicals or destructive fishing gear, the violation of fishing permits in terms of the type of catch or the fishing period, pollution resulting from the disposal of liquid wastes or oil spills, and illegal fish trawling, especially in the Red Sea.

Crimes in the coastal and marine environment

The main environmental crimes in the coastal and marine environment include pollution resulting from the discharge of oily wastes into the Red Sea, oil leakages from ships, the illicit felling of mangrove trees, illegal fishing methods such as using poisons and unacceptable fishing nets, the disposal of cooling water and chemicals by factories, and the importation of invasive species in ballast water.

Pollution in the industrial sector

The industrial sector in Sudan has suffered from a lack of investment and this reflects in their poor environmental performance. Most industries have been releasing untreated wastewater into the Nile, the country's main water source.

The dumping of wastes

With regard to hazardous wastes, the disposal of medicinal wastes represents a major environmental threat to urban communities in Sudan as adequate facilities to handle such wastes are lacking in most urban centres. When it comes to solid wastes, with exception of the state of Khartoum, which in 2002 established the Khartoum cleaning project for solid-waste collection and disposal, the country has no waste-collection and disposal facilities and such wastes are disposed of haphazardly.

LEGAL AND INSTITUTIONAL FRAMEWORKS

Sudan has numerous pieces of legislation aimed at protecting and conserving the environment. It is claimed, however, that these laws, acts and ordinances, which are of a sectoral nature, reflecting the structure of government

institutions and departments, has led to a situation where natural resources are managed in a fragmented and un-coordinated manner, resulting in government institutions working in isolation from each other. In the meantime, the Higher Council for Environment and Natural Resources (HCENR), which was established in 1990 to coordinate sectoral laws for environmental management, is yet to achieve its objectives.

Environmental laws in Sudan include the Environmental Protection Act of 2001, the Forests Act of 1989, the Forests National Corporation Act of 1986, the Forests and Renewable Natural Resources Act of 2002, the Wildlife and National Parks Protection Act of 1986, the Fresh Water Ordinance No. 24 of 1954, the Marine Fisheries Ordinance of 1937, the Marine Act of 1961, the Environment Health Act of 1975 and the Interim Constitution of 2005.

A major weakness of the institutions responsible for environment protection in Sudan is that they fall under different ministries and that there is no effective mechanisms to coordinate their efforts. Bodies directly or indirectly involved in environmental management include the HCENR, the environmental protection department in the CID, the Ministry of the Environment and Physical Development, and the Forestry, Wildlife Conservation and Range and Pasture departments. Their duties and responsibilities seem uncoordinated and often to overlap, which has prevented the achievement of the objectives of sustainable environmental management and the protection of Sudan's natural resources.

TRAINING CAPACITY NEEDS FOR ENVIRONMENTAL LAW ENFORCEMENT AGENCIES AND OFFICIALS

There are training gaps that need to be bridged to enhance the capacities of the agencies to combat environmental crime in Sudan. In particular, knowledge of the legislation that governs the environment needs to be enhanced, while skills with regard to specialised investigation, arrest and prosecution should be improved. Other areas that would benefit from training are specialised surveillance and investigation skills, especially in the case of field staff, Environmental Impact Assessment (EIA) principles and procedures, negotiation skills on Multilateral Environmental Agreements (MEAs), the handling of trans-boundary environmental crimes, wildlife ecology and the changing environment, wild animal behaviour, and techniques to control poaching and wildfires. The training needs could be achieved through seminars, workshops, short courses and in-house training using experienced members of staff.

CONCLUSION AND RECOMMENDATIONS

This report concludes that environmental crime in Sudan is not yet very serious and can be controlled by good natural resources management and protection since offences are of an individual nature rather than being highly organised. Even so, environmental crime presents a key challenge to Sudan's development since the greater part of the population depends to a large extent on natural resources for its livelihood.

It is therefore recommended that significant efforts be made to raise awareness of the effects of environmental crime on the environment and the economy at the public and the decision-maker levels. Of paramount importance is the sensitisation of the judiciary, the prosecution and the police to the importance of environmental protection, and the serious social and economic repercussions that may result from failure to react promptly and strongly against environmental offenders.

There is also an urgent need for the reorganisation of some of Sudan's government departments and institutions concerned with the environment to avoid dualism in affiliation, to enhance efficiency when addressing environmental issues, and to promote improved cross-sectoral coordination. Furthermore, the division of responsibilities between the central government and federal states need to be clarified to avoid disputes and overlaps.

The capacities of institutions responsible for environmental protection need to be strengthened by improving their mobility and communication levels, so as to enhance their capabilities with regard to preventing and detecting environmental crimes and enforcing laws. Most of the national legislation pertaining to environmental protection is weak and out-dated. The legislation needs to be revised and updated to address current national and international developments in environmental crime prevention.

Of considerable importance is the availability of accurate statistics on the real contribution of natural resources to Gross Domestic Product (GDP), food security, poverty reduction and the livelihood of the Sudanese people. Unless such data becomes available, the ability of the relevant institutions to obtain sufficient funds from the treasury for the protection and rehabilitation of the environment, and for the sustainable management of these resources, will remain limited. Equally important is the quantification of the loss to GDP of environmental crime. Relevant government departments and institutions should take the lead in conducting regular surveys in this regard.

The cross-boundary nature of environmental issues requires strong cooperation between the federal government, the government of Southern Sudan (GOSS), state governments, non-governmental organisations

(NGOs), neighbouring countries and the international community.

Finally, the rise in environmental crime should also be addressed by the development of legislation and policy

that enables local communities to benefit from the country's natural resources, thereby encouraging them to value and protect the environment.

Introduction

This report deals with the nature and extent of environmental crime in Sudan. It is based on a study that was commissioned by the Environmental Crimes Project (ECP), which is implemented jointly by the Institute for Security Studies (ISS) and the East African Police Chiefs Cooperation Organisation (EAPCCO). The main objective of the ECP is to enhance human security by improving regional law enforcement and policy-making aimed at fighting environmental crime in East Africa.

The ECP falls under the Environmental Security Programme (ESP) of the ISS. This programme is geared to addressing a wide range of issues, including environmental crime, climate change, energy security, food security, natural resources conflict, pollution, gender-related issues in the environment, human security, environmental diplomatic discourse and capacity building, and sustainable livelihoods.

‘Environment’ is the combination and the interaction of all the physical factors that constitute the surroundings of human beings, including land, water, the atmosphere, sound, odour, taste, climate and other life, such as animals and plants. Environment also covers social and cultural factors, in both the natural and the built environment. Particularly in Africa, the environment plays a vital role in supporting different forms of life, in alleviating poverty and in economic development.

Crime, on the other hand, can be defined as an act, usually grave, that is punishable by law¹. Environmental crime, therefore, can be defined as an act against the environment that contravenes specific legislation such as local by-laws and national or international laws, thereby infringing on the right of citizens to benefit from their surrounding environment. As far as Sudan is concerned, the environment is managed at different levels, namely

at federal government, government of Southern Sudan (GOSS) and federal state levels.

Most of the environmental statutes currently in force in Sudan have their origins in the colonial period. These laws either determine the management of the country’s natural resources, such as forests and woodlands, wildlife, inland and marine fisheries, and land tenure, or human and animal health. All this legislation is of a sectoral nature; only in 2001 was a framework environmental law adopted.

Before the signing of the Comprehensive Peace Agreement (CPA) in 2005 that ended over two decades of civil war in Sudan, Sudan’s environment was governed by laws and policies formulated at federal government level. After the CPA, which established the GOSS, some laws and policies relating to the environment in Southern Sudan have been formulated at the GOSS level. This includes the Wildlife Service Act of 2008, the Forest Policy Framework of 2007 and the Environment, Wildlife Conservation and Tourism Policy Framework and Work Plan 2006 – 2011. However, federal government laws relating to the environment are still used in the GOSS, such as the Environmental Protection Act of 2001 and the Forest Act of 1989.

Environmental crime is of growing concern in Sudan, in particular because of the proliferation of illegal firearms as a result of recent civil strife. Environmental crimes are committed in the wildlife, forest, land and water sectors, and include the poaching and killing of wild animals, the illegal logging and trading of timber, the pollution of water resources, and the haphazard dumping of wastes along highways.

Sudan’s environmental crime is blamed for causing the degradation and depletion of natural resources as a result of uncontrolled use and over-utilisation, particularly in

the southern region of the country. Degradation partly results from the interruption of the traditional and generally sustainable use of resources by the outbreak of civil war. However, despite misuse and over-utilisation, natural

resources are still the primary source of livelihood and economy activity. Local communities depend on the environment and specifically on natural resources for subsistence agriculture, hunting, fishing, fuel and building.

The state of the environment in Sudan

Sudan is a vast and diverse country covering an area of 2.5 km². Its ecological zones range from hyper-arid in the north to humid and sub-humid in the south. The extension of the country from a latitude of nearly four degrees in the south to more than 22 degrees in the north, and the associated rainfall variation from zero to more than 1 000 mm, together with the variety of soil types, has resulted in a range of flora and fauna species that has traditionally been utilised by local communities to satisfy their needs for food, fodder, medicine and income generation.

The Nile River with its various tributaries crosses the country from south to the north with an annual flow of about 84 billion m³ of which Sudan's share is 18,5 billion m³ at Aswan. The country is endowed with underground water, which has yet to be tapped, in addition to numerous seasonal rivers outside the Nile Valley that need to be controlled and regulated to maximise their utilisation. Forests and grasslands cover an area of about 138,6 million ha.² These resources have permitted the build-up of a national herd of an estimated 140 million head of cattle, sheep, goat and camel, as well as a variety of game. The Nile Valley and the Red Sea's abundance of fish and aquatic life support food security in addition and attract tourism. The country is also rich in mineral resources, including oil, production of which has developed rapidly to 500 000 barrels a day.

The total population of the Sudan is estimated to stand at nearly 40 million, with an annual growth of about 2,7 per cent and a geographical density of slightly over 12 persons per km². However, population distribution is uneven; about a third of the population occupies less than seven per cent of the land area and many parts of the country are unoccupied. This uneven distribution has significant implications for the country's natural resources. A clear example is the distribution of population and forestry

resources – more than two thirds of the population is dependent on one-third of the forestry resources in the north, while the ratio is reversed in the forest-rich south.³

Agriculture provides the main livelihood for Sudan's people and is also the country's main economic activity and export, apart from oil. It provides employment for over 70 per cent of Sudan's workforce and contributes about 40 per cent of Gross Domestic Product (GDP). The principal agricultural exports are oil seed, natural gum and other non-wood forestry products (NWFP), livestock, cotton, hides and skins, meat and oilseed cake. Export earnings from NWFP, including wildlife products, amount to 17 per cent of total non-oil export earnings.⁴

The country has shown much commitment towards environmental protection since the mid-1970s. According to Ali,⁵ this commitment was triggered by environmental disasters, in particular desertification and drought, that struck African Sahel states from 1968 to 1973, and by the emerging global environmental awareness that followed the Stockholm Conference on the Human Environment in 1972.

Sudan is rich in both underground and surface natural resources, although these have remained largely undeveloped because of political and economic constraints. The country has abundant arable lands, water and great faunal and floral variety. It is also endowed with oil and a range of metallic and non-metallic minerals, including gold (about 6 t/a), silver, copper, iron ore, manganese, zinc, gypsum, salt, marble and granite. However, the country is also characterised by serious environmental problems resulting from the over-exploitation of certain natural resources and natural factors. Desertification, deforestation, the depletion of wildlife, soil erosion, dust storms and periodic persistent drought head the list of environmental difficulties being faced the country.

The United Nations Environmental Protection Agency (UNEP) in its environmental assessment for the Sudan identified the following critical environmental issues that are closely linked to the country's social and political challenges:⁶

- There is a strong link between the environment and conflict, as reflected by the Darfur crisis. The country's long history of conflict has had a significant impact on its environment. On the other hand, environmental issues and competition over oil resources have contributed significantly to internal conflict in Sudan
- Massive and unprecedented population displacements resulting from internal conflict have had significant environmental impacts
- Desertification and regional climate change have represented a continuous stress factor on pastoralist communities, particularly in Darfur and Kordofan in southern Sudan, and have as a result contributed significantly to the country's ethnic and political conflicts
- The long and devastating droughts of past decades, which have undermined food security, are a strong factor in human displacement and related conflicts
- Inadequate rural land tenure is an underlying cause of many environmental problems and a major obstacle to sustainable land use as farmers have little incentive to invest in and protect natural resources
- The alarming deforestation crisis in the drier regions, which is driven principally by energy needs and agricultural expansion, is one of the country's major environmental concerns
- Dam construction is considered by many environmentalists as a very important environmental issue in the water resource sector in Sudan. Major environmental problems associated with dam construction include silt loss for flood recession agriculture, dam sedimentation, severe riverbank erosion and the degradation of downstream habitats
- Rapid and chaotic urbanisation and associated uncontrolled sprawl, chronic solid-waste management problems and lack of wastewater treatment are the leading environmental threats facing Sudan's urban centres
- Industrial development and the associated release of effluent from factories, as well as the disposal of production water associated with crude oil extraction, are issues of particular concern
- The past few decades have witnessed a major assault on wildlife and habitats resulting from habitat destruction, the fragmentation of farming land and deforestation. This has led to a significant depletion of the country's biodiversity. On the other hand, Sudan's marine environment is considered to be a largely

intact ecosystem, but it is currently under threat from the economic and shipping boom at Port Sudan and new oil export facilities. These developments could affect marine environmental integrity if not handled carefully

- Recent constitutional developments have led to significant changes in the framework for environmental governance in Sudan and could help to create the conditions necessary for reform, provided the regulatory authorities are enabled to overcome their critical structural problems and under-resourcing

AN OVERVIEW OF SUDAN'S FOREST RESOURCES

Sudan is classified as a moderately forested country with about 29 per cent forest and woodlands cover,⁷ of which only 4,5 per cent is gazetted forest reserve. Almost two-thirds of the country is desert or semi-desert. While low-rainfall woodland savannah forest covers most of central Sudan, open broad-leaved forests are most common in southern Sudan, with closed forests found in small niches on mountain slopes in the same region.⁸ Fig. 1 shows the extent of the country's forest cover. Basically, seven types of forest zones can be identified from north to south, according to the Harrison and Jackson classification, as follows: a) Desert; b) Semi-desert; c) Low-rainfall woodland savannah on clay; d) Low-rainfall woodland savannah on sand; e) High-rainfall woodland savannah; f) Special forest types; and g) Montane forest.

Thus, while most of Sudan is desert or semi-desert, the greater part of southern Sudan is rich in natural forests and woodlands, which are estimated to cover about 29 per cent (about 191 667 square kilometres) of the total area of Southern Sudan.⁹ The region has a humid climate and most areas receive annual rainfall of between 900 and 1 800 mm/a. Its 72 forest reserves cover an area of 762 778 ha and another 49 forest reserves with an area of 442 908 ha are in the process of being gazetted.

An Africover study has revealed that over 70 per cent of the Sudanese people depend on forests to earn their livelihoods. The forests provide fuel-wood, charcoal, building materials, timber, gum, food, fodder and native medicines. This over-dependence of a growing population on forests and forest products is so delicate that a balance will need to be found between protective objectives and livelihood security. Most forests in the country fall under protective measures that try to rationalise the use of forests in a sustainable manner.

According to national statistics, forests contribute about 3,3 per cent of GDP. However, this figure includes neither the outputs collected and/or consumed directly by local communities in the informal sector, nor the service

Figure 1 Sudan land cover map

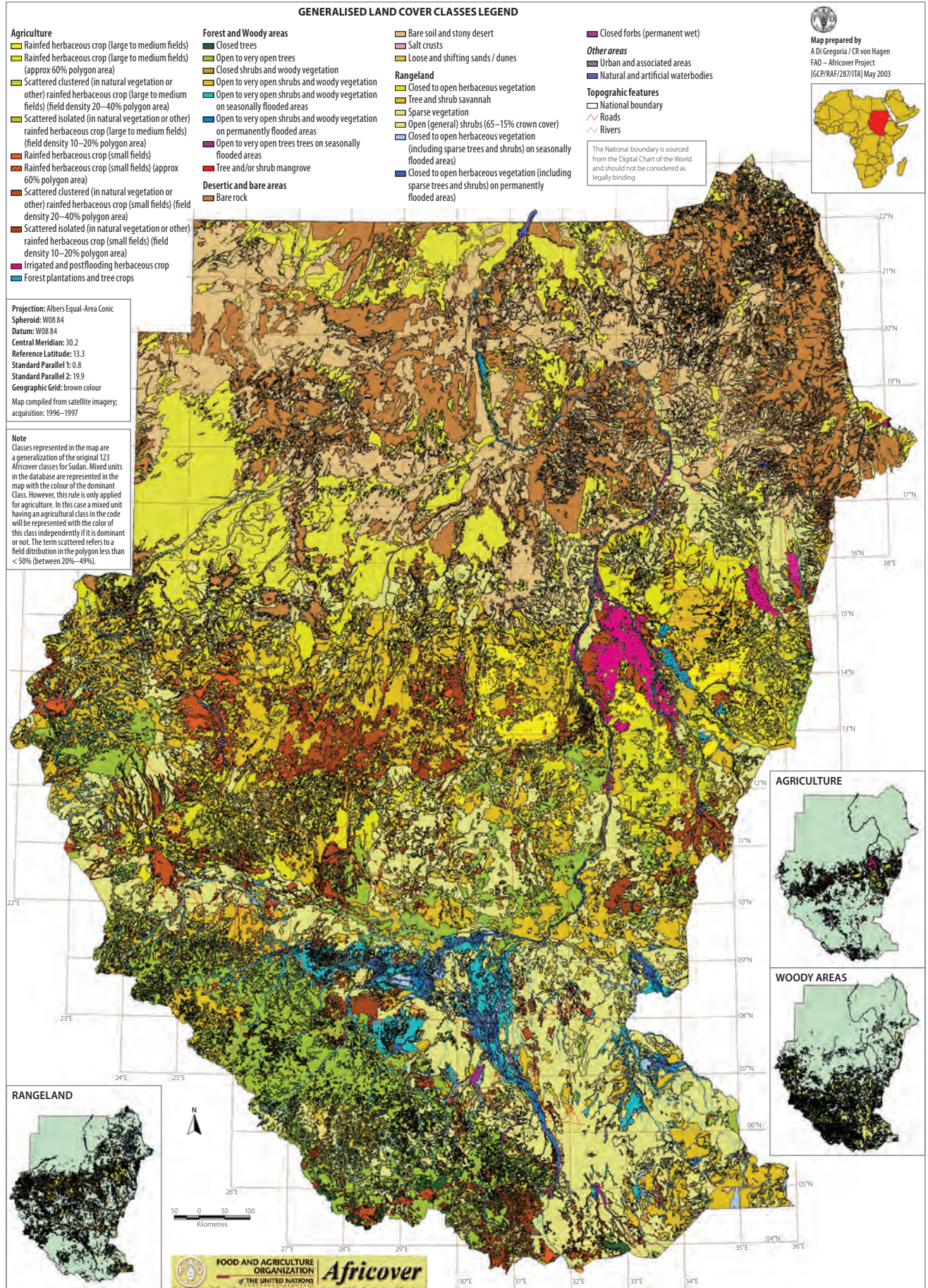
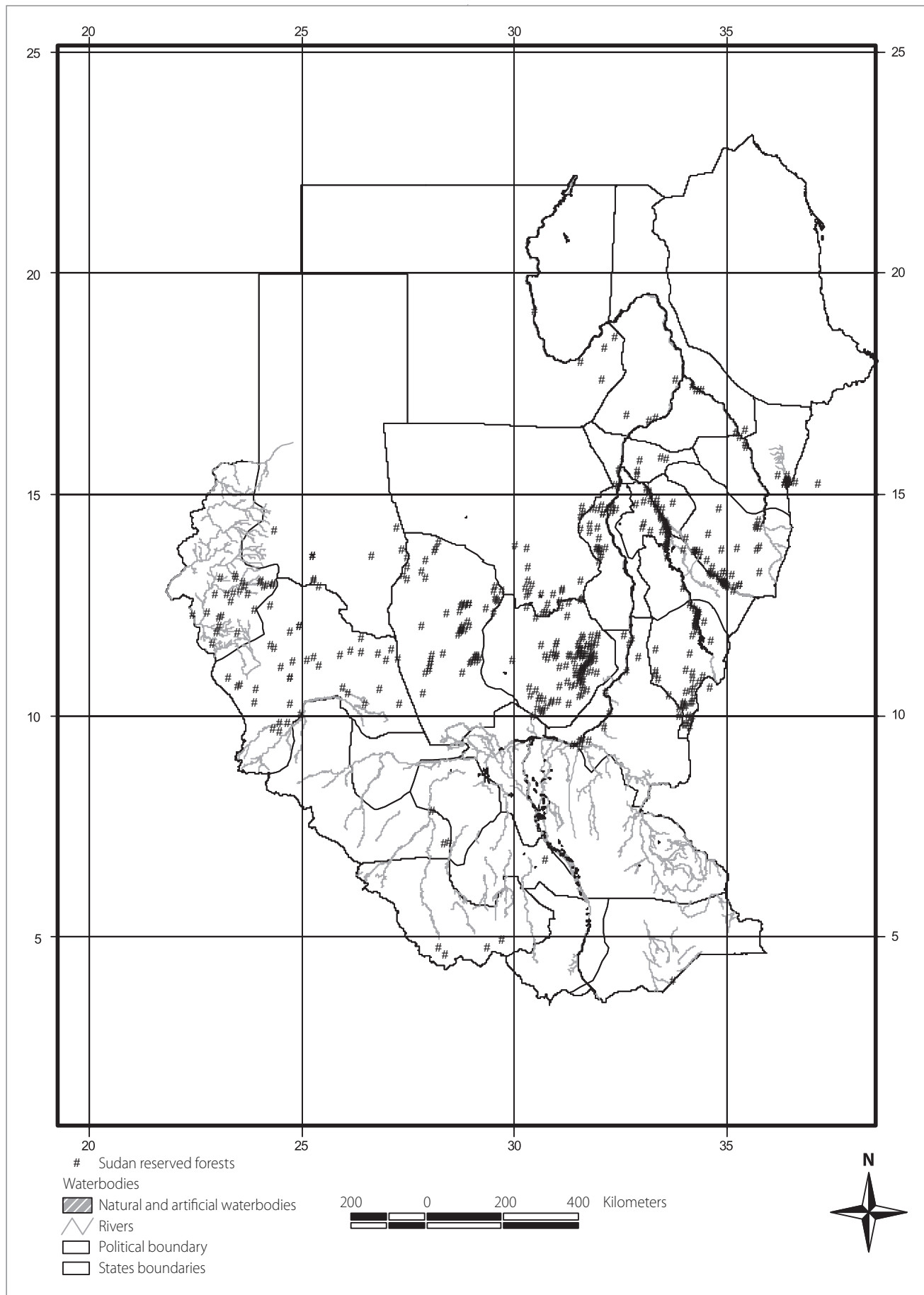


Figure 2 Gazetted reserve forests in the Sudan



Source GIS Unit, FNC, Khartoum, Sudan

value of forests, such as the use of forests for the performance of cultural practices. A forest valuation study estimated the total contribution of forestry to the national economy at 12 per cent of GDP.¹⁰ Forest products are in demand throughout the country. The means and intensity by which these products are obtained continue to have an impact on the forest environment.

The concept of forest reserves in Sudan is based on the understanding that management planning and felling programmes should be concentrated inside the reserves since regeneration and reforestation can occur within the protected environment of such reserves. But slow progress has been made with the development of working projects inside reserves in the last decade. The area under working plans increased from 0,4 per cent to only 1,0 per cent during that period.¹¹ Forests situated outside reserves should be protected in order to regulate their utilisation. Forest reserves are controlled by patrolling and guarding.

Because of mismanagement of forest reserves, most of the forests are degraded and some have become treeless areas as a result of illegal felling and agricultural encroachment. Recently, pilot projects have started to develop rehabilitation programmes based on collaborative management involving local communities. Mutual benefits include cropping and forest establishment.¹²

A recent forestry sector review indicated that total reserved areas at the end of 2005 covered 11 290 358 ha.¹³ Fig. 2 shows the distribution of reserved forests in Sudan. Federal and state forests covered 11 272 028 ha, community forests 13 615 ha and private forests 4 715 ha.

General threats in the forestry sector

During the last 50 years, forest cover in Sudan has decreased from 34 per cent¹⁴ to 29 per cent.¹⁵ UNEP has indicated that between 1990 and 2005 the country lost 11,6 per cent of its forest cover, or about 8 835 000 ha.¹⁶ At the regional level, two thirds of the forests in north, central and eastern Sudan disappeared between 1972 and 2001. The Forests National Cooperation (FNC) suggested that the forest cover in northern Sudan was estimated to have dropped to around 12 per cent.¹⁷ The decline in forest cover in northern, central and western Sudan is mostly attributed to the fact that the fragile arid and semi-arid ecosystems of these regions are the home for two thirds of Sudan's population and support most of the country's economic activities. It is here where vast areas of forests and woodlands were converted into mechanised and semi-mechanised rain-fed agricultural schemes. The total forests and woodland acreage allocated for mechanised agriculture during the last three decades is estimated at about 15 million ha.¹⁸

Another factor in the decline of these forests is domestic energy needs. Reports suggest that, even after the recent development of oil production, dependency on wood fuel as a source of energy remains high. Energy from woody biomass amounts to 69 per cent of the total national energy balance, in spite of government measures to encourage petroleum fuels and the noticeable increase in the consumption of liquid petroleum gases from 35 800 t in 2000 to 214 000 t in 2005.¹⁹

Oil exploration and development activities have also had a significant effect on forests and woodlands. Nimr has indicated that trees were removed during the exploration process as a safety measure around security force barracks and to satisfy the energy needs of new settlements around the oil facilities. He estimated that for each well drilled, a 1 km diameter circle was cleared of trees.²⁰

The fact that 65,5 per cent of the population of Sudan is rural and that of this number over 70 per cent is poor,²¹ poses an additional threat to the country's forestry resources and the integrity of its environment as a whole. Previous reports on the national consumption of forestry products indicated that 89 per cent of the energy consumption in the rural sector came from woody biomass.

The recurrent cycles of drought and desertification pose an ongoing threat to the country's vegetation cover, to its biodiversity and to the integrity of its environment. The mass movement south of many tribal groups from the arid and semi-arid northern fringes of the country has put heavy pressure on the natural resources in many parts of the south and has led to growing conflicts between the different land users. The recent conflict in Darfur is attributed partially to conflict over resources. Wildfires, the illicit felling of trees and overgrazing are among the factors that contribute to tree-cover loss.

Internally displaced persons (IDPs) and international refugees in Sudan have been estimated by UNEP to total more than five million people. These live in rural camps, informal settlements and urban slums in eastern, western and southern Sudan²² and have aggravated environmental damage to an already vulnerable environment. High concentrations of people in camps result in deforestation and a fuel-wood crisis, land degradation, unsustainable groundwater extraction and water pollution. Environmental concerns have rarely been a factor in the choice of camp sites for refugees and IDPs in Sudan.

A survey by the FNC in 2002 revealed that a number of indigenous trees and shrubs are either on the verge of extinction, with the remaining species confined to limited locations, or are seriously threatened. About 241 tree or shrub species showed marked retreat in their distribution and/or regeneration as a result of climatic conditions and/or their intensive removal for fuel, fodder and round wood, or for land clearance for cultivation.²³ A number

of ministerial decrees have been issued to ban the cutting of endangered tree species such as *Hyphaene thebaica*, *Balanites aegyptiaca*, *Daldergia Melanoxylon* etc.

AN OVERVIEW OF WILDLIFE RESOURCES

Sudan is quite rich in its wildlife and most of the wildlife species currently found on the African continent are present in the country. Syd Ahmed and Ibnouf have reported that almost all mammalian orders in Africa consisting of between 224 and 266 mammalian species occur in Sudan.²⁴ In addition, about 871 species of birds, 106 species of fresh water fish and 90 reptile species are found in the country. Abdelhameed has indicated that Dinder National Park alone hosts over 250 species of birds, 27 species of large mammals and a number of smaller mammals that have not been enumerated.²⁵

Wildlife diversity in the southern region is greater than in the rest of the country. For instance, 12 out of 13 mammalian orders in Africa are found in Southern Sudan.²⁶ According to the Environment, Wildlife Conservation and Tourism Policy Framework and Work Plan 2006 – 2011, game was particularly abundant throughout the region before the outbreak of civil war.²⁷ At that time, Southern Sudan was believed to host the largest elephant herds in Africa and also had black and northern white rhino, white-eared kob, tiang, antelopes and several endemic bird species, among many others. Local communities co-existed with wild animals and used traditional weapons, such as arrows and spears, to hunt them for subsistence. To some extent this activity was sustainable.

However, during the civil wars many civilians acquired firearms illegally, resulting in a great increase in the indiscriminate killing of game for subsistence and commercial purposes, which led to a decline or disappearance of some species. Although current and historic game counts for the region are not available since surveys are rarely carried out, wildlife officials maintain that there has been a severe decline in game populations. This echoes the results of a survey conducted between 2000 and 2004 with the support of the United States Agency for International Development (USAID), which revealed a steady decline of Sudan’s wildlife population.²⁸ The main reasons for this decline are as follows:

- Excessive harvesting of game
- Encroachment on protected wildlife areas for economic pursuits
- The collapse of administrative and infrastructure systems because of civil war
- A lack of proper management of protected areas

Major threats in the wildlife sector

Major threats in the wildlife sector are agricultural expansion, overgrazing, drought, deforestation, armed conflict, poaching and overhunting. Owing to these and institutional factors, the country’s wildlife resources reflect a noticeable deteriorating trend, with many species considered to be threatened by extinction. Abdelhameed has pointed out that protected areas are threatened by socio-economic factors related to

Table 1 National parks and their distribution in Sudan

National park	Date of reservation	Area (000 ha)	Ecological zone	Geographical location
Dinder	1935	890	Savannah	North
The Southern National park	1939	2 300	Savannah	South
Radoom	1983	1 250	Savannah	North
Nimoli	1945	41	Savannah	South
Boma	1986	2 280	Savannah	South
Bandiglo	1986	1 650	Swamps	South
Shambi	1990	62	Swamps	South
Sangabaib	1990	26	Marine	North
Wadi-Hawer	2002	10 000	Semi-desert	North
Jabel Hasania	2003	1 000	Semi-desert	North
Dongonab	2002	20	Coastal	North
Total area		19 519		

Source Abdelhameed²⁵

population growth; civil strife and armed conflict that hinders management efforts; the influx of migrants and displaced people and the resultant pressure on the natural resources; weak institutional capacity and administrative capabilities; and an underestimation of the value and importance of the protected areas and the resultant inadequate allocation of developmental funds.²⁹ Most of the protected areas remain without management plans, while some do not even have field offices to look after wildlife management.

Reports suggest that about 17 mammal, eight bird and one reptile species are considered to be under threat.³⁰ Endangered species listed in previous reports include the oryx gazelle, the Sommering gazelle, the addax gazelle, the dama gazelle, the wild sheep, the wild ass and the cheetah. Ostrich is reported to have disappeared from semi-desert regions and to occur only in limited numbers in the southern savannah. There is also a serious decline in the presence of guinea fowl and bustards due to over-hunting.

WATER RESOURCES

The main water source in Sudan is the Nile River and small tributaries that drain into the Nile. There are also boreholes that are used mainly for domestic purposes. Water resources are affected by unreliable and erratic rainfall, human activities that lead to the destruction of catchments, the damming of rivers and turbidity. The effects are a reduction in water volume carried by the rivers, resulting in reduced water supply, increased pollution of water sources and reduced fish supplies. The cracking of the boreholes is another problem, particularly in Juba town, where it has led to water borne diseases, especially cholera.

RANGE AND PASTURELAND

Rangelands in the Sudan show a continuous decline in area and quality. The latter is manifested in decreasing numbers of palatable grass species and an increase in unpalatable ones. Some palatable range grasses are considered endangered species, e.g. *Blepharis ciliaria* and *Blepharis linarifolia*. Most rangelands in the country are under communal use and except for the Forestry and Renewable Natural Resources Act of 2002, which contains some provisions on range and pastureland, there is no legislation governing the use of rangelands in Sudan.³¹

INLAND FISHERIES

Inland fisheries in Sudan are found mainly in the waters of the Nile and its tributaries. Research indicates that the

Nile contains over 300 species of fish, of which 126 are found in the Sudan. The total potential yield of fish from Sudan's inland fisheries is estimated at 100 000 t/a, two thirds of which falls in the Sudan areas of Upper Nile State.³² However, because of problems of access and security, this potential has not been tapped, leaving the main fishing reservoir in northern Sudan, which has a potential annual yield of 25 000 t.

Major threats to inland fisheries include the damming of rivers, water pollution, turbidity, weaknesses in institutional capacity and law enforcement. The construction of dams along the Nile and its tributaries represent a serious threat to freshwater fisheries. Khalid indicated that, with exception of the Jebel Awlia dam, which was built by the British in 1937, all dams that have been built along the Nile do not make provision for the natural migration of fish stocks.³³ He attributed the extinction of some migratory fish species, such as the European eel, which was found along the Nile until the mid-sixties, to the construction of the Aswan Dam.

It is a matter of regret to many national fisheries' experts that even at recently established dams, such as the Hamdab, no consideration has been given to fish migration. Damming also has another harmful environmental impact on fisheries, namely the annual practice of flushing dams at the beginning of the rainy season. The high turbidity caused by this results in the suffocation of fish. Seasonal turbidity in Nile water, especially in the Blue Nile, also causes fish mortality. Research has shown that the inflow of highly turbid water from the Ethiopian highland during July and August usually results in fish mortality because of temporary oxygen deficiency.³⁴

COASTAL AND MARINE ENVIRONMENT

Sudan's Red Sea coast extends for about 920 km and incorporates some 9 800 km² of fishing waters at a depth of less than 200 m. This area is rich in marine fishing resources. Of the 450 fish species identified in the Red Sea, 250 species are found in Sudanese waters. Of these, 93 species are of commercial importance. Catch levels are estimated at about 1 500 t/a, which is considered far below its potential.³⁵ The Red Sea is also one of three regions of the world that host ornamental fish species with market potential in the ornamental fish trade. Furthermore, the Red Sea is one of Sudan's most attractive ecotourism destinations with an abundance of fish and coral life. It constitutes the best preserved ecosystem in the country owing to a lack of development. The coastal mangrove forests are an important source of firewood, fodder and building material.

Objectives of the study

The aim of this study was to collect data and generate information that would result in the publication of a comprehensive status report on the nature and extent of environmental crime in Sudan. The study was conducted under the Environmental Crime Project (ECP), which is intended to improve protection of East African flora, fauna and the environment. The ECP has the following key objectives:

- Carry out an in-depth analysis of the extent and nature of illicit trade in forest products, wild animals, the illegal dumping of hazardous substances, the illegal transportation of hazardous waste and its transit through member states
- Develop tools for capturing information in East Africa in order to have a basis for monitoring trends
- Enhance capacity among inter-governmental and national agencies working to combat environmental crime
- Analyse and determine the role of Non-governmental Organisations (NGOs) assisting with law enforcement in member states and identify ways in which this collaboration may be strengthened

- Publish research findings and raise awareness of the issues, particularly at the level of member states and inter-state policy making
- Facilitate community participation in the management of natural resources by building partnership with communities adjoining forest areas, game reserves and mining sites
- Support the implementation of existing legislation and formulate new legislation in the EAPCCO member states
- Based on the capacity-needs assessment, build the capacity of law enforcement agencies and communities to address crime related to the environment

A study was carried out between October 2008 and March 2009 in Khartoum and Juba to address these objectives. The study had two main aims, namely to assess the nature and extent of environmental crime, and to assess the capacity needs of the environmental law enforcement agencies in the country.

Study approach and methodology

Researchers carried out an extensive literature review and interviews covering the major bodies concerned with the environment to identify the nature of environmental crimes and legislation related to the environment, its development and effectiveness. The terms of reference (TOR) for the study were as follows:

- Perform an extensive literature review on the status of the natural resources in the country, their extent, positive and negative change trends, the dangers and threats facing them, the size of crimes and offences committed, relevant legislation and the effectiveness of law enforcement
- Study the kind and size of offences committed in the field of natural resources, such as illegal tree felling, illegal hunting and the unauthorised acquisition and trade in such goods
- Collect information on the types of pollution experienced within the country arising from transportation and the dumping of hazardous materials
- Collect data on illegal trade in animals and plants and their products
- Review the environmental law enforcement system in the country

- Study and assess the capabilities of relevant government bodies in the prevention and detection of environmental crimes through the enforcement of environmental law
- Identify and study the constraints facing governmental institutions in fighting environmental crimes
- Assess the role played by active and effective civil society organisations in assisting government institutions to fight environmental crimes
- Analyse the data collected, draw conclusions, make recommendations and present the report according to the format specified in the TOR

In pursuit of the study, researchers collected references from various instances in Khartoum, Juba and Port Sudan. Interviews were held with experts and scientists at these departments and organisations. The bodies visited included the National Central Bureau (NCB), Khartoum, the Criminal Investigation Department (CID), Khartoum and Equatoria State in Juba, as well as wildlife management, water resources management, forests, fisheries, environment and sanitation departments.

The nature and extent of environmental crime in Sudan

The main environmental crimes stipulated in article 20 of Sudan's Environmental Protection Act of 2001³⁶ include pollution in different forms, including the pollution of water, air, soil, food and the atmosphere, epidemic and acoustic or noise pollution. Other serious environmental crimes include illegal hunting, the removal and felling of trees, changes in the natural water flow, the dispersal of genetically modified organisms without compliance to regulatory measures, the illegal manufacture of products and the abuse of soils. Encroachment on forest land for cultivation, grazing and fuel-wood collection, and the use of forest as war zones and for defence are also considered serious environmental crimes.

Sudan has shown growing commitment to environmental protection since the mid-1970s. This commitment was triggered by increasing environmental threats, namely desertification and periodic persistent drought, deforestation, the depletion of wildlife populations because of excessive hunting and deforestation, soil erosion, dust storms and declining land productivity. In addition, global awareness about the state of the environment, and the need for regional and national cooperation to eliminate or at least reduce the most pressing environmental problems as identified by the Stockholm Conference on Human Environment in 1972, the Nairobi Declaration of 1982, the Rio Environmental Summit of 1992 and other relevant regional and international conferences contributed positively to a heightened national commitment to environmental protection.

In pursuit of this commitment, a number of Sudanese states have taken certain positive steps to counter environmental crime. The government of the state of Khartoum has established three prosecuting attorney's offices for environmental crimes – Environment and Consumer Protection Prosecuting Attorneys' Offices – and three

Environmental Protection Courts at the capital cities of Khartoum, Khartoum North and Omdurman. Other states, such as Gedaref, Gezira and North Kordofan, have banned the use of plastic bags, which are considered a threat to animals and the environment.

Government institutions have filed most of the complaints at the Environment and Consumer Protection Prosecuting Attorneys' Offices. Cases reported include illegal tree felling, the pollution of rivers and drinking water, air pollution by factories and the brick-making industry, and noise pollution, especially as caused by electric generators. The few cases reported by individuals mostly relate to leakages in the sewage system and the associated unpleasant odours, and noise deriving from electric generators. Ibrahim attributes the reluctance on the part of individuals to file environmental cases to a general attitude among Sudanese citizens that environmental crimes are a public concern that should be taken care of by government.³⁷ Environmental crimes are generally investigated and brought to trial under laws such as the Forest Act of 1989, the Environmental Protection Act of 2001 and the General Criminal Act of 1954.

Ibrahim has suggested that in order to obtain satisfactory results with regard to environmental protection, efforts need to be focused on establishing and strengthening three interrelated areas,³⁸ namely the judiciary, the police and its prosecuting attorney, and the inspectorate. In his view the establishment of Environmental Protection Courts, the Environment and Consumer Protection Prosecuting Attorneys' Offices and an Environmental Administration department at the CID needs to be complemented on the part of the Ministry of the Environment and Physical Planning by a strong environmental inspection department as an implementing tool for detecting and reporting environmental crimes.

ENVIRONMENTAL CRIME RELATED TO THE FORESTRY SECTOR

Forests in Sudan are categorised into three main types, namely forest reserves, plantation forests and community forests. The basic aim of forest reserves is the conservation of rare species and water catchments. Plantation forests have been established for specific purposes, while community forests are mainly reserved for certain socio-cultural practices. The protection and use of the latter type of forest is vested in the controlling community.

According to articles 15 and 16 of the Forest Act of 1989³⁹ the main environmental crimes in the forestry sector include the following:

- The kindling, carrying or causing of fire in a forest. Wildfires are caused by a number of practices, including the setting of fire by herdsmen for pasture renewal, by hunters during the hunting of bush meat, or during honey collection
- Illegal entry into a forest reserve area
- The illegal logging and/or sawing of round wood
- The cutting, collecting, destroying or converting for private benefit of any forest product without permit
- The transportation of or an attempt to transport any forest produce without permit
- The grazing of livestock in a forest reserve
- The making of charcoal

The Forest Act protects forests both within and outside protected areas. Any transportation of forest products requires a removal pass without which the consignment is regarded as illegal. Similarly, encroachment on forest land by land users such as farmers, especially those producing for commercial purposes, and settlement in forests

are illegal according to the Act. Some of the crimes or offences are of a trans-boundary nature, especially in war-prone areas on the borders with Uganda and Kenya. These crimes, particularly the harvesting of forest products, have become more serious following the availability of improved equipment, such as, for instance, power saws. Oil exploration and development activities have also had a significant impact on forest and woodland removal.

From a legal perspective, the greatest challenge lies not just in the effectiveness of the legal framework, but in its enforcement or implementation. Kanoan, Soliman and Mosoti in their comprehensive review of forestry legislation in the Sudan concluded that both the Forest Act and the Forests and Renewable Natural Resources Act of 2002 were not adequately enforced.⁴⁰ A comparison of forestry offences registered with the police or prosecuting attorneys' offices, pending cases under investigation and cases brought to trial (Table 2) were indicative of this. The table also shows that the number of cases that were brought to trial after the completion of investigations and the number of judgements has been very low. The weak law enforcement capacity indicated is mostly attributed to inadequate legal machinery, lack of resources and inexperience or disinterest on the part of the prosecution and judiciary.

ENVIRONMENTAL CRIME IN THE WILDLIFE SECTOR

Crimes in the wildlife sector are related either to the resource itself or to its habitat. The former take the form of poaching; illegal hunting; violation of hunting permits with regard to the hunting season, hunting places, approved species or the quantities and means of hunting; and smuggling of wildlife and/or their products. The

Table 2 Registered forest offences, investigations and cases brought to trial (2004 – 2008)

Year	Criminal cases filed	Cases settled during investigation	Cases under investigation	Cases submitted for trial	Cases with judicial decree	Untried cases
2004	1 149	112 (9,7%)	629	292	152 (13,3%)	885 (77,0%)
2005	1 625	169 (10,4%)	58	1 062	338 (20,8%)	1 118 (68,8%)
2006	2 023	368 (18,2%)	218	568	303 (15,0%)	1 352 (66,8%)
2007	1 859	681 (36,6%)	357	763	461 (24,8%)	717 (38,7%)
2008	1 884	424 (22,5%)	949	515	176 (9,3%)	1 284 (68,2%)
Total	8 520	1 754	2 211	3 200	1 430	5 064

Source FNC Annual Reports 2004 – 2008

origin of smuggled wildlife products can be either from within Sudan or from neighbouring countries, which can often be determined from the type and quantities of products. A recent incident in which a combat force from Sudan's Custom Authority seized about 186 ostrich eggs, 425 elephant tusks and 11 kg of ivory antiques indicated clearly that the products had been collected beyond the country's borders.

Crimes affecting wildlife habitats take the form of encroachment on reserves by agricultural and grazing activities, the ignition of fires by honey collectors and the illegal felling of trees. Wildlife crimes in southern Sudan increased alarmingly during the recent civil strife and thereafter because of a proliferation of firearms. It is estimated that in this region alone over one million guns are in illegal circulation.

ENVIRONMENTAL CRIME IN THE WATER SECTOR

According to officials in the Department of Water Resources, the main crimes related to water resources include the following:

- Pollution caused by wastes from households, industries and urban centres because of the absence of proper sewage systems, and the application of herbicides and insecticides. Water pollution affects mainly the Nile River, Sudan's main water source
- Trans-boundary water pollution, which is most pronounced in the Nile. In 2003/4 chemicals were discovered in the White Nile that had not originated from Sudan
- Poison fishing, which leads to water pollution
- Pollution as a result of indiscriminate waste disposal resulting from the absence of landfill sites. In 2008 a company responsible for collecting and disposing wastes was reported to the police for disposing solid wastes either on or along public roads
- Cultivation along river banks that leads to water pollution, siltation and an increase in water turbidity. The pollution is caused by the application of manure and fertilizers
- The location of hotels with poor sewage systems along the Nile. In 2008, two cases were reported to the police in southern Sudan accusing the InterAfrica Hotel and the Hamza Inn of discharging untreated wastes into the Nile
- Deforestation in catchment areas, which results in increased surface runoff and river siltation
- Other water-related crimes include illegal connections to treated-water systems, the illegal pumping of water and the destruction of water systems and pipes

These crimes, all of which contravene article 20 of the Environmental Protection Act of 2001, affect human health and safety in general, quite apart from increasing the cost of water treatment for domestic use.

ENVIRONMENTAL CRIME IN THE FISHING SECTOR

Crimes in the fishing sector can relate to the use of destructive fishing methods, such as poisonous chemicals or destructive fishing gear; the violation of fishing permits with regard to the types of fish caught or the fishing season; pollution resulting from the disposal of liquid wastes or oil spills; or fish trawling, especially in the Red Sea. The spread of the use of destructive fishing gear in the inland fishing sector can be attributed to the weakness of legal mechanisms and the tendency of state authorities to levy higher licensing fees on offenders.

The sugar, textile and cement industries represent a major source of river pollution and are an ongoing threat to inland fisheries.³³ Most of these industries, which are generally located near rivers, do not have treatment facilities for their liquid wastes and dispose of it in rivers. Incidents of fish mortality resulting from the disposal of waste by sugar mills occur often. A recent case (April 2009), involving the disposal of waste by the Khash Elgerba Sugar Mill on the Blue Nile resulted in noticeable fish mortality and brought the issue to the fore. However, such cases are rarely taken to court and the offenders are often not incriminated.

ENVIRONMENTAL CRIME RELATED TO THE COASTAL AND MARINE ENVIRONMENT

The Red Sea is a major shipping transit route, connecting the Indian Ocean with the Suez Canal. The ports of Sudan host a range of vessels, from small coastal tenders to bulk grain carriers. In the absence of facilities for receiving oily waste from bilges, as well as adequate controls, ships discharge this effluent into the sea. The result is chronic oil pollution around the ports and along the coast. The economic and shipping boom in Port Sudan and the new oil export facilities there have worsened the environmental situation, while the establishment of new ports and harbours such as Bashier 1, Bashier 2 and Suakin poses an additional risk. An example of the risks being faced is an oil spill that occurred at Bashier 2 in January 2008. Leakage from an oil tanker resulted in a high fish mortality and damage to 4 550 mangrove trees in Garouri forest. New construction, salt production sites and the dumping of wastes and refuse on the coast are affecting seaweeds on which fish feed.

Other offences that affect the marine environment negatively include the illicit felling of mangrove trees; illegal fishing methods, such as the use of heavy vessels and fishing nets that cause increased water turbidity and the death of rare aquatic life such as sharks and sea turtles, and the disposal of cooling water and chemicals by factories. There is also a risk of invasive species being imported in ballast waters.

POLLUTION IN THE INDUSTRIAL SECTOR

UNEP has indicated that with the exception of the newly developed oil facilities, Sudan's industrial sector has suffered from a lack of investment. A side effect of this is poor environmental performance by the sector. A clear example is provided by the sugar industry. All of Sudan's five sugar mills were found to be releasing untreated factory wastewater directly into the Blue and the White Niles.⁴¹ This resultant river pollution is suspected of being a major cause of regular fish mortality, particularly in the Blue Nile. It is worth noting that the Kenana sugar mill has started constructing a wastewater treatment plant to address the problem.

Similarly, water contaminated by oil and chemicals represents a serious environmental hazard in the country. Reports suggested that for each barrel of oil produced in the Sudan, between two and five barrels of polluted water is generated.⁴² With current oil production levels having reached around 500 000 barrels a day, the amount of polluted production water is enormous. However, an encouraging step was the establishment of a pilot project in Heglig oilfield in 2006 to reutilise wastewater having been treated by bioremediation for the establishment of irrigated forest plantations. Measures

are now underway to replicate this kind of project in other oil fields.⁴³

DUMPING OF WASTES

Hazardous wastes

The disposal of medicinal waste represents a major environmental threat to urban communities in the country as adequate facilities to handle such waste is lacking in most urban centres.

Solid wastes

Until recently the country has had no experience in solid waste management. In 2002 Khartoum State established the Khartoum Cleaning Project, a solid waste-management programme. House-to-house domestic refuse collection and commercial and industrial waste-container collection has been introduced. Use is made of press-pack refuse compactors, dump trucks and hook-lifters to transport refuse and waste to a dump site or to transfer stations from where it is taken by long semi-trailers to a landfill site.

Sewage wastewater

The only urban centre in the country with a sewage wastewater system is the city of Khartoum, but even here coverage amounts to only around five per cent. The balance of Khartoum and all other big urban centres in the country use sewage drains. This represents a potential environmental threat as it will eventually lead to groundwater pollution. There is growing concern among environmentalists and concerned bodies about this threat.

Legal and institutional framework related to the environment

LEGAL FRAMEWORK

The Interim National Constitution of 2005 incorporates numerous provisions that have a direct bearing on the environment. For example, Article 11(1) provides that the people of Sudan shall have the right to a clean and diverse environment. The same article goes on to say that the state and citizenry have a duty to preserve and promote the country's biodiversity. Article 11(2) prevents the state from pursuing any policy or taking any action that adversely affects the existence of any species of animal or vegetative life, or their natural habitat. To ensure that these benign principles and directives are crystallised into binding legal rules, Article 11(3) urges the state to adopt legislation that ensures the sustainable utilisation of natural resources.

There are many sectoral laws and ordinances that deal with environmental protection and conservation. Examples include legislation dealing with land tenure, forestry, wildlife, fisheries, agriculture, the environment and public health. These legal instruments provide the regulatory powers to control the use of certain natural resources, and stipulate the penalties for violations. Although this legislation was meant to act as a tool for environmental protection, the rapid increase in environmental degradation has raised concerns about the effectiveness of the legal framework. It has also raised questions about the whole issue of environmental governance in the country.

It is claimed that Sudan's sector-based environmental legislation, which is closely linked to individual government departments and institutions, has led to a situation where the state's resources are managed in a fragmented and uncoordinated manner, and has resulted in government institutions operating in isolation from each other.

In order to address this situation, the Higher Council for Environment and Natural Resources (HCENR) was called into existence in 1990 as a national coordinating body. However, for reasons unknown, the HCENR has fallen short of achieving its mandate. The fragmented management of the country's natural resources was subsequently aggravated by the enactment of the Sudan Transitional Constitution in 2005, which has delegated most powers over resources management to lower government levels. These instances now claim full jurisdiction over resources, but lack the technical and financial capabilities to address the matter.

This situation has raised government concern at the highest levels and resulted in the cabinet of the Government of National Unity (GNU) to issue Decree No. 35 of 2007, which calls for the amendment of the constitution to ensure greater federal control over forestry and wildlife resources. On a national level, natural resources are considered as national wealth that should be managed within a national perspective, while internationally the issue forms the basis of government's commitments to a number of multilateral environmental treaties.

ENVIRONMENTAL PROTECTION ACT OF 2001

The Environmental Protection Act of 2001 has the following objectives:

- To protect the environment in its holistic definition for the realisation of sustainable development
- To improve the environment and the sustainable exploitation of natural resources
- To create a link between environmental and developmental issues, and to empower concerned national

authorities and organs to assume an effective role in environmental protection

Section III of the Act outlines general policies and principles for the protection of the environment. It is worth noting that these policies and principles are not legally binding, but are guidelines to be observed by the authorities concerned when setting development policies. These guidelines are summarised in articles 17 and 18.

Article 17 calls on any individual who intends to implement any project that is likely to have a negative impact on the environment to present an Environmental Impact Assessment (EIA) for approval by the Monitoring and Evaluation Committee of the HCENR. The study should contain the following information:

- The anticipated impact of the project on the environment
- The negative impacts that could be mitigated during implementation of the project
- Alternative options for the proposed project
- A clear undertaking that the short-term utilisation of natural resources and the environment will not jeopardise their long-term sustainability
- The precautionary measures to be taken to mitigate the negative impacts of the project

Article 18 lists the duties of the competent authority in complying with the general environmental policies and directives, as follows:

- To lay down quality control standards for the protection of the environment
- To preserve water sources from pollution
- To protect air, food, soil and vegetation cover from pollution and degradation
- To preserve the flora and fauna from extinction as a result of illegal hunting or any other human threat
- To protect food from contamination or pollution by chemicals or any other factor
- To protect the air from pollution caused by physical operations or chemicals
- To preserve the soil from any pollution resulting from harmful industrial and other types of waste

LEGISLATION RELATED TO FORESTRY

The history of the forestry service in the Sudan is associated with a continuous development of forest legislation since the establishment of the Department of Forests and Woodlands by the British government in 1902. However, the first sound legislation to govern the country's forestry resources was enacted in 1932 when the Central Forestry

and the Provincial Forestry acts came into law. These two acts remained in operation until the late 1980s, when they were subjected to a comprehensive revision that resulted in the enactment of the Forests Act of 1989 and the Forests National Corporation Act of 1986. These pieces of legislation were praised for being the first set of comprehensive legislation to govern the forestry sector in Sudan and to recognise new types of forest ownership aside from national and regional forest reserves.⁴⁴ Forest ownership could now include private, community and institutional forest reserves managed by individual owners, committees and institutions respectively. The acts determined that all types of forest reserves would fall under the technical supervision of the FNC.

Forests and Renewable Natural Resources Act of 2002

As a result of the adoption of the Federal Government System (FGS), the 1989 laws were revised in 2002 and merged into one law, namely the Forests and Renewable Natural Resources Act. Unlike its predecessor, the new Act attempts to follow a more holistic approach by providing a framework for the management and protection of forests and renewable natural resources, including pastures, rangelands and certain aspects of agricultural land use. It also provides a framework governing the management of the forestry sector.⁴⁵ Under the Act, federal forest reserves are managed by the FNC and state forest reserves by the state in accordance with FNC policies and technical plans. The law also encourages the establishment of private, communal and institutional forests and retains the FNC's right to provide technical supervision over all types of forests in the country. Control over tree felling outside the reserves was tightened up by introducing a permit system controlled by the FNC.

The Act obliges investors in agricultural schemes to leave not less than 10 per cent of the total area of a rain-fed project and not less than 5 per cent of the area of an irrigated project as shelter belts and protective wind breaks. Investors are also obliged to convert the cleared trees into forest products.

The Act also obliges any driver of any vehicle used for transporting forest produce to obtain a permit from the respective authority. Furthermore, it imposes a deterrent penalty, namely the confiscation of any property, including the means of transport used in the commission of the forest offence, for the benefit of the corporation. Unsuccessful attempts were subsequently made to revise this Act in the light of the many changes that had taken place in the country, namely the adoption of a new constitution following the signing of the CPA, the federal system adopted by government, the division of authority

and wealth among the various levels of government, the development of an oil industry, the risks posed by the current rate of deforestation, including the loss of the country's place in the international gum arabic market, and the growing awareness of forestry's role in environmental conservation.

LEGISLATION RELATED TO WILDLIFE

The first wildlife legislation in Sudan, the Wildlife Act, was introduced in 1935, when national parks and game reserves were gazetted and their management was entrusted to the Wildlife Administration. Since then the Act has been amended in 1965 and in 1986. Following the adoption of a federal system and the Constitution of 1998, the management of the wildlife sector was split between the federal government and state authorities. In spite of this, the Wildlife and National Parks Act of 1986, which assigned responsibility for wildlife management to the Federal Ministry of Interior and (technically) to the Federal Ministry of Information and Tourism, remained unaltered even after the signing of the CPA and the Interim Constitution of 2005.

Wildlife and National Parks Protection Act of 1986⁴⁶

This is the key legal instrument available for wildlife management at federal level. The Act aims to:

- protect and conserve national parks and game animals hunting areas
- use and develop wildlife resources rationally
- implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) agreement of 1973
- provide statistical data on the numbers and distribution of wildlife resources
- encourage research into wildlife and their habitats

The main features of the Act are as follows:

- It defines the national parks and identifies the competent authority that gives permits for entering, staying in and hunting in the parks
- It lists the prohibited acts inside national parks, namely the felling of trees, the setting of fires, the excision of parkland, the construction of houses, digging or mining, entry of domestic animals, the carrying of guns, the disruption of water courses, and the culling or disturbing of game
- It indicates the measures and the competent authority for declaring new areas as game reserves and/or

bird sanctuaries in which hunting without a permit is prohibited. The general manager of a park or sanctuary may issue hunting permits and also has the power to determine the rules that govern hunting in terms of the hunting season, the means and duration of hunting, and the types and ages of animals to be hunted

- It sets out the regulations for trade in game animals and/or their parts
- It indicates the level of penalties for all wildlife offences
- It lists the animals that are prohibited from being hunted, animals that may be hunted under permit, and animals that are prohibited from being exported without a permit

FRESHWATER FISHERIES LEGISLATION

The principal inland fisheries legislation in force at present is the Fresh Water Ordinance No. 24 of 1954. Breuil, in his comprehensive overview of inland fisheries legislation in Sudan, considers the ordinance to be outdated and ill-adapted to the country's new federal arrangements.⁴⁷ He points out that the ordinance and its 1955 application order clearly only applies to the Nile. In other words, although the ordinance appears to apply to all freshwater rivers and lakes in Sudan, it has never been formally applied to the whole territory.

The main features of the ordinance include the regulation-making powers of the Minister of Animal Resources, which need to be notified in the *Official Gazette* (sect. 2), prohibited acts, which determine that no person shall introduce non-indigenous freshwater species without a permit (sect. 4), the permitted use of fishing gear (sects 5-7), and the licences required for boating (sect. 8) and for fishing (sect. 9). The ordinance also grants to the relevant minister the power to determine protective measures, such as closed areas and seasons for certain fish species, and to prohibit the use of fish traps.

MARINE FISHERIES LEGISLATION

The legislation currently in force is the Marine Fisheries Ordinance of 1937. Fishing in Sudan's territorial waters is regulated by the licensing of fishing craft and the issuing of fishing permits to persons engaged in commercial fishing. It empowers the Minister of Animal Resources to declare any part of the country's territorial waters closed for the better conservation and development of fisheries. The ordinance gives powers to the local authority to amend schedules and make regulations that are consistent with it. Persons who act in contravention or fail to comply with any of its provisions are liable to a fine not exceeding

50 Sudanese pounds, or imprisonment not exceeding three months, or both. The court may also order the confiscation of any craft, apparatus or instrument employed in the commission of any offence, and the cancellation or suspension of licences and fishing permits.

Recently the Red Sea State ordered a revision and updating of the ordinance in the light of developments onshore and the establishment of new oil export terminals. The new legislation has been passed by the state's legislative council and is now awaiting approval of the federal government.

Marine Act of 1961

The Marine Act of 1961 empowers the minister to make regulations for loading cereals and other difficult and hazardous products and materials. The Act is accompanied by a number of regulations that regulate the marking of crafts (Reg. 2), the issuing of permits (Reg. 3), the landing of catches (Reg. 4), the size of fish caught (Reg. 5), the mesh size of fishing nets (Reg. 6), prohibition on the use of explosives (Reg. 7), and penalties to be applied (Reg. 8).

OTHER LEGISLATION AFFECTING THE ENVIRONMENT

Public Health Act of 1975⁴⁸

This Act protects general public health by regulations issued by the Public Health Council, whose members include the Ministries of Agriculture and Forests, Federal Rule, Animal Health and various administration departments of the Ministry of Health.

Environment Health Act 1975⁴⁹

The Act covers prevention of water pollution, inspection of drinking water, disposal of waste and sewage, inspection of industrial areas and bakeries, prevention of air pollution and inspection of waste dumping places and brick kilns.

INSTITUTIONAL FRAMEWORK

The Higher Council for Environment and Natural Resources

The HCENR was established under the auspices of the presidency following the enactment of the Environmental Protection Act of 2001. The council is presided over by the Federal Minister of Environment and Physical Planning, while the Minister of Agriculture and Forestry acts as deputy chairman. Membership of the council is drawn from other relevant ministries, the trustees of the

National Environmental Fund and professional members with experience and knowledge of the environment and natural resources.

The HCENR's responsibilities can be summarised as follows:

- To determine, in coordination with concerned organs, policies relating to –
 - natural resources, including their development and their sustainable exploitation; and
 - the protection of the environment
- To coordinate the activities of the federal states' councils for environment and natural resources as regards the assessment and auditing of the natural resources, including environmental changes induced by desertification and environmental pollution
- To set a long-term federal plan of action for the sustainable use of natural resources and the preservation of the environment, and to follow up with all authorities concerned on their implementation
- To review periodically legislation aimed at the protection of the environment and natural resources to ensure its compatibility with international standards, and to propose reforms to the authorities concerned
- To constitute technical committees to assist in the performance of its powers
- To coordinate state efforts with regard to accession to agreements on the environment and to designate the organs responsible for implementation
- To encourage and support scientific research in all disciplines related to the environment and natural resources in cooperation with the National Centre for Research
- To develop, in cooperation with the organs concerned, a federal plan for raising environmental awareness levels through the inclusion of environment and sustainable development topics in school and university curriculums

Environmental Protection Department in the CID

The Environmental Protection Department was established in 2006 as a unit in the CID at federal government level to deal specifically with environmental crimes in Sudan. The need for this department arose out of the continual increase in environmental crimes, some of which involve a number of sectors and are at times trans-boundary in nature and difficult to handle. Trans-boundary environmental crimes are handled through the International Police (Interpol). The Environmental Protection Department operates throughout the country, working across sectors, but is situated in the federal

government. Similar departments do not exist in other CID offices within the GOSS and state governments.

The department's four environmental desks handle illegal manufacturing industries, environmental pollution, waste poison and the abuse of soils (soils and forests). The department has some 25 officers who are based in Khartoum and in sub-bureaus in the states. In addition, officers from Khartoum visit the states to do surveillance work and to work with local informers. They also interact with NGOs. Officers perform their duties in accordance with police regulations during investigations, arrests and prosecutions. The national police also has a mandate to deal with environmental crimes as stipulated in the Environmental Protection Act of 2001.

A special court in Khartoum deals exclusively with cases related to environmental crime and is served by special prosecutors. Police and staff of the Wildlife Conservation Department are involved in all investigations, arrests and prosecutions in environmental cases. In some cases, the Attorney General's Office undertakes the prosecution.

According to the department's officers, their primary objective is not to prosecute offenders, but to prevent the committing of environmental crimes by applying deterrence mechanisms and by increasing public awareness. From early times, Sudanese were vigilant in protecting the environment as religious practices prohibited the destruction of the environment and the misuse of its resources. In the light of this ancient practice, public awareness is one of the major tools for the reduction of environmental crime. More than 90 per cent of environmental crimes in the country are committed by Sudanese people, while foreigners are responsible for the remainder. Foreign involvement increased following the discovery of oil.

The department has different outreach programmes that include the arrangement of seminars and workshops. Considerable use is made of the media, in particular radio and television. A monthly television programme, 'Police and People', is hosted. It features discussions on environmental issues such as awareness of environmental laws, understanding environmental crimes and offences, and the role played by local people in fighting and combating crime.

Ministry of Environment and Physical Development

The federal Ministry of Environment and Physical Development is responsible for protection of the environment in general. It performs the executive and advisory roles in matters related to the environment, and is also responsible for implementing all international conventions related to the environment and environmental resources,

including water and wildlife. It coordinates environment-related projects and activities of other ministries.

Each state is required to have its own ministry of environment and physical development that is to assume responsibility for environmental protection and management at state level. Surprisingly, only three of Sudan's 26 states have established such a ministry. Officials in the federal ministry are therefore required to work down to state and local government levels in most states.

The ministry responsible for the environment in the GOSS was the Ministry of Environment, Wildlife Conservation and Tourism before its Directorate of the Environment was shifted to the Ministry of Housing, Physical Planning and Environment. This ministry is responsible for the protection and management of the environment within the jurisdiction of the GOSS.

GOSS officials expressed concern that no new law specifying the environmental responsibilities of the GNU, the GOSS, the federal states and local governments has been adopted following the establishment of the GNU. On the other hand, officials in GOSS's Directorate of Environment argued that since there were two distinct administrative systems in the country, one for the north and one for the south, federal government laws should be scrapped and separate environmental laws should be written for the north and south. They argued that there was a need for environmental policy and laws that would suit the environment and the culture of the people of Southern Sudan. The reason for this was that current national policies and laws were based on Islamic principles, which made them difficult to implement in the Christian south. Should it not be feasible to enact separate policies and laws for the GOSS, the inclusion of separate chapters regulating the south in the policies and laws of the GNU was proposed.

Currently the GOSS mainly employs orders at the local level to protect and manage the environment. There are three main regulations related to natural resources protection that are not sector-specific, which regulate forestry, wildlife and agriculture. Local orders are also referred to as sectoral policies and contain some environmental elements. Officials in the GOSS Directorate of Environment were hopeful to utilise the sectoral policies to develop an environmental policy for the GOSS.

The Directorates of Environment in both the federal government and the GOSS are well staffed with specialised officials and field staff. EIAs are mandatory for projects affecting the environment and are controlled by EIA specialists, while a federal government committee follows up on the implementation of EIA provisions. In the GOSS, about 300 people, including officials from ministries and NGOs, have been trained in the basics of EIA.

Generally though, it seems that officials and field staff do not have sufficient knowledge of environmental

policies and laws, and thus have difficulty in implementing them. They also lack financial resources, especially in the Southern Sudan.

Ministry of Agriculture and Forests

The Ministry of Agriculture and Forests operates in both the federal government and the GOSS. Our concern for this study was the forestry department. Nationally, forests are governed by the FNC, a semi-autonomous government institution established in 1986 after the amendment of the 1932 Central Forest and the Provincial Forest acts and the adoption of the Forests National Cooperation Act of 1986. In the GOSS, the department of forests is responsible for state forests.

The FNC is well established in the country, with offices in each state and extension officers in every locality. Some 500 field staff are distributed evenly throughout the country to supervise the forests. Their main difficulty in enforcing the law is the activities of certain government bodies, especially the military, which are difficult to control and to apprehend. Armed military personnel have been harvesting forests, especially in the war zones. Forest officers, who are also armed, are accompanied by military police and police officers to apprehend such personnel found committing forest crimes. FNC officers have powers of arrest and take offenders to the nearest police station for charging. They also have the power to confiscate forest products and transport equipment used to convey such products. However, the confiscation of such equipment is on hold for the present pending the outcome of a court case. As an incentive, 10 per cent of the value of confiscated products and transport equipment is paid to the forest officer who made the arrest.

The Forests Act provides for the out-of-court settlement of offences or crimes. Settlement is usually arranged at state level, subject to approval by the FNC's general manager, who is guided by a legal officer. In each state the Attorney General's Office has a legal officer assigned to handle forest-related crimes. Investigations into crimes are carried out by either the police or the Attorney General's Office. A forest officer has the right to appeal to a higher court if he is dissatisfied with the decision of a lower court. The main challenge though is law enforcement.

The FNC is directly responsible to the Minister of Agriculture and Forests. Its mandate can generally be summarised as follows:

- To lay down general policies pertaining to forestry
- To make rules and methods to enable the proper utilisation and development of forests, and to report on the status of forest resources

- To achieve full protection of the environment
- To propose laws for the implementation of approved forest development policies
- To supervise all forests of the country
- To promote awareness of the need for good forest care
- To conduct forest studies and to plan for the increase of forest reserve cover to a minimum of 20 per cent of Sudan's land area
- To increase the size of planted forest areas and to supply saplings
- To develop gum arabic and other non-wood forestry products, and to coordinate with other bodies on the implementation of forest policies, particularly with regard to the combating of desertification

The Wildlife Conservation Department

The Wildlife Conservation Department was established in 1902 as unit resorting under the Administrative Secretary of the colonial government. The responsibilities assigned to that unit were to protect rare game, to regulate hunting and to protect farmers from wild animals. Today the mandate of the Wildlife Conservation Department includes the following tasks:

- To protect wildlife and their habitats for the conservation of biological diversity and the environment
- To establish and develop protected areas
- To encourage the rational utilisation of wildlife resources and the development of rural communities
- To regulate the trade in wildlife and/or its products
- To raise awareness in rural communities about the importance of wildlife conservation
- To establish and manage game ranches and zoological gardens
- To enforce the Wildlife and National Parks Protection Act of 1986

Range and Pasture Administration

The mandate and responsibilities of the Range and Pasture Administration include the following:

- To formulate range management and fodder production policy
- To develop the animal production sector (both traditional and modern) in accordance with the available resources and sustainable development principles
- To demarcate and map natural range land and other resources related to animal production
- To execute all the studies necessary to establish a comprehensive database for the proper management and use of range resources

- To create links with research institutions and other bodies working in the field of range and pasture management and the environment as the whole
 - To carry out, in cooperation with research institutions, universities and other projects, experimental applications in the field of fodder crops under artificial and rain-fed irrigation systems in response to the requirements of animal producers
 - To study the possibility of establishing improved ranges under irrigated and rain-fed agriculture with mono-crop or mixed crop (grass/legume) varieties for direct grazing or for the production of dry or green fodder
- To coordinate efforts by research institutions and development projects aimed at speeding up the process of introducing fodder crops and improved pastures under agricultural rotation, and to increase the area allotted to fodder crops
 - To improve the availability of range plant and fodder crop seed and to ensure the availability of seeds with the required purity and quality standards
 - To carry out studies and plans for fodder and animal production on private farms and animal production schemes

Non-governmental organisations

A number of NGOs and civil societies operate in Sudan with the objective of protecting and developing the environment. Among the most active are the Sudanese Society for Environment Protection, the Sudanese Social Forestry Society (SSFS) and the Environmental Union.

THE SUDANESE SOCIETY FOR ENVIRONMENT PROTECTION

The Sudanese Society for Environment Protection has been registered in accordance with the Humanitarian Aid Act of 2006 to pursue the following aims:

- Protection and improvement of the environment through sustainable development by advocating against any act that may deteriorate the environment
- Establishment and development of links with related bodies at the local and international levels through cooperation and networking
- Encouragement of research aimed at environmental protection and conservation, the keeping of records on the history of the Sudanese environment, and positive environmental initiatives
- Promoting an end to conflicts and wars and mitigating their impact on the environment
- Spreading and deepening the concept of sustainable development, and the understanding that this process concerns all sectors of society, as well as working towards a general improvement in the human condition

- Supporting and protecting human rights, especially those concerning the environment, and combating poverty and its negative impacts on the environment

The society has laid a number of charges in connection with environmental crime, including one against the Khartoum Waste Disposal Company for dumping waste in the Khartoum Sunt Forest and others against the National Electricity Corporation for cutting trees and extending a high-voltage power line through a residential area.

THE SUDANESE SOCIAL FORESTRY SOCIETY

Although one of the SSFS's main objectives is to preserve natural forests as a national heritage, it is not deeply involved in fighting forest offences. The only role it plays in this regard is to raise environmental awareness among communities.

THE ENVIRONMENTAL UNION

The Environmental Union has set itself the important task of working with concerned government institutions to advocate for the enforcement of environmental laws and prosecute environmental infringements. It is also concerned with propagating environmental awareness.

Capacities of institutions to combat environmental crimes

A major weakness of the institutions responsible for environmental protection is that they belong to different ministries, including Agriculture and Forests, Animal Wealth, Health, Environment and Physical Planning, Tourism, and the Interior. There is no effective mechanism for coordinating their efforts. The HCENR, which was created to perform this role, deviated from its original mandate when it was affiliated to the Ministry of Environment and Physical Planning. There is not even coordination between the institutions and administrations dealing with environmental affairs within one ministry, for example the Range and Pasture Administration, the FNC and the Natural Resources Administration, all of which fall under the Ministry of Agriculture and Forests. In the Wildlife Conservation Department, the staff has technical responsibility to the Ministry of Tourism, but administrative responsibility to the Ministry of Interior. Research work in all sectors is the responsibility of the Ministry of Science and Technology, but this ministry has few, if any, links to relevant sectoral departments.

Most of the institutions responsible for combating environmental crime lack the capacity to enforce environmental legislation. This is attributable to a number

of factors, including an inability to detect and combat environmental crimes because of a lack of mobility and poor communication facilities, low staff morale owing to poor incentives, and little enthusiasm and support from the public. Other factors may be a lack of commitment, disinterest and awareness on the part of the police, the prosecution attorney and the judiciary. Human resource development in most of these institutions is also very low. Experienced personnel have left government service to seek better pay in neighbouring oil-rich Arab countries and even in Europe and America. The shortage of personnel is aggravated by an absence of training in modern technologies. This situation has been made worse by strong government restrictions on overseas training, with higher-degree studies being confined to Sudanese universities. In some instances, as with the Inland Fisheries and Marine Life acts, legislation is out of date and cannot cope with current developments.

Moreover, a lack of networking and cooperation between the federal government, the GOSS, state governments, NGOs and neighbouring countries has limited the capacities of national institutions to tackle cross-border environmental crimes.

Regional and international environmental treaties

The recognition and ratification of international environmental treaties by Sudan goes back to the mid-1930s. Since then a number of regional and multilateral environmental treaties have been ratified in addition. In 2006 the HCENR grouped these treaties into the following three categories.

PRE-STOCKHOLM CONFERENCE, 1972

Six international and regional conventions were ratified by Sudan before the Stockholm Conference. Two of them are of significance. The Convention Related to the Preservation of Fauna and Flora in their Natural Condition (1933) was signed and ratified by Sudan in 1935. Based on that convention the first wildlife act was enacted in 1935 and national reserves were declared and established. The Convention of Wetlands of International Importance, Especially as Water Fowl Habitats, which was ratified in Ramsar, Iran in 1971 and amended in 1982 and 1987, was signed and ratified by Sudan in 2005.

POST-STOCKHOLM CONFERENCE, 1972

This category includes 12 treaties ratified by Sudan after the Stockholm Conference and before the Earth Summit in 1992. The most important are the following:

- The Convention Concerning the Protection of the World Culture and Natural Heritage (1972), which Sudan signed and ratified in 1973

- The Convention on International Trade in Endangered Species (1973), ratified by Sudan in 1982
- The Regional Convention on the Conservation of the Red Sea and Gulf of Aden (1982), ratified in 1985
- The Basel Convention on the Control of the Transboundary Movement of Hazardous Wastes (1989), ratified in 2006
- The Nile Basin Initiative (1999), which has the aim of sharing the Nile basin resources among the ten Nile basin countries in an equitable and sustainable manner

POST-RIO CONFERENCE AND AGENDA 21

These include the following:

- The United Nation Convention on Climate Change, signed by Sudan in 1992 and ratified in 1993
- The International Convention on Biological Diversity, signed in 1993 and ratified in 1995
- The International Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, signed in 1994 and ratified in 1995
- The Kyoto Protocol, ratified in 2005
- The Cartagena Protocol on Bio-safety to the Convention on Biological Diversity, of which Sudan became a member in 2005
- The Stockholm Convention on Persistent Organic Pollutants (POPs), signed in 2001 and ratified in 2006

The training capacity needs of environmental law enforcement officers and institutions

Interviews and discussions with environmental law enforcement officials revealed the training gaps that need to be bridged to enhance the capacities of their agencies to combat environmental crimes in Sudan.

ENVIRONMENTAL PROTECTION DEPARTMENT IN THE CID

The main training gaps identified include knowledge of the legislation that governs the environment. For police officers to enforce environmental crimes, a legal knowledge and understanding of the laws to be implemented and employed in combating environmental crime is essential. Since environmental crimes are very specific compared to common criminal law, it is necessary to train police officers in specialised investigations, arrest procedures and the prosecution of environmental criminal cases. This is particularly important as some people commit environmental crimes in the course of their daily activities without premeditation. The gathering of environmental evidence requires special investigation, arrest and prosecution skills. Such training could be conducted through workshops and seminars.

DIRECTORATE OF ENVIRONMENT AFFAIRS

The main training gaps that need to be addressed in the Directorate of Environment in both the federal government and the GOSS are knowledge of environmental law, implementation of the law, and specialised surveillance and investigation skills, in particular at field-staff level. Other important training gaps are knowledge of the principles and procedures of EIAs, and negotiation skills with regard to MEAs.

FORESTS NATIONAL COOPERATION AND THE FORESTS DEPARTMENT

Forests are among the most vulnerable to crime in Sudan, particularly in the southern region owing to the fact that the major part of the population depends on forests and forestry products to sustain their livelihoods. Enforcement therefore needs to be participatory in nature in order to obtain the support of the local community as far as the protection and management of this resource is concerned. For this reason, forest officers need to be equipped with the relevant skills to handle forest crimes. The main training areas identified include law enforcement mechanisms, the handling of trans-boundary forest crimes, and specialised investigation and surveillance skills. Officers need exposure to best practice procedures in other countries. Such training can be achieved through seminars, workshops and short courses.

WATER RESOURCES

Water resource protection and management is a cross-sectoral issue in Sudan, as in other countries. The training requirements for law enforcement officers therefore cut across different sectors, including forests, environment and health, among others. Training requirements are mostly technical in nature, such as modelling and water quality monitoring, but also includes knowledge of environmental law and the handling of trans-boundary water crimes.

WILDLIFE CONSERVATION DEPARTMENT

Officials in the Wildlife Conservation Department indicated that among the areas where training is inadequate

are surveillance and prosecution techniques, while refresher courses on environmental law and especially on how to put them into practice are also needed. Other

training requirements include wildlife ecology and the changing environment in general, animal behaviour and techniques to control poaching and wildfires.

Conclusions and recommendations

Environmental crime in Sudan is not yet very serious and can at this stage still be controlled with ease by good resources management and environmental protection. Offences are of an individual nature, rather than being highly organised. Most offences are the result of the country's high poverty rate, poor environmental awareness among citizens and decision-makers, and the state of insecurity resulting internal strife. Reluctance on the part of the public to assume its full legal rights and responsibilities, as provided for in most national environmental legislation, by reporting environmental crime to the police or Prosecuting Attorney's Offices remains a problem. The general perception among the public that environmental crime is a government concern needs to be addressed to ensure sustained support by all sectors of society for the work of law enforcement agencies.

Environmental crime presents a key challenge to development in Sudan since the larger part of the population is dependent on natural resources for their livelihoods. As such, a concerted effort needs to be made to raise environmental awareness at all levels of society. Also of paramount importance is the sensitisation of judicial personnel, prosecuting attorneys and police officers about the importance of environmental protection and the serious social and economic repercussions that may result from a failure to react promptly and strongly against those who commit environmental crimes.

There is an urgent need for the reorganisation of national government institutions dealing with the environment to avoid dualism in affiliation, to enhance their efficiency and to allow for better cross-sectoral coordination. Furthermore, the division of responsibilities between the federal government and its states needs to be clearly defined to avoid disputes. Although the interim constitution provides for the division of wealth and authority

between federal and state governments, the practical expression of this still needs to be clarified by the commissions concerned.

The capacities of institutions responsible for environmental protection need to be strengthened by improving their mobility, communication facilities and capabilities to prevent and detect environmental crimes and enforce the law. More attention has to be given to human resource development through continuous training at both local and foreign institutions, exchange visits and the improvement of salary structures and working conditions.

Most national legislation pertaining to environmental protection is weak and outdated, and needs to be revised and brought into line with modern practice to cope with current developments and environmental concerns at both national and international levels.

Of equal importance is the need for statistics on the real contribution of basic national resources, such as forestry and wildlife products on food security, poverty reduction and the impact of environmental measures on the livelihood of the Sudanese people. Another need is to know the exact contribution of forestry and wildlife products to the country's GDP. Unless such data becomes available, the ability of concerned institutions to tap adequate funds from the treasury for the protection and rehabilitation of the environment, and the sustainable management of these resources, will remain limited.

Equally important is the quantification of the loss to GDP that is caused by environmental crime. Relevant government departments and institutions should conduct regular surveys to assess the level of the population's dependency on natural resource-based goods and the financial loss to the country as a result of environmental crime.

The cross-boundary nature of environmental crime requires strong networking and cooperation between the federal government, the GOSS, state governments, NGOs, neighbouring countries and the international community.

In general, environmental crime should be addressed by putting into place legislation and policies to ensure that local communities benefit from the country's natural resources and are thus encouraged to value and protect the resources.

Notes

- 1 JB Sykes, *The Concise Oxford Dictionary*, Oxford: Oxford University Press, 1976.
- 2 Food and Agriculture Organization of the United Nations (FAO), *Sudan Africover Land Cover Atlas*, Africover Project, 2003.
- 3 Forests National Cooperation (FNC), The national campaign for combating forest crimes, office report, Khartoum, Sudan, 2002.
- 4 Bank of Sudan, *Foreign Trade Statistical Digest*, 42(4), Khartoum, 2005.
- 5 EM Ali, The national legislation and regulations on pesticides: An evaluation in light of the Stockholm Convention on Persistent Organic Pollutants 2001, Higher Council for Environment and Natural Resources (HCENR), Khartoum, Sudan, 2003.
- 6 United Nations Environmental Programme (UNEP), Environmental assessment in Sudan, 2007, www.unep.org (accessed 20 May 2009).
- 7 Forestry Research Association (FRA), Global forest resource assessment, FAO, Rome, 2005.
- 8 GOSS, Forest policy framework submitted to Southern Sudan Legislative Assembly on 10 October 2007, Ministry of Agriculture and Forestry, Juba, 2007, 4
- 9 MN Harrison and JK Jackson, Ecological classification of the vegetation of the Sudan, Sudan Government, Khartoum, 1958.
- 10 AAM Salih, Valuation and investment in sustainable forest management in Sudan, desk study, working group of experts for the FAO Planning and Statistics Branch, Forestry Department, Rome, 2003.
- 11 EA Elsiddig, AG Mohammed and TA Abdel Magid, Sudan forestry sector review, FNC, National Forest Program Facility, 2007.
- 12 Ibid.
- 13 FNC, Annual Report, Khartoum, 2007.
- 14 MN Harrison and JK Jackson, Ecological classification of the vegetation of the Sudan, Sudan Government, Khartoum, 1958.
- 15 FRA, Global forest resource assessment, 2005.
- 16 UNEP, Environmental assessment in Sudan, 2007.
- 17 FNC, Annual Report, Khartoum, 2008.
- 18 S Syd Ahmed, Agriculture in Sudan and the challenges of globalisation, Ministry of Agriculture and Forests, Khartoum, 1999.
- 19 HB Nimir and AA Abdelsalam, Oil sector development and forestry in Sudan. Paper for the revision of national forest policy, Legislation and Institutional Reorganisation Project, FNC, Khartoum, Sudan, 2005.
- 20 Ibid.
- 21 H Gafar, Poverty reduction: A national strategy for sustainable development for Sudan, Ministry of Finance and National Economics, HCENR, 2nd workshop, 2003.
- 22 UNEP, Environmental Assessment in Sudan, 2007.
- 23 FNC, Annual Report, Khartoum, 2003.
- 24 S Syd Ahmed and MO Ibnouf, An outlook programme for the protection and development of wildlife resources in the new millennia, The Wildlife Workshop, Wildlife Research Centre and the Arab Agriculture and Development Organisation, Khartoum, 2-3 July 2001 (in Arabic).
- 25 SM Abdelhameed, The economic dimension of wildlife tourism. Paper presented at the Promotion of Tourism in Sudan seminar, Ministry of Cabinet Affairs, Khartoum, September 2008 (in Arabic).
- 26 GOSS, Environment, Wildlife Conservation and Tourism Policy Framework and Work Plan 2006–2011, Ministry of Environment, Wildlife Conservation and Tourism, Juba 2007.
- 27 Ibid, 7
- 28 Ibid, 2
- 29 SM Abdelhameed, The economic dimension of wildlife tourism, 2008.
- 30 SM Abdelhameed and MB Nimr, Protected areas in the Sudan, A documentary booklet prepared by the Wildlife Research Centre, Animal Research Cooperation, Ministry of Science and Technology, Khartoum, 2006.
- 31 Sudan Government, Forests and Renewable Natural Resources Act of 2002, Khartoum, Sudan.
- 32 S Hodgeson, Preliminary report on inland fisheries legislation, FAO, Rome, 1998.
- 33 A Khalid, verbal communication, Khartoum, April 2009.
- 34 C Breuil, Sudan, field report, FAO, Rome, 1999.
- 35 S Hodgeson, Preliminary report on inland fisheries legislation, 1998.
- 36 Sudan Government, National Environmental Protection Act 2001, Khartoum, Sudan.
- 37 Saad Eldin Ibrahim, Secretary General, HCENR, Khartoum, Sudan, personal communication, April, 2009
- 38 Ibid.
- 39 Sudan Government, National Forests Act of 1989, Khartoum, Sudan.

- 40 Kanoan, G, Soliman, J, and Mosoti, V, Proposed amendments to the Sudan legislative framework on forestry: The Forests and Renewable Natural Resources Act, Act No. 11, 2002 and the Forests National Corporation Order of Establishment, consultancy report TCP/SUD/2903 - Revision of forest policy, legislation and institutional re-organisation, FNC, Sudan, 2006.
- 41 UNEP, Environmental Assessment in Sudan, 2007.
- 42 Nimir, HB, and Abdelsalam, AA, Oil sector development and forestry in Sudan. Paper for the revision of national forest policy, Legislation and Institutional Reorganisation Project, FNC, Khartoum, Sudan, 2005.
- 43 Efatih Farah, Director, Heglig Forest Plantation Project, Port Sudan, April, 2009, personal communication.
- 44 G Kanoan, J Soliman, and V Mosoti, Proposed amendments to the Sudan legislative framework on forestry: The Forests and Renewable Natural Resources Act, Act no. 11, 2002, and the Forests National Corporation Order of Establishment, Consultancy report, TCP/SUD/2903 - Revision of forest policy, legislation and institutional re-organisation, FNC, Sudan, 2006.
- 45 Ibid.
- 46 Sudan Government, Wildlife and National Parks Protection Act of 1986, Khartoum, Sudan.
- 47 C Breuil, Sudan, field report, FAO, Rome, 1999.
- 48 Sudan Government, Public Health Act of 1975, *Sudan Laws 1961-1981*, Vol. 3(7).
- 49 Ibid.



ISS Head Office

Block D, Brooklyn Court
361 Veale Street
New Muckleneuk, Pretoria, South Africa
Tel: +27 12 346-9500 Fax: +27 12 346-9570
E-mail: iss@issafrica.org

ISS Addis Ababa Office

1st Floor, Ki-Ab Building
Alexander Pushkin Street
Pushkin Square, Addis Ababa, Ethiopia
Tel: +251 11 372-1154/5/6 Fax: +251 11 372-5954
E-mail: addisababa@issafrica.org

ISS Cape Town Office

2nd Floor, Armoury Building, Buchanan Square
160 Sir Lowry Road, Woodstock, South Africa
Tel: +27 21 461-7211 Fax: +27 21 461-7213
E-mail: capetown@issafrica.org

ISS Nairobi Office

Braeside Gardens, Off Muthangari Road
Lavington, Nairobi, Kenya
Tel: +254 20 386-1625 Fax: +254 20 386-1639
E-mail: nairobi@issafrica.org

ISS Pretoria Office

Block C, Brooklyn Court
361 Veale Street
New Muckleneuk, Pretoria, South Africa
Tel: +27 12 346-9500 Fax: +27 12 460-0998
E-mail: pretoria@issafrica.org

www.issafrica.org

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