



*The infrastructure and staff capacity of Dindir National Park were greatly improved thanks to a grant from the Global Environment Facility, but sufficient and sustainable government funding is urgently needed now that GEF support has come to an end (left)*

*The core of the park is comprised of wetlands that are critically important as reliable sources of water in the dry season (top right)*

*Although many have been poached, the park still supports a significant population of larger mammals. Warthogs are very common in the park's wetlands (bottom right)*

### **CS 11.2 Dindir National Park: an ecosystem under siege**

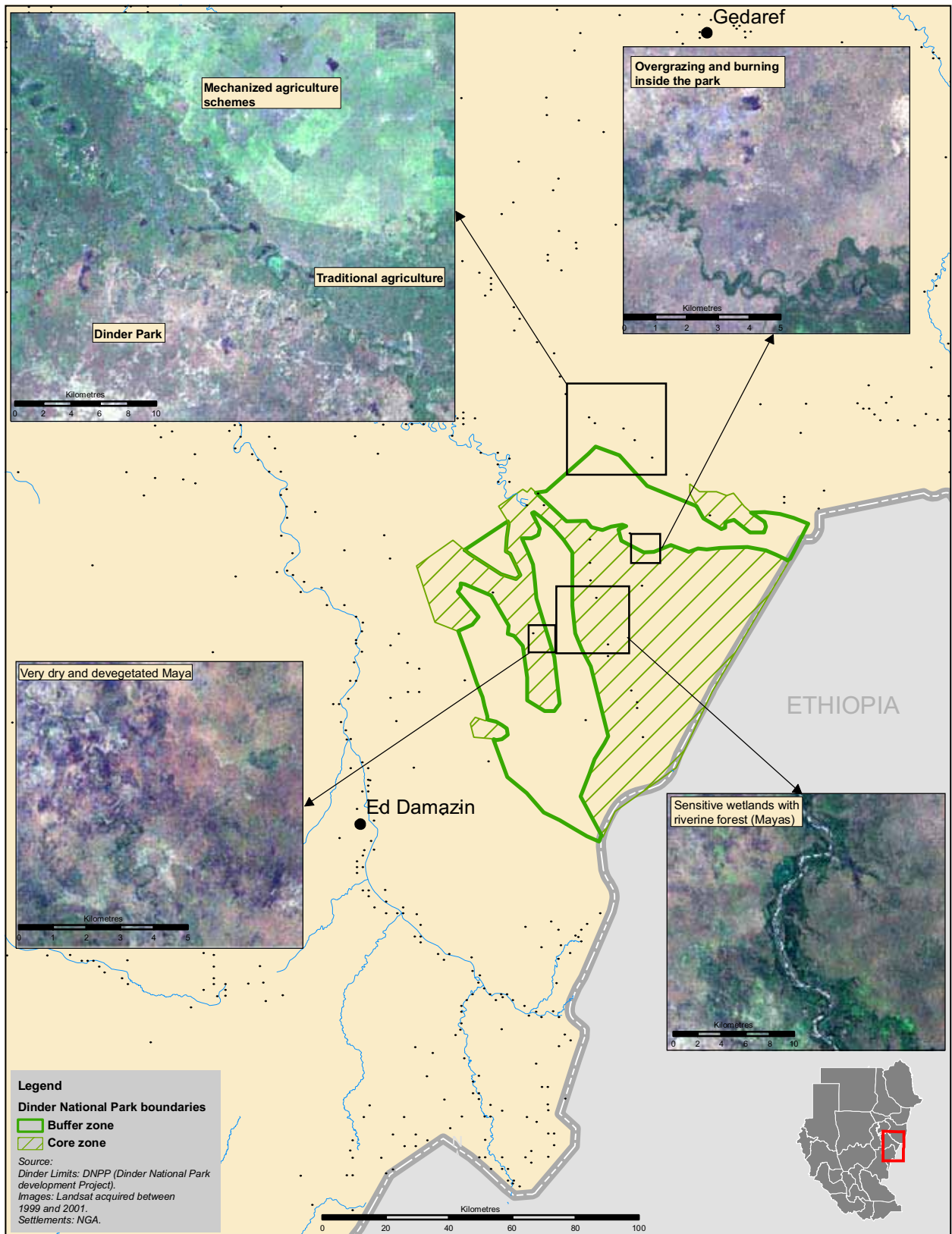
Dindir National Park is the most important terrestrial protected area in the northern states of Sudan. Located on the Ethiopian border, straddling Blue Nile and Kassala states, it is approximately 10,000 km<sup>2</sup> in size. The most important features of the park are a series of permanent and seasonal wetlands known locally as *mayas*, which are linked to streams running off the Ethiopian highlands to the east.

The habitat and wildlife of Dindir National Park can currently be described as badly degraded and under serious threat from a number of ongoing problems, including encroachment, habitat degradation and poaching.

Until the 1960s, the area surrounding Dindir was relatively uninhabited. Since then, however, migration and land use changes have resulted in development around the park, to the extent that some forty villages now exist along its borders. Large-scale mechanized agriculture to the north and west has not only pushed traditional agricultural communities to the edge of the park, but by taking over most of the land previously used for grazing, has also led pastoralists to invade the park in large numbers. Livestock compete with wildlife for fodder and water, and transmit diseases such as rinderpest and anthrax, while burning degrades the grassed woodland habitat. Poaching is also a major problem, as is the felling of trees for firewood by trespassers and fires set in the course of honey extraction.

Between 2002 and 2006, the park benefited from a USD 750,000 Global Environment Facility (GEF) grant that resulted in increased capacity for the wildlife force and a well thought out management plan with a strong emphasis on community involvement in the conservation of the park. This funding ceased in early 2006 and the future preservation of the park hangs in the balance. Without further injection of funding by the government or the international community, it is very likely that the gains achieved by the GEF grant will be lost and that degradation will continue.

Figure 11.3 Dinder National Park





The harvesting of animals in Sudan takes two general forms: commercial poaching for non-meat products, and the bushmeat culture and industry. The two forms are often combined, but each has different cultural, ecological and legal aspects and needs to be tackled in a different manner.

Commercially oriented poaching for non-meat products, such as ivory, skins and live animals for pets, was historically a major industry but is now reduced due to a steep drop in the targeted wildlife populations. This form of harvesting is completely illegal in Sudan, with the sole exception of the continued existence of a small-scale commercial trophy hunting business in the Red Sea hills.

Important poaching targets are now almost exclusively found in Southern Sudan and include elephants, snakes, leopards, parrots, chimpanzees and tortoise, with the live animal trade being most important for the latter three species and classes. Ivory poaching was and still is a significant problem that needs to be addressed as a matter of priority in order to safeguard the remaining few elephants in the country (see Case Study 11.3). Protecting the limited number of chimpanzees still present is also considered a vital task for the wildlife forces of Southern Sudan (see Case Study 11.4).

Bushmeat (meat harvested by hunting wild animals) has always been part of the Sudanese



*The collection of baby animals to serve as pets is common in Southern Sudan. The long-term survival rate of such individuals is very low. A Patas monkey in Jonglei state (top), a servile cat in Aweil, Northern Bahr el Ghazal (bottom left) and a hyena in Rumbek, Lakes state (bottom right)*



*In Sudan, the demand for ivory comes principally from tourists and foreign workers who are perhaps unaware of the global ban on ivory trading*

### **CS 11.3 The illegal ivory trade in Sudan and the regional extinction of the African elephant**

Sudan has been a centre for elephant hunting and ivory trade for centuries. Since 1990, however, it has been illegal under the Convention on International Trade in Endangered Species (CITES) to export ivory. Killing elephants or selling ivory from animals killed after 1990 is also illegal in Sudan. Given that most of the old (pre-1990) unmarked stock was in all likelihood used up long ago, any current ivory trade is no doubt illegal.

Nonetheless, the ivory trade and poaching of elephants in Sudan continue to this day, with export through illegal international trade networks. The international NGO Care for the Wild conducted a detailed investigation of the issue in 2005, and follow-up reconnaissance and interviews by UNEP in mid-2006 largely confirmed the findings.

During the war years, the main agents of the ivory trade were the military forces of the north that benefited from their unmonitored access to the south and the borders with the Central African Republic (CAR) and the Democratic Republic of Congo (DRC). The drastic reduction in elephant populations within Sudan and the gradual withdrawal of the northern forces from Southern Sudan have probably reduced direct military involvement, but private raiders remain in business. There have been consistent reports of heavily armed horsemen from Northern and Southern Kordofan, as well as Southern Darfur, coming into Southern Sudan, CAR and DRC on ivory-poaching trips. The latest report was received by UNEP from a government official in Western Bahr el Ghazal in July 2006.

The main centre of the ivory trade is Omdurman, a city across the river from Khartoum. The 2005 NGO report quotes 50 souvenir shops, 150 craftsmen and up to 2,000 items in individual shops. The main customers were reported to be Asian expatriates. UNEP visits to shops in Omdurman in July 2006 also revealed substantial amounts of ivory on sale and confirmed the presence of foreign ivory buyers.

The illegal ivory trade is a critical force driving the regional extinction of the African elephant. In order for the elephant to have a chance of survival in Sudan and elsewhere in central Africa, this trade needs to be shut down by tackling both the supply and the demand. There is no doubt that this will be a very arduous task.

Completely cutting off the supply through anti-poaching measures in the south will be extremely difficult due to the overall lack of governance in the region, the wide availability of firearms and the multiple national borders. At the same time, addressing the demand will be a particularly sensitive and politically challenging task. Possible but controversial measures to stop the demand include shutting down the carving industry through national legislation, or exerting diplomatic pressure on Asian governments to enforce the CITES convention on their own citizens traveling to Sudan, through a combination of persuasion and enforcement.



diet, with the exception perhaps of the most ancient agricultural societies based along the Nile. It partly sustained the SPLA during the conflict and was a critical fallback food source for millions of Sudanese in times of crop and livestock failure. During periods of famine, southern Sudanese reported eating any and all types of wild fauna, from buffalo to field mice.

The current issue with the bushmeat 'industry' is a combination of a lack of control and a lack of data. Indeed, there is very limited control on the continued harvesting of important food species such as the white-eared kob, but there is also no data available to assess whether current rates of harvesting are sustainable.

It is unrealistic to expect a blanket ban on bushmeat to be enforceable in Southern Sudan at this time. What is needed instead is the establishment of a system and culture of sustainable harvesting, where

local hunters and communities take the bulk of the responsibility for the care of such resources.

### Wildlife tourism

The main problem with wildlife tourism in Sudan is that it does not exist on a commercial scale. In 2005, the total number of foreign visitors to Dinder National Park and the marine parks was less than one thousand. Protected areas are hence not commercially self-sustaining and need constant subsidization, creating an evident issue of prioritization for one of the world's poorest countries.

There is currently no wildlife tourism industry whatsoever in Southern Sudan either, and the prospects for rapid growth are slight due to insecurity and a lack of infrastructure. Accordingly, the habitual issue of controlling the impacts of tourism does not yet apply to Sudan.



*Crocodile and python skin accessories are popular in markets in Khartoum, but there is no data on the impact of this trade on reptile populations in Sudan*



*This young chimpanzee – named Thomas by wildlife rangers – was confiscated from a trader in Yei, Central Equatoria, in April 2006. He is shown here with his current keeper, the Undersecretary to the Government of Southern Sudan, Ministry of Environment, Wildlife Conservation and Tourism. His fate is uncertain as chimpanzees are completely unsuitable as pets and there are no rehabilitation or holding facilities in Sudan. The Ministry is searching for solutions, both for Thomas and for chimpanzee conservation in general*

### **CS 11.4 Chimpanzee hunting and live capture in Southern Sudan**

The chimpanzee (*Pan troglodytes*) is found in relatively undisturbed tropical forest regions in central and western Africa; the forests of the far southern edge of Sudan represent the eastern limit of its habitat.

Like all of the great apes, the chimpanzee is in danger of extinction. Throughout its range, the species is subject to a variety of threats, including habitat loss and fragmentation, the bushmeat industry, and live capture. While all of these issues are important in Sudan, the predominant problem is the bushmeat trade and the resulting live capture of animals. Typically, a mother and other family members are shot for meat, and the juveniles are captured alive for later sale as pets.

Sudan has been invited to sign the Kinshasa Declaration supporting the Great Apes Survival Project (GRASP) but, as of end 2006, has yet to do so.



## 11.5 Wildlife and protected area sector governance

### Governance structure

The governance structure and legal situation of the wildlife and protected area management sector are complex and partially dysfunctional. The 2005 Interim National Constitution explicitly places management of the wildlife of Southern Sudan under the authority of the GOSS. At the same time, a number of international treaties such as the Convention on International Trade in Endangered Species (CITES) and the Ramsar Convention are managed at the federal level. This creates some confusion for the management of sites and issues in Southern Sudan.

### Government of National Unity

In the Government of National Unity, wildlife and protected area management are the responsibility of the Ministry of Interior, as wildlife forces are part of the country's unified police forces. The controlling ordinance is the 1986 Wildlife Conservation and National Parks Ordinance. While there are numerous deficiencies in the structures and legislation which hamper practical governance, a principal problem is under-investment in the forces, resulting in a very low level of capacity in the field.

### Government of Southern Sudan

Wildlife and protected area management in Southern Sudan are the responsibility of the Wildlife Conservation Directorate of the GOSS Ministry of Environment, Wildlife Conservation and Tourism. Like many of the new GOSS institutions, this structure is still extremely weak in capacity due to shortages in skilled manpower, equipment and accommodation. It does, however, have moderate amounts of funding and is receiving limited capacity-building.

While there is currently no GOSS legislation on wildlife and protected area management, the SPLM had a working Commission on Wildlife, and issued a number of directives for areas under its control.

A particular and unusual challenge for the new ministry is the requirement from GOSS to absorb

large numbers of troops demobilized from the Unified Forces and directed to civilian sectors such as the police, wildlife forces, prisons and fire brigades. As of late 2006, the projected size of the wildlife force was over 7,300, which would probably make it the world's largest. If not well managed, training, managing and financing such a large force is expected to be major problem for the ministry that could distort the operations of the unit and distract it from its core role as the focal point for environmental governance (including wildlife) in Southern Sudan.

On a positive note, the Wildlife Conservation Society, an international NGO, announced in November 2006 that it was forming a multi-year partnership with the GOSS to build capacity in the wildlife forces and progress sustainable management of wildlife resources via a series of practical projects. One of the early activities planned is a major aerial survey of the protected areas to count wildlife populations and assess habitat conditions. The first stage of the fieldwork was completed in early 2007.



*Innovative and sustainable solutions are needed to stem the decline of wildlife of Southern Sudan. These juvenile ostriches taken from the wild as chicks and raised in an aid compound in Padak will grow too big, powerful and dangerous to be kept as pets. The long-term fate of these particular individuals is sealed, but the species can be preserved in the region*

### 11.6 Conclusions and recommendations

#### Conclusion

The issues relating to wildlife and protected area management are notably different in the north and south of Sudan. Economic pressures underlie the destruction of northern and central Sudan's wildlife, as well as the degradation of its protected areas. In a period of conflict and extreme poverty, investment in this sector was not a priority for the predecessors of the Government of National Unity. However, the new wealth provided by oil revenue will hopefully allow a gradual turnaround of this situation.

In Southern Sudan, the limited short- to medium-term prospects for wildlife tourism imply the need for alternative revenue streams to finance wildlife management. Potential alternatives include sustainable game ranching and the formalization of the bushmeat industry.

With the exception of three park areas (Dinder, Sanganeb and Dongonab Bay), the data on the wildlife and protected areas of Sudan is insufficient to allow the development of management plans. Before detailed planning can take place, more in-depth assessments will need to be carried out.

#### Background to the recommendations

The following recommendations are structured to fit the post-CPA institutional arrangements. They are aimed at pragmatic solutions for economic sustainability and prioritization of expenditure. For Southern Sudan, the need for comprehensive capacity-building within the wildlife management sector is clear. As of early 2007, GOSS is in receipt of assistance from both USAID and the Wildlife Conservation Centre; moreover, it has capacity for self-improvement via the Boma Wildlife Training Centre. However, it should be noted that the wildlife sector is unique in that it has a high potential for attracting partnerships with international NGOs and thus has better funding prospects than many other environmental sectors.

#### Recommendations for the Government of National Unity

**R11.1 Reform and rationalize institutions, laws and regulations.** The institutions, laws and regulations related to wildlife and protected area

management at all levels of government need to be rationalized and improved. Due to the overlapping nature of many of the existing institutions, laws and regulations, this would, in the first instance, need to be done as a joint exercise by GONU, GOSS and state governments.

CA: GROL; PB: MI and MEPD; UNP: UNEP and INGOs; CE: 0.5M; DU: 3 years

**R11.2 Invest in the management of Dinder National Park.** This would entail implementation of the current management plan, which is both adequate and up to date.

CA: GI; PB: MI and MEPD; UNP: UNEP and INGOs; CE: 3M; DU: 5 years

**R11.3 Shut down the illegal ivory carving and trading industry.** This is a clear governance issue with north-south peace implications that can be addressed without causing significant economic hardship on the national scale.

CA: GROL; PB: MI; UNP: UNEP and CITES; CE: nil; DU: 1 year

#### Recommendations for the Government of Southern Sudan

**R11.4 Develop interim strategies and plans for the management of protected areas and wildlife** including the surveying of all protected areas. Detailed long-term plans, policies and legislation cannot be rationally developed or implemented due to the current lack of information and governance capacity. Interim measures are needed.

CA: PA; PB: MEWCT; UNP: UNEP and INGOs; CE: 4M; DU: 2 years

**R11.5 Develop focused plans for the management of Nimule National Park, the Sudd Ramsar site (including its elephant population) and the conservation of chimpanzees and migratory antelopes including the white-eared kob.** These four items have common features (international support, practicality and conservation urgency) that make them targets for early practical action.

CA: GROL; PB: MEWCT; UNP: UNEP and INGOs; CE: 2M; DU: 2 years



# Marine Environments and Resources

*Port Sudan, which hosts the largest sea freight terminal in the country, typifies the situation for marine resources in Sudan: economic development is occurring at the expense of the environment, and the surrounding lagoons are suffering from land-based pollution and modification due to the indiscriminate building of infrastructure.*







## Marine environments and resources

### 12.1 Introduction and assessment activities

#### Introduction

The coral reefs of the Sudanese territorial waters in the Red Sea are the best preserved ecosystems in the country. To date, these precious assets have been largely protected by the lack of development, but the economic and shipping boom focused on Port Sudan and the oil export facilities is rapidly changing the environmental situation for the worse.

At present, the state of the coastal environment is mixed: while steady degradation is ongoing in the developed strip from Port Sudan to Suakin, good conditions prevail elsewhere along the coast. On and above the tideline, the symptoms of overgrazing and land degradation are as omnipresent in Red Sea state as elsewhere in dryland Sudan.

The preservation and sustainable development of the marine resources of Sudan will require an integrated approach. For this reason, all of the

issues specifically related to marine and coastal environments are collated and discussed here, though several cut across sectors covered in other chapters of this report.

#### Assessment activities

For this assessment, UNEP drew upon a significant available databank on the marine resources of Sudan [12.1, 12.2, 12.3, 12.4, 12.5]. In addition, a UNEP field mission covered the coastal strip from 100 km north of Port Sudan to the Tokar delta. Fieldwork included an extensive investigation of the Port Sudan area.

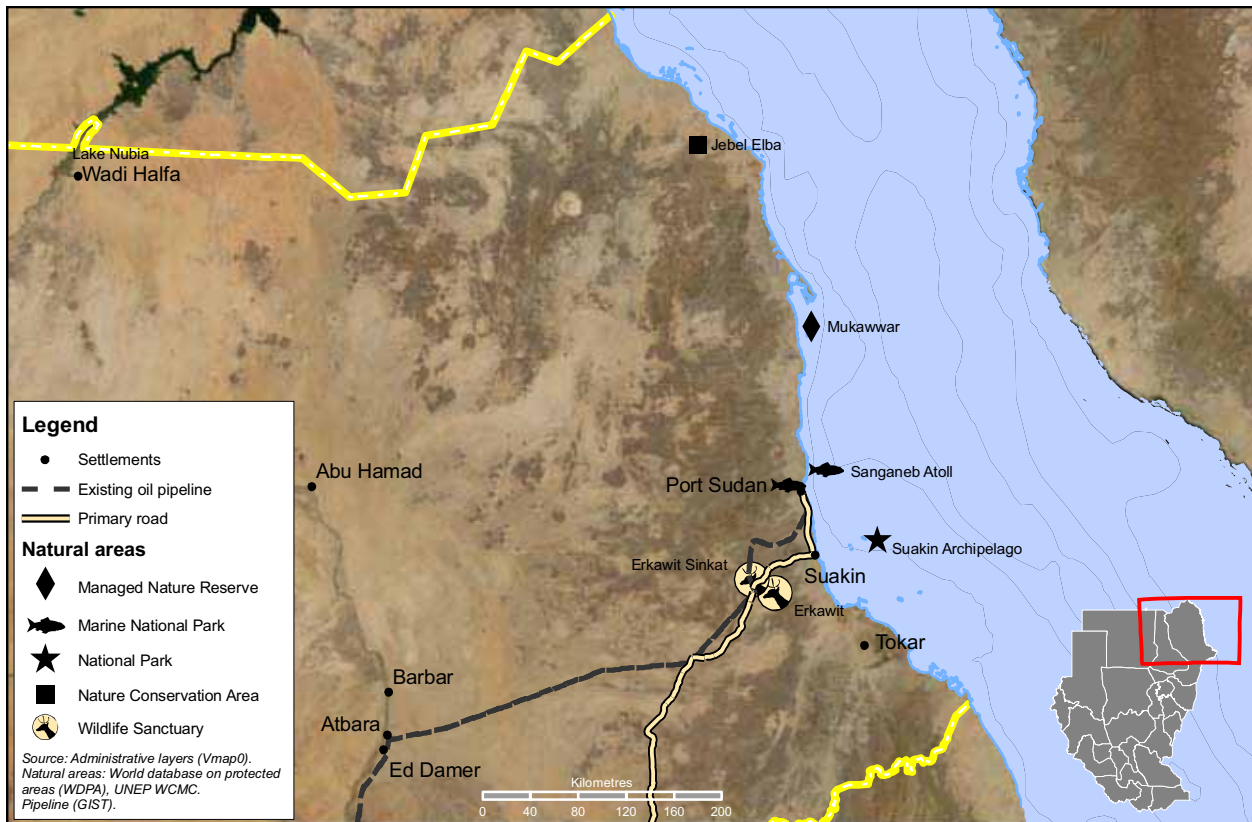
UNEP has been involved in the assessment and management of the natural resources of the Red Sea since the 1980s in its role as a supporter and participant in the Regional Organization for the Conservation of the Environment of the Red Sea and the Gulf of Aden (PERSGA). PERSGA-sponsored projects have included surveys of the coral reefs and other important marine habitats of Sudan.

While it did not extend to the habitat's condition, UNEP's assessment of the marine environment of Sudan was considered adequate to cover and provide an update on the main environmental issues.



*A typical shoreline north of Port Sudan, with sparse vegetation on a sandy-silty beach, a sheltered zone and the fringing reef (indicated by the breaking waves in the distance)*

Figure 12.1 Sudan coastline



The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

## 12.2 Overview of marine and coastal environments and resources

### The Red Sea

The Sudanese Red Sea is famous for its attractive and mostly pristine habitats, particularly its coral reefs. Three distinct depth zones are recognized: shallow reef-studded shelves less than 50 m deep, deep shelves 500 to 1,000 m deep, and a central trench more than 1,000 m deep, reaching a maximum of 3,000 m off the city of Port Sudan. The Red Sea is home to a variety of pelagic fish including tuna, but the overall fish density is relatively low due to limited nutrient input. The sea hosts important populations of seabirds and turtles, as well as mammals such as dugong, dolphins and whales.

### Coastline and islands

The coastline of Sudan on the Red Sea is some 750 km long, not including all the embayments

and inlets [12.2]. Numerous islands are scattered along the coast, the majority of which have no water or vegetation. The dominant coastal forms are silty beaches, rocky headlands and salt marshes, commonly bordered with mangroves. Fringing coral reefs are very common and water clarity is generally high due to the lack of sedimentation.

Average precipitation in the coastal areas is extremely low, ranging from 36 mm per year at Halaib to 164 mm per year at Suakin, so that the desert extends right to the tide mark. The only exception is the Tokar delta, which receives substantial run-off from seasonal streams originating in the Ethiopian and Eritrean highlands.

The islands and most of the coastline are relatively undisturbed and host important feeding and nesting sites for a variety of seabirds. The three most ecologically important habitats are coral reefs, mangroves and seagrass beds.



## Coral reefs

Three types of coral reefs are found in Sudanese waters:

- fringing reefs, which lie 1-3 km offshore;
- patch reefs, which lie up to 15 km offshore, separated from the fringing reef by deep and wide channels; and
- pillar reefs or atolls, found 20 km or more offshore, such as the Sanganeb atoll.

The coral reefs of Sudan are considered to be in moderate to good health, despite an extensive cover of algae over some fringing reefs. Some die-back/coral bleaching has occurred, particularly in the upper ten metres [12.3, 12.7].

## Mangroves

Mangrove stands are a key coastal habitat, which provide forage, wood products and breeding grounds for fish. Extensive stands were originally found in areas where the seasonal streams (*khors*) reach the coast, as these produce the brackish and sediment-rich conditions necessary for mangroves to thrive. Mangroves stands are currently under severe pressure along the entire coastline from a combination of overgrazing and over-cutting, and in some regions, wholesale destruction due to coastal industrial development.

## Seagrass beds

Seagrass beds are found in shallow coastal waters, around mangroves and between the low tide line and fringing reefs. They are highly productive habitats that provide grazing for dugong, and support fish and trochus shellfish.

## 12.3 Environmental impacts and issues

### A high quality environment under pressure

The Sudanese marine and coastal environment is in relatively good condition overall, with isolated badly degraded areas. The region, however, is subject to a mounting list of environmental impacts linked to urban and industrial development, and to overgrazing. The principal environmental issues are:

- coastal habitat destruction by development;
- oil industry spill risks;
- passing ship pollution;
- pollution from land-based sources;
- risk of importing invasive species in ballast water;
- fisheries management;
- mangrove cutting and overgrazing; and
- marine protected areas and tourism.



*Soft coral at Sanganeb. The coral reefs of Sudan are in very good to moderate condition away from the major urban areas. They are partly protected by their isolation and the lack of run-off from the desert*



*A major extension to the Port Sudan harbour, known as the Green Port, is going ahead in an area surrounded by seagrass beds and coral reefs. It is now necessary to focus on planning port operations to minimize ongoing impacts*

### **Coastal habitat destruction by development**

Development along the Red Sea coast is largely limited to a 70 km strip extending from Port Sudan to Suakin. This zone includes the two cities, the major ports, the oil terminals, saltworks, a shrimp farm and the new Red Sea Economic Free Trade Zone.

The damage to coastal habitats due to construction within this strip is extensive and in some cases both completely unnecessary and probably uneconomic in the long term. In some areas such as the main commercial port of Port Sudan, habitat destruction is unavoidable: though regrettable, local environmental damage is outweighed by the scale of the economic benefit. In other

cases, however, the benefits of development are questionable.

Twenty kilometres south of Port Sudan, productive mangroves have been destroyed by saltworks construction; saltwater access canals and banks have cut through mangrove stands, disrupted groundwater flows and sediment deposition patterns. Approximately eight kilometres south of Port Sudan at Kilo Tammania, mangroves have been destroyed by the poor design of an outfall access road and recreation area [12.2].

As discussed in Chapters 7 and 13, industrial development in Sudan occurs in the absence of an effective environmental impact and management culture. This is clearly apparent in the Port Sudan region.



Figure 12.2 Port Sudan and coral reef



The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

### Oil industry spill risks

The risk of oil spills from the relatively new Bashir crude oil export terminal is discussed in detail in Chapter 7. The risks are considered to be moderate and the reported response measures close to international standards. The new Alkheir petroleum and gas export terminal is also considered to represent a moderate risk.

However, the loaded crude oil and product tanker traffic leaving the two terminals and traveling east to the Indian Ocean remains a considerable risk, due to the navigational hazard presented by the numerous fringing and patch reefs. In 2004, a freight vessel, the MV *Irens*, grounded on the reef at the Wingate anchorage area some 10 km east of the Alkheir terminal [12.2].

### Passing and docked ship bilge water and oil pollution

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



*Ships passing and entering ports in Sudan currently have no place to deposit oily waste, such as that generated by clearing bilges and fuel tanks. In the absence of facilities and controls, the risk is that ships jettison this oil at sea*

small coastal tenders to bulk grain carriers. In the absence of controls and facilities for receiving oily waste from bilges, ships discharge this effluent into the sea. This results in chronic oil pollution around the ports, but also along the coast, as discharges from passing ships drift landwards.





*The Port Sudan landfill is located at the head of a seasonal watercourse. Every wet season, the run-off draws pollution from the site to the coastal lagoons*

### Pollution from land-based sources

The industrial facilities and utilities of Port Sudan are a major source of land-based pollution for the Red Sea. They include two power stations, a desalination plant and the harbour dockyard. Other facilities in the area, such as a tire factory, a tannery, and an oil seed factory, are now closed down.

Electrical power stations A and C were found to be dumping substantial quantities of waste oil onto open ground in adjacent vacant land (station C is described in more detail in Case Study 7.1). In addition, the desalination plant was found to be at the origin of a significant pollution by hypersaline effluent (see Case Study 12.1). The harbour dockyard, which has no oily water treatment facility, was another expected source of pollution, but was not inspected. Other parts of the harbour, including the main warehouse, were investigated and found to be relatively clean, except for one open warehouse filled with unwanted pesticides and other chemicals.

Figure 12.3 Port Sudan power station and salt flats



The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.



UNEP also visited a small oil refinery located five kilometres south of Port Sudan (see Figure 12.3). Site personnel reported that an oil-water separator was used for water treatment, and that the treated effluent and cooling water were discharged to sea, although this could not be verified by UNEP due to access restrictions. The refinery grounds and surrounds were markedly cleaner than the adjacent electrical power station C.

Additionally, the harbour lagoons are polluted by litter, waste oil and sewage from wet season run-off from the *khor* Kilab, which borders the old industrial area of Port Sudan. This area contains numerous small factories and vehicle repair workshops that dump used oil and other waste into the stream bed throughout the year.

Finally, the main Port Sudan landfill, which is located in the head of the *khor*, is a source of surface and groundwater contamination. The run-off from the dump also eventually ends up in the harbour. The landfill is covered in detail in Case Study 6.4.

### **Risk of importing invasive species in ballast water**

No port in Sudan has facilities for receiving ballast water, which is instead discharged by the ships either in the harbour or in the approaches. This practice carries the risk of importing invasive species (larvae, parasites and infectious agents) from where the ship last docked and took in the ballast.

### **Fisheries management**

Marine fisheries and mariculture industries in Sudan are currently underdeveloped. They are also poorly controlled and subject to repeated proposals for expansion from foreign investors.

The artisanal fleet on Sudanese waters is comprised exclusively of locally made wooden boats and small fiberglass tenders. Fishing methods include hand lines, and bottom set and pelagic gill nets, with 80 percent of the catch coming from hand lines. Prior to 2005, an Egyptian shrimp trawling fleet operated offshore of the Tokar delta, but it was



*Cargo ships carry seawater as ballast, which is drawn in or discharged when cargos are loaded and unloaded. When this occurs thousands of kilometres away from the intake point, there is a risk of introducing alien species into the local marine environment*



*This lagoon in the centre of the city of Port Sudan is already burdened with urban pollution and shoreline development. Unless a solution for the saline effluent is found, the lagoon is expected to become a biologically dead zone*

*Reverse osmosis units separate seawater into two streams: freshwater for consumption and a high salinity effluent which needs to be disposed of in an appropriate manner to avoid environmental damage*

### **CS 12.1 The impact of pollution from the Port Sudan desalination plant**

This desalination-based freshwater production plant in Port Sudan provides an unfortunate case study in the importance of locating industrial facilities correctly in order to optimize benefits to local citizens and minimize environmental impacts.

The plant, which was built in 2004, plays a vital role in the provision of freshwater to the city. Based on a reverse osmosis process that is powered by diesel, it has a combined freshwater output of 7,500 m<sup>3</sup> per day and an effluent discharge of 2,500 m<sup>3</sup>.

The facility is located on the shoreline of a shallow and moderately polluted saltwater lagoon that was an important if declining fishing ground until 2004, but is now surrounded by urban development. The original plant design envisaged extracting water from the lagoon, but health concerns forced a late revision in the form of a 4 km pipeline to convey seawater in from the coastline. The effluent from the plant, however, is currently discharged directly into the lagoon as per the original design.

The salinity of the effluent is approximately four times that of seawater, and it contains traces of chlorine and anti-scaling agent. The local authority reported that a major fish kill occurred during plant commissioning and there are current complaints from local residents regarding skin rashes, although the link between this public health problem and the increased salinity is unclear at this stage.

What is clear is that the combination of a nearly closed system and ongoing saline inputs will in time result in a hypersaline and ecologically dead (and most probably anaerobic) lagoon in an urban area. While the local authorities were very much aware of this problem at the time of UNEP's visit, there was no agreement on the solution due to the high cost of all options proposed to date.



banned by the Red Sea State Governor during the 2005-2006 season, apparently due to a licensing dispute. At present, no legal offshore fishing is conducted by foreign vessels, though the potential for illegal fishing is high as there is effectively no monitoring.

The fisheries industry is constrained by a lack of investment in facilities to handle the catch, as well as by a limited domestic market. The daily fish catch is monitored by the local fisheries authority and estimated to be approximately 1,100 tonnes per year [12.2, 12.8]. Most of the fish is consumed locally. There is a small export market to Saudi Arabia and Egypt for fresh coral fish and shark, and some 200 to 300 tonnes of trochus shellfish are exported – mainly to Europe – per year.

Though historically significant, mariculture and the collection of wild pearl oysters in the Red Sea region ended in the 1990s. It may or may not be revived. Shrimp farming has just commenced, with one farm located 35 km south of Port Sudan, but this venture is struggling to establish local and export markets.

The key environmental issue for the fisheries and mariculture industries is the lack of effective governance. This leaves the environment highly vulnerable to overfishing and uncontrolled mariculture expansion.



*At present, the domestic marine fisheries industry is very limited. Most of the catch is consumed locally. A small volume of high-quality fish is exported to other Gulf countries*



*Camels grazing on mangroves 20 km south of Suakin. The impact of such grazing can be seen in the absence of foliage below three metres. This stand also shows signs of extensive timber-cutting*



© RED SEA ENTERPRISES

*Spinner dolphins offshore of Suakin. The marine tourism industry in Sudan still operates on a small scale, catering mainly to scuba divers, but the quality and quantity of marine life holds promise for the long-term growth of the industry. Protection and control measures need to be improved to ensure that this growth occurs without harm to the environment*

### Mangrove cutting and overgrazing

Mangrove leaves are edible for camels and are thus vulnerable to grazing damage in periods of scarcity. Most of the accessible mangrove stands visited by UNEP had the characteristic clipped look resulting from overgrazing. Mangroves can also supply wood for fuel and construction, and unsustainable cutting has clearly been a problem in the accessible stands.

### Marine protected areas and tourism

There are two declared marine protected areas in Sudan: Sanganeb Marine National Park and Dongonab Bay (with Mukawar Island). Sanganeb Marine National Park is described in detail in Case Study 12.2.

Dongonab Bay National Park lies 125 km north of Port Sudan and covers 60 km of coastline and

a shallow bay with a wide diversity of marine habitats, including coral reefs and seagrass beds that support a large population of endangered dugong. The park also has a significant resident human population in a number of small fishing villages, and hosts a salt plant.

In addition, four high-value habitats have been proposed as marine protected areas:

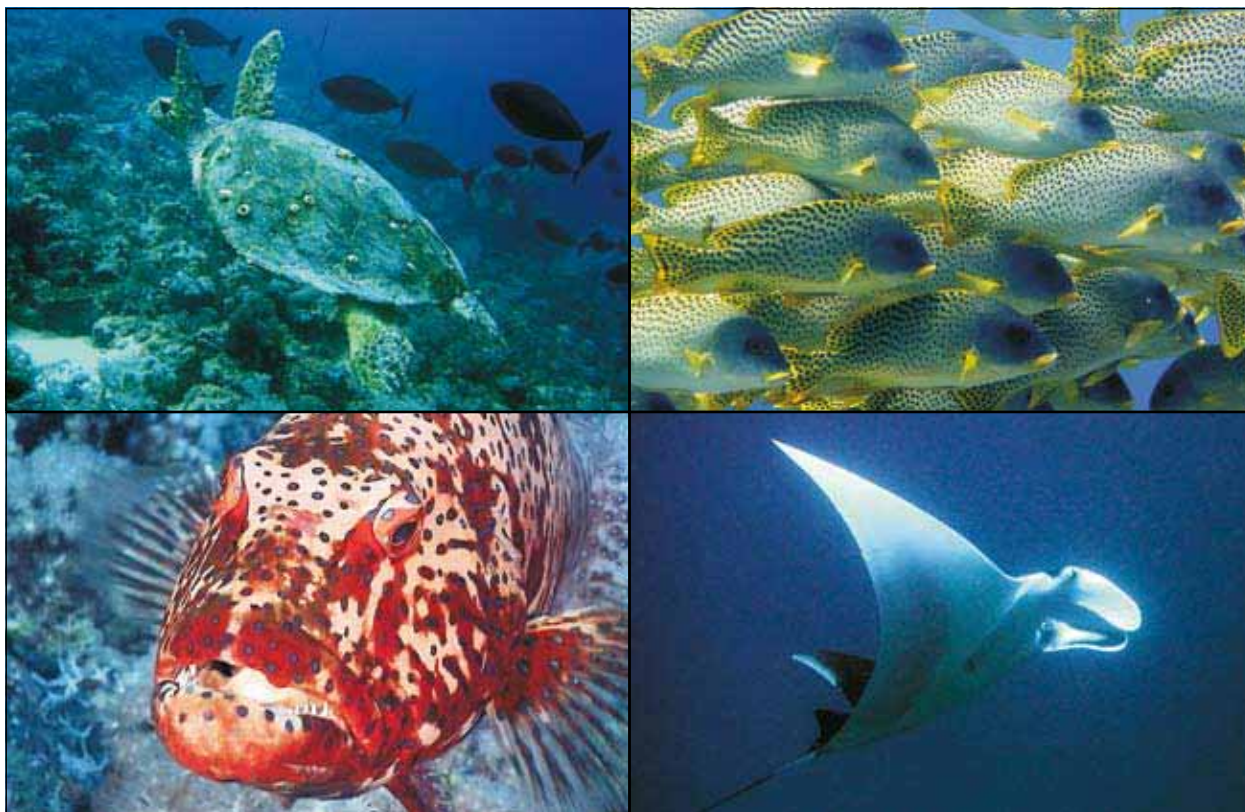
- Suakin Archipelago, which comprises coral reefs surrounding a number of sandy islands approximately 20 km south-east of Suakin; these are important nesting sites for marine turtles and sea birds;
- Khor Kilab Bird Sanctuary, a 2 km<sup>2</sup> estuarine area on the south side of Port Sudan harbour;
- the Abu Hashish area, a 5 km<sup>2</sup> area on the eastern side of the new Green port, containing numerous coral reefs; and
- Shuab Rumi, a 4 km<sup>2</sup> area of coral reefs 50 km north of Port Sudan.

To this list, UNEP would add **all** of the remaining mangrove stands along the Sudanese Red Sea coastline, as this habitat is now under severe pressure and disappearing rapidly in some areas.

At present, the marine tourism industry is centred mainly on Sanganeb and to a lesser extent on Shuab Rumi. The Dongonab area is relatively remote and rarely visited. For the most part, tourism consists of international diving holidays, with visitors flying to Port Sudan and residing on large hotel boats, which travel to anchor at the various diving sites for a few days at a time. There is also some limited local recreation along the coastline.

The major environmental issue related to marine tourism is the lack of handling facilities at the dive sites and ports. For example, dive boats are forced to anchor on the reefs, causing damage, because they do not have mooring buoys. Tourism operators are highly aware of this problem, but do not have the legal mandate to install the necessary equipment, as that rests with the Sea Ports Corporation. An additional issue is the limited capacity for governance of the parks and tourism in all places.





### CS 12.2 Sanganeb National Park: a microcosm of high reef biodiversity

The Sudanese coast harbours the most diverse coral reefs in the Red Sea. The small Sanganeb Atoll, arguably the only true atoll in the Red Sea, is situated approximately 30 km north-east of Port Sudan. It lies close to the centre of Red Sea marine biodiversity, where conditions are optimal for coral growth and reef development.

Sanganeb's physical features include an outer rim that encloses three central lagoons, areas of back reefs, and shallow water reef flats dominated by massive colonies of porites, goniatrea and montipora. Outside this outer rim, the reef drops vertically, interrupted by terraces, to the seabed some 800 m below. The drop from the reef flats to the reef slopes hosts a spectacular diversity of coral and fish species.

The coral fauna of the Sanganeb Atoll, which may well prove to be among the richest in the Red Sea, inhabits a number of different bio-physiographic reef zones. To date, a total of 124 cnidarians have been recorded. The atoll also hosts significant populations of *Trochus dentatus* (giant spider conch) and sea-cucumbers, which are commercially exploited elsewhere in Sudan.

Over 251 coral reef fish species have so far been recorded and this number may rise to more than 300. Populations of larger species such as bumphead parrotfish (*Bolbometopon muricatum*), bumphead wrasse (*Cheilinus undulatus*), and groupers, which are vulnerable to overfishing throughout their ranges, appear healthy in Sanganeb. The open waters around the atoll include a large number of pelagic fish species such as tuna, barracuda, sailfish, manta rays and sharks. Sailfish are reported to spawn in the Sanganeb lagoon.

The atoll was declared a National Park in 1993 and is currently one of two marine protected areas in Sudan (the other is the Dongonab Bay and Mukawar Island National Park, gazetted in 2005). Management plans for both sites were developed by the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) in 2003. Sanganeb additionally lies within one of two proposed Ramsar sites along the Sudanese coast, and is on Sudan's tentative list for UNESCO World Heritage status. At present, the park covers an area of approximately 22 km<sup>2</sup>, but there are proposals to create an additional buffer zone that would increase the area to approximately 260 km<sup>2</sup>.

Sudan's Wildlife Conservation General Administration signed an agreement with the international NGO the African Parks Foundation to implement the existing management plans for both Sanganeb and Dongonab Bay National Parks [12.6]. In June 2006, the Foundation and IUCN undertook a baseline biodiversity survey of both parks.

The atoll has considerable potential as a major destination for diving tourism, but the infrastructure to support and manage increased tourism has yet to be put in place.

### 12.4 Marine and coastal environmental governance

#### Governance structure

The governance structure for the Sudanese Red Sea coastline, territorial seas, islands and associated marine protected areas is very complex and in consequence, fragmented.

Sudanese ports are managed by the Sea Ports Corporation, which is part of the federal Ministry of Transport. The important exception is the arrangement at the Bashir Oil Terminal port facilities, which also come under the management of the Ministry of Energy and Mining. Marine fisheries are governed by the Marine Fisheries Administration, which is part of the federal Ministry of Agriculture and Forestry. The marine protected areas are under the responsibility of the Headquarter of Wildlife Conservation in the federal Ministry of Interior, and wildlife conservation services staff are actually managed by the Ministry of Interior, as they are part of the country's united police force.

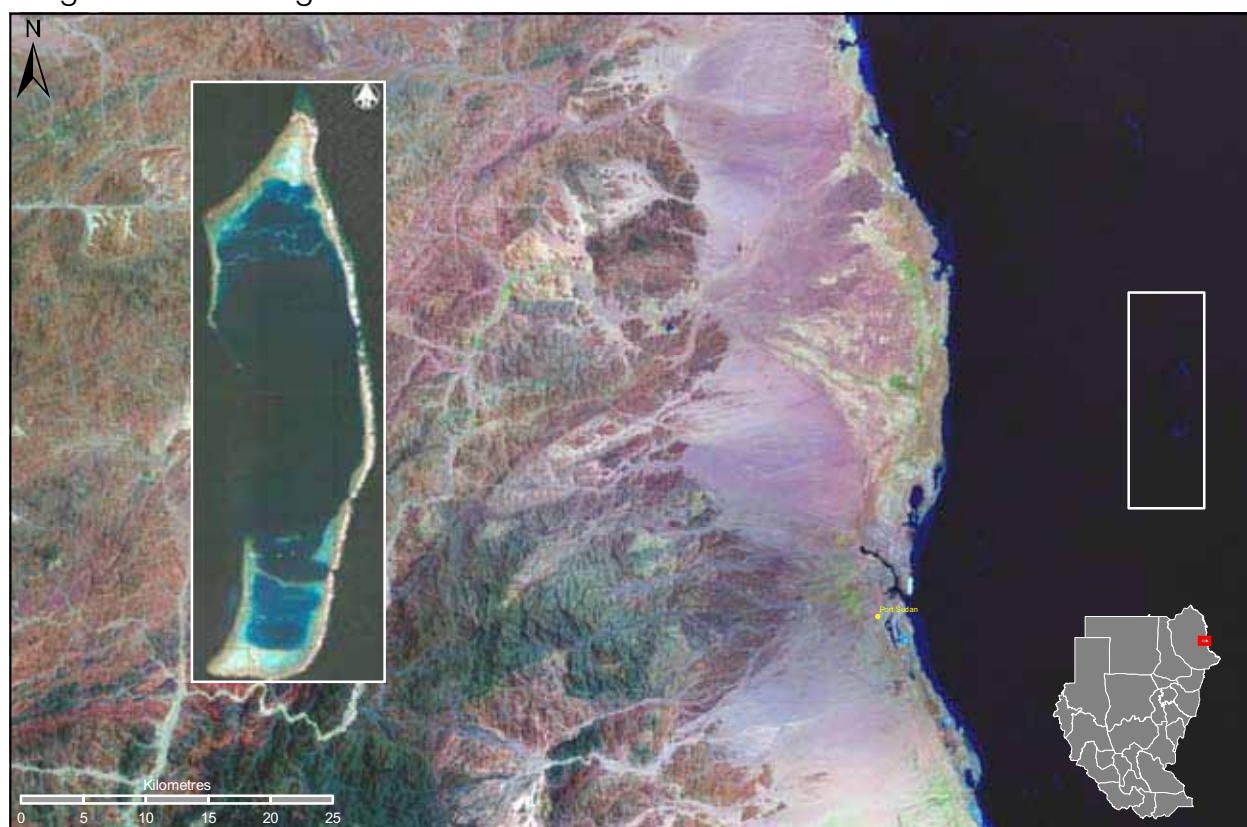
At the state level, the governor and the local government of ministers and advisors have significant and broad-reaching authority, which overlaps with the federal mandate to a large extent.

Red Sea state is unusual in that it has a working body specifically for marine environment protection – the newly formed Marine Environmental Protection Authority (MEPA). In addition, the State Council for Environment (SCE) provides an oversight and coordination role. Finally, the NGO sector is also active in Port Sudan.

#### Legislation and coordination

Appropriate and up to date legislation and guidance is lacking for the direction of the various authorities. Fisheries legislation, for example, is based largely upon acts drafted by the British in the 1930s. A number of important legal documents have been developed more recently, but have yet to be ratified or implemented by the federal authorities. The new state-sponsored SCE is anticipated to improve coordination between the various actors, though it is constrained by legislation to be largely advisory.

Figure 12.4 Sanganeb National Park



The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.



## Governance performance

While the Red Sea region has a number of interested and responsible parties for environmental protection, the complex governance structure and ensuing fragmentation of responsibility hamper practical performance by the authorities.

In addition, a severe lack of financial resources affects all governance operations (except for the Bashir Oil Terminal and the Sea Ports Corporation), and legislative deficiencies hinder both the authorities and civil society. For instance, many of the major facilities are managed at the federal level, which makes enforcement of legislation at the state level problematic.

## 12.5 Conclusions and recommendations

### Conclusion

Compared to many parts of Sudan, the coastal and marine environments are still in very good condition. The marine habitats have global as well

as national significance and are currently the most important foreign tourist attractions in Sudan.

The environmental issues faced by the region will require an integrated approach to have any chance of successful resolution. The multiple competing uses and threats for shared resources such as shipping channels, estuaries, coral reefs and pelagic fisheries cannot be addressed in isolation.

The general level of environmental awareness and interest among Red Sea state stakeholders is impressive and higher than that seen in many other parts of Sudan. However, this interest needs to be converted into practical action, in the first instance by transferring more authority to the local level.

### Background to the recommendations

The two key themes for the recommendations are: integration, based on the concept of Integrated Coastal Zone Management (ICZM), and devolution of responsibility to the Red Sea state level.



*Young men on duty on national service picking up litter from the tidal lagoons of Port Sudan. The level of interest in the environment in Red Sea state is among the highest in all of Sudan*

The objective of Integrated Coastal Zone Management (ICZM) is to establish sustainable levels of economic and social activity in coastal areas while protecting the coastal environment. It brings all those involved in the development, management and use of the coast together in a framework that facilitates the integration of their interests and responsibilities.

In support of the devolution of powers, the 2005 Interim Constitution grants states the authority to manage their natural resources. This general clause needs to be strengthened for the unique coastal and marine environment, with more detail on the division of powers for a range of issues such as fisheries, coastal development, land-based marine pollution sources and tourism. This process would correct the current imbalance due to the fact that much of the interest in environmental management resides in Red Sea state while the mandate for management resides largely at the federal level.

### Recommendations for the Government of National Unity

**R12.1 Ratify and enforce existing prepared legal instruments for the marine environment.** Documents that are ready but not yet translated into law or firm standards include the Sudanese Maritime Law and the National Oil Spill Contingency Plan.

CA: GROL; PB: GONU Assembly; UNP: UNEP; CE: 0.1M; DU: 2 years

**R12.2 Develop legislation and statutory guidance covering offshore fisheries.** This should cover issues such as prohibited areas and the granting of licenses to both domestic and international operators.

CA: GROL; PB: MAF; UNP: FAO; CE: 0.3M; DU: 2 years

**R12.3 Adequately fund the marine fisheries inspection and data collection services** operating out of the Red Sea ports to enable monitoring of catches and offshore fisheries including foreign vessels.

CA: GI; PB: MAF; UNP: FAO; CE: 3M; DU: 2 years

**R12.4 Adequately fund the two marine protected areas of the Red Sea** that have existing management plans and follow through with those plans to develop self-sustaining revenue streams for those areas. Sanganeb Marine National Park is the priority site.

CA: GI; PB: MI, UNP: UNEP; CE: 5M; DU: 5 years

### Recommendations for the Red Sea State Government

**R12.5 Enforce existing EIA legislation on planned developments on the coastline,** including the Red Sea Free Trade Zone. This will require more direct involvement of the Red Sea State Government in support of the Marine Environment Protection Authority.

CA: GROL; PB: RSS MEPA; UNP: UNEP; CE: 0.1M; DU: 2 years

**R12.6 Enforce existing water pollution legislation on industrial and utilities plant discharges into the Red Sea.** This will require more direct involvement of the Red Sea State Government in support of the Marine Environment Protection Authority.

CA: GROL; PB: RSS MEPA; UNP: UNEP; CE: 0.1M; DU: 2 years

**R12.7 Advocate and progress federal/state power-sharing on marine environmental issues.** Set out and restructure the power-sharing arrangements for coastal and marine natural resources management to allow direct liaison and resolution at the state level.

CA: GROL; PB: RSS MEPA; UNP: UNEP; CE: 0.1M; DU: 3 years

**R12.8 Introduce the concept of Integrated Coastal Zone Management** through revised master-planning for the whole coast with a focus on the areas of Port Sudan, Suakin and Tokar.

CA: GROL; PB: RSS MEPA; UNP: UNEP; CE: 0.4M; DU: 3 years



# Environmental Governance and Awareness

*Under UNEP sponsorship, several consultation meetings were held between the environment ministries of the Government of National Unity and the Government of Southern Sudan to discuss national action plans for environmental management.*





## Environmental governance and awareness

### 13.1 Introduction and assessment activities

#### Introduction

Environmental governance and awareness are at a crossroads in Sudan. For several decades, the priorities of a war economy and a range of escalating environmental issues overran incremental progress in these areas. Now, two major events have radically reshaped the governance context and helped create the conditions for positive change.

First, the Comprehensive Peace Agreement (CPA) [13.1] and the Interim Constitution [13.2] have made much of the existing governance structures and legislation obsolete, creating a major opportunity for reform. Second, the injection of oil revenue has greatly boosted the financial resources of both the Government of National Unity (GONU) and the Government of Southern Sudan (GOSS), enabling such reform to be translated into concrete action.

This chapter provides an overview of the national structures, legislation and culture related to environmental management and awareness, with a focus on how to integrate or 'mainstream' environmental considerations into government and society in Sudan.

#### Assessment activities

Not only was the review of environmental governance in Sudan an integral part of UNEP's work in the country, but the assessment process itself was modelled to concurrently assist in the development of improved governance and a higher level of environmental awareness.

A detailed institutional assessment was conducted for the GONU, GOSS and selected state governments, including Khartoum, Red Sea, Gezira, Sennar, White Nile and Bahr el Jabal (Central Equatoria) [13.4]. This entailed a legal

and practical review of all current and relevant treaties and legislation (including the CPA, the DPA, and the GONU and GOSS Constitutions) and follow-up interviews with government officials in both executive bodies and in over twenty ministries at the three working levels – national, regional and state.

The role of civil society was also evaluated, through extensive interaction with NGOs and the tertiary education sector, as represented by the many academics involved in the assessment process.

### 13.2 Overview of environmental governance structures

#### A complex and evolving national context

The main feature of environmental governance in Sudan is that it has not been able to keep pace with the evolving national context, as driven by a series of major changes, such as the cessation of the north-south conflict, the associated peace agreement and Interim Constitutions, the development of the oil industry, the escalation of the Darfur crisis and the partial resolution of the Eastern Front conflict. Underlying these events have been the creeping processes of population growth, climate change and land degradation. The net result today is a governance structure and culture that no longer fit the country's current circumstances.

#### Conflict and peace, the CPA and the 2005 National and GOSS Interim Constitutions

The cessation of hostilities between north and south opened up the country to the rule of civilian law and radically altered its political structure.

The Interim Constitution of the Republic of Sudan adopted on 6 July 2005 reflects the Comprehensive Peace Agreement (CPA) of January 2005 and defines a new set of rules for governance in general, and for environmental governance in particular. The two main elements of this new policy context are a high level of decentralization of powers to the states, and the creation of a Government of Southern Sudan (GOSS).

## 13 ENVIRONMENTAL GOVERNANCE AND AWARENESS

Table 25. Powers and responsibilities set out in the 2005 Interim National Constitution relating directly or indirectly to environmental governance

<b>Schedule (A) National powers</b>	
Section	Title
15	National lands and national natural resources
19	Meteorology
23	Intellectual property rights, including patents and copyright
25	Signing of international treaties on behalf of the Republic of Sudan
27	National census, national surveys and national statistics
29	International and interstate transport, including roads, airports, waterways, harbours and railways
30	National public utilities
33	Nile Water Commission, the management of Nile waters, transboundary waters and disputes arising from the management of interstate waters between northern states and any dispute between northern and southern states
<b>Schedule (B) Powers of the Government of Southern Sudan</b>	
2	Police, prisons and wildlife services
6	Planning for Southern Sudan government services including health, education, and welfare
9	The coordination of Southern Sudan services or the establishment of minimum Southern Sudan standards or the establishment of Southern Sudan uniform norms in respect of any matter or service referred to in Schedule C or Schedule D, read together with Schedule E, with the exception of Item 1 of Schedule C, including but not limited to, education, health, welfare, police (without prejudice to the national standards and regulations), prisons, state public services, such authority over civil and criminal laws and judicial institutions, lands, reformatories, personal law, intra-state business, commerce and trade, tourism, environment, agriculture, disaster intervention, fire and medical emergency services, commercial regulation, provision of electricity, water and waste management services, local government, control of animal diseases and veterinary services, consumer protection, and any other matters referred to in the above Schedules
10	Any power that a state or the National Government requests it to exercise on its behalf, subject to the agreement of the Government of Southern Sudan or that for reasons of efficiency the Government of Southern Sudan itself requests to exercise in Southern Sudan and that other level agrees
14	Public utilities of the Government of Southern Sudan
19	Any matter relating to an item referred to in schedule D that cannot be dealt with effectively by a single state and requires Government of Southern Sudan legislation or intervention including, but not limited to the following: (1) natural resources and forestry (2) town and rural planning (3) disputes arising from the management of interstate waters within Southern Sudan
<b>Schedule (C) Powers of states: regarding environmental governance, most powers – executive and legislative – are at state level</b>	
8	State land and state natural resources
13	The management, lease and utilization of lands belonging to the state
17	Local works and undertakings
21	The development, conservation and management of state natural resources and state forestry resources
23	Laws in relation to agriculture within the state
27	Pollution control
28	State statistics, and state surveys
31	Quarrying regulations
32	Town and rural planning
36	State irrigation and embankments
40	State public utilities
<b>Schedule (D) Concurrent powers: The National Government, the Government of Southern Sudan and state governments shall have legislative and executive competencies on any of the matters listed below</b>	
1	Economic and social development in Southern Sudan
3	Tertiary education, education policy and scientific research
4	Health policy
5	Urban development, planning and housing
6	Trade, commerce, industry and industrial development
7	Delivery of public services
12	River transport
13	Disaster preparedness, management and relief, and epidemics control
15	Electricity generation, and water and waste management
17	Environmental management, conservation and protection
19	Without prejudice to the national regulation, and in the case of southern states, the regulation of the Government of Southern Sudan, the initiation, negotiation and conclusion of international and regional agreements on culture, sports, trade, investment, credit, loans, grants and technical assistance with foreign governments and foreign non-governmental organizations
23	Pastures, veterinary services, and animal and livestock disease control
24	Consumer safety and protection
25	Residual powers, subject to schedule E
27	Water resources other than interstate waters
31	Human and animal drug quality control
32	Regulation of land tenure, usage and exercise of rights in land.
<b>Schedule (F) Resolution of conflicts in respect of concurrent powers: If there is a contradiction between the provisions of Southern Sudan law and/or a state law and/or a national law, on the matters referred in Schedule D, the law of the level of government which shall prevail shall be that which most effectively deals with the subject matter of the law, having regard to:</b>	
1	The need to recognize the sovereignty of the nation while accommodating the autonomy of Southern Sudan or of the states
2	Whether there is a need for national or Southern Sudan norms and standards
3	The principle of subsidiarity
4	The need to promote the welfare of the people and to protect each person's human rights and fundamental freedoms





*The Ministry of Environment and Physical Development, in Khartoum*

The need to preserve a measure of equality between states while awarding a high level of autonomy to Southern Sudan was addressed by granting all states a high level of autonomy, and creating a specific regional level of government – the GOSS – in the south. This model, characterized by a somewhat asymmetrical (between north and south) but overall decentralized system of governance, was adopted by the Interim Constitution.

UNEP has analysed the impact and new legal status quo of the 2005 Interim National Constitution; Table 25 on the previous page sets out its interpretation of national, regional, state and concurrent powers related to environment.

In terms of environmental governance, the impact of these changes is evident in the south, but not yet in the north and east.

In December 2005, the GOSS adopted its own regional Constitution, which echoes the key terms of the Interim National Constitution and adds detail, including substantial text on natural resource management [13.3]. On the Eastern Front, the peace process is still in its early stages, so the implications for environment and natural resource management are not clear at this stage. Finally, the Darfur Peace

Agreement (DPA) does not include significant detail on the environment and, as of June 2007, is not being implemented due to ongoing conflict.

### **GONU federal structure**

The structure of environmental governance in the GONU is characterized by a multiplicity of small units linked to environment but not closely linked to each other. The key units are the Ministry of Environment and Physical Development (MEPD), the Higher Council for Environment and Natural Resources (HCENR), a number of state-level councils and other bodies, and departments or units in line ministries such as the Ministry of Agriculture and Forestry.

The Ministry of Environment and Physical Development was created in 2003. The MEPD's mandate, which covers surveying, construction, urban planning and now environment, is derived from the Environmental Framework Act of 2001. However, no actual environmental mandate for the MEPD is specified in the legislation, as the legislation pre-dates the establishment of an environment portfolio within the ministry. The MEPD's Department of Environmental Affairs (DEA) only has approximately ten staff members.

## 13 ENVIRONMENTAL GOVERNANCE AND AWARENESS

The Higher Council for Environment and Natural Resources was established by the 2001 Environmental Framework Act. Its mandate focuses on policy coordination for all sectors that have a role in the protection of the environment or use of natural resources, but no role in implementation. It was conceived as a ministerial-level forum supported by a secretariat. The Minister of Environment serves as the chairman of the HCENR. As of late 2006, however, the actual Higher Council has never been formally convened. All of its activities have been carried out by the secretariat, managed by the Secretary-General.

A key function of the HCENR to date has been that of focal point for international liaison and agreements. So far, virtually all of the international conventions, multilateral environmental agreements (MEAs) and Global Environment Facility (GEF) projects have been managed by this body. The HCENR employs 50 to 60 staff, of which approximately 20 are career civil servants. The rest are funded on short-term

contracts connected to MEA or GEF projects [13.4].

Several other ministries have important environment-related portfolios. In some ministries, this translates into dedicated departments; in others, environmental issues are in theory integrated into normal business.

The Ministry of Tourism and Wildlife (MTW) manages all wildlife issues in the northern and central states, and also plays an important role in the management of marine protected areas. In the Ministry of Agriculture and Forestry (MAF), the Forests National Corporation (FNC) comprises a great deal of practical expertise in forest management and conservation. The Ministry of Irrigation and Water Resources (MIWR) has a functioning environmental unit, though major realignment is now underway following the attachment of the Dams Implementation Unit to the President's Office. Finally, a unit within the Ministry of Industry (MoI) undertakes and partly evaluates the environmental impact assessments provided by projects [13.4].



*The Ministry of Environment, Wildlife Conservation and Tourism, in Juba*



## GOSS regional structure

The design of the Government of Southern Sudan, which was created in the wake of the CPA, is nearly complete. Key posts have been established and awarded, but the development of the civil service is still in the early stages.

Within the GOSS ministerial structure, coordination and leadership on environment and wildlife issues are the mandate of the Ministry of Environment, Wildlife Conservation and Tourism (MEWCT). The MEWCT has over 600 allocated staff positions at the regional and state level, and over 7,300 allocated positions for the wildlife forces (see Chapter 11). The MEWCT had a budget of USD 4 million in 2006, excluding most of the costs of the wildlife personnel. Almost all of the MEWCT staff is newly appointed and relatively inexperienced in civil servant tasks. The exception is the wildlife sector, where the GOSS has inherited some of the expertise developed by the SPLM during the conflict period [13.10].

As is the case for GONU, several other GOSS line ministries have environmental responsibilities, including the Ministry of Agriculture and Forestry (MAF), the Ministry of Animal Resources and Fisheries (MARF), the Ministry of Water Resources and Irrigation (MWRI), and the Ministry of Industry and Mining (MIM).

## State government structures

While the Interim National Constitution allocates fairly uniform responsibilities to all states, the environmental governance situation, in practice, varies greatly between the north, south and Darfur.

The Environmental Framework Act provides a mandate for state-level environmental administration and legislation, which was reinforced by the Interim Constitution in 2005. Several northern states (Red Sea, Gezira, Sennar, White Nile, Gedaref, Nile and Khartoum) have established environmental administrations that range from individual part-time efforts to well organized councils on environment involving several line ministries at the state level. Red Sea state is the most advanced in this respect, as it has both a coordinating council and a new Marine Environmental Protection Authority.

Interviews with these state-level units revealed that there was no universal model and that their origins were state-based, resulting from individual initiatives, personal political support, or decrees from governors or state ministerial decisions [13.4].

In contrast, state governments in the south have virtually no environmental administrations or capacity whatsoever. Similar to the GOSS in general, southern state governments are currently still growing. In principal, however, environmental issues enjoy a high level of support from the interviewed governors.

The three Darfur states are essentially in the same position as the southern states in terms of institutional capacity for environmental issues, but have even less capacity to act due to the conflict. The level of political support was not established in this assessment.

## 13.3 Overview of environmental and natural resource legislation

### Environmental aspects of the 2005 Interim National Constitution

At the level of general principles, environmental protection is a national objective, which is not subject to interpretation by other levels of government.

In Chapter 2 of the Constitution, Article 11 states that for the State of Sudan as a whole, the conservation of the environment, and of biodiversity in particular, should be pursued, and that the State should ensure a sustainable utilization of natural resources, including by prohibiting actions that would adversely affect the existence of specific species. Article 17 reaffirms that it is the responsibility of Sudan as a whole to fulfil its international obligations. Chapter 3 adds that it is the duty of every Sudanese citizen to preserve the natural environment [13.2].

The Interim Constitution radically changes the relative authority of the various actors and stakeholders in the field of environment by transferring significant powers from the national to the state level and, in the case of GOSS, to the regional government.

### The Environmental Framework Act of 2001

In 2001, the President of the Republic of Sudan signed an environmental framework law that is still in force today [13.4]. The Environmental Framework Act, referred to hereafter as the 'Act', has five chapters and twenty-nine articles:

- Chapter 1: Preliminary regulations;
- Chapter 2: the Higher Council for Environment and Natural Resources;
- Chapter 3: Policies and general trends for the protection of the environment, evaluation and environmental follow-up;
- Chapter 4: Violations, penalties and punishments; and
- Chapter 5: General rules, standards and methods of combating pollution.

Five general environmental objectives are stated in the Act, leaving it up to sector ministries to achieve these goals while performing their tasks or implementing their policies:

- the protection of the environment and its natural balance, and the conservation of its components and social and cultural elements, in order to achieve sustainable development for future generations;
- the sustainable use of resources;
- the integration of the link between environment and development;
- the empowerment of the authorities responsible for the protection of the environment; and
- the activation of the role of the concerned authorities and prevention of relaxation or disposal of duties.

Generally speaking, the law is more detailed for the protection of natural resources than for pollution control and regimes. According to Article 18, environmental impact assessments are required for projects likely to have a negative impact on the environment.

The MEPD has been asked to review and redraft the 2001 Act and all legislation to reflect the new legislative mandates of the MEPD and the

HCENR under the 2005 Interim Constitution. This process will be far-reaching, not only because it will need to clarify the division of labour between MEPD and HCENR, but also because the Interim Constitution deeply affects the geographical division of powers, as indicated above.

### GONU sector legislation

The GONU has a large body of sectoral legislation with linkages to environmental governance, which virtually all predates the CPA and 2005 National Constitution. Key acts and associated line ministries include:

- Ministry of Tourism and Wildlife: the Wildlife Conservation and National Parks Act (1986);
- Ministry of Agriculture and Forestry: the Forests Act (1989);
- Ministry of Agriculture and Forestry: the Pesticides Act (1994);
- Ministry of Animal Resources: the Freshwater Fisheries Act (1954) and the Marine Fisheries Act (1937);
- Ministry of Irrigation and Water Resources: the Water Resources Act (1995);
- Ministry of Health: the Environmental Health Act (1975) (water and air pollution); and
- Ministry of Industry: the Petroleum Wealth Act (1998).

Another area of governance with strong links to environmental governance is land tenure. This topic is not covered by any single line ministry, but important legislation includes the Unregistered Lands Act (1970) and the Civil Transactions Act (1984). The implications of deficiencies in land tenure are covered in Chapter 8.

### GOSS legislation

As of early 2007, the process of legislation development within GOSS is still in its early stages. The legal basis for environmental governance is therefore effectively absent in Southern Sudan at this time.

In the interim period, the GOSS judiciary and ministries have taken the approach of using directives from the GOSS President, governors and



ministers as temporary control measures. Though there are numerous SPLM policy documents and directives from the time of the conflict, these are not automatically translated into GOSS legislation and so are not legally valid.

In theory, the potential exists for the GOSS to use GONU legislation – including the Environmental Framework Act – as interim measures for governance of issues within the GOSS mandate, but this may be difficult to implement in practice.

### State legislation

Red Sea state is the only state in Sudan to have developed a state-level framework law, known as the State Environmental Law of 2005. Other northern states have formalized their individual approaches to environmental governance via governor or state minister decrees and directives, and through reference to the GONU Environmental Framework Act of 2001.

### International agreements

Sudan is a party to the following global and regional multilateral environmental agreements (MEAs):

- the Convention on Biological Diversity (CBD - 1992);
- the Cartagena Protocol on Biosafety (2000);
- the African-Eurasian Waterbird Agreement (AEWA - 1999);
- the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES - 1973);
- the African Convention on the Conservation of Nature and Natural Resources (Africa Convention - 2003);
- the Ramsar Convention on Wetlands (1971);
- the Convention Concerning the Protection of the World Cultural and Natural Heritage (UNESCO WHC - 1972)
- the United Nations Convention to Combat Desertification (UNCCD - 1994)

- the United Nations Framework Convention on Climate Change (UNFCCC - 1994);
- the Vienna Convention for the Protection of the Ozone Layer (1985) and the Montreal Protocol on Substances that Deplete the Ozone Layer (1987);
- the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989);
- the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement of Hazardous Wastes within Africa (1991);
- the Stockholm Convention on Persistent Organic Pollutants (POPs - 2001);
- the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (1998);
- the United Nations Convention on the Law of the Seas (1982) and the Convention on the International Maritime Organization (1958); and
- the Regional Convention for the Conservation of the Environment of the Red Sea and the Gulf of Aden (PERSGA - 1982).

Funding supplied to Sudan in the period 2002 - 2006 to support the implementation of MEAs was approximately USD 5 million in total (see Chapter 14) [13.11, 13.12, 13.17, 13.18, 13.19, 13.20].

The 2001 Environment Act gives the HCENR the mandate to specify the channels assigned to implement the MEAs. In most cases, the HCENR has designated itself as the focal point. Many of the MEA support projects have a project coordinator hosted by the HCENR, and most activities are conducted at the federal level in Khartoum. Following the realignment of powers set out in the 2005 Interim Constitution, the national implementation mechanisms required by most MEAs will now fall largely under the responsibility of the states.

Aside from progress reporting, compliance with the agreements is variable, but overall at a low level.

### 13.4 Environmental education and civil society

#### Environmental education and awareness

Environmental education and awareness in Sudan are relatively limited, but gradually increasing.

Environmental science is a popular subject in the country's universities, and environmental studies programmes have multiplied over the years. Due to a lack of funding and equipment, as well as to a certain extent the lack of a culture of experimental science, environmental science is taught almost purely theoretically.

Environmental education at the primary and secondary school level is not institutionalized, but individual efforts at environmental curriculum development and outreach are taking place under the management of national NGOs [13.4].

#### National environmental NGOs

Building on a tradition of environmental societies dating back to the early 20<sup>th</sup> century, Sudan has several solid non-governmental organizations, within and outside Khartoum. Since the adoption of the Environmental Framework Act in 2001, NGOs have become important stakeholders in environmental affairs.

At present, the majority of NGO activities are focused on the northern states and the Red Sea. Environmental NGOs are present in Southern Sudan and Darfur as well, but are either very new or constrained by ongoing conflict.

Many of the activities funded by international partners have been implemented through NGOs such as the Sudanese Environment Conservation Society (SECS). Environmental NGOs were part of the technical team for this assessment, and completed a range of desk studies and field missions. They also played an active role in the Khartoum and Juba NPEM workshops in 2006 (see Section 13.8).



*The South Sudan National Environment Association, which was founded in Boma in 2006, is the first national environmental NGO to be established in Southern Sudan*

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*SECS has established several community-managed forests to provide firewood to the communities and act as shelter belts around villages and buffer zones against desert encroachment*

### **CS 13.1 The Sudanese Environment Conservation Society**

The Sudanese Environment Conservation Society (SECS) is a non-governmental and non-profit organization established in 1975 with a mandate to raise environmental awareness among different communities and advocate on issues related to environment. It is open for membership to all Sudanese who can serve its mandate, and has more than 120 branches all over the country.

The Society's activities are organized under three main programmes: Institutional Development and Capacity-Building, Environmental Rehabilitation and Environmental Education. It has established several working groups and networks throughout the country, including the Poverty Network, Desertification, Biodiversity, Environmental Law, Human Rights, Landmines, POPs, Climate Change, Women's groups, and others. SECS also hosts other programmes funded by the Nile Basin Initiative's micro-grants component, Nile Basin Discourse and the Darfur Joint Assessment Mission. Finally, SECS is a focal point in Sudan for IUCN, Bird International, UNDP, FAO, UNEP, and UN HABITAT.

At the grassroots level, SECS develops and implements practical and replicable environmental projects that contribute to the alleviation of poverty in rural and sub-urban areas. For example, the Society has established several community-managed forests, including a twenty-hectare forest in El Dein, Southern Darfur and a five-hectare forest in Sabnas, White Nile state. These community forests supply fuelwood, and can act as shelter belts around villages and buffer zones in areas afflicted by desert encroachment.

SECS has also supplied thirty schools in Khartoum state with natural water coolers, prompting other organizations to adopt the technology and supply universities, colleges, and prisons with the same. Moreover, to reduce the dependence on fuelwood and charcoal as the only source of energy for cooking, SECS has championed the introduction of Butane gas cookers and has distributed over 1,100 Butane gas cylinders in the villages of Gammoia (Khartoum state), Dinder (Blue Nile), El Rahad (Northern Kordofan), and Sabnas (White Nile) to date.

Over the years, the Society's activities have generated a vast amount of knowledge. Reports and other documents are available at the SECS library, which is open to students and researchers. Several academic institutions have also been established to address environmental issues and train researchers, such as the Institute of Environmental Studies at the University of Khartoum, the Faculty of Natural Resources at the University of Juba, and Environmental Studies at Ahliya University. SECS collaborates closely with these institutions by sharing information, as well as supporting and participating in their various activities.

### **Environmental data collection, management and dissemination**

As highlighted throughout this report, not only is there relatively little solid environmental data available on Sudan (at both the national and international levels), but much of the existing data is obsolete.

The UNEP assessment found no institutionalized system of environmental data management or organized process for the dissemination of data to the public. Collection is limited to isolated work by individual ministries and academics. Most of the available data is linked to forestry, agriculture and health, and there is only limited information on water resources, industry, wildlife, climate and environmental governance. What does exist is generally not easily accessible to the public due to cost issues. Confidentiality constraints are not considered to be a major concern, except for isolated controversial projects and areas.

### **13.5 Overview of environmental governance and awareness issues**

UNEP has compiled a comprehensive list of issues affecting environmental governance and awareness in Sudan. The list below focuses on central issues and opportunities only; sectoral issues are covered in Chapters 6 to 12, and governance issues relating to international aid are discussed in Chapter 14. Note that many subjects are cross-cutting and overlapping:

#### **Social, development and investment issues:**

- priorities in a post-conflict country;
- large-scale development mindset;
- lack of enforcement;
- limited governance capacity; and
- scarcity of environmental data.

#### **Structural and legislative deficiencies:**

- the CPA and Interim Constitution;
- GONU structure including international agreements;

- GONU legislation;
- GOSS structure;
- GOSS legislation;
- GONU and GOSS line ministries; and
- states.

#### **Environmental governance and peacebuilding:**

- the need and topics for north-south dialogue; and
- the NPEM process.

### **13.6 Social, development and investment issues**

#### **Priorities in a post-conflict country**

The length and continuity of regional conflicts in Sudan put the country on a war footing for almost fifty years, with obvious impacts on its economy and governance culture. The destabilizing effects of conflict aside, Sudan remains a very poor country with an extremely limited tax base (though this is now starting to change due to oil revenue).

As a result of this uniquely unfortunate history, environmental conservation and sustainable development have not been financial or political priorities for the Government of Sudan. This is reflected in the annual budgets for all areas of environmental governance and natural resource management, which have never been adequately funded.

The promising exception to this situation is the allocation of USD 4 million by GOSS to the Ministry of Environment, Wildlife Conservation and Tourism in the 2006 budget. This scale of funding sets a very positive precedent, which must be encouraged.

#### **Large-scale development mindset**

In Sudan, the government has historically tended to rely upon a limited number of very large-scale investment projects or programmes to boost development. For some time, this tendency was exacerbated by investment and aid policies from the international community, which favoured large-scale infrastructure and agricultural development.



UNEP teams covered many of these large development projects in the course of their assessment, including large dams and the Jonglei canal (see Chapter 10), oil production (see Chapter 7), and the Gezira and New Halfa irrigation schemes, numerous sugar plantations and major rain-fed agricultural schemes in central Sudan (see Chapter 8).

These different programmes were found to have a number of negative features in common with respect to the environment: they were all conceived and supported at the highest political level; they often proceeded to the construction phase relatively quickly and without comprehensive analysis of economic, social and environmental sustainability; and they caused extensive and often unexpected environmental damage. The Jonglei canal is the best known example of the high risks and costs of this type of approach for project developers, local populations and the environment (see Case Study 10.2).

While environmental impact assessment documents were produced for the more recent projects, they were never publicly released or integrated into the planning and design process, and therefore had a negligible effect in terms of impact mitigation or community acceptance.

Significant improvements in environmental governance and sustainable development will not be possible without tackling the core issue of this effective immunity of major project developers from environmental considerations.

A more appropriate model for environmentally sensitive projects can be drawn from best international practice. Typically, the project development process includes a paced sequence of environmental, social and economic impact assessments and public consultations – before the project starts. This process can help both community acceptance and environmental sustainability.



*A UNEP training course on environmental information management was held for Sudanese government and NGO staff in Nairobi in late 2006. A significant investment in data collection, management and dissemination should be an early part of any programme to improve environmental governance in the country*

### Limited governance capacity

Environmental governance authorities in both GONU and GOSS have insufficient capacity to adequately implement existing mandates. For GONU, this is principally due to under-investment in the sector, while GOSS is completely new and therefore still weak.

The UNEP assessment found the human resource capacity to be high in many instances, with experienced and competent personnel throughout government ministries and the civil service. Just as importantly, the tertiary education system produces significant numbers of graduates in environmental subjects. The overriding constraint on the civil service's capacity is insufficient funding, which translates into deficiencies in knowledge, staff numbers, equipment, accommodation and operating expenses.

UNEP considers that given sufficient time and funding, building capacity in the Sudanese civil service to help achieve improved environmental governance is entirely possible and relatively straightforward. For such work to be sustainable, however, it would need to have significant counterpart funding from the GONU and GOSS, and avoid 100 percent international aid funding (see Chapter 14).

### Lack of enforcement

Existing GONU laws have deficiencies (see next section), but are nonetheless perfectly usable for a wide range of applications, from EIA provisions to wildlife poaching to pollution control. Unfortunately, enforcement of the existing environmental legislation is extremely limited at all levels. The development of capable institutions – even if backed by improved legislation – will not result in any real improvement unless the culture of non-enforcement is addressed concurrently, starting at the highest level.

### Scarcity of environmental data

The pervasive scarcity of solid quantitative data on all aspects of the environment of Sudan constrains rational planning for resource management and conservation. Besides, the absence of strong and credible signals that real problems exist – which can only be provided by up to date data – makes it

difficult to even raise awareness at the government level. A significant investment in data collection, management and dissemination should therefore be an early part of any programme to improve environmental governance in Sudan.

## 13.7 Structure and legislative issues

### Legislative complexity and overlap

The Comprehensive Peace Agreement is a landmark achievement that has brought peace to most of Sudan. The resulting governance situation, however, is highly complex. This is particularly apparent in the environmental governance and natural resource management elements of the 2005 Interim National Constitution: as shown in Table 25, there is a great deal of overlap and potential for confusion. The Schedule (F) Resolution of Conflicts in Respect of Concurrent Powers appears sensible in principle, but is expected to be very slow and complicated in practice in the event of a dispute.

### GONU core structure (including international agreements)

The current GONU structure for environmental governance is problematic and considered to be a major obstacle for reform, irrespective of potential funding and legislative improvements.

At present, the various arms of government with an environmental mandate are poorly connected or not connected at all, and have duplicate mandates and insufficient resources, leading to unproductive competition and conflict. Given that the principal coordinating body, the Higher Council for Environment and Natural Resources has never actually met, high-level leadership is lacking.

The international community's environmental sector has played a role in this situation, and may have inadvertently worsened it (see Chapter 14). Indeed, the MEA and GEF funding processes have helped perpetuate an ad hoc fundraising and externally driven project-based mindset within GONU, which in turn has significantly hindered the capacity-building and reform of the responsible organizations, such as the Ministry of Environment and Physical Development.



UNEP considers substantive reform of the GONU environmental governance structure to be a pre-requisite for lasting improvement in this sector. The scope of the reform should address the following subject areas:

- the structures and interfaces of the MEPD, the HCENR secretariat and the HCENR;
- the development of coherent units within MEPD to focus on a range of coordination and policy topics including:
  - multilateral environmental agreements;
  - economic sector-specific environmental governance (for the oil industry, for example);
  - outreach and assistance to the regional and state levels; and
- the development of an Environmental Protection Authority or similar body to implement and enforce legislation.

The international convention secretariats will also need to cooperate in this process and ensure that best use is made of available resources to implement the conventions.

### **GONU legislation**

GONU legislation in the field of environment and natural resource management has many deficiencies: it is obsolete, incomplete and unclear in parts, and as a result, difficult to enforce.

GONU officials are already aware of the deficiencies in the existing legislation and are starting to work on a revision of the Environmental Framework Act of 2001. This work needs to be strongly supported and followed through with a substantive programme of legislative development that tackles underlying details, such as the provision of statutory guidance and integration into different economic sectors, like industry and agriculture.

### **GOSS core structure**

The GOSS core structure for environmental governance is considered to be appropriate and well designed at the ministerial level. Three major issues, however, need to be resolved in order to progress further in organizational development and capacity-building:

- organizing the large number of wildlife forces (7,300) and maintaining a balance in the ministry between the three directorates of environment, wildlife and tourism;
- determining the role of the ministry in practical issues such as the implementation of practical policies and the enforcement of environmental legislation; if appropriate, a semi-autonomous Environmental Protection Authority or similar unit may need to be developed; and
- determining the relationship between GOSS and southern states on environmental governance, in order to progress associated capacity-building and legislative development.

### **GOSS legislation**

Given the GOSS's complete lack of environmental legislation, it is clear that a vast amount of development work is required. The principle issue of concern is timing, as the experience of other post-conflict countries has shown that this process can take several years to do well. Leaving Southern Sudan without any environmental controls during the post-conflict period is considered to be an unacceptable risk for its environment. Accordingly, some interim measures and risk-based prioritization are recommended:

- Develop an interim set of working guidelines on priority topics and issue them as a directive from the Ministry;
- Focus first on structuring framework legislation to allow work on underlying legislation to start; and
- Work concurrently on finalizing the framework legislation and the priority sector legislation.

The priority sectors are:

- environmental impact assessment and project development permitting;
- urban planning and environmental health, including waste management; and
- oil industry environmental legislation (in cooperation with GONU).

### GONU and GOSS line ministries

Environmental authorities in both GONU and GOSS face the challenge of mainstreaming environmental considerations into other line ministries. This will require focused programmes to increase inter-ministerial coordination, and the development of new (or improvement of existing) sector-specific environmental legislation. It should be noted that some line ministries have strong units and/or experienced personnel working on environmental issues, while others have neither staff nor resources. Solutions will therefore need to be tailored to each ministry.

### States

As a result of the 2005 Interim National and GOSS Constitutions, all of Sudan's twenty-five states now have a legal mandate for natural resource management that reaches well beyond their current capacity. They are in need of general assistance, particularly in the areas of operating expenses, human resources capacity-building and the development of state-level legislation.

In order to avoid a high level of variation between states and the unnecessary duplication of effort, GONU and GOSS federal-level bodies should provide a coordinated programme of assistance, in the form of a development 'package' that could be rapidly rolled out to all states.

## 13.8 Environmental governance and peacebuilding

### The NPEM process

The government-led process of developing a National Plan for Environmental Management (NPEM) constitutes a good example of proactive work to improve environmental governance and practical cooperation between north and south on substantive governance issues. The process commenced in late 2005 and the first working draft was released in early 2007 [13.5]. The underlying objective or final product of the NPEM is envisaged to be an environmental action plan or series of plans that set out the priorities for Sudan in terms of corrective action and targeted investment in environmental issues.

Given that the NPEM objectives are close to those of the UNEP assessment process, they have effectively been combined. One clear difference between the two processes, however, is the form and ownership of the final documentation: UNEP is responsible for this report, while the national plans must by default be owned by the government.

If it is successfully concluded, the most likely final documentation of the NPEM will be a national-level plan presented to the GONU parliament in 2007 and a matching regional document presented to the GOSS parliament in 2007 or 2008. It is anticipated that both this process and the guidance included in the final documents will significantly assist the development of environmental governance in Sudan.

The process has also provided a platform for open and detailed dialogue between technical professionals, civil servants and politicians from northern and southern states. Two key events were held in July 2006 in Khartoum and November 2006 in Juba, respectively. Over forty papers covering environmental issues from all parts of the country were presented and discussed at these workshops, which were attended by over 300 people.

The principal added value of the NPEM model is that it is less formal and therefore less politically charged than the CPA-instigated commissions, but that it nonetheless provides an organized forum for debate on sensitive topics with the support of neutral international parties, such as UNEP and the Nile Basin Initiative.

### Expanding the NPEM model to other issues and regions

As discussed in Chapter 4 and elsewhere in the report, several environmental issues represent potential 'flashpoints' that could lead to renewed conflict:

- the environmental impacts of the development of the oil industry (Chapter 7);
- the southward migration of northern pastoralists due to land scarcity and degradation (Chapters 3 and 8);



- tree-felling for the charcoal industry in the north-south boundary zone (Chapter 9);
- new and planned dams and major water projects, including any revival of the Jonglei canal project (Chapter 10);
- ivory and bushmeat poaching (Chapter 11).

The NPEM style of technical dialogue could be extended to these topics to further assist the process of peacebuilding in Sudan.

## 13.9 Conclusions and recommendations

### Conclusion

The CPA, the Interim National Constitution and the Interim GOSS Constitution have significantly changed the framework for environmental governance in Sudan. Given that the GOSS and states now have extensive and explicit autonomy in this area, environmental governance has become more of a regional issue. This is reflected in the findings and recommendations.

At the national level, Sudan faces many challenges to meet its international obligations, as set out in the treaties and conventions it has signed over the last thirty years. An additional difficulty in this area is incorporating GOSS-related issues. A range of reforms and significant investment are clearly needed.

The overall technical skill and level of knowledge in the environmental sector are very high and some practical legislation is already in place. However, the regulatory authorities also have critical structural problems, and are under-resourced and ineffective. Further, enforcement is highly variable and there is a fundamental disconnect between the environmental sector, the highest levels of government and the other sectors and ministries responsible for the development of Sudan.

In the conflict- and instability-wracked regions of Darfur and the Three Areas, environmental governance is essentially absent, even though environmental issues are among the causes of the conflict.

In Southern Sudan, finally, environmental governance is in its infancy, but the early signs are positive. High-level political and cross-sector support is visible, and the new structures are considered to be relatively suited to the task. The environment ministry and other authorities presently have negligible capacity and hence require comprehensive capacity-building. Environmental policies, plans and regulations for all sectors need to be developed from first principles. Due to the combination of the lack of environmental governance and the post-conflict development boom, the environment of Southern Sudan is currently extremely vulnerable.

### Background to the recommendations

A key theme for the recommendations in this chapter is the need for local ownership and leadership on governance issues. International assistance is needed but must play a supporting role only, particularly with respect to funding. Accordingly, the central recommendation for both GONU and GOSS environmental authorities, and especially for the former, is to work to achieve sustained high-level and mainstreamed political support. This support should then be converted into adequate budgets, appropriate mandates, and assistance in the development, ratification and enforcement of robust legislation.

### Recommendations for the Government of National Unity

**R13.1 The MEPD should undertake an environmental awareness campaign targeted at GONU senior leadership, ministries and other civil service bodies.** This would entail use of materials generated by the NPEM, UNEP and MEPD, and a sustained programme of communication via presentations, bulletins and other tools.

CA: GROL; PB: MEPD; UNP: UNEP and UNDP; CE: 0.2M; DU: 1 year

**R13.2 The MEPD Minister should convene the first true HCENR meeting with minister-level attendance.** This would be an important and symbolic step towards integrating environmental issues into GONU and commencing the reform process.

CA: GROL; PB: MEPD; UNP: UNEP; CE: nil; DU: 3 months

**R13.3 Secure funding and mandates, and undertake a comprehensive reform of the GONU core environmental governance structure.** This will entail a wide range of activities, as set out in section 13.7, and could take up to two years to complete. The cost estimate covers only the reform process and not the subsequent operational costs of the new structure.

CA: GROL; PB: MEPD; UNP: UNEP and UNDP; CE: 1M; DU: 2 years

**R13.4 Undertake a comprehensive and staged legislation development programme.** This should start with a revision of the Framework Act, followed by the full suite of supporting statutory guidance, sector and state legislation.

CA: GROL; PB: MEPD; UNP: UNEP; CE: 1.5M; DU: 4 years

**R13.5 Develop a dedicated environmental data management centre.** This centre should focus on the collection, collation and public dissemination of scientifically sound environmental data to support all aspects of environmental governance.

CA: TA; PB: MEPD; UNP: UNEP; CE: 1M; DU: 2 years

**R13.6 Invest to sustain the operations of the reformed and upgraded environmental governance sector.** There is no substitute for sufficient and secured annual funding to allow the MEPD and other related bodies to fulfil their mandates.

CA: GI; PB: MEPD; UNP: UNEP; CE: 5M; DU: per annum minimum

### Recommendations for the Government of Southern Sudan

**R13.7 Develop interim strategies, plans and directives for environmental governance.**

Detailed long-term plans, policies and legislation cannot be rationally developed or implemented due to the current lack of information and governance capacity. Interim measures are clearly needed.

CA: GROL; PB: MEWCT; UNP: UNEP and USAID; CE: 0.3M; DU: 6 months

**R13.8 Develop and implement a practical action plan for environmental management in Juba with a range of partners.** Practical action programmes are urgently needed in Southern Sudan to demonstrate progress and the benefits of peace. Projects in Juba have added value over other Southern Sudanese cities, in that they are relatively easier to manage, have high visibility and can be used as part of the capacity-building programme.

CA: PA; PB: MEWCT; UNP: UNEP and others; CE: 3M; DU: 3 years

**R13.9 Implement a comprehensive capacity-building programme for the MEWCT and other GOSS ministries associated with environment and natural resource management.** Development of a skilled and well equipped workforce at the regional and state level is a major multi-year task.

CA: CB; PB: GOSS; UNP: UNEP and USAID; CE: 5M; DU: 3 years

**R13.10 Develop the full package of environmental legislation, regulations and implementation plans.** Once the basic capacity is in place, longer-term plans and solutions can be developed. This needs to be a multi-sector effort to ensure buy-in and enforceability.

CA: GROL; PB: GOSS; UNP: UNEP and USAID; CE: 1M; DU: 3 years



# International Aid and the Environment

*Food distribution at a transit  
camp for internally displaced  
persons, in Southern Sudan.  
The humanitarian aid  
programme in the country is the  
largest of its kind worldwide.*



UNHCR  
The UN Refugee Agency





## International aid and the environment

### 14.1 Introduction and assessment activities

#### Introduction

International aid represents approximately three percent of Sudan's economy, and the humanitarian aid programme in the country is the largest of its kind worldwide. Some 15 percent of the population are completely or largely dependent on international food aid for survival, and the number is rising due to the Darfur crisis.

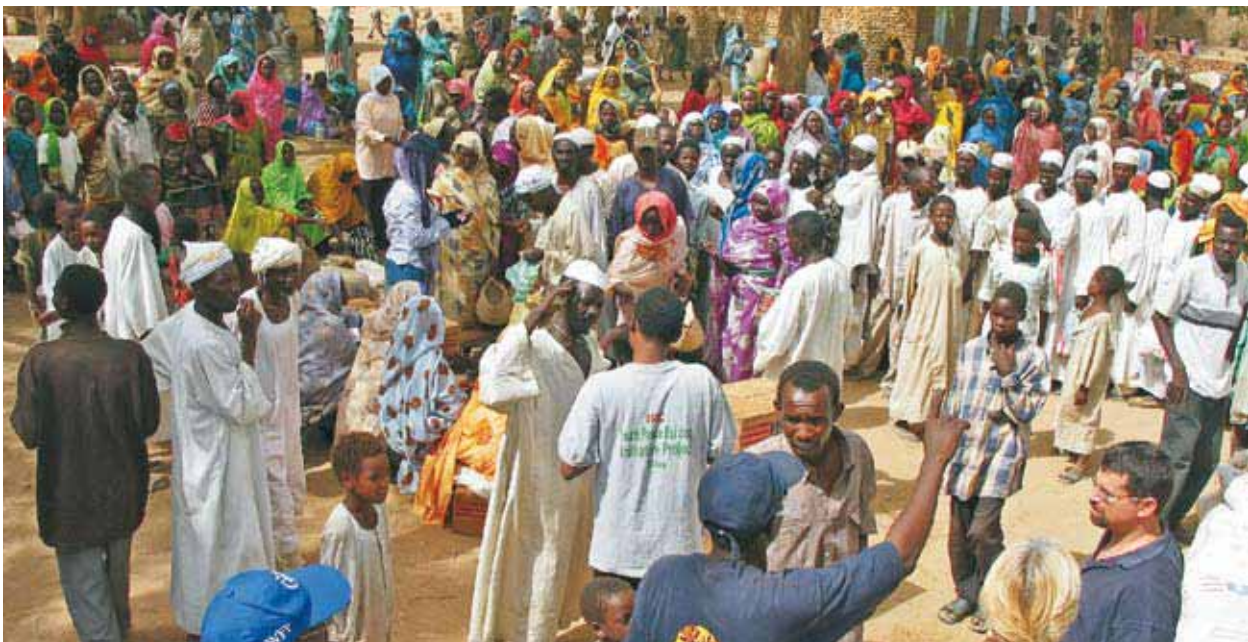
A core principle for the UN programme in Sudan and elsewhere is to 'do no harm' through the provision of aid. This applies to the environment as well. Indeed, humanitarian, recovery and development aid programmes that inadvertently create or exacerbate local environmental problems may, in the long run, do more harm than good to local communities aspiring to sustainable livelihoods. In this context, a review of the environmental impacts of the international aid programme in Sudan was considered an appropriate component of the UNEP post-conflict assessment.

Furthermore Sudan, like many developing countries, receives international aid from a variety of sources for a number of environmental issues as diverse as biodiversity conservation, climate change adaptation, control of redundant pesticides and transboundary water resources management. In view of UNEP's planned follow-up capacity-building activities in Sudan, an evaluation of the impact of such programmes was also deemed necessary.

#### Assessment activities

The assessment of the impact of international aid was included in the overall scope of activities carried out by UNEP in Sudan. A significant amount of background information was available on humanitarian, recovery, development, and environmental aid: the UN and Partners Work Plan for 2006 [14.1] provided a detailed basis for a desk-based analysis, and substantial project documentation (including progress and closure reports) was available for virtually all of the environment-specific aid programmes identified, such as those funded by the Global Environment Facility (GEF).

UNEP assessment teams visited dozens of aid projects as they travelled through Sudan, gaining a first-hand impression of impacts in the field. The projects and programmes viewed include:



*The influx of large numbers of displaced persons and the associated humanitarian aid has created a 'relief economy' in some Darfuri towns, which is in turn driving environmental degradation*

- food aid programmes managed by WFP, contractors and partners in several states;
- UN agency and government-managed internally displaced persons camps in Darfur;
- the WFP-managed Southern Sudan roads and Bor dyke projects;
- FAO agricultural projects in Southern Kordofan;
- UN and other agency compound- and facility-building programmes in Southern Sudan;
- return and support programmes managed by WFP, FAO, UNHCR and IOM in Jonglei state;
- EC-sponsored Oxfam agricultural projects in the Tokar delta, in Red Sea state;
- the Dinder National Park GEF project;
- the USAID STEP project training facilities in Southern Sudan;
- the Port Sudan GEF project for the Marine Environmental Protection Authority; and
- the Nile Basin Initiative project offices and sites.

### **UN Sudan environmental impact grading and integration assessment**

The environmental impact of UN aid and peacekeeping programmes is rarely studied, due to the understandable priority of providing urgently needed vital services and commodities such as security, food, drinking water and shelter. In Sudan, however, the humanitarian programme has now been managing a series of crises for over twenty years. The UN and partners spend over USD 2 billion per year in the country (including peacekeeping costs [14.2]) and work in a number of environmentally degraded regions like Northern Darfur, Southern Kordofan and Kassala. UNEP therefore considers that an assessment of the environmental impacts of the UN Sudan programme is warranted.

The international aid community in Sudan operates at least partly outside the national regulatory framework. For environmental issues, such as the potential impact of the programmes it manages, the aid community is effectively fully self-governed. There is no single mandatory or even agreed environmental standard or code of conduct guiding the UN agencies and their partners operating in Sudan and or other post-conflict countries.

To date, the most relevant document is the SPHERE Project Humanitarian Charter and Minimum Standards in Disaster Response [14.3], which includes some guidance notes and limited standards on the environmental impact of specific activities. Several agencies also have internal guidelines, which are generally voluntary and applied at the discretion of the agency country director (or head of mission for peacekeepers).

In the absence of an agreed and appropriate existing standard, UNEP adopted a three-part system for this assessment:

1. Assessing the potential negative environmental impacts of projects using the established UNEP/World Bank 'ABC' project screening system;
2. Searching for evidence of integration of environmental issues into project design and implementation by qualitative review; and
3. Searching for potential positive environmental impacts of projects by qualitative review.

The UNEP/World Bank 'ABC' system for screening the environmental impact of projects is a qualitative process that gives a preliminary rating to projects based on project size, type, and location [14.4]:

- Category A: likely to have significant adverse environmental impacts (on a national scale);
- Category B: likely to have adverse environmental impacts; and
- Category C: likely to have negligible or no environmental impact.





*The UN compound in Juba hosts a number of UN and other international agencies providing humanitarian and development assistance in Southern Sudan*

## 14.2 Overview of international aid in Sudan

### A major and long-standing aid programme

Foreign aid – which has played a crucial role in the country's development – has had a turbulent history in Sudan, with changes in the political regime and economic crises leading to corresponding modifications in donor country programmes.

Development aid commenced after independence and continues to this day. Sudan first obtained public sector loans for development from a wide variety of international agencies and individual governments. Major lenders included the World Bank (both the International Development Association and the International Finance Corporation), as well as the governments of the United States, China, the United Kingdom and Saudi Arabia. As Sudan defaulted on some of its debts in the late 1970s, however, many of these credit providers have now ceased development loans and provide direct grants or other forms of assistance instead.

Large-scale humanitarian aid, which now constitutes approximately 80 percent of direct international aid to Sudan, started in the 1980s. Operation Lifeline Sudan (OLS) was established in April 1989 as a consortium of two UN agencies, UNICEF and

the World Food Programme, as well as more than 35 non-governmental organizations [14.5]. It provided humanitarian assistance to central and south Sudan without a major break for 17 years, and continues today, in modified form. Current large-scale humanitarian assistance operations in Darfur began in 2003 and are ongoing, with over 2,000,000 beneficiaries [14.1].

### The aid programme for 2006

Total international aid to Sudan for 2006 was valued at over USD 2 billion, making Sudan the largest recipient of direct aid in Africa. Approximately USD 1.7 billion were received in the form of grants, commodities and services, and other direct assistance monitored by the UN. Other sources of aid, which are less easily quantifiable, included aid managed outside the UN system, aid from Arab states and China, and development loans from a range of international partners.

Given that Sudan's estimated gross domestic product for 2005 was USD 85.5 billion [14.6], international aid in 2006 represented 2 to 4 percent of the economy (depending on the method of measurement and multiplier effect). Table 26 shows the total humanitarian aid requested in the UN Work Plan of January 2006, broken down into twelve themes or sectors. Table 27 shows the same expenditure divided by state and region (with some projects labelled as national in scope).

Table 26. UN and Partners Sudan Work Plan 2006 Aid projections by sector

Sector	Value (USD)	Number of projects
Basic infrastructure and settlement development	118,138,319	16
Cross-sector support for return	67,287,999	20
Education and vocational training	198,331,275	50
Food aid	603,762,013	44
Food security and livelihood recovery	117,598,136	69
Governance and rule of law	12,706,000	62
Health	142,461,918	140
Mine action	54,819,670	44
NFIs, common services and coordination	157,257,653	28
Nutrition	51,832,047	42
Protection and human rights	72,414,506	80
Water and sanitation	134,954,916	66
<b>Grand total</b>	<b>1,731,564,452</b>	<b>661</b>

Table 27. UN and Partners Sudan Work Plan 2006 Aid projections by state and region

Region	Value (USD)
National programmes	144,652,806
Southern Sudan	650,859,700
Darfur	650,422,397
Abyei	23,433,461
Blue Nile	41,122,373
Southern Kordofan	90,017,289
Eastern Sudan	70,042,272
Khartoum and other northern states	61,014,154
<b>Grand total</b>	<b>1,731,564,452</b>

In practice, expenditure is further broken down into two major categories: humanitarian (USD 1.519 billion or 88 percent), and recovery and development (USD 211 million or 12 percent).

The strong emphasis on humanitarian projects shows that the majority of international aid to Sudan is currently aimed at saving lives. In line with humanitarian needs, most of the aid goes to Darfur and Southern Sudan. Recovery and

development needs are secondary. Projects related to good governance – which is a core issue for environment – received USD 12 million or 0.7 percent of the total amount of aid for 2006.

### 14.3 Overview of environmental aid programmes in Sudan

#### Historical programmes related to the environment

Investment in the environment in Sudan began in the form of wildlife-related initiatives in the early 20<sup>th</sup> century. These were followed in the post-war period by a range of technical studies on soil, flora and fauna, some quite detailed in nature [14.7]. After independence, investment in environmentally beneficial projects continued but on an insignificant scale compared to the environmentally destructive agricultural development projects initiated at the same time. The most significant historical aid projects are probably the forestry and shelter belt projects implemented and managed by FAO from the 1970s to the 1990s, evidence of which UNEP sighted in the course of field reconnaissance in Khartoum state, White Nile state and Northern Kordofan.

#### Current structure

The current arrangements for the delivery of environmentally oriented aid programmes to Sudan are not structured or formally connected in any way, and are not comprehensively recorded in any management system. Based on the information available, UNEP has categorized environment-related projects and expenditure for 2006 in Table 28 on the following page.

It should be noted that while projects related to water and sanitation do have environmental aspects, they were not categorized as ‘environmental projects’ in this assessment. The criteria used by UNEP to identify specific ‘environmental projects’ were those provided by Part 1 of UN Millennium Development Goal no. 7: *integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources*. Only projects whose objectives correspond to those criteria were considered as ‘targeted environmental projects’. Note that Water and Sanitation is an entire sector of the UN Sudan Work Plan.



Table 28. Summary of environment-related aid activities in Sudan in 2006

Type of programme	Number of projects	2006 Sudan project cost (USD)
<b>Conventional aid programmes</b>		
Total of all UN country programmes – as recorded in the UN 2006 Work Plan (January 2006 version)	661	1,730 million
Targeted environmental projects within conventional humanitarian programmes	3	Approx. 0.30 million
Targeted environmental projects within conventional recovery and development programmes (both inside and outside the Work Plan)	2	Approx. 2.5 million
Conventional humanitarian, recovery and development programmes that have mainstreamed or seriously attempted to mainstream environmental issues into project design and implementation	3	Unknown
<b>Active environmental aid programmes – usually multi-year</b>		
Regional programmes with a major environmental component	7	Unknown – < 10 million
Assistance programmes for implementation of ratified multilateral environmental agreements and conventions (active in 2006)	3	Unknown – < 1 million
Total 2006 active environment-related or integrated projects	18	Unknown

### Targeted environmental projects within humanitarian programmes

Using the aforementioned criteria, the assessment identified only three projects in the humanitarian field in 2006 that were specifically targeted at environmental issues; UNEP is involved in two of these:

- the Tearfund Darfur environment study, which began in the third quarter of 2006 [14.8]; this assessment-based project is funded to a total of USD 200,000 by UNICEF, DFID, and UNHCR – UNEP has provided technical assistance;
- the International Red Cross flood preparedness and tree-planting project in IDP settlements in Khartoum; UNEP is funding this project for USD 60,000; and

- the forestation and provision of alternative energy resources (fuel-efficient stoves) project, funded to a total of USD 30,000 by the Fondation Suisse de Déminage (FSD).

### Targeted environmental projects within recovery and development programmes

The UNEP assessment found only two projects in the recovery and development field in 2006 that were specifically targeted at environmental issues:

- the UNEP post-conflict environmental assessment for Sudan, funded by Sweden and the United Kingdom; and
- the Sudan Transitional Environment Programme (STEP) funded by USAID for approximately USD 6 million over a period of three years (see Case Study 14.1) [14.9, 14.10].

### Mainstreaming environmental issues in conventional country programmes

There are no established criteria within the UN to determine whether an aid project has truly integrated or mainstreamed environmental issues into its design and implementation, or made a serious attempt to do so. Accordingly, the UNEP assessment was based on an ad hoc qualitative analysis using the following checklist of questions:

1. Has any form of environmental impact assessment, even very basic, been carried out?
  2. Has the project design been altered significantly on the basis of such an EIA?
  3. Have any proactive measures been taken to minimize environmental impacts?
  4. Have any opportunities for a positive environmental impact been proactively included in the project?
- the USAID-sponsored WFP and GTZ management of the construction-related impacts of the Southern Sudan roads programme [14.11] (see Case Study 14.2);
  - the USAID-sponsored construction of the Bor dyke [14.12];
  - a camp rehabilitation project managed by UNHCR and IUCN in Kassala state [14.13]; and
  - a town planning project sponsored by USAID in Southern Sudan [14.9].

UNEP screened over 650 country projects for Sudan in 2006 and found that only four could be considered by any reasonable measure to have truly mainstreamed environmental issues or made a serious attempt to do so. None of these were in the 2006 UN Work Plan:

#### CS 14.1 The USAID Sudan Transitional Environment Programme for Southern Sudan

The USAID Sudan Transitional Environment Programme (STEP), which is focused on stability and the prevention of conflict, was established in August 2005. It aims to address critical environmental issues that constitute potential sources of conflict in Southern Sudan.

The STEP team is currently working with the Directorate of Environmental Affairs in the GOSS Ministry of Environment, Wildlife Conservation and Tourism (MEWCT), to establish an inter-ministerial GOSS Environmental Consultative Group, whose mandate is to bring together representatives of key ministries to discuss and sanction the establishment and implementation of government-wide environmental policies, procedures and guidelines for impact monitoring in selected sectors (transportation and roads, water and sanitation, oil exploration and production, education and health).

To date, the STEP team has trained 120 GOSS officials in environmental impact assessment (EIA) procedures. These trained personnel are expected to conduct EIAs for all projects that are considered to have serious environmental consequences. STEP has also facilitated the establishment of the South Sudan National Environment Association (SSNEA), and contracted a short-term organizational establishment consultant from among the members of the organization to promote early activities within the membership.

In addition, STEP has organized study tours to sub-Saharan African countries for GOSS officials to be exposed to modern environmental and natural resources sustainable management practices.

The Programme's most significant undertaking, in collaboration with the World Food Programme and the GOSS Ministry of Transport and Roads, has been the successful completion of environmental impact assessments for the WFP road project (see Case Study 14.2) and the Bor dyke.





*Since late 2003, some 1,400 km of road have been rebuilt under the WFP project*

#### **CS 14.2 The Southern Sudan roads project**

The Southern Sudan roads project is an example of how the assessment and mitigation of environmental impacts can be built into aid projects, as well as an illustration of how aid-funded development projects can have a significant negative effect on the environment.

Two decades of civil war destroyed the region's road network and most other infrastructure, leaving it isolated and economically crippled. With the signing of the Comprehensive Peace Agreement and the return of peace, the need to connect isolated and remote areas to major towns was deemed a high priority by the Government of Southern Sudan, the United Nations and USAID.

To facilitate the return of internally displaced persons (IDPs) and the delivery of much-needed humanitarian aid to the remote regions of Southern Sudan, USAID contracted the World Food Programme (WFP) to rebuild and maintain the region's dilapidated road network.

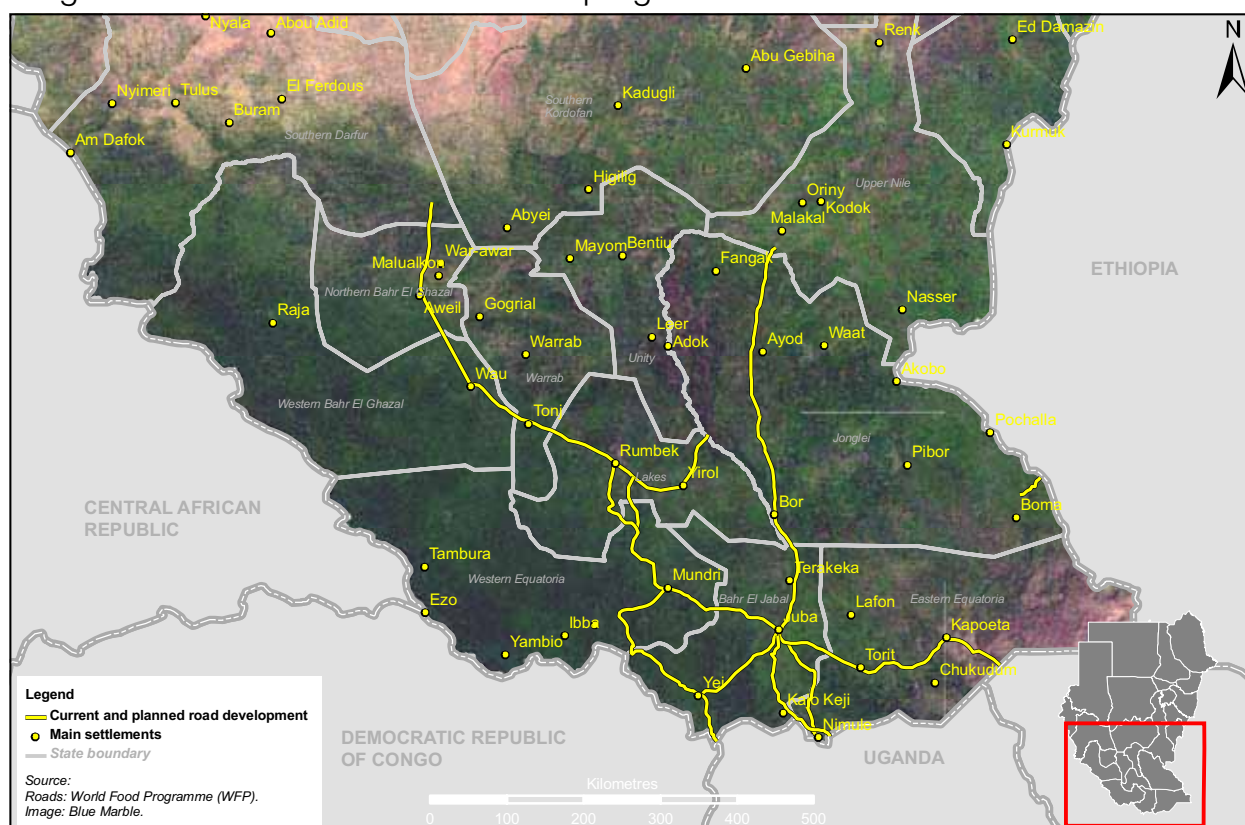
The WFP road project aims to rebuild more than 3,000 km of roads in the war-ravaged south, at a cost of USD 183 million. Pending sufficient funding, the entire region will eventually be opened up by improving road links between Kenya, Uganda and Sudan (see Figure 14.1). It will also connect the Nile River to key feeder roads. Once complete, it will be possible, for the first time in a generation, to travel by road from the southern borders of Sudan to Khartoum and onto Egypt. Since late 2003, WFP has rebuilt some 1,400 km of roads, repaired bridges and culverts, and in the process removed and destroyed some 200,000 pieces of unexploded ordnance in Southern Sudan. The project has linked major towns across the south and reopened trade routes with neighbouring countries.

The social and economic benefits of the work completed to date are undeniable: according to a recent WFP survey, the roads built so far have halved travel time to markets, schools and health centres. Bus services now operate on all major routes and the cost of public transport has decreased by 50 to 60 percent. The price of commodities has also fallen. Besides, the roads project employs 1,650 Sudanese nationals, including 250 working in de-mining.

The negative environmental impacts of the project, however, are also clear. According to the USAID-sponsored EIA, these include soil erosion, impacts on local hydrology, negative aspects of abandoned borrow pits, construction camp impacts, road dust, and most importantly, the indirect but real impact of opening up large regions of tropical forest and several protected areas.

UNEP can add one specific issue to this general list: the effect of traffic on wildlife, as seen on the Bor-Padak road in Jonglei state, which cuts directly across the annual migration route of several hundred thousand antelope (tiang and white-eared kob). The road is also likely to attract settlers and make large-scale hunting much easier. Appropriate mitigation measures are needed as a matter of urgency if this road is not to become the root cause of a decline in these wildlife populations.

Figure 14.1 Southern Sudan roads programme



The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

### Proposed and planned environmental programmes for Sudan

A number of projects related to the environment of Sudan have been proposed and are expected to start in 2007, subject to funding and other issues. These include:

- the Africa Parks Foundation-Cousteau Society project (Phase I) for protected area management and integrated coastal zone management (Red Sea state only);
- the Wildlife Conservation Society programme for Southern Sudan wildlife and protected area management;
- the expanded USAID Sudan Transitional Environment Programme (STEP) for Southern Sudan;
- the UNEP-UNICEF Darfur integrated water resource management project;
- the UNEP-UNDP Darfur aid and environment project;

- the UNEP-UNDP Darfur conflict and environment project; and
- the UN Habitat Darfur ‘woodless construction’ project.

### Regional environmental programmes

As set out in Table 29 on the following page, Sudan is a participant in numerous regional programmes that include an element of aid provision on environmental topics, in addition to opportunities for networking and cooperating with surrounding countries. Each programme focuses on the issues related to the management of a major shared natural resource or a shared problem. Note that the total value covers all countries involved in the programme (UNEP efforts to obtain clarity on Sudan’s share were unsuccessful due to time constraints).

The majority of the funding for these programmes comes via the Global Environment Facility, and each programme is managed entirely separately. Administration and funds are managed by UNDP Khartoum.





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*The international aid community in Sudan includes a wide range of actors, as illustrated by this water point established by a partnership of UN and development cooperation agencies and international NGOs*

Table 29. Regional aid-based programmes related to the environment [14.14]

Project title	Total value (million USD)
The Strategic Action Programme for the Red Sea and Gulf of Aden (PERSGA programme)	19,34
The Nile Basin Initiative, the environmental component of which is the Nile Transboundary Environmental Action Project	27,15
Formulation of an action programme for the integrated management of the shared Nubian aquifer	1
Demonstration of sustainable alternatives to DDT and strengthening of national vector control capabilities in the Middle East and North Africa	8,5
Mainstreaming conservation of migratory soaring birds into key productive sectors along the Rift Valley/Red Sea flyway	10,24
Elimination of persistent organic pollutants and adoption of integrated pest management for termites	3,5
Removal of barriers to the introduction of cleaner artisanal gold mining and extraction technologies	7,125
<b>Total</b>	<b>76,85</b>

Table 30. Global Environment Facility projects for Sudan [14.14]

Programme name	Convention	Cost (million USD)
National biodiversity strategies, action plan and the report to the CBD	Biodiversity	0.334
Conservation and management of habitats and species, and sustainable community use of biodiversity in Dinder National Park	Biodiversity	0.75
Clearing-house mechanism enabling activity	Biodiversity	0.014
Assessment of capacity-building needs and country-specific priorities in biodiversity management and conservation in Sudan	Biodiversity	0.102
Community-based rangeland rehabilitation for carbon sequestration	Climate change	1.5
Capacity-building to enable Sudan's response and communication to the UNFCCC	Climate change	0.29
Barrier removal to secure PV market penetration in semi-urban Sudan	Climate change	0.75
Expedited financing of climate change enabling activities (Phase II)	Climate change	0.1
National Adaptation Programme of Action (NAPA)	Climate change	0.2
National Capacity Self-Assessment (NCSA) for Global Environmental Management	Multi-focal areas	0.225
Initial assistance to Sudan to meet its obligations under the Stockholm Convention on Persistent Organic Pollutants (POPs)	Persistent organic pollutants (POPs)	0.5
<b>Total</b>		<b>4.765</b>

### Global programmes promoting compliance with international conventions

As detailed in Chapter 13, Sudan is a signatory to sixteen multilateral environmental agreements (MEAs). The majority of these MEAs provide aid to developing countries to assist them to work towards compliance with the terms of the agreement. This aid focuses on the years immediately following the signing, to support the signatories in understanding the obligations, collecting data, and planning a country-specific compliance programme. The best funded MEAs are the climate change (UNFCCC) and biodiversity (CBD) conventions, which are funded through the Global Environment Facility.

In the period 2002-2006, Sudan benefited from eleven GEF-funded projects to a total of USD 4.76 million, as detailed in Table 30 above.

Each programme is/was managed entirely separately. Administration and funds are/were managed by

UNDP Khartoum. As of end 2006, Sudan had not yet proposed any projects for GEF funding Tranche 4.

### 14.4 Overview of impacts and issues for aid and the environment

#### Unintended impacts and coordination issues

UNEP's assessment revealed a wide range of issues linked to unintended impacts of aid programmes, aid effectiveness and coordination. The key issues were considered to be:

- agricultural substitution by food aid;
- environmental impacts of humanitarian, and recovery and development country programmes;
- lack of issue integration into UN country programmes; and
- environment sector management and effectiveness.





*Food distribution in Um Shalaya IDP camp, Western Darfur. Over six million Sudanese depend on food aid provided by the international community*

### **Agricultural substitution by food aid**

The dominant but unintended impact of aid on the environment in Sudan is linked to the provision of food aid by the international community to over 6,000,000 destitute people, or approximately 15 percent of the population. Food aid has been supplied to the Sudanese on a large scale since 1989. Its provision has become almost institutionalized and routine, particularly in Southern Sudan and increasingly in Darfur.

Without international or national aid, and in the absence of import purchasing power, this food would have to be produced in Sudan, placing an additional burden on the rural environment, particularly in the northern half of the Sahel. In many of the poorer and arid parts of Sudan such as Northern Darfur, it is clear that this extra load would intensify the observed land degradation to potentially critical levels.

This finding raises the important issue of how the international community proposes to eventually cease large-scale provision of food aid to Sudan. Any exit strategy will need to consider the risk of increased land degradation in the most vulnerable areas, if only to reduce the likelihood of having to remobilize food aid to the same areas as a result of famine arising from desertification.

The option of shifting large return populations to lesser stressed areas in order to reduce food aid is also problematic in the long term, as the assessment has shown that no area in Sudan is immune from the population-linked problems of deforestation and land degradation. Moving people south to higher rainfall areas will not solve the underlying problem.

One potential approach would be to focus on assisting economic development in order to enable more of the population to shift from subsistence agriculture to alternative livelihoods, relying on household purchasing power for food security. Food would be purchased from the domestic market, taking a share of what is currently exported. Such an approach would also have a linked environmental payback.

### **Environmental impacts of humanitarian, and recovery and development country programmes**

Of the 661 projects screened, two projects were classified as Category A (likely to have significant adverse environmental impacts), one project as Category B (likely to have adverse environmental impacts), and 658 projects as Category C (likely to have negligible or no environmental impact).

The two Category A projects are the Southern Sudan roads rehabilitation programme (see Case Study 14.2) and the Bor flood control dyke project in Jonglei state by the Bor-Padak rural trunk road. Both of these major infrastructure initiatives have followed a form of EIA process, and are in this respect considered positive examples for the UN. However – as indicated in the EIA studies themselves [14.11, 14.12] – their negative environmental impacts are likely to be significant on a local scale. The negative environmental impacts of the Bor dyke project, in particular, have a direct link to livelihoods and food security.

While the proactive implementation of an EIA process by USAID is to be commended, the fact that this process was essentially self-managed by USAID and its contractors highlights an evident need for environmental governance at the national level and/or some form of environmental standard for international aid projects of this nature. At present, many bilateral agencies are more advanced than the UN in this respect, as they already have some form of environmental policy, standard and safeguard system in place.

The Category B project-related issue is linked to the operation of health clinics in Southern Sudan. The waste management situation in Southern Sudan is generally problematic, and there are currently no clinical waste management facilities in the region. Disposal options for clinical waste are thus far from optimal, although investments in waste management are underway as of early 2007.

The great majority of projects rated as Category C are considered to have negligible environmental impacts on the national scale, but adverse effects are expected at the local level for all projects, except for purely human resource projects such as training.

However, the cumulative impact of more than 650 projects is expected to be very significant. In this context, environmental best practice or proactive mitigation measures at the local level become more important.

### **Lack of issue integration into UN country programmes**

Not one of the 658 non-environmental projects listed in the 2006 UN Work Plan were judged by

UNEP to have fully integrated or ‘mainstreamed’ environmental issues, though one project had made a serious attempt to do so (the WFP and GTZ management of the construction-related impacts of the Southern Sudan roads programme, see Case Study 14.2).

This finding is surprising in its uniformity and indicates that the UN humanitarian, recovery and development teams in Sudan are clearly not taking environmental issues into account in project planning and implementation in the field, despite some awareness of the importance of environmental issues within the aid community.

UNEP looked for best practice in environmental management in aid projects through a process of project field inspections and desk study reviews, and found that individual examples of good practice stood out against a background of generally indifferent or poor environmental management. Waste management and use of construction materials contributing to deforestation were two key areas of concern.

### **Environment sector aid management and effectiveness**

A range of management issues significantly reduce the environmental aid sector’s effectiveness in Sudan. The key problems are fragmentation, lack of coordination, limited prioritization and lack of counterpart funding. These issues are perhaps not unique to Sudan or to the environment sector, but nonetheless need to be addressed if future aid is to be used to the country’s best advantage.

The total budget allocated to the environment in Sudan by the international aid community is almost impossible to evaluate accurately, as the sector is extremely fragmented. UNEP identified over twenty ongoing or proposed aid-funded environmental activities for Sudan, through a year-long process of enquiry and discovery; it is likely that a number of additional existing projects were not found.

Coordination is quite limited, and there is no central reporting system. Furthermore, there is no formal or regular forum in which the numerous actors in the environmental field can meet and exchange information – all such events to date



have been ad hoc. The MEA and GEF global structure contributes to this confusion, as it results in a number of separate teams and projects running in parallel, with no permanent country presence and multiple reporting lines.

In addition, there is no consistent country-driven prioritization process. Generally speaking, regional programmes appear to be reasonably well aligned with country needs, as they have long consultation and development processes that allow for more meaningful local input. In contrast, global MEA activities in Sudan are presently managed in a formulaic manner, by which a series of standard steps are taken in order to progress eligibility for subsequent funding. This is not conducive to the alignment of future projects with the priorities of the country.

This overall negative review is somewhat offset by the quality of the individual projects. While the UNEP assessment did not extend to a project audit level, the reconnaissance work indicated that individual projects were often very well designed and managed. Many projects had very accurately identified several of the key issues and developed appropriate solutions. Two good examples of this were the programme for Dinder National Park managed by UNDP and HCENR, and the rehabilitation of community rangelands project managed by UNDP. Both have now been completed.

A further defining feature of the environmental aid sector over the last decade has been the very limited extent of government counterpart funding. In many projects, the funding has been 100 percent international, with no financial contribution by the government. This has resulted in aid-generated structural problems and a lack of government ownership and continuity.

The Khartoum-based secretariat of the GONU Higher Council for Environment and Natural Resources was originally conceived as a coordinating body. Now however, most of its funding and activities are focused on the implementation of MEA and GEF-funded projects. As such, it has essentially become an organization sustained by international aid in the form of a series of often unrelated convention projects. Most of the HCENR staff work on a contract basis, and return to academia upon project completion. As a result, there has been negligible capacity-building in the core civil service from these projects.

The lack of government ownership in the environmental sector is also evident in the lack of counterpart funding. In many cases, projects have been shut down when international aid has ceased, and Sudan now has a series of needs assessments, capacity assessments, status reports and management plans that have progressed to final document stage and no further.

This lack of government counterpart funding for environmental issues was relatively understandable in the war economy that prevailed for over two decades. Now however, Sudan should start to contribute significantly to this sector.

## Analysis of the findings

In the 2006 Work Plan, environment was designated by the UN as one of four cross-cutting issues for special focus (the other three were HIV/AIDS, gender and capacity-building). UNEP was nominated as the UN focal point for environment, and this assessment is one of its initial activities in attempting to 'mainstream' or integrate environmental issues into the UN aid agenda in Sudan.

The assessment results are overall fairly negative, but not uniformly so, as a number of high quality projects and efforts were noted. Two core problems were identified. First, the impacts of good individual projects and efforts are greatly weakened by a lack of integration into the core government and international aid programmes. Second, the environment and natural resource management sector suffers from a lack of funding and funding continuity. Indeed, the five environment-specific programmes within the UN 2006 Work Plan had a combined budget of approximately USD 2.8 million, representing less than 0.2 percent of the UN country programme expenditure.

In order to direct corrective action, the underlying causes for these problems need to be understood. UNEP has identified the following five factors:

**1. Humanitarian focus.** Humanitarian responses are typically designed for fast mobilization in emergencies, which allows little time for integration of cross-cutting issues like the environment. Agencies engaged in humanitarian work have mandates and management procedures to focus



*The dyke by the Bor-Padak rural trunk road was dug to control flooding in the region, but is now a cause for concern as it is leading the land beyond it to dry out and is thus reducing grazing land for both livestock and wildlife*

on supply to beneficiaries without corresponding attention to management of the (natural) resources used for supply. This exacerbates the risk of environmental degradation.

Sudan is unusual in that the emergency has been ongoing for many years, but given that the humanitarian needs are not diminishing on an annual basis, the general approach has not changed. Long-term resident UN programmes are usually development-focused; in Sudan it is the opposite.

**2. Lack of a resident agency focal point for the environment.** The promotion of environmental issues is a subject at the margins of the mandates of many UN agencies, but only one agency – UNEP – has it as its core mandate. Historically, UNEP has not been present in the field on a residential basis. As a result, the topic of environment is in part orphaned and struggles to compete for attention and funding, given the plethora of other often very urgent issues facing the UN country team.

**3. Managerial separation of the global and regional environmental programmes from the UN country programme.** At present, the majority of the funding for environment in Sudan comes from the secretariats of the multilateral environmental conventions (MEAs) and the Global Environment Facility (GEF). A very small regional contribution comes directly from UNEP. None of these institutions currently have a residential presence in Sudan and are hence not answerable in any way to the UN country team (bar UNEP starting in 2006). UNDP is often tasked with administering convention and GEF projects, but does not have full discretion on allocation and management issues.

**4. Lack of quantification and measurable results.** In the general drive for aid effectiveness, it is important that needs and aid programme outputs be measured. This is very well established for the humanitarian sector (food tonnage delivered, number of wells installed etc.). In contrast, work in the environmental sector in Sudan has been largely



qualitative. Needs and outputs have not always been clearly defined and stated in the context of the overall goals of the UN response. This tends to work against attracting and retaining aid investment.

**5. Lack of high-level government buy-in.** The lack of significant and high-level pressure on the UN from GONU regarding environmental issues indicates that the government has not been convinced of the scale and importance of the needs in this sector either.

## 14.5 Conclusions and recommendations

### Conclusion

The assessment of the international aid programme in Sudan has raised a number of issues that need to be resolved to avoid inadvertently doing harm through the provision of aid, and to improve the effectiveness of aid expenditure in the environmental sector.

The dominant impact of aid on the environment in Sudan is the provision of food aid to some 15 percent of the population. Sudan is essentially now caught in a vicious circle of food aid dependence and environmental degradation: if food aid were reduced to encourage a return to agriculture, the result under current circumstances would be an intensification of land degradation, leading to the high likelihood of a return to food insecurity in the long term.

The analysis of the other links between international aid and the environment in Sudan indicates that most aid does not cause significant harm to the environment. However, integration of environmental issues into the current programme is negligible, and the environment-related expenditure that does occur – while it is acknowledged and welcomed – suffers from a range of management problems that reduce its effectiveness.

### Background to the recommendations

Given the current environmental situation in Sudan, increased international aid for environmental issues is warranted. All other issues being equal, the level of food security in many parts of Sudan

will gradually drop and rural livelihoods will be increasingly threatened unless problems such as desertification and deforestation are tackled. This in turn will drive conflict, displacement, and further degradation, and as a result increase demands for humanitarian aid and peacekeeping.

At the same time as investment is increased, the effectiveness of all expenditure for environmental issues will need to be significantly improved through better coordination and other structural reforms.

The recommendations below are based on the themes of improved UN coordination and national ownership, which are two of the principles currently driving UN and aid reform in Africa and elsewhere. The majority of the programmes requiring investment are listed in other chapters; the financial investment in this chapter relates solely to coordination and UN agency assistance.

### Recommendations for the United Nations in Sudan

**R14.1 Implement a focal point and long-term, centralized environmental technical assistance service for aid agencies in Sudan.** The long-term goal is the full integration of environmental issues into the UN aid programme in Sudan. This recommendation entails the establishment of UNEP offices in Khartoum and Juba, the provision of a service for environmental advice and rapid assessment for all agencies and NGOs, and a focal point to promote investment and coordination in environmental issues.

CA: TA; PB: UNCT; UNP: UNEP; CE: 3M; DU: 3 years

**R14.2 Help mainstream environmental issues into the UN programme through improved structure and monitoring via the UN Work Plan.** This would entail measures such as collating and including all ongoing environmental projects from all parties into the annual UN Work Plan process and elevating environment from a ‘cross-cutting issue’ to an investment sector or sub-sector.

CA: GROL; PB: UN RCHC; UNP: UNEP and UNDP; CE: nil; DU: ongoing

**R14.3 Advise future international environmental aid proposals and funding offers to fit within a national management framework presented by the combination of the UN Work Plan, the UNEP assessment and the GONU and GOSS NPEM processes.** This would not entail additional fund-raising, but only directing funds towards priority areas and projects as determined by these linked processes, which have already conducted the groundwork to develop a list of priorities and have a high level of ownership at the national level.

CA: GROL; PB: UN RCHC; UNP: UNEP and UNDP; CE: nil; DU: ongoing

**R14.4 Set government counterpart funding as a key criterion for funding environmental projects in Sudan.** The level of funding provided by the government partner is a litmus test for government commitment and the prospects for sustainable project benefits. The international: national funding ratio should in no case be greater than 4:1, and should ideally be 1:1 or less.

CA: GROL; PB: GONU and GOSS; UNP: UNEP; CE: nil; DU: 3 years then review

### **Recommendations for the Government of National Unity**

**R14.5 Officially designate and support the GONU Ministry of Environment and Physical Development as the GONU focal point for**

**liaison for all international aid projects in the environmental sector that require a GONU government partner, including MEAs and GEF projects.** This will significantly assist coordination and central planning. Once contact and a framework are established, liaison can be delegated to the appropriate level on a project-specific basis. This initiative needs to include capacity-building (see Chapter 13) to enable the government to participate actively in such projects.

CA: GROL; PB: MEPD; UNP: UNEP; CE: nil; DU: 3 years then review

### **Recommendations for the Government of Southern Sudan**

**R14.6 Officially nominate and support the GOSS Ministry of Environment, Wildlife Conservation and Tourism as the GOSS focal point for liaison for all international aid projects in the environmental sector that require a GOSS government partner, including GEF projects.** This will significantly assist coordination and central planning. Once contact and a framework are established, liaison can be delegated to the appropriate level on a project-specific basis. This initiative needs to include capacity-building (see Chapter 13) to enable the government to actively participate in such projects.

CA: GROL; PB: MEWCT; UNP: UNEP; CE: nil; DU: 3 years then review



# Conclusions

*A fish eagle crossing the White Nile flood plain, against a backdrop of seasonal rangeland fires set by pastoralists. Sustainable management and development of natural resources is one of the greatest challenges facing post-conflict Sudan.*





## Conclusions

### 15.1 Introduction

The UNEP post-conflict environmental assessment of Sudan has made clear that Sudan is affected by a number of severe environmental issues, which are closely tied to the country's social and political problems with conflict, food insecurity and displacement.

Ignoring these environmental issues will ensure that some political and social problems remain unsolvable and even likely to worsen, as environmental degradation mounts at the same time as population increases. Resolving them will require a cross-cutting effort in the political arena.

Investment in the environmental sector has suffered greatly from the conflicts that have wracked Sudan for most of the last fifty years, and environmental concerns still cannot be adequately addressed in Darfur today. Corrective action, however, can start in much of the rest of the country. Moreover, thanks to the benefits of oil exports, Sudan can for the first time afford to significantly invest its own resources into such action.

Recommendations on each of the various cross-cutting issues and sectors have already been set out in Chapters 3 through 14. These have been viewed and vetted by the Governments of Sudan and other national and international stakeholders. As such, they represent an agreed way forward for each sector.

This chapter summarizes the findings and recommendations of the UNEP post-conflict environmental assessment, and proposes the general way forward for the Governments of Sudan, civil society and the international community, to help ensure that these recommendations are acted upon.

### 15.2 Key findings

Over 100 environment and governance issues are discussed in Chapters 3 through 14, many of which are closely connected or different aspects of the same problem. These items have been distilled into three positive and seven negative key findings:

### Positive findings

- 1. The oil-driven economic boom can fund the necessary investment in improved environmental governance.** The total cost of the recommendations listed in this report is USD 120 million over three to five years. With oil exports expected to be in excess of USD 5 billion in 2006, the government clearly has the capacity to pay some if not all of these costs. On this basis, all future international aid projects for environmental governance should have a strong element of matching government funding.
- 2. The combination of the natural resources of the south and the resource needs of the north represents a real opportunity for large-scale sustainable trade in raw and added-value natural resources.** Many of the resources of Southern Sudan could be used to drive economic development, but are currently being wasted. For example, Khartoum state imports construction timber even as mahogany trees are burnt to clear land for shifting agriculture in the southern states. While tight controls are obviously needed to avoid over-exploitation, extracting added value from the natural resources of the south is key to both economic development and conservation.
- 3. Political support for the environment is strong in the newly formed Government of Southern Sudan, and rising in the Government of National Unity.** Support is both political (in terms of awareness-raising) and practical (in terms of allocating GONU and GOSS core budgets to tackling environmental governance and natural resource management issues).

### Negative findings

- 4. Environmental degradation in northern, central, eastern and western Sudan is widespread, severe and continuing at a linear rate.** The most common forms of degradation – desertification and deforestation – are long-term problems that may worsen in the future. The northern coastline and marine habitats have been locally damaged near urban areas, but remain in good condition overall.

5. **Environmental degradation in south Sudan is overall moderate but locally severe and generally increasing at a rapid pace.** Ongoing deforestation, which could worsen considerably in the coming years due to the massive refugee and IDP return process underway, represents a significant lost opportunity in sustainable development and economic growth.

6. **Southern Sudan's environment is highly vulnerable to development-induced damage in the post-conflict period.** Given the near complete absence of environmental governance, natural resources such as timber and the remaining wildlife are vulnerable to over-exploitation.

7. **Environmental degradation, as well as regional climate instability and change, are major underlying causes of food insecurity and conflict in Darfur – and potential catalysts for future conflict throughout central and eastern Sudan and other countries in the Sahel belt.** Setting aside all of the social and political aspects of the war in Darfur, the region is beset with a problematic combination of population growth, over-exploitation of resources and an apparent major long-term reduction in rainfall. As a result, much of northern and central Darfur is degraded to the extent that it cannot sustainably support its rural population.

Although not a novel finding to those working in this field in Darfur, it is not commonly understood outside the region. Yet it has major implications for the prospects for peace, recovery and rural development in Darfur and the Sahel. Indeed, the situation in Darfur is uniquely difficult, but many of the same underlying factors exist in other parts of Sudan and in other countries of the Sahel belt. Darfur accordingly holds grim lessons for other countries at risk, and highlights the imperative for change towards a more sustainable approach to rural development.

8. **Long-term peace in Sudan is at risk unless sustainable solutions are found for**

**several environmental issues identified as potential conflict 'flashpoints' in Unity and Upper Nile states, the Three Areas and other north-south border zones.** In general order of priority, these unresolved issues are:

- the environmental impacts of the development of the oil industry;
- the southward migration of northern pastoralists due to land scarcity and degradation;
- tree-felling for the charcoal industry in the north-south boundary zone;
- new and planned dams and major water projects, including any revival of the Jonglei canal project; and
- ivory and bushmeat poaching.

An appreciation and long-term solutions for these environmental issues should be integrated into peacebuilding efforts to reinforce the prospects for sustainable peace.

9. **Environmental governance and policy failures underlie many of the problems observed.** Many of the issues identified cannot be resolved by more aid or investment, but require changes in government policy instead. This is particularly the case for agricultural development. In addition, the basics for good environmental governance are lacking or need substantial strengthening throughout the country. Areas necessitating attention include legislation development, civil service capacity-building and data collection.

10. **United Nations work in the field of environment and aid in Sudan could be much improved by increased efforts in coordination.** At present, environmental issues are not integrated into the larger UN humanitarian programmes, and numerous structural and management problems reduce the effectiveness of environment-specific programmes, such as those funded by the Global Environment Facility. Improved coordination could resolve many of these problems without significantly raising overall aid expenditure.

### 15.3 Key recommendations and investment requirements

Eighty-five detailed recommendations are provided in Chapters 3 through 14. These have been distilled into four general recommendations:

- 1. Invest in environmental management to support lasting peace in Darfur, and to avoid local conflict over natural resources elsewhere in Sudan.** Because environmental degradation and resource scarcity are among the root causes of the current conflict in Darfur, practical measures to alleviate such problems should be considered vital tools for conflict prevention and peacebuilding. Climate change adaptation measures and ecologically sustainable rural development are needed in Darfur and elsewhere to cope with changing environmental conditions and to avoid clashes over declining natural resources.
- 2. Build capacity at all levels of government and improve legislation to ensure that reconstruction and economic development do not intensify environmental pressures and threaten the livelihoods of present and future generations.** The new governance context

provides a rare opportunity to truly embed the principles of sustainable development and best practices in environmental management into the governance architecture in Sudan.

- 3. National and regional government should assume increasing responsibility for investment in the environment and sustainable development.** The injection of oil revenue has greatly improved the financial resources of both the Government of National Unity and the Government of Southern Sudan, enabling them to translate reform into action.
- 4. All UN relief and development projects in Sudan should integrate environmental considerations in order to improve the effectiveness of the UN country programme.** Better coordination and environmental mainstreaming are necessary to ensure that international assistance ‘does no harm’ to Sudan’s environment.

#### Analysis of chapter recommendations

The recommendations from each chapter have been collated by issue and economic sector in Table 31, and by theme in Table 32.

Table 31. Recommendations by economic sector and geographic region

Issue and economic sector	No.	Cost of recommendation by region/target (USD million)			
		National (including Darfur)	Southern Sudan	International Community	Total
Natural disasters and desertification	3	4.0	–	–	4.0
Conflict	4	–	–	2.9	2.9
Displacement	4	–	–	5.3	5.3
Urban environment and environmental health	6	5.0	2.0	1.0	8.0
Industry	5	2.9	1.0	–	3.9
Agriculture	8	14.6	9.2	–	24.0
Forestry	13	10.6	7.8	0.3	18.7
Water resources	9	11.6	2.0	–	13.6
Wildlife and protected area management	5	3.5	6.0	–	9.5
Marine and coastal resources	8	9.1*	–	–	9.1
Environmental governance and awareness	10	8.7	9.3	–	18.0
International aid and the environment	6	–	–	3.0	3.0
<b>Total</b>	<b>85</b>	<b>70</b>	<b>37.3</b>	<b>12.5</b>	<b>119.8</b>

\*Includes USD 0.7 million by Red Sea state



Table 32. Recommendations by theme and region/target

Recommendation theme	Costs of recommendation by region (USD million)			
	National (including Darfur)	Southern Sudan	International Community	Total
Governance	9.1	6.5	0.3	15.9
Technical assistance	13.0	6.0	6.5	25.5
Capacity-building	7.0	12.0	–	19.0
Government investment	25.1	–	–	25.1
Awareness-raising	0.2	0.1	0.5	0.8
Assessment	9.6	0.7	1.2	11.5
Practical action	6.0	12.0	4.0	22.0
<b>Totals</b>	<b>70</b>	<b>37.3</b>	<b>12.5</b>	<b>119.8</b>

### Cost of the recommendations

Depending on the approach, the cost of a list of recommendations for the substantial resolution of the major environmental issues in Sudan could run from millions to billions of US dollars. In the context of the competing needs of post-conflict recovery and the ongoing Darfur crisis, it is at present clearly unrealistic to expect such additional expenditure. However, it is critical that expenditure be raised from its current negligible level to one at which a real difference can be made (and measured). Accordingly, the costed recommendations are kept below USD 5 million per government, per sector, and per annum – and address only the most urgent or logical first few items.

The resolution of many of the issues raised will also require considerable time. UNEP estimates that building national capacity and addressing some of the more complex policy, legal and political issues noted in this report will take a minimum of three to five years. Reversing the noted trends of environmental degradation could take much longer.

UNEP does not expect work on all of the listed recommendations to commence in 2007; some indeed may never be taken up. Moreover, the costs listed are only basic estimates that will need to be refined in the project development stage. However, they provide a good indication of the scale of investment required to make a significant difference to the current environmental situation and trends in the country.

It should be noted that in addition to the expenditure discussed above, a major investment in environmental

health infrastructure (water supply and treatment, sewage treatment etc.) is unavoidable if GONU and GOSS wish to achieve major improvements in the health sector. In this area, ‘soft’ approaches like awareness-raising and capacity-building will be of limited benefit in the absence of ‘hard’ improvements in water supply and sanitation infrastructure.

The total cost of this report’s recommendations is estimated at approximately USD 120 million over three to five years: USD 70 million for GONU, USD 37.3 million for GOSS and USD 12.5 million for the international community. These are not large figures compared to the Sudanese GDP in 2005 (USD 85.5 billion), and are hence considered to be relatively affordable for both GONU and GOSS. The recommendations aimed specifically at the international community come to approximately 0.5 percent of annual aid expenditure for Sudan in 2006 – again relatively affordable.

### Financing the recommendations

The UNEP proposal is that the Government of National Unity and the Government of Southern Sudan own this list of sector recommendations and contribute the majority of the funds. International aid should make up the difference on a partnership basis, with a view to providing technical assistance and capacity-building rather than just funding. As mentioned in the previous chapter, sole funding by the international aid community is specifically not recommended for three reasons:

1. Prior experience in Sudan and elsewhere has shown that one hundred percent aid-funded recovery and development projects often have

poor sustainability and collapse when donor funds are withdrawn. Part-financing by the government typically results in much better design and national ownership;

2. International aid funding for Sudan has its limits, and urgent humanitarian needs will continue to draw the bulk of the available funds. It will simply not be possible to raise all the required finances from international donors; and
3. Many of the recommendations focus on policy and governance, so the direct costs are limited and internal to government civil services.

Some sectors such as industry, urban development and forestry have a high potential for part-financing by the private sector, but any revenue-generating option, such as license fees and royalty agreements, should be designed and introduced with care to avoid governance problems.

## 15.4 The way forward

### Establishing roles and responsibilities in GONU, GOSS and the UN

UNEP's recommendations envisage a key role for several government ministries within GONU and GOSS, as well as for over ten different UN agencies. Their wholehearted support is required for the implementation of many recommendations.

UNEP and its government counterparts in the GONU and GOSS environment ministries cannot play the roles of the other parties, as they do not have the mandate or the capacity to do so. They can, however, catalyse action from their counterparts to pick up the recommendations and assist them throughout the process. The first stage in the implementation of the recommendations has in fact already occurred, as the respective ministries and UN agencies were asked for their views and support in the report drafting process. The recommendations in this final report reflect that input.

UNEP proposes to maintain a central role through the establishment of a Sudan country programme for the period of at least 2007-2009 (funds permitting). For each recommendation listed, UNEP will have one of three positions:

- a central role as the lead UN agency or one of a small joint agency team;
- a catalysing and supporting role to other UN agencies; or
- a tracking role for recommendations that do not require substantive UN input.

On the government side, the environment and wildlife ministries and authorities will also need to determine their specific role for each recommendation, and engage the appropriate line ministries if required.

### UNEP country programme

The UNEP Sudan country programme is still under development as of early 2007, but an outline can be presented.

Funds permitting, UNEP will establish more permanent project offices in Khartoum and Juba, to implement a core programme for the period 2007-2009. In 2009, the possibility of an extension will be reviewed against a set of exit criteria based on the situation in the country and progress on addressing the environmental issues listed in this report. Key themes for the UNEP programme are anticipated to be the same as the recommendation themes:

- governance (with a focus on legislation development);
- technical assistance and capacity-building;
- awareness-raising and advocacy;
- assessment; and
- practical action.

The exception is the recommendation category of government investment, as this is considered to be a role for the GONU and GOSS only.

### Advocacy, and awareness- and fund-raising

The funding and political support required to implement the recommendations will need to be found through an organized process of advocacy and awareness-raising. This effort will by default be led in the first instance by UNEP and its government counterparts in GONU and GOSS.

UNEP has developed a range of assessment products to assist this process and will lead fund-raising within the international community. The government counterparts will direct fund-raising within their respective governments, using normal annual budgetary mechanisms and all other avenues for extra-budgetary funding. The existing National Plan for Environmental Management (NPEM) process could be utilized to this end by the GONU Ministry of Environment and Physical Development.

It is anticipated that awareness- and fund-raising will take a minimum of one year to complete substantially. Some projects will start much sooner than this, but major items, such as line ministry policy shifts and infrastructure investments, will probably require one to three years.

### **Development of national, regional and sectoral plans and action programmes**

Once the agreed partners are on board and funds have been allocated, the recommendations list can be converted into a number of national, regional, sectoral and project plans for implementation. Wherever possible, these plans should be integrated into general development and poverty reduction strategies rather than be stand-alone initiatives.

In the water sector, for example, individual states have the responsibility to develop five-year State Water Master Plans; this represents an ideal opportunity to mainstream environment and sustainability issues into concrete policy and investment programmes at the intermediate level. At the international level, UNEP will be working to integrate environmental issues into the UN Development Assistance Framework (UNDAF) process, planned for late 2007, and the joint government-UN Poverty Reduction Strategy Papers (PRSPs).

### **Annual and three-year progress review**

This UNEP assessment project has been a major and relatively costly undertaking. Its first phase has now been successfully completed. The real test, however, will be the rate of implementation of its recommendations, which will only be possible to accurately evaluate some time after the public launch of the report and other assessment products.

**It is therefore recommended that UNEP and partners conduct an evaluation of the status of the recommendations at the end of 2009. Interim assessments should be conducted on an annual basis, starting in December 2007.**

## **15.5 Concluding remarks**

Sudan is now at a crossroads. While the country clearly faces many severe environmental challenges, the combination of the 2005 Comprehensive Peace Agreement and the oil-driven economic boom represents a major opportunity for positive change.

The sustainable management of the country's natural resources is part of the solution for achieving social stability, sustainable livelihoods and development in the country. For this goal to be reached, however, it will be necessary to deeply embed a comprehensive understanding of environmental issues in the culture, policies, plans and programmes of the Government of Sudan and its international partners, such as the United Nations.

This will require a long-term process and a multi-year commitment from both the Government of Sudan and its international partners. As the environmental expert of the United Nations, UNEP is ready to assist the Government and people of Sudan, as well as their international partners, in taking forward the recommendations developed from this assessment.





# Appendices

# Appendix I

## List of acronyms and abbreviations

<b>AMCEN</b>	African Ministerial Conference on the Environment
<b>AMIS</b>	African Union Mission in Sudan
<b>BOD</b>	Biological Oxygen Demand
<b>°C</b>	Degrees Celsius
<b>CAR</b>	Central African Republic
<b>CBD</b>	Convention on Biological Diversity
<b>CITES</b>	Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>CPA</b>	Comprehensive Peace Agreement
<b>DEA</b>	Department of Environmental Affairs (GONU MEPD)
<b>DFID</b>	Department for International Development (UK)
<b>DPA</b>	Darfur Peace Agreement
<b>DRC</b>	Democratic Republic of Congo
<b>DSS</b>	Department of Safety and Security (UN)
<b>EC</b>	European Commission
<b>EIA</b>	Environmental Impact Assessment
<b>ERW</b>	Explosive Remnants of War
<b>ESPA</b>	Eastern Sudan Peace Agreement
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FNC</b>	Forests National Corporation
<b>FRA</b>	Forest Resources Assessment
<b>FSD</b>	Fondation Suisse de Déminage
<b>GDP</b>	Gross Domestic Product
<b>GEF</b>	Global Environment Facility
<b>GNP</b>	Gross National Product
<b>GONU</b>	Government of National Unity
<b>GOS</b>	Government of Sudan
<b>GOSS</b>	Government of Southern Sudan
<b>GRASP</b>	Great Apes Survival Project
<b>GRID</b>	Global Resource Information Database (UNEP)
<b>GTZ</b>	Deutsche Gesellschaft für Technische Zusammenarbeit (German Technical Cooperation)
<b>HCE</b>	Higher Council for Environment
<b>HCENR</b>	Higher Council for Environment and Natural Resources
<b>IAEA</b>	International Atomic Energy Agency
<b>ICRAF</b>	International Centre for Research in Agroforestry
<b>ICZM</b>	Integrated Coastal Zone Management
<b>IDP</b>	Internally Displaced Person
<b>IGAD</b>	Inter-government Authority on Drought
<b>INGO</b>	International Non-Governmental Organization
<b>IOM</b>	International Organization for Migration
<b>IUCN</b>	The World Conservation Union
<b>IWRM</b>	Integrated Water Resource Management
<b>JEM</b>	Justice and Equality Movement
<b>km</b>	Kilometre (measurement)
<b>km<sup>2</sup></b>	Kilometres squared (area)
<b>km<sup>3</sup></b>	Kilometres cubed (volume)
<b>LPG</b>	Liquefied Petroleum Gas
<b>LRA</b>	Lord's Resistance Army
<b>m</b>	Metre (measurement)
<b>m<sup>2</sup></b>	Metres squared (area)
<b>m<sup>3</sup></b>	Metres cubed (volume)
<b>MAF</b>	Ministry of Agriculture and Forestry (GONU/GOSS)
<b>MAR</b>	Ministry of Animal Resources (GONU)
<b>MARF</b>	Ministry of Animal Resources and Fisheries (GOSS)
<b>MDG</b>	Millennium Development Goal
<b>MEA</b>	Multilateral Environmental Agreement
<b>MEPD</b>	Ministry of Environment and Physical Development (GONU)
<b>MEWCT</b>	Ministry of Environment, Wildlife Conservation and Tourism (GOSS)
<b>MFA</b>	Marine Fisheries Administration (GONU)
<b>MI</b>	Ministry of Interior (GONU)
<b>MIM</b>	Ministry of Industry and Mining (GOSS)



<b>MIWR</b>	Ministry of Irrigation and Water Resources (GONU)
<b>MEM</b>	Ministry of Energy and Mining (GONU)
<b>MEPA</b>	Marine Environment Protection Authority (Red Sea state)
<b>MoF</b>	Ministry of Finance (GONU)
<b>MoI</b>	Ministry of Industry (GONU)
<b>MOSS</b>	Minimum Operating Security Standard
<b>MOU</b>	Memorandum of Understanding
<b>MPA</b>	Marine Protected Area
<b>MTR</b>	Ministry of Transport and Roads (GOSS)
<b>MTW</b>	Ministry of Tourism and Wildlife (GONU)
<b>MWRI</b>	Ministry of Water Resources and Irrigation (GOSS)
<b>NAPA</b>	National Adaptation Programme of Action
<b>NBI</b>	Nile Basin Initiative
<b>NCP</b>	National Congress Party
<b>NDVI</b>	Normalized Difference Vegetative Index
<b>NCSA</b>	National Capacity Self-Assessment
<b>NEPAD</b>	New Partnership for Africa's Development
<b>NFI</b>	Non-Food Item
<b>NGO</b>	Non-Governmental Organization
<b>NPEM</b>	National Plan for Environmental Management
<b>NSAS</b>	Nubian Sandstone Aquifer System
<b>NSWCO</b>	New Sudan Wildlife Conservation Organization
<b>NTEAP</b>	Nile Transboundary Environment Action Project
<b>NWA</b>	Nile Water Agreement
<b>OCHA</b>	United Nations Office for the Coordination of Humanitarian Affairs
<b>OHCHR</b>	Office of the United Nations High Commissioner for Human Rights
<b>OLS</b>	Operation Lifeline Sudan
<b>PCDMB</b>	Post-Conflict and Disaster Management Branch
<b>PCEA</b>	Post-Conflict Environmental Assessment
<b>PERSGA</b>	Regional Organization for the Conservation of the Environment of the Red Sea and the Gulf of Aden
<b>POPs</b>	Persistent Organic Pollutants
<b>PPD</b>	Plant Protection Directorate (GONU MAF)
<b>ppm</b>	Parts per Million
<b>PRSPs</b>	Poverty Reduction Strategy Papers
<b>SCE</b>	State Council for Environment (Red Sea state)
<b>SECS</b>	Sudanese Environment Conservation Society
<b>SPLA</b>	Sudan People's Liberation Army
<b>SPLM</b>	Sudan People's Liberation Movement
<b>SSARP</b>	Southern Sudan Agricultural Revitalization Programme
<b>SSCSE</b>	South Sudan Centre for Statistics and Evaluation
<b>SSNEA</b>	South Sudan National Environment Association
<b>UN</b>	United Nations
<b>UNCCD</b>	United Nations Convention to Combat Desertification
<b>UNCT</b>	United Nations Country Team
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>UNDAF</b>	United Nations Development Assistance Framework
<b>UNDG</b>	United Nations Development Group
<b>UNDP</b>	United Nations Development Programme
<b>UNDPKO</b>	United Nations Department of Peacekeeping Operations
<b>UNEP</b>	United Nations Environment Programme
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNFPA</b>	United Nations Population Fund
<b>UNHCR</b>	United Nations High Commissioner for Refugees
<b>UNICEF</b>	United Nations Children's Fund
<b>UNIDO</b>	United Nations Industrial Development Organization
<b>UNMAS</b>	United Nations Emergency Mine Action Programme in Sudan
<b>UNMIS</b>	United Nations Mission in Sudan
<b>UNOPS</b>	United Nations Office for Project Services
<b>UNRCHC</b>	United Nations Resident and Humanitarian Coordinator
<b>USAID</b>	United States Agency for International Development
<b>UXO</b>	Unexploded Ordnance
<b>WFP</b>	World Food Programme
<b>WHC</b>	UNESCO World Heritage Convention
<b>WHO</b>	World Health Organization
<b>WUA</b>	Water Use Associations

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**Special note:** In the course of the assessment in 2006, UNEP sponsored two major environmental workshops, one held in Khartoum in July and the other in Juba in November. At these events, technical papers were presented on the environmental issues of Sudan as input to both the UNEP report and the forthcoming government-owned National Plan for Environmental Management. The full list of these papers is offered below. Individual papers have been included in the chapter references where appropriate.

### **Proceedings of the Khartoum Workshop on the Post-Conflict National Plan for Environmental Management in Sudan, July 2006**

- Abdelgani, M.E. and Z.E. Alabjar. *Environmental Research Capacity in Sudan*.
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- Mahgoub, E.F.E.T and K. M. Riak. *Wetland Management in Sudan*
- Ibrahim, A.M and K. H. Badi. *Forest Management and Conservation*
- Mohamed, H.M. and A. R.M. Hamid. *Range Management and Conservation in Sudan*
- Abdel Rahman, M.E.A. and M. O. El Sammani. *Natural Resources and Socio-economic Parameters*
- Abdel Salam, M.Y. *Marine and Coastal Environment Conservation in Sudan*.
- Omwenga, J.M. *Global Management of Freshwater Resources – The Nile Basin – A Perspective*
- Liabwel, I. *Water Management in Southern Sudan*

- Ayoub, A.T. *Linkages between Food Security and Natural Resource Conditions*
- Awad, N.M. *International and Regional Agreements*
- Satti, M. *Partnership for Sustainable Development on the Red Sea Coast*
- El Hassan, H.M. and M. Osman. *Gaps in Natural Resources Management in North Sudan States*
- El Hassan, B.A. *Resource-Based Conflicts and Land Use Systems*
- Abdelbagi, A.O., Mohamed, A.A., El Hindi, A.M. and A.M. Ali. *Impact of Pesticides and Other Chemicals on the Environment*
- Murkaz Ali, E.T. *Overview of Relevant Policies, Strategies and Legislation Related to Environment and their Relevancy under the CPA*
- Ibnoaf, M. *A Pro-Poor Post-Conflict Participatory Approach*
- El Moghraby, A.I. *Management of Natural Resources in the Sudan*
- Desertification Control and Mitigation of Drought Effects in Sudan

### **Proceedings of the Juba Workshop on the Post-Conflict National Plan for Environmental Management in Sudan, November 2006**

- Hassan, K.I. *The Impact of Climate Change on Food Security*
- Bojoi, M. *Wildlife Tourism and Poverty. Present State and Strategy for Development in South Sudan*
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