



Environment and Natural Resources as a Core Asset for Wealth Creation, Poverty Reduction, and Sustainable Development

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Executive Summary

1- *Sudan* the largest country in Africa covers an area of approximately 2,506,000 sq. km. It extends over six major ecological zones, namely, Desert, Semi-Desert, Low rainfall Woodland Savannah, High-Rainfall Woodland Savannah, Flood Region and the Montane Vegetation. Endowed with rich and varied natural resources both renewable and unrenowable, for its largeness and diverse physical elements, being reflected by its geological formations, climatic variance, ecological zones, and abundant water sources, of which the Nile and its tributaries constitute a major feature. This diversity is also reflected in its people, and as a result the country is multi-cultural, multi-ethnic, multi-lingual and multi-religious.

2- *Natural Resources Stock-taking*: The northern half of the country is arid and hyper arid, the rest ranging from arid to semi-arid with a greater part suffering from significant moisture deficit. Sudan has a few high land areas. In Darfur, Jebel Marra elevation 3100 meters above sea level, and mountain Kinyeti, on the forntier with Uganda reaches, nearly 3200 meters. This leaves the vast majority of the country under 800 meters, with the Nile valley lying between 300-400 meters. Several geographical regions are usually distinguished, based on the combination of climatic zones and topography.

Rainfall averages less than 25mm annually in the northern most part of the country. It generally increases towards the south, averaging 200mm around Khartoum, and 800mm on the northern fringe of the swamps. The southern border lands receive over 1400mm annually.

Geology: Excluding the superficial deposits, the most extensive Formation in the country is the Basement Complex. Nubian Sandstone Formations occur widely in the northern and central Sudan, and are probably the most important water bearing formations. Also important on ground water consideration are Um Rruwaba and El Atshan formations which are extensive in the southern half of the country.

Soils:The UNESCO-FAO soil map covered Sudan in its Africa sheets (UNSCO-FAO 1971).Nearly 100 soil categories are distinguished within Sudan. Out of these 4 merit to be highlighted:-

Xerosols: Extensively utilized as grazing land and for casual crop raising.

Arenosols: Found throughout west central Sudan (Darfur-Kordofan), being extensively used for cultivation, and known to be of poor organic matter content.

Vertisols: Probably the widest spread soils in the Sudan. They are dark cracking clays, very heavy, and difficult to work with traditional hand implements.

Fluvisols: Found throughout the Nile valley and the major Wadies.

Forestry: Figures on the forestry land are inconsistent, because of different definitions currently used. The figure of 96-106 million hectares is often quoted by different sources as classified forests, representing about 36% of Sudan's surface area

Water Resources: Basically Comprise the Nile and its tributaries from which we get 20000 million m³ at Sennar Dam according to Nile water agreement. The renewable underground water provides 4500 million m³, the seasonal streams give up to 6000 million m³ while fall which varies from one year to another gives an average of 1000000 million m³ water under normal rainy season.

3. Population projection for year 2006 reveals that Sudan total population (000) =36297.0 classified by mode of living as 29.09% Urban and 70.91 Rural, showing that more than 70% of the total population lives in rural areas. They are mainly traditional farmers and pastoralists directly depend on their natural environment for their livelihoods and survival

4. Crop production and animal raising depend entirely on the renewable natural resources. Food crops Dura, wheat, Millet and other cereals are grown over vast areas of central clay plains in central Sudan and on the undulating sand dunes of the West under rain-fed traditional and semi-mechanized systems. Cash crops cotton, sugar cane beside fodder crops and some food crops are grown in the irrigated projects. On the other hand sandy soils of the West provide the most suitable environment for sesame, ground nuts and others as cash crops. Range lands of

total area reaching 68.45 million hectares provide more than 80% of the animals and wildlife feed. Recently petroleum as unrennewable Natural Resource adds nearly 9% to the country's GDP.

5. In spite of the immense diversified resources assets the country possesses, Sudan is described as land of misused resources, hardship and poverty. It is rather difficult to reach an accurate estimation of the level of poverty in Sudan at present; due to lack of recent poverty data, it could be argued that poverty in Sudan may perhaps be in the range of 50-60%. Poverty rate is higher in the rural areas compared to urban centers.

Eradication of extreme poverty and hunger is the top listed goal under the UN Millennium Development Goals (MDG's). Sudan has unlimited opportunities to achieve this goal, because of its immense and diversified Natural Resources. (vast agricultural land, surface and underground water resources, wealth of livestock of all kinds, minerals and other underground resources including oil and gold). Sudan economy is mainly agricultural and the agricultural sector constitutes the core of Sudan life and the main driving force of the economy even with the emerging oil sector.

6. To make Sustainable integrated rural development possible, we need rational integrated Natural Resources management, policies and legislations. Sudan was one of the first African countries to promulgate legislations concerning protection of the environment. Government records show that there are about 150 acts, orders, guide lines and regulations addressing environmental issues since 1903, the most recent and important ones are: 1- The Environmental protection act (2001). 2- Forest and Renewable Natural Resources Act (2202); and Sudan National Interim Constitution (2005) in which there is a clear commitment towards the environmental protection.
7. Sudan could be one of the richest countries in the World. However perverse incentives prohibited the rural poor to use their Natural Resources effectively. Lack of explicit land use policy supported by legislation, a situation that continues to generate intensified conflicts among the different land users.
8. *Land tenure*: Successive laws and decrees have undermined the legal rights of rural Sudanese communities in general, and the small producers (farmers and pastoralists) in particular. Especially egregious and repressive is the 1970 Unregistered Land Act that created land as a scarce commodity subject to privatization, accumulation by a minority and commercial speculation that resulted in modified local land tenure systems and conditions of popular access to and control over land and, therefore, setting in motion a process of continuous alienation of agro-pastoralists from their traditional homelands. The Act, a de facto nationalization by the state, denies any formal legitimacy or juridical status to traditional property rights and implies the cancellation of all rights relating to water, land and grazing by pastoralists, as well as the suppression of any future income related to such rights.

The Act effectively enabled the government to implement its development policy based on the horizontal expansion of the agricultural sector, both irrigated and rain fed mechanized. By 2001, the total area under mechanized farming reached 8.5 million hectare compared to 0.96 million in 1970/71, an increase of 606%. In addition, and upon facilitation by the Investment Act of 1990, vast tracts of land have been allotted to private capital investments, including foreign capital, a situation that resulted in heavy cuts in rural communities' rights to land and dislocation of considerable people out of land.

9. *Emerging issues*: The various and recurring conflicts that have plagued Sudan since independence can be attributed to a host of inter-related, cumulative and complex factors, natural resources have played a key role in triggering and fuelling these civil wars. The issue of who controls natural resources, who has access to them, how they are distributed and who participates in the decision-making process, has often been among the root causes of the Sudanese conflicts.

In this regard and since the vast majority of people depend on land and water resources to make a living; Issues of land degradation, desertification, deforestation, loss of biological diversity, resource base conflicts, land tenure etc are to be discussed critically.

1- Introduction

Sudan is the largest country in Africa and the ninth largest in the world covers an area of approximately 2,506,000 sq. km, in north east Africa. The country extends over six major ecological zones, namely, Desert, Semi-Desert, Low rainfall Woodland Savannah, High-Rainfall Woodland Savannah, Flood Region and the Montane Vegetation. (Annex 6.1).

The country is then endowed with rich and varied natural resources (NR) both renewable and unrenovable, for its largeness and diverse physical elements, being reflected by its geological formations, climatic variance, ecological zones, and abundant water sources, of which the Nile and its tributaries constitute a major feature. This diversity is also reflected in its people, and as a result the country is multi-cultural, multi-ethnic, multi-lingual and multi-religious.

Geography:

The northern half of the Sudan is classified by UNESCO (1977) as arid and hyper arid, with the rest of the country ranging from arid to semi-arid under the same classification; and with a greater part of it suffering from significant moisture deficit.

Sudan has a few high land areas. In Darfur, Jebel Marra elevation is nearly 3100 meters above sea level, and mountain Kinyeti, on the forntier with Uganda reaches, nearly 3200 meters. This leaves the vast majority of the country under 800 meters, with the Nile valley lying between 300-400 meters. Several geographical regions are usually distinguished, based on the combination of climatic zones and topography. *Major distinctive regions are:*

North Desert Region: Nearly uninhibited, except for the densely populated Nile valley running through it, with plains spanning most of the country outside the mountainous areas. The Nile valley and the northern desert region are relatively featureless, being characterized by low rolling hills in some areas or stabilized sand dunes.

The Savannah Region: Occupies the middle two thirds of the country. Savannah vegetation varies, relatively from sparse on the fringe of the desert, to fairly lush in the south.

Mountains: Out of these, the Red Sea hills are arid and inhospitable to human settlements. The Jebel Marra area is somewhat better watered and support sedentary agriculture, as does the Nuba Mountains Region of Kordofan. Immatong and Dongotona Mountains, along the southern border, are relatively sparsely populated, and are covered partially by rain forests.

Sudd Swamps of Southern Sudan: Forming a large body of water, resulting from the over-spill of the White Nile annual flood, lost to the swamps. It is sometimes distinguished as separate from the Nile proper.

Climate:

Rainfall averages less than 25mm annually in the northern most part of the country. It generally increases towards the south, averaging 200mm around Khartoum, and 800mm on the northern fringe of the swamps. The southern border lands receive over 1400mm annually. (Annex 6.2). the rainy season lasts from April to October in the south, and decreasing in length towards the north.

Mean daily temperature is fairly high throughout Sudan, with a maximum in the hottest month of above 40⁰C, throughout the northern half of the country. Generally it ranges from 10-20⁰C in winter, with exception of Jebel Marra, where it is about 6-8⁰C.

Geology:

Excluding the superficial deposits, the most extensive Formation in the country is the Basement Complex. Various Basement Formations occur in different regions of the Sudan. Nubian Sandstone Formations occur widely in the northern and central Sudan, and are

probably the most important water bearing formations. Also important on ground water consideration are Um Rruwaba and El Atshan formations which, are extensive in the southern half of the country.

Soils:

The UNESCO-FAO soil map covered Sudan in its Africa sheets (UNSCO-FAO 1971). Nearly 100 soil categories are distinguished within Sudan, which may be broken-down into (Yermesols, Lithosols, Regosols, Xerosols, Arensols, Vertisols, Fluvisols, Ferralsols, Gleysols, Cambisols...etc). Out of these existing types, 4 merit to be highlighted:-

Xerosols: Extensively utilized as grazing land and for casual crop raising.

Arenosols: Found throughout west central Sudan (Darfur-Kordofan), being extensively used for cultivation, and known to be of poor organic matter content.

Vertisols: Probably the widest spread soils in the Sudan. They are dark cracking clays, very heavy, and difficult to work with traditional hand implements.

Fluvisols: Found throughout the Nile valley and the major Wadies.

Vegetation:

The vegetation may be divided into 5 main zones:-

- a. **Desert Zone:** Located north of lat. 17N, excluding the Red Sea Hills. Annual rainfall is less than 50mm. No vegetation in this part, except for a few ephemeral herbs and grasses that grow after the scanty rains, forming what is known as Gizzu.
- b. **Semi-Desert Zone:** Located between latitudes 14⁰-17⁰N, including the Red Sea Hills. Vegetation is made up mainly of annual and perennial grasses and herbs, with or without woody plants. According to the soil type and the amount of rainfall, this zone is divided into 5 sub-zones, distinguished on combinations of the dominant plant species and soil types.
- c. **Wood Land Savanna Zone:** Receives Monsoon rainfall ranging from 300-1200mm. The presence of tall grass species plays an important role in determining the climax vegetation. Most plants are fire resistant, with the vegetation formed of mixed grasses and bushes, with or without trees; and with the zone divided into two sub-types.
- d. **Flood Zone:** With a total area of 116,000 sq. km. According to the amount of flooding, 3 types of vegetation may be distinguished: high land rarely flooded; intermediate land, flooded during the rainy season; and swamps, of which 13500 sq.km are permanent
- e. **Montane Zone:** Comprising areas of high altitude, where vegetation changes with height. Of these we mention the Immatong and Dongotona Mountains.

Wildlife:

Because of the great latitudinal span of Sudan and mixed and marked differences in climate, the country was once very rich in game animals. Brocklehurst (1931) mentioned the existence of rich and varied game animals in Sudan. Nimir after Setzer (1956) listed 224 species and sub-species of mammals, other than bats. Nimir(1983) produced a list of 52 major wildlife species and their distribution in northern Sudan.

Unfortunately, during the last decades, human and domestic livestock population have rapidly increased in Sudan, and this has resulted in intensive land use and in a drastic reduction in the number of many species. Their plight has also been made worse by lack of rainfall during the last epochs in the history of the country. No recent information on most of the wildlife species is readily available

Forestry:

Figures on the forestry land are inconsistent, because of different definitions currently used. The figure of 96-100 million hectares is often quoted by different sources as classified forests, representing about 36% of Sudan's surface area. Of this 1.2-1.44 million hectares are designated as protected Forest Reserve Estates which the Government owns. The majority of wood utilized from Sudan's forests is for fire- wood, for the greater part of energy consumed in Sudan is from wood or charcoal, and nearly all fuel wood is obtained from the natural forests and the desert scrub. Another major use of forest is for Gum Arabic production. Fuel wood production is a major reason that vast areas have been deforested to meet the increasing demand of the growing rural population.

Based on 1993 Census, the National Forest Corporation estimated wood fuel consumption for 16 States in Northern Sudan to be 15770830 m³ of round wood, giving 0.71 m³ as percapita consumption per annum. Forestry Corporation after FAO (1998) estimated the wood resources of the northern states by 127365350 M³. Comparing this figure with consumption, we clearly observe that actual cutting figures are much higher than consumption rates, resulting in high forest depletion. (Annex 6.3 Forests Areas in Sudan).

Water Resources

Basically Comprise the Nile and its tributaries from which we get 20000 million m³ at Sennar Dam according to Nile water agreement. The renewable underground water provides 4500 million m³, the seasonal streams give up to 6000 million m³ while fall which varies from one year to another gives an average of 1000000 million m³ water under normal rainy season. The study is to address, focus and explore the issue of Environment and Natural Resources as core asset for wealth creation, poverty reduction and sustainable. In a broader sense as the backbone of the integrated rural development that we are looking for. Therefore issues such as livelihoods, natural resources governance, market chains and value adding on natural resources together with emerging issues will be explored and analyzed to show the role and extent of the environmental assets in livelihoods of the Sudanese citizens namely the rural poor.

2- Environmental and Natural Resources as Key asset for rural economic growth and livelihood improvement

Population projection for year 2006 reveals that Sudan total population (000) =36297.0 classified by mode of living as 29.09% Urban and 70.91 Rural, showing that more than 70% of the total population lives in rural areas. They are mainly traditional farmers and pastoralists directly depend on their natural environment for their livelihoods and survival

2.1 Natural Resources the core component for the people's livelihoods

Crop production and animal raising in Sudan depend entirely on the renewable natural resources, namely Water, Soil, Vegetation cover and the Wild life. Food crops like Dura, wheat, Millet and other cereals are grown over vast areas of central clay plains in central Sudan and on the undulating sand dunes of the West under rain-fed traditional and semi-mechanized systems. Cash crops namely cotton, sugar cane beside fodder crops and some food crops are grown in the irrigated projects. On the other hand sandy soils of the West provide the most suitable environment for sesame, ground nuts and others as cash crops. Range lands of total area reaching 68.45 million hectares provide more than 80% of the animals and wildlife feed. Recently petroleum as unrennewable Natural Resource adds nearly 9% to the country's GDP.

2.1.1 Agricultural Activities

Nearly 140 millionhectares, almost half Sudan's surface area is classified as suitable for agriculture. Many other sources give about 96 million hectares as cultivable. Only about 8-10% of this figure is currently utilized for agriculture. (Annex 6.4).However because a large

proportion of these cultivated lands depend on rainfall, the amount actually cultivated in any particular year can greatly vary due to fluctuations in precipitation.

Forms of the practiced agriculture could be distinguished under:-

- Traditional rain- fed.
- Rain fed mechanized farming.
- Irrigated, small and large farms.
- Associated activities such as gum production.

Table 1 shows rain-fed and irrigated agriculture acreage for 2001-2005.

Table1: Rain fed and Irrigated Agric. Acreage

Year	Irrigated Agric. Acre	Rain fed Agric. Acre
2001	3208640	34063360
2002	3039000	37830000
2003	3308000	41760000
2004	3624000	33400000
2005	2306000	30605000

Source; Ministry of Agriculture

Regarding crops, the major types in Sudan in terms of total production and acreage planted are:

Sorghum: Grown under rain and irrigated cultivations for staple needs.

Wheat: Traditionally, being grown along the Nile north of Khartoum, mostly on basin flooding, and latter pumps have been increasably utilized. With the change in consumption patterns in favour of wheat, it is now an important cash crop, particularly in Gezira, Ghashm El Gibra and White Nile schemes.

Cotton: Cotton is historically an important crop from an economic view point. Sudan produces three types of cotton. Most important is the long staple cotton which is grown mainly in Government irrigated schemes in the Gezira, Rahad, New Halfa, Gash, and Toker Deltas. Short and medium stable cotton are grown in a number of schemes along the White and Blue Niles, and are also found on rain-fed lands in South Kordofan, and early in the Equatorial area.

Groundnuts: Mostly grown on rain fed lands especially sandy goz, with smaller proportion on irrigated areas, and with the greater part of the production exported.

Sugar: Has become an important crop with the country operating four sugar plantation schemes, with a fifth under execution.

2.1.2 Range and Livestock

Much of Sudan surface area is more suited for livestock grazing than cultivation. (Annex 6.5 Rangeland). Cattle, sheep, goats and camels are all herded in various combinations by the nomadic groups of the country, who account for approximately 8% of the population (1993 Census). In addition settled people often keep some animals. Total herd size is over 40 million for cattle, 49 million for sheep, 42 million for goats, and 3.9 million for camels as revealed the Ministry of Animal Wealth records (2006) Table 2. Annual growth rate for the period 2000-2005 is found to be 1.2% for cattle, 1.4% for sheep, 1.7% for goats, and 4.3% for camel.

Table2: Estimated Animal population (000) 1999-2005

Year	cattle	Sheep	Goats	Camels
1999	35825	44802	37346	3031
2000	37093	46095	38548	3108
2001	38325	47043	39952	3203
2002	39479	48136	41485	3342
2003	39667	48440	42030	3503
2004	39760	48910	42179	3724
2005	40468	49797	42626	3908

Source: Ministry of Animal Wealth.

Generally, camels are found in the more semi-arid north, while cattle are the main grazing animals in the central and the southern areas. Few figures on carrying capacity or stocking rates are available.

2.1.3 Forests and wood land resources

The wood land resources constitute a major source of economic benefits to the house hold sector and the small enterprises and industries such as brick making, bakeries and furniture industries. The household sector generates benefit from wood and non-wood products. The small industries require wood only for energy. The reserved forest resources generate sizeable annual revenue to the national budget from sales and taxes.

2.1.4 An Overview of Sudan Resources Base

- Sudan is described either in terms of great wealth and high potential, or as land of misused resources, hardship and poverty. Either way, the country does have several natural resources assets. The first by far, in the perception of most Sudanese, is the Nile; moving much needed water from Ethiopia and Uganda through the plain lands of the country. It has provided irrigation water for the major gravity irrigation projects, and for many of the pump schemes along its banks, with the area under the two, estimated at over 40 million acres.
- Less understood is the importance of the unused soil resources of the east central Sudan. The clay plains being sloping in most places provide ideal circumstances for gravity irrigation. Similar clay plains have been utilized for rain-fed mechanized agriculture.
- Outside the clay plain areas highly fertile soils are confined to smaller areas of Wadi beds, and in parts of volcanic Jebel Marra. Higher rainfall in the southern region creates a higher crop potential there.
- Despite impressive achievements in irrigated and mechanized agriculture, most Sudanese wealth is still in livestock holdings. Sudan vast area is mostly used for grazing and supporting large numbers of cattle, sheep, goats and camels, as quoted previously, with an over all growth rate of 1.5%, 1.3%, 1.7% and 4.3% for Cattle, Sheep, Goats and Camels respectively. However, still most of these livestock numbers are regarded as fixed rather than disposal wealth.
- Wood land resources in the country have severed from growing demand for construction and fuel. The south has the greatest potential, at present with a projected forestry supply for at least the next decade. As for many of the other areas production has declined and higher priority must be given to preservation and replanting of wood land in most parts of the country.
- While agriculture and its related livelihoods and economic activities remain the mainstay of the economy, minerals and mining has begun to play a remarkable role in the future of the country. Oil has been discovered in many parts especially the Southern Region, with its exploitation taking striding steps, and there are hopes that petroleum will form a great potential as a foreign exchange earner. Other minerals such as gold, chrome, copper, lead and zinc are also being prospected, which in all give optimism in the future of mineral development in the Sudan, though this may have little impact in the next few years.

2.2 Poverty in Sudan

It is rather difficult to reach an accurate estimation of the level of poverty in Sudan at present; due to lack of recent poverty data (the last nationally representative house hold income and expenditure survey was carried in 1978). It could be argued that poverty in Sudan may perhaps be in the range of 50-60% as in most of its neighboring countries. Nur,E.M(2003) and Abdelrahman,H.G(2003) reported a lot about income, human poverty and poverty reduction strategy but neither of them has spelled out the poverty rate in Sudan. In general poverty rate is higher in the rural areas compared to urban centers.

Eradication of extreme poverty and hunger is the top listed goal under the UN Millennium Development Goals (MDG's). Sudan has unlimited opportunities to achieve this goal, because of its immense and diversified Natural Resources (vast agricultural land, surface and underground water resources, wealth of livestock of all kinds, minerals and other underground resources including oil and gold). Sudan economy is mainly agricultural and the agricultural sector constitutes the core of Sudan life and the main driving force of the economy even with the emerging oil sector.

2.3 Environmental Laws and Regulations

To make what have been said happen we need rational integrated Natural Resources management, policies and legislations. Sudan was one of the first African countries to promulgate legislations concerning protection of the environment. Government records show that there are about 150 acts, orders, guide lines and regulations addressing environmental issues since 1903, the most recent and important ones are: 1- The Environmental protection act (2001). 2- Forest and Renewable Natural Resources Act (2202); and Sudan National Interim Constitution (2005) in which there is a clear commitment towards the environmental protection.

2.4 Perverse Incentives

Sudan could be one of the richest countries in the World. Perverse incentives prohibited the rural poor to use their Natural Resources effectively. Lack of explicit land use policy supported by legislation, a situation that continues to generate intensified conflicts among the different land users.

The customary resource tenure systems have been undermined by interventions from the larger Sudanese polity. The Land Acquisition Ordinance, 1930, paved further the way for government to acquire any "*land subject to village or tribal rights*" when it "*appears that it is likely to be required permanently or temporarily for any public purpose*". Far from rectifying the colonial anomalies, the first substantive national legislation on natural resources, The Unregistered Lands Act, 1970, proved even more repressive and detrimental. Article 4 (1) states that all land of any kind *whether waste, forest, occupied or unoccupied, which is not registered before the commencement of this Act shall be the property of the Government and shall be deemed to have been registered.*

The negligence of the rural people in policy-making and administration seems to have been facilitated by the on going marginalization of the rural people by the central Government.

Lack or as in many location the absence of infra structure and market facilities.

The successive spells of drought are hardly a new phenomenon in the wider region of which Sudan is part of it.

3. Natural Resources Governance as a core of sustainable development and livelihood improvement

3.1 Agricultural sector governance

Agriculture forms the largest single part of the economy and is also one of the largest and most serious environmental problems. Governance of the agricultural sector is relatively straightforward and well structured. There are Ministries of Agriculture and Ministries of Animal Resources to provide policies and projects that will rapidly increase food security.

Under prevailing Land Acts it seems difficult to devolve Natural Resources governance to the lowest accountable bodies and to people and communities. The land tenure situation is truly problematic and a major obstacle to sustainable land use. Prior to the 1970s, communal title to share rural land was generally acknowledged at the local level but undocumented. Traditional community-based land management systems were in place and apparently reasonably effective. This situation was radically changed in the 1970s by a number of ill planned initiatives, the consequences of which are still being felt today.

The imposition of the 1970 Unregistered Land Act effectively sequestered most of the untitled land (the majority of the rural Sudan) as Government property. An addition act at the same name, 1971 the People's Local Government Act effectively removed the authority from the pre-existing traditional land management systems, which had until then provided vital checks and balances in the absence of a modern land tenure system. As a result of this legislation and subsequent related acts, the majority of Sudanese are effectively farming and rearing livestock on Government land without any real supervision or form of title. As the pre-existing control measures are also either weakened or destroyed completely there is effectively a governance vacuum on rural land use in much of the country. This deficiency in rural land tenure is one of the root causes of many agricultural, environmental and social problems in Sudan. Without ownership, people have little incentive for investment in and protection of Natural Resources. Landowners, particularly smallholders are also vulnerable to more economically powerful or better armed groups, who may wish to dispossess them in order to utilize the land for their own purposes.

3.2 Forestry sector governance

Forests are one of the major natural resources in Sudan, and the history of legislation regarding the use of forests started during the colonial period with the Woods and Forests Ordinance 1901; the Forests Ordinance 1908; and the Forest Conservation Rules 1917. Through a series of legislative measures most forests became government property and extensive forests reserves were established.

3.3 Land governance

With the exception of the continuously cultivated lands in northern and central riverain Sudan; which is recognized and registered as private property; all other lands are registered as Government Land leased to different land users for certain period of time. Therefore land is a central issue to all rural communities. The concept of customary tribal homeland is the most important constituent of traditional land tenure in Sudan, and it is intimately related to the principle of native administration. The system follows historically derived tribal territorial rights initially constituted during the successive indigenous kingdoms of pre-colonial Sudan. Within the tribal homeland the collective security of the tribe is constituted and individual rights to land were recognized and could be inherited but with no power to alienate land from the ownership of the tribe.

3.4 Natural Resources devolution

Sudan environmental act which is supported by statements and articles in Sudan's 1998 Constitution; says the role of the state Government is environment protection, rational use and sustainable development for the benefit of generations. Under our federal system of today; the country is divided into 26 states. Hence responsibilities for environmental management are divided between the federal and state governments. The federal has the exclusive jurisdiction

on matters relating to natural resources, minerals, sub-terranean wealth and trans-boundary waters. Detailed regulations on lands, state forests, agriculture, animal and wildlife are state responsibility subjected to federal planning and coordination. In case of conflicts, federal jurisdiction prevails over the state one. Other issues which are considered joint or with concurrent powers include: environment, environmental health, tourism, town planning, housing and quarries.

3.5 Improved Natural Resources governance

As a result of more than four decades of instability, the governance system, including Natural Resources governance has been severely affected. Environmental governance, or the lack of it, is part of a larger problem. For this reason Sudan is described as land of misused resources, hardship and poverty. What is lacking is the improved Natural Resources governance. Improved governance of the immense diversified resources could change and improve the livelihoods the people in general and the rural poor in particular; where land is the basic survival and social reproduction, a source of individual and tribal pride, a general relationship between social groups and also a constant source of potential exploitation and conflict.

3.6 State governance

The most appropriate model for governing the country and ensures equitable access to resources and benefits, would be one that is based on political and fiscal decentralization. There is at present a general consensus in the country that empowerment of the local populations coupled with adequate transparency would improve governance and ensure local involvement in deciding what is best for local communities and how this is to be achieved. A start has been made in this direction with the creation of the federal structure since 1992. A critical and in depth evaluation of the experience with the current federal structures and arrangements would constitute the first step to future development of the system in the light of the lessons of experience. However, in this endeavour, adequate notice should be taken of the limitations imposed on the extent to which decentralisation can be advanced by shortages of administrative and institutional capacities, which would imply that some form of middle ground devolution involving the centre, the states and localities needs to be found for the short term. A concerted and effective programme of institutional and administrative capacity building specifically directed at states and localities and involving the engagement of Non-governmental Organizations (NGOs) in providing technical assistance and training, is to be designed for the medium term with the ultimate aim of improving both their institutional and absorptive capacities so as to enable a more far reaching programme of devolution of powers in future to the States/Localities thereby enhancing their empowerment and their contribution as effective vehicles for service delivery.

3.7 Land Tenure, Rural Poverty and conflict

Successive laws and decrees have undermined the legal rights of rural Sudanese communities in general, and the small producers (farmers and pastoralists) in particular. Especially egregious and repressive is the 1970 Unregistered Land Act that created land as a scarce commodity subject to privatization, accumulation by a minority and commercial speculation that resulted in modified local land tenure systems and conditions of popular access to and control over land and, therefore, setting in motion a process of continuous alienation of agro-pastoralists from their traditional homelands. The Act, a de facto nationalization by the state, denies any formal legitimacy or juridical status to traditional property rights and implies the cancellation of all rights relating to water, land and grazing by pastoralists, as well as the suppression of any future income related to such rights.

The Act effectively enabled the government to implement its development policy based on the horizontal expansion of the agricultural sector, both irrigated and rain fed mechanized. By 2001, the total area under mechanized farming reached 17.2 million feddan compared to 2.0 million in 1970/71, an increase of 606%. In addition, and upon facilitation by the Investment Act of 1990, vast tracts of land have been allotted to private capital investments, including

foreign capital, a situation that resulted in heavy cuts in rural communities' rights to land and dislocation of considerable people out of land.

In addition, the Act, together with the distorted and confused devolution of powers between the Central Government and the regions under the present Federal (decentralization) system, have also given rise to land claims with conflicting sources of legitimacy and contradictory outcomes regarding who can establish access to and control over land. This is believed to have brought about sharp swings in the land available for agro-pastoralists, thereby suggesting an intensifying resource scarcity, competition and conflict over land.

3.8 National Commitment towards Environmental Protection

Sudan was one of the earliest African countries to pass regulatory measures aimed at protecting various components of the environment and human health. In fact, a considerable number of regulatory measures were promulgated before the achievement of independence in 1956. The Diseases of Animals Act, 1901, the Locust Destruction Act, 1907, the Agricultural Pest Prevention Act, 1919 and the Foodstuff and Necessaries Act, 1926 are examples for legislation enacted during the Anglo-Egyptian Condominium epoch.

The successive national governments had also passed numerous regulatory measures with a view of protecting various environmental components and human health. The Water Hyacinth Control Act, 1960 , the Pharmacy and Poisons Act, 1963 the Crops Control Act, 1972 , the Ionizing Radiation (Regulation of Use) Act, 1971 , the Livestock Route and Veterinary Control Stations Act, 1974 , the Quarantine Act, 1974 , the Pesticides Act, 1974 , the Environmental Health Act, 1975 , the Public Health Act, 1975 , the Forests Act, 1989 and the Environmental Protection Act, 2001 are some few examples for the so many dozens of regulatory measures passed by the successive national regimes.

It is worth noting that most of the regulatory measures that were promulgated by the successive national governments had been subjected, either to amendment or abrogation. For example, the Pharmacy and Poisons Act, 1963 was replaced by the Pharmacy and Poisons Act, 2001, and the Pesticides Act, 1974 was abrogated by the enactment of the Pesticides and Products for the Combatement of Pests Act, 1994. The Forests Act, 1989 was also replaced by the Forests and Renewable Natural Resources Act, 2002. The Encouragement of Investment Act, 1999 can be cited as a best example for an enactment that had been amended and abrogated more than three times within four years.

Apparently, increasing global awareness during the past twenty years about the state of the environment and the need for regional and national cooperation in environmental protection had resulted in the adoption of relatively more holistic environmental laws compared with the already existing regulatory measures. In this regard, the best enactment to quote as an example is the Environmental Protection Act, 2001. By virtue of section 5 of this Act, the Higher Council for Environment and Natural Resources (HCENR) is established to shoulder the responsibility to delineate Environment and NR policies and put these regulatory acts on the ground.

3.9 Rural / Urban disparities

Indices measuring factors enabling a minimum of decent living reveal significant rural/urban disparities (Sudan PRSP 2004-2006). On average, the proportion of rural people with no access to electricity (87.4%), with no access to safe drinking water (53.0%), with poor sanitation (53.3%), dependent on the use of biomass energy (92.6%) are higher than those in urban areas. In addition, the rural national average for the composite index of deprivation at 74.5% is significantly higher than the urban national average of 54.3%. This is a reflection of the wide disparities in access to life amenities. In rural areas, the proportion of people with no access to electricity ranges from 99.6% in Western Kordofan to 57% in Khartoum (Annex 6.7 Administration Boundaries), the proportion of those with no access to safe drinking water ranges from 92.3% in the Blue Nile to 14% in Khartoum and the proportion of those with poor sanitation (no toilets) ranges from 89.1% in Northern Kordofan to 15.6% in River Nile State.

However, even in urban areas disparities between different parts are considerable. The proportion of people with no access to electricity ranges from 89.2% in Malakal to 27.4 in Gezira, the proportion of those with no access to safe drinking water ranges from 94.6% in Malakal to 3.2% in Khartoum and the proportion of those who depend on biomass energy ranges from 99.6% in Malakal to 40.8% in the River Nile.

Ranking States by rural deprivation in the combined economic index reveal that the most deprived areas are to be found in the Blue Nile, Northern Kordofan, Western Darfur, the Red Sea and Western Kordofan. These are rural areas with the highest levels of deprivation and are characterised by sub-group averages of poverty indicators that are higher than the national rural averages. On the other hand, ranking States by urban deprivation in the combined economic index reveal that the worst areas are Malakal, Southern Kordofan, Wau and the Blue Nile all of which have sub-group averages of poverty indicators that are higher than the national urban averages.

One of the main causes is the sustained urban bias of the development strategies adopted since independence. These tended to neglect the traditional agricultural sector where the vast majority of population lives and is the main source of rural livelihood. This resulted in high rural to urban migration unaccompanied by either increased productivity in the sector or sufficient urban development to generate the necessary urban employment opportunities. Not that the development of the agricultural sector was completely ignored but that it was dichotomous in nature in the sense that islands of modern irrigated agriculture coexisted side by side with vast traditional rain-fed agriculture. While the former benefited from modern scale specific technologies and market access, the latter lagged behind in terms of production technologies, finance, management, research, extension, market access and rural roads etc. As a result of this unbalanced urban/rural development structure, the traditional agricultural sector continued to be the major source of unlimited supply of unskilled labour to urban centres thereby swelling the ranks of informal labour markets where there is little employment at or near subsistence wages and exerting additional pressures on already limited and overstretched social services and facilities. These trends were further aggravated by those displaced by both natural (rainfall failures leading to famines) and man made disasters (civil strife).

3.10 Women and Environment

Yagoub, A.M (2006) reported that women in many parts of the country and their status as producers are generally marginalized because of the male and urban biased policies that affected their traditional role as resource managers. With environmental deterioration of natural resources, women's roles are rendered into survival strategies. Under such circumstances, women's new roles are directed towards food production and hence, their knowledge of natural resources is classified from a user perspective. Hence, they become to perceive natural resources differently and accordingly, they take decisions mainly to ensure food security. In this matter, group and collective work provided them with power to implement their priorities. They devised the *Sheikha* as an institution to mobilize women in communal activities and hence, integrate female efforts to male efforts in resource management. The survival strategies led to the creation of women institutions designed to lift the burden of resource degradation from women. All these led to changes in the strictly gender specific jobs as more women became involved in the establishment of woodlots, in the establishment of green belts and in other community activities.

3.11 Community rights and responsibilities awareness

Rural people are well aware about their rights and responsibilities for devolved natural resource governance under their traditional land tenure systems; under which the concept of customary tribal homeland is the most important constituent of traditional land tenure; which is intimately related to the principle of native administration. The system follows historically derived tribal territorial rights initially constituted during the successive indigenous kingdoms of pre-colonial Sudan. Within the tribal homeland the collective security of the tribe is constituted

and individual rights to land were recognized and could be inherited but with no power to alienate land from the ownership of the tribe.

The general features of customary tenure could be summarized in the following:-

- + Occupied lands for cultivation, pasture, woodcutting, etc are not formally registered.
- + Usufructuary rights, not ownership rights, are the predominant forms.
- + Rights are liable to be defeated/ reversed after the elapse of certain period of time over which such rights are not exercised.
- + Rights of excluding non-tribe members from the use of land.
- + Land is deemed to be the property of a tribe or clan and dealings in land are an exception rather than the rule.
- + The allocation of land rights is vested in the village's headman (Sheikh). The Sheikh has the right to divide the land within his domain among his villagers as well as to allot land to outsiders or to settle a dispute if he wishes to do so.
- + Women have restricted access to land rights and in most cases, they do not possess the land, unless inherited from fathers or husbands.

Land tenure legislation since Independence differed only in superficial respects from the colonial legacy. The only significant difference for agro-pastoralists is perhaps that the national governments took the colonial legislation and policies to their logical conclusion. It was in 1970 when the first substantive national legislation on natural resources, the Unregistered Lands Act, was introduced and implemented indiscriminately all over the country. The legislation proved even more repressive and detrimental than the colonial ones.

The 1970 Act even entitled the Government to use force in safeguarding its "land"; this has further been strengthened by the 1991-1993 amendments to the 1984 Civil Transactions Act, which states that: "No court of law is competent to receive a complaint that goes against the interest of the state." The question is whose land is then; is it a government or a tribal land? This is the dispute of day and it is one of the main reasons of conflicts in Sudan, (Darfur Crisis). Under such circumstances sustainable rural development is rather impossible.

4. Market chains and value added

In rural areas, the market catchments area is defined by the boundaries of the localities where you find market places and specific market days. People usually bring their products to these small local markets from which the middlemen take these products in bulk to the bigger marketing centers. The higher percentage of the revenue goes to these middlemen; the revenue trapped by the rural population is meager. Handling cost is sometimes prohibitive and may account for 37% of the consumer's price which seriously restricted the trade flow. At community level, interest groups of women and men producers could be established to exploit market opportunities made available by the vertical linkage for livestock production, the pre-financing of crop marketing, and the credit financing of value added enterprises. The interest groups can then be federated into an apex organization that will be active in facilitating trade transactions at the local markets level. This apex organization would then organize the market pre-financing for selected food crops (sorghum, wheat and millet) and cash crops (sesame, ground nuts, gum Arabic etc.).

The specific problem that needs to be addressed is that small producers tend to lose about 40% of the value of their produce each year because they are obliged to repay in kind and at a fixed predetermined price the production loan made under shiel (merchant) or salam (crop credit) systems. This requires establishment of a market pre-financing fund to provide the mechanism for optimizing returns to small producers from the sale of their harvest. The principle under which the market pre-financing fund is to establish a market committee at the local market level to manage the fund and the marketing operations; a floor price is determined at the start of the agricultural season for the purchase of surplus produce of a given food or cash crop. Small producers are paid the full floor price in cash at delivery of their

product to the marketing committee. The committee will store the produce and sell at opportune times when prices rise. At the end of the season, the profits will be distributed will distributed between the producers, the marketing committees managing the fund and the financial institution administrating the fund. The marketing committee can be the apex organization producers' interest groups, the farmers' union, or the locality, provided it is an institution that can be made accountable to the producers.

4.1 Market structure

It refers to the elements that make up the market and influence its behavior and performance in terms of efficiency in resource use, development in the commodity and its supply, relative stability in prices and equity along the commodity chain. Such elements include: seller concentration, product differentiation, barriers to entry of new actors or firms, buyer concentration, height of fixed cost and barrier to exit beside growth rate of market demand.

4.2 Grain market structure

The market structure of sorghum is defined to be an oligopoly. The market is dominated by few farmers' traders who influence very much the prices in the market. Producers of sorghum in the mechanized sub-system are also traders and speculators and often have oligopolistic control over the sorghum market. Their relative price setting power is further enhanced by the country's size and seemingly isolated sorghum markets.

Wheat market is more or less of a competitive nature by virtue of having large number of buyers and sellers, mostly in northern Sudan. The market for wheat flour is monopolistic in nature. They import huge quantity of wheat from Canada and Australia.

For millet the structure is very much of oligopoly because of the few big traders. At retail level the structure resembles very much pure competition in western Sudan and in the vast rural areas and rural cities where buyers and sellers concentration is low.

Cereal markets are rudimentary and underdeveloped. Grades and standards are lacking or poorly implemented. Cereals trade is highly influenced by the structural production problems (low productivity and high production cost), leading to various interventions by various actors. The cereal market is best described as oligopolistic in nature. Major markets are fairly integrated but irregular price behavior appears as result of different trader's tactics and poor infrastructure. Market information are collected by many actors but the scope and coverage are limited. Similarity in markets in either of supply or demand zones is an advantage that helps actors to concentrate on few typical markets and stretch the variables coverage.

Horticultural market is considered rudimentary. Production preparation which is essential in horticultural crops is minimal; grading based on varietals differences is the most recognized standard. The market is dominated by few established small traders; mostly oligopoly, but the nature of the product undermines very much the tactical behavior of oligopolists. Distribution channels are short and direct and variable in nature (from food catering to grocery stores to street vendors). Commission brokers at terminal markets are many and form a distinct feature of horticultural trade in the country. The horticultural centre market in all major cities plays a major role in price setting especially for the highly perishable crops. It is also accessible to many traders resulting in shorter distribution channels. There is limited information available on the commodity market, mostly related to collection of government dues. Recommended activities for better market analysis and planning for this sector development include 1- Market monitoring through expansion of information coverage in few typical markets and in the potential zones. 2- Intensive coverage of greater Khartoum.

4.3 Livestock markets

Primary Market: Parts of the village market or open ground in or around the village in production areas where selling and buying take place in specified or unspecified time. Have no physical infrastructure. Transit where animals do not stay over night, usually market days end at 4.00 P.M. Selling and buying by direct negotiation or some times through an agent.

Secondary markets: Have some facilities and infrastructure. Animals may stay overnight before being moved to the next destination.

Terminal markets: These are livestock and meat terminal markets. Usually at big cities. Have proper fencing, water and feed facilities. Animals are destined here for exports.

4.4 Agro-industry

Sudan agricultural exports comprises: cotton, sesame, ground nuts, gum Arabic, sorghum, camels, cattle, and sheep. All of which are exported as raw or live animals. The country has started processing cotton and sugar cane. Rural people can process all their produce to clothes, vegetable oil, processed gum, meat, leather products, handicrafts etc. What is lacking is the technical know how, infrastructure and financing. If the state or the internal community, could help these rural poor, they will certainly better process and value-add on their natural resources based products.

4.5 Market channels

Agricultural commodities whether they are cash or food follow different channels before they reach the consumer or shipped abroad. They start from the farm gate to the local markets at village level. Food crops go either to the consumer or to the middlemen and retailers. Cash crops go directly to middlemen and small traders who take it to bigger traders in big cities or to export companies. Livestock follow the route discussed under the heading livestock markets.

5- Natural resource economics and national accounting

Crop production and animal raising are the two main occupations in the country where agriculture contributes 31% of the country's Gross Domestic Production (GDP). (Table 3) compared to other kinds of the economic activities. Relating population to GDP at market price, The Central Bureau of Statistic- National Accounts Administration (2007) reported GDP per capita for year 2006 at current price million Sudanese Pounds (SDG millions) as GDP=95303.611, population= 36297.0 and the GDP per capita= 2.625.

Table 3: Gross Domestic Production by kind of Economic Activity at current market prices for years 2004 – 2006 (SDG millions)

Kind of economic activity	2006	2005	2004
Agriculture, Livestock, Forestry and Fishing	29652.721	26324.280	23369.447
Petroleum	9485.647	6720.022	4760.740
Mining and Quarrying	191.988	151.842	120.090
Manufacturing and Hand crafts	8908.158	7546.217	6392.500
Electricity and Water	1140.337	972.254	828.954
Building and Constriction	4130.907	3286.393	2614.530
Commerce, Restaurants and Hotels	14888.352	12664.686	10773.138
Transport and Communication	11356.668	9773.212	8410.537
Finance, Insurance, Real-estate and Business services	7189.519	6172.878	5299.995
Community, Social and personal services	1168.144	1034.808	916.692
Nominal finance institutions	-661.306	-597.146	-539.211
Government Services	5357.736	4539.107	3845.560
Producers of private non-profit services to Households	907.033	801.283	707.862
Import Duties	1587.707	1373.388	1188.000
Grant total GDP	95303.611	80763.224	68688.825

Source: Central Bureau of Statistics- National Accounts Administration

Sudan's economic performance since independence in 1956 has been well below expectations particularly in view of the country's endowment with natural resources and the substantial investments made in human resource development and skills. At the heart of this phenomenon lies a civil war that has been raging since independence except for a brief respite after the Addis Ababa peace agreement of 1972. Another major contributing factor was weak and inappropriate economic policies that prevailed for the better part of the post independence period. At the present time, Sudan stands at the cross roads of major change. Peace finally seems to be at hand and major economic reforms were undertaken over the past few years resulting in improved economic performance and setting the stage for more inclusive, equitable and sustained economic growth. Though both these developments are welcome, their interaction poses new challenges to the country – namely how to meet the immediate demands of the peace and maintain a favourable macro economic environment for enhanced growth and development.

5.1 Sudan and the MDGs:

Being a member of the UN, Sudan is committed to the realization of MDGs and will spare no effort to achieve them. By examining various official planning and policy documents, there is clear reference to the MDGs and the aspiration of the country is to achieve the goals within the timeframe specified in this regard. This is evident both at the overall national level and sectoral policies and plans. Further, the MDGs have been the central theme of the ongoing process of developing the *National 5-year Strategy (2007-2011)*; an issue that reflects a political commitment to the development goals and Sudanese aspirations.

The efforts of the Ministry of International Cooperation (MIC) have been focusing on advocacy and reporting on progress toward implementing and achieving the MDGs. However, this effort of the MIC should be expanded to a clearly spelled-out implementation arrangement and identified institutional structures -including other government bodies- mandated with the task of overseeing the implementation of the MDGs.

5.2 MDGs Status and achievement:

Various documents and available data show that there has been slow/ moderate progress regarding the achievement of the MDGs.

Goal 1: Eradicate extreme poverty and hunger

Poverty: There is a wide agreement that achieving Goal-1 is essential to the achievement of many of the other goals; and conversely achieving Goal-1 will be impossible without progress in the rest of the MDGs.

To compare poverty rates across time; national poverty line is needed, for which there is no consensus in Sudan yet. Given the type, comprehensiveness and focus of the current available data it is not possible to reach an accurate estimation of the level and rates of poverty in Sudan at the present time. This can be attributed to the lack of recent poverty specific data (the last nationally representative household income and expenditure survey was carried out in 1978).

The results of recent surveys, though not poverty specific in focus or design, has been used to map-out human poverty in Sudan in terms of deprivation in three dimensions: 1) survival; 2) knowledge; and 3) a minimum level of Decent Living Standards. These- in broad terms- are similar to the Human Development Index developed by the UNDP and used in its annual global report about human development. The human development index (HDI) is a simple summary measure of three dimensions of the human development concept: 1) living a long and healthy life, 2) being educated; and 3) having a decent standard of living. Thus it combines measures of life expectancy, school enrolment, literacy and income to allow a broader view of a country's development.

Achievement: Using the above mentioned proxy indicators and data from recent surveys underscore widespread poverty in the Sudan. Based on data from these surveys; the Poverty Unity in the Ministry of Finance and National Economy imputed that poverty in Sudan will be in the range of 50-60% in Northern states and much higher in Southern states.

Further, data indicate that most of the poor are rural residents, though urban poverty is also prevalent as a result of internal migration resulting from inequality access to resources and power and underdevelopment in rural and underprivileged areas in different parts of the country.

Observation and anecdotal evidence tells that the progress toward achieving this target on of eliminating poverty and human deprivation has improved in the last 5 years compared to the levels of the 1990. This is consistent with the levels of Sudan Human Development Index (HDI). Sudan has scored in 2003 (0.512) compared to (0.465) in 1995 and (0.500) in 2000. The HDI for Sudan in 2003 (0.512) placed Sudan in the list of countries with Medium Human Development Index.

Hunger: Although the country is considered agro-pastoral with estimated annual production - from wheat, sorghum and millet cereals- of about 3.6 million MT in 2000 and 5.3 million MT in 2005. Yet, this fall short from the estimated consumption levels, for instance in 2006 the estimated production is 5.3 million MT and the consumption is 6.8 million MT, with regional and seasonal variation in production, consumption rate and access to dietary needs. Further, the country has a very good livestock and it constitutes 45% of the agriculture sector contribution to the GDPs. Vulnerability to food insecurity and consequently hunger is high due to natural and man made conditions.

Chronic hunger as measured by the prevalence of underweight children under-five years of age and the proportion of population below minimum level of dietary energy consumption has improved in form the levels of 1990. The prevalence of underweight children under-five years of age has slightly improved from 33% in 1990 to 29.6% in 2006 (SHHS, 2006). For adult nutritional status which is measured and tracked by the Proportion of population below minimum level of dietary energy consumption, the level declined from 31% to 26%.

Nevertheless, in addition to inequality, overall progress is not on track to achieve the goal and in some areas the conditions have deteriorated. For instance the undernourishment prevalence (height for weight) is only 8.8% in Gezira state and hit 37.1 and 38.9% in Upper Nile and Unity state respectively (SHHS, 2006).

Goal 2: Achieve universal primary education

Education: Achieving progress in education, in the long run, is essential to achieve other MDGs such as tackling poverty and disease. Available data shows that the overall progress in basic education is still low and has been improved from 48% in 1991 to 60% in 2004. The Net Enrolment Ratio for 1991 is only 40% increased to 53% in 2006. With regard to Adult and youth literacy rates some progress has been realized, the Adult literacy rate improved from 45.8% to 60.9% and youth literacy rate moved from 65% in 1990 to 77.2% in 2004

Further, there are huge regional disparities. The higher levels of enrolment are found in the more prosperous northern regions that are not directly affected by the conflict, whilst the lowest ratios correspond to the conflict affected regions of the South, the West and Eastern Sudan.

Goal 3: Promote gender equality and empower women

Government of Sudan in recognition of the status of women and their central role in the society and social and economic development, a number of strategies, policies and programs had been initiated. MDG 3 has received an appreciable attention and is considered as a framework to facilitate women's full participation in all spheres of life and attaining a sustainable social development. All constitutions have given women "equal right" without discrimination as to sex, race or religion. Available data shows that the rate of women participation and voting in general elections is higher than that of men (National Election Authority, 2000), reflecting the key role of women in political, social and economic life. However, we have to bear in mind that there are social values and some tradition that affect the realization of the full potential of women especially in rural and peripheral areas and regions where illiteracy rate is high.

Fortunately, the government has recently endorsed a national policy for women empowerment and action plan for the years 2007-2011. This policy document and its action plan -developed with optimism with regards to the six critical areas of concern- have addressed and emphasized these areas of concern emanating from the Beijing Platform for Action and are consistent with it.

Achievements: using the agreed to MDGs indicators to judge progress tell that noticeable progress in Goal 3 has been achieved. The Ratios of girls to boys in primary and secondary education have improved significantly from 0.85 and 0.92 in 2000 to 0.92 and 1.0 respectively in 2005. However, the ratios of girls to boys in tertiary education have reach 1.4. Also ratio of literate women to men, 15-24 years old improved to 0.58, the share of women in wage employment in the non-agricultural sector increase from 26% in 2000 to 30% in 2005 and the proportion of seats held by women in national parliament increase from 10% to 18.3% in 2005, which are good in comparison with regional levels.

Goal 4: Reduce child mortality

The child health indicators showed significant improvement between the baseline levels of 1990 and 2006. For instance, the Infant Mortality Rate reduced from 80ⁱ to 68ⁱⁱ in 2000 and further declined to 52/1000 in 2006. The under-5 mortality rate per 1,000 live births declined from 143 to 73 deaths /1000 live births in 2006. Nevertheless, disaggregating data shows marked disparities in infant and under-5 mortality between states and urban rural population as well as mother education and level of social class. The Expanded Program on Immunization (EPI) has achieved the national target of DPT3 coverage of over 83%.

Analyzing health care utilization data from health statistics indicate that the majority of morbidity and mortality among under-five children is due to diseases including Malaria, Pneumonia with other ARI s, Diarrhea, Malnutrition and Measles.

These data indicates the strong link between Goal 4 and other MDGs particularly Goal 1, 2 and. This goal is likely to be achieved by 2015; however, scaling up of services and interventions targeting under-five children is required.

Goal 5: Improve maternal health

Overall MMR in north Sudan has been reduced from 552 in 1990 to 509 maternal deaths per 100,000 live births in 1999, the result of the SHHS, 2006 still not ready and expected to show some progress. However, the preliminary findings of the SHHS from north Sudan showed considerable improvement in Khartoum, central and northern regions. But the conflict affected states showed some deterioration. These ratios are better than those in many countries in sub-Saharan Africa, but they are the worst in the Eastern Mediterranean region.

Goal 6: Combat HIV/AIDS, malaria and other diseases

Epidemiological studies showed that the country is classified to be in an early stage of a generalized epidemic. The prevalence rate among adult population is 1.6% among the general population. There are, however, regional variations: the prevalence of HIV infection is higher in the Southern states, Eastern states, Khartoum and White Nile States. Further, the number of reported AIDS cases is increasing from year to another.

The comprehensive knowledge about HIV Prevention (Proportion of young women aged 15-24 years who both correctly identify ways of preventing the sexual transmission of HIV and who reject major misconceptions about HIV transmission) is improved from 2% in 2000 to 9.4% in 2006.

With the increased donor funding, signing of the CPA and the high political commitment the National HIV/AIDS Control Program is in a better position to accelerate its activities to prevent further deterioration in the situation.

Malaria:

Annually, malaria is estimated to cause around 7.5 million attacks of sickness and to kill around 35,000 people. At public-sector health facilities, malaria accounts for about one-fifth of outpatient attendances and in public-sector pediatric hospitals the case fatality rate ranges from 5% to 15%.

The caseload has been reduced somewhat in recent years. The annual parasite incidence per 1,000 people fell from around 400/1,000 in 1993 to 71/1,000 in 2005 and is declining since then.

The Sudan Household Health Survey 2006 showed that 49.8 percent of children under the age of five slept under any mosquito net the night prior to the survey. The percentage of households with at least one insecticide treated bed net is 18.1%.

TB

TB accounts for 12% of hospital admissions and is one of the main causes of hospital death. The results of the recently conducted tuberculin survey are not yet available. Nevertheless, the available data dating back to 1986 estimate the annual risk of infection to be 1.8%, of which around half are smear-positive. Accordingly, the total case load is estimated to be around 50,600 cases.

In the year 1999, maximum case notification was reached (26,950), but since then, case notification showed a gradually declining trend. In 2005 the case detection rate was 44.3% which is far below the global target of 70%. The majority of TB patients are in the productive age of their life (15-45 years). There is also a strong link with HIV/AIDS; over the period 1988-96, 6% of TB patients were found to be HIV-positive.

Goal 7: Ensure environmental sustainability

Environment resources sustainability:

Sudan is endowed with huge and diversified natural resources. Fertile land, natural forests, fresh water, biodiversity, wild and domestic animal stock, marine ecosystems, mineral and oil resources and reserves. The challenge is how to effectively manage, protect and develop in a sustainable manner.

Modernization of the economy and the social life has brought about many changes. Massive agricultural schemes like the Gezira (2.5 million Feddans), and other schemes were established. This involved building dams and irrigation works (10 thousand km of canalization in the Gezira scheme alone). Many industrial complexes were also established in main cities. Further, in the mid 1990th oil production started.

Several factors, including mismanagement, natural and manmade disasters, have contributed to a range of environmental problems including land degradation and desertification, deforestation, soil erosion, water pollution, energy scarcity, human health hazards, deterioration in biodiversity.

As a member of the international community, the government of Sudan is committed to many environmental conventions including, the list below, though not inclusive, represent the key international convention that the government has signed/or ratified:

- UN convention to combat Desertification (UNCCD) signed on June 1992 and ratified on 1994;
- UN convention on biodiversity signed in June 1992 and ratified on October 1995;
- UN framework convention on climate change (UNFCCC) signed June 1992 and ratified on Aug. 1993
- Kyoto Protocol to UNFCCC signed and ratified on Feb. 2005

The commitment towards environmental protection is motivated by assuming its reasonability in this regard and the local situation of the environmental deterioration mainly desertification, soil degradation and, the endangered biodiversity and frequent drought. This Realizing these fact, Sudan was one of the first African countries to promulgate legislation concerning protection of the environment. Government records show that there are about 150 Acts, orders and guidelines and regulations addressing environmental issues since 1903.

Soil degradation: is a major problem since it means the inability of the resource to sustain production. Soil degradation has resulted from repeated use of fire deforestation, drought and the dearth of reforestation efforts.

Biodiversity: According to the National Drought and Desertification Control Programme's Monitoring Unit, more than half the land area is affected by desertification – as a result of inappropriate land use methods, over-cultivation, over-grazing and deforestation. In 1990 deforestation was taking place at 1.06% per annum. It is found that 504 thousand hectares are deforested annually, but only 30,000 ha are reforested. A number of wild life species were lost in the last two decades; many more are endangered or vulnerable. This is mostly due to habitat destruction. Several grasses and herbs have disappeared due to overgrazing, repeated droughts and fires.

In the urban areas there are serious problems of industrial pollution, especially in Khartoum, Port Sudan, Wad Madeni and El Obeid where industrial enterprises are discharging raw, untreated effluents and toxic wastes. This takes place in the absence of guidelines, standards and enforceable legislation on industrial pollution or environmental control.

Access to safe Drinking water: Though Sudan has huge water resources, yet access to safe drinking water and adequate sanitation remain a major concern for Sudan. In rural areas the overall daily per capita amount of drinking water was only 35% to 60% of the minimum required amount and in urban areas 38% to 44%. Population with access to an improved water source is only 59.3% and the proportion of those who have access to improved sanitation is only 31.2%.

Inequity and equality in the proportion of population with access to an improved water source are also prominent among regions and states. The levels ranging from 24% in Blue Nile state

to 93% in Khartoum state. In many parts of the country accessibility hinges not on the physical availability of water but, rather, on how water is managed.

Slum and improved housing: The arrival of internally displaced people has heightened the demand for shelter in receiving areas that were not even meeting the demands resulting from natural population growth. This has put increasing pressure on infrastructure and social services. Most of the occupants of the squatter settlements tend to dispose of human excreta in open spaces and dispose of solid waste in streets between the houses and in other open spaces – a consequence of the unavailability of proper sanitation and of rural cultures.

On average it is estimated that 64% of the population have access to sanitation, though there are wide regional variations. The ratio of populations who have access to sanitation networks are only 6%, while the ratio of urban population who have access to septic tanks is not more than 3.5%. For the Northern States, according to the population census: 45% has pit latrines, corresponding figures for Urban and rural are 58% and 38% respectively.

5.2 Marketing and Trade

Agriculture plays the major role in the Sudanese economy which is reflected in remarkable crop and livestock production. Ministry of Finance (2003) showed 4583000 metric tons as total production for the main food and cash crops (dura, wheat, groundnuts, sesame and cotton for year 2000). Likewise 8824000 metric tons of animal products mainly milk, meat, fish, poultry meat and eggs for year 2001 to meet both local markets demands and the export. The major export commodities include; cotton, oil seeds, gum Arabic, hides and skins, horticultural crops life animals, etc. However, only 3-4 commodities account for the bulk of Sudan export trade.

Access to international markets is considered as the main constrain which has decreased the growth rate of the Sudanese exportable commodities because of its inability to meet the requirements of the foreign markets. As well the country is suffering from lack of competitive ability due to high production cost, poor transportation and marketing facilities in addition to the lack of suitable physical infrastructure. Further more, lack of information regarding availability of export opportunities, consumer preferences and the market structure of the importing countries.

At rural level, marketing and rural financial services has been found to be the most tangible focus for beneficiary group formation and their participation in productive activities. At the same time, previous interventions with financing crops – essentially of subsistence nature- have not been successful and forced beneficiaries into the poverty trap through defaults and debt rescheduling. To improve the situation we need to focus on improving productive enterprise through emphasis on marketing and produce added value opportunities. This could be achieved through:-

- Rural feeder roads to enhance trade opportunities, food security and improve social and civil security.
- Conduct marketing studies, set up a market information system and train the main economic actors on use of the market information for business development.
- Provision of investment financing to allow the target group the means of exploiting improved marketing arrangements and improve their business and trade performance.
- Rehabilitation of the existing facilities.

5.3 Strategic environment assessment

During the past three decades of war, limited efforts were exerted to streamline environmental concerns developing programmes and most of these efforts were triggered by the donor community and yield development of environmental strategies that addressed specific environmental aspects such as Biodiversity, Climate Change etc. however the implementation of these strategies/action plan was hindered by lack of a holistic view on environment and development and the limited financial resources. Moreover, most of these strategies/studies

did not cover the South Sudan due to security reasons. As the reconstruction and development process proceeds, environmental and natural resources management and conservation must be streamlined into every decision making process to achieve long-term prosperity, economic security and sustainable livelihoods.

6. Management Systems

6.1 Government system

The concept of management of the natural resources and environment have evolved through a long history of surveys, studies and assessments of the natural resources situation in the country since early 1930's. By time the question of the effect of the use of water resources on the vegetation cover as resulting in land degradation came to the foreground. The implied effects gradually led to the formation of the Soil Conservation Committee in the early 40's to develop policies for the conservation of the natural resources, with its works consolidating soon in 1946, into an implementation arm – the Soil Conservation and Land Use Department.

From that time till and now, Sudan has made long strides in attempting to manage its natural resources.

Accompanying the evolution of the institutional structure, there developed a large body of Legislation of Conservation of Natural Resources, and concern about phenomena like desertification and land degradation.

6.2 NGO'S

Many NGO'S foreign and national, in addition to CBO'S are involved in natural resources and environmental conservation, as part of their developmental pursuits.

6.3 Communities

Communities are of variant presence and constitution, existent in rural and urban areas. They are interactive with the resources and the environment in their livelihood pursuits. The government institutions and NGO'S converge at some points with the communities, reaching them as recipient of development inputs and care-takers of the environment, through jointly implemented programmes. The substantial roles of communities in managing their resources feature high in evolved indigenous systems of exploitation and conservation. In all rural areas, communities, through their native bodies own the land, and allocate it accordingly to individual needs. This is observed through customary law and traditional conservation mechanisms.

Under developmental activities including public development programmes and donor assisted projects, communities have proven to be responsive in organizing themselves to receive input deliveries, also responsive to building environmental awareness; through entering into viable partnership, through evolved modalities, in forestry conservation, income generating activities, health, education and water supply programmes, with an emerging role for women in the different programmes.

7. Emerging issues

While the various and recurring conflicts that have plagued Sudan since independence can be attributed to a host of inter-related, cumulative and complex factors, natural resources have played a key role in triggering and fuelling these civil wars. The issue of who controls natural resources, who has access to them, how they are distributed and who participates in the decision-making process, has often been among the root causes of the Sudanese conflicts. Consequently, in order to restore lasting peace and ensure Sudan's future stability and

sustainable development, any reconstruction efforts and peace-building initiatives will need to actively address environmental issues and natural resources management. So far, most of the questions surrounding environmental issues have not been addressed adequately or equitably, and competition over 'scarce' natural resources is still fuelling ongoing conflicts and could re-ignite others. It should thus be obvious, that any efforts by the international community and the people of Sudan to restore peace throughout the country will have to rest on a comprehensive, efficient and sustainable approach to natural resources management.

In a country where 80% of the people directly depend on their natural environment for their livelihoods and survival, and where agriculture contributes nearly 31% to the country's GDP, the way in which natural resources are tackled and especially how the land issue is addressed, will have a determining impact on Sudan's future development pattern. It is particularly crucial that in the early stages of the reconstruction process, sound foundations are put in place to ensure equitable and sustainable development.

In this regard and since the vast majority of Sudanese people depend on land and water resources to make a living; the way land and water resources are managed has a direct impact on both Sudan's human and economic development. Issues of **desertification** and **land degradation** are thus of major importance. Both reconstruction and development projects will need to take this into account and ensure that further degradation does not take place while also providing for an adequate level of restoration.

Land degradation is particularly acute in Sudan and results from a combination of factors, including, population growth, increasing poverty, unchecked agricultural expansion combined with unsustainable practices, deforestation, lack of a coherent land use and tenure policy, and a variety of institutional factors. Faced with a growing population, authorities in Sudan have promoted the horizontal expansion of mechanized rain fed or irrigated agriculture to compensate for declining yields. These agricultural schemes are often characterized by monocropping and intensive cultivation practices, which tend to leave the soils nutrient-deficient and eventually lead to further land degradation. This is particularly the case in the northern parts of the country. Small-scale farmers and herders also contribute to land degradation and desertification, through the cultivation of unsuited, marginal or protected areas, overgrazing and deforestation.

Deforestation occurs especially in the southern parts of the country where vast areas of the forests are harvested each year to accommodate agricultural needs, as well as to provide construction material and energy in the form of fuel wood and charcoal. At present, over 80% of Sudan's energy needs are met by biomass products.

While Sudan is endowed with a wide range of species and ecosystems diversity, years of continued warfare and increasing poverty have had devastating consequences on the country's **biological diversity**. Both plant and animal species are being destroyed to meet military (feeding soldiers, financing military equipment...) and agricultural needs. Sudan's national parks and protected areas are also under threat from encroaching agricultural practices, pervasive poverty, and a lack of control and policing. In short, deforestation and biodiversity loss in Sudan have their causes in agricultural expansion, heavy reliance on biomass, overgrazing, lack of protective and enforcement mechanisms, population pressure, and years of conflicts.

With regard to **water resources** and although little reliable data is available, Sudan's rivers and coastal waters are under threat from chemicals (pesticides & fertilisers) and various pollutants (e.g. Persistent Organic Pollutants) mainly as a consequence from agricultural and industrial activities, as well as inadequate waste disposal techniques. Similarly, siltation, sedimentation and the proliferation of aquatic weeds (e.g. water hyacinths) also pose a threat to the country's waterways. The same is true for Sudan's wetlands, particularly the Sudd wetlands, the largest in Africa, which are of global significance and fulfil a crucial ecological

and regulatory role. With this in mind, any future developments, such as road building and rehabilitation, or canal and dykes construction, will need to take into account potential wetlands loss or degradation.

Apart from affecting Sudan's aquatic diversity, the unchecked pollution of waterways has direct impacts on human health, and certain irrigation schemes and water harnessing methods create favourable breeding conditions for water-borne diseases such as malaria and bilharzias. Finally, while freshwater resources are rather plentiful in the South, the northern parts of the country have to make do with limited and relatively scarce and variable water resources. Thus effective water conservation techniques combined with a reduction in water loss, through leakages, evaporation or inefficient irrigation systems, must be put in place.

In conclusion, issues of land degradation, desertification, deforestation, loss of biological diversity and the degradation of water resources are all closely inter-linked and impact on each other in a variety of ways. In turn, they are caused by a series of common and crosscutting trends and issues. Among these are the fact that Sudan and its people have been in a state of conflict for many decades, deepening poverty and under-development (94% of the population lives below the poverty line), weak environmental governance and capacity, inadequate agricultural practices and land use policies, population growth (2.7% annually on average), and overall lack of environmental information and data.

Apart from environmental problems directly linked to the country's natural resource base, Sudan is also faced with environmental challenges related to its present and future economic development, such as **urbanisation and industrialisation**. While economic development and industrial growth can have positive social and human development outcomes, they can also be accompanied by serious negative consequences for the environment and human health. The challenge for Sudan will be to ensure that economic growth is sustainable by meeting the people's social needs without causing damage to human health and the environment.

Although at this stage, industrial pollution might not on the whole be the country's most pressing environmental issue, due to the relatively small size of its industrial base, the fast developing oil industry will most probably accelerate the pace of industrialisation once a comprehensive peace agreement is signed. With this in mind, Sudan and its partners, should ensure that the oil sector in particular and the industrial sector in general put in place clean production processes and techniques, and conduct environmental assessments of their activities, products and services.

With industrial development and peace, Sudan's major urban centres, which are already confronted to uncontrolled and unsustainable urbanisation, will most probably be faced with an even faster urban growth rate. Here again, the necessary tools and institutions need to be put in place so as to prevent, or at least mitigate the worst effects of rapid and uncontrolled urban growth, among these; inadequate public transport systems, poorly maintained or inexistent sewage systems, air pollution, inadequate power and water supplies, and poor housing conditions.

8. Recommendations

a- The policy, legal and institutional framework created during the past century has been rendered inadequate by the tremendous changes in the social, political, economic and cultural circumstances of the country over this period. The increase in population and the large-scale process of population redistribution have resulted in a heightened demand and competition for access to land and other natural resources. In addition the changes in the global environment brought about by the globalization of economies and politics have combined to create a reality that is significantly different from the one conceptualized when the existing frameworks were created. This reality calls for a whole new approach to land tenure and natural resource governance. An important task for the future, then, is to address the injustices produced by earlier land use practices and to provide a secure tenure situation for rural communities, the overwhelming majority of the population.

The essential step here is the clarification of the national positions in respect of all matters concerning access to, control and use of land. This essentially involves land reform that has two interrelated aspects, namely policy and substantive law.

- a) Democratization of land administration systems and structures
- b) Clarification of the relative position of individuals in communities in which they live for the design of new land rights systems.
- c) Comprehensive and integrated resource management that suit the complex realities of Sudan environments.
- d) Examination of the shortfalls of customary land tenure, particularly measures relating to democratization of local administration systems and discrimination against women.
- e) A fresh look at the resources of the country, by conducting surveys and studies that enable factual standing on these resources. 200 million feddans of arable land as the country's potential for agricultural development, quoted through the different epochs, has become questionable.
- f) Focus on development of regional plans, to be based on the 26 states, to assess resources in each, identify problems and potentialities, and design action programmes to arrest ongoing hazardous use, and promote the rational utilization of the available potentialities. The plans should come within timeframes of long term durations.
- g) Based on the state's regional plans, develop a country master plan that caters for economic development, natural resource conservation, and environmental enhancement.
- h) Complementary to the above; implement National Action Plan for combating desertification (NAP). (Annex 6.8), for its specific role in arresting a problem which is severely affecting the greater northern part of the country, and for its addressing of identified issues in the states.
- i) Fill the gap in current policies of handling the natural resources and the environment as separate entities, by strengthening actions leading to the integration of the two fields, resource-wise, institutionally and in programmes.
- j) Invigoration of existing legislations in areas of natural resources and the environment, and filling the gaps in laws and regulations, for more effective management in the two fields.
- k) Plan with the people, by working closely with the communities as essential stakeholders at different levels, for the popularization of the natural resources and environmental policies, and the accompanying legislations and programme for attaining integrated actions.
- l) Coordination of the efforts targeting of the development of the two fields (natural resources and the environment) through creation of bodies that bring together the government apparatuses, the different stakeholders, and the donor's community.

Annexes

Annexes 1: Terms of references

Terms of reference for study

The national consultant for Sudan will produce a National Situation report of no longer than 31 pages (excluding annexes) in a format as described in Annex 1. The report will address, but not be limited to the following major areas (the questions are meant to assist the national consultant in exploring the main theme in question and are not all inclusive):

1.1 Livelihoods (wealth creation, poverty reduction):

- How are natural resources a core component of people's livelihoods?
- What contribution do environmental and natural resource assets make to the achievement of the MDGs and PRSPs?
- What are the policy and legal incentive in place (or evolving) to make this happen?
- What are the perverse incentives (policy, law, markets) which prevent people from being able to benefit from their natural resource assets on a sustainable basis?

1.2 Natural resource governance (rights, equity including gender, devolution):

- To what extent has natural resource governance being devolved to the lowest accountable bodies and to people and communities?
- How can improved natural resource governance improve rural people's livelihoods and reduce risk;
- To what extent is policy and legal rhetoric being put into practice on the ground?
- Is their and equitable (including gender equity) distribution of the costs and benefits of devolved natural resource governance, including equity in access and ownership rights, land and resource tenure?
- Are rural people and communities adequately informed about their rights and responsibilities for devolved natural resource governance, and are they in a position to take on such rights?

1.3 Market chains and value adding on Natural Resources:

- How can rural people better engage in the market so that larger proportions of income from natural resources are trapped at the community and family levels?
- What are the policy, institutional and structural impediments for such engagement? How can these be resolved in a practical manner?
- How can rural people and communities' better process and value-add on natural resource based products in a manner that is socially beneficial and environmentally sustainable?
- What are the market chains for natural resource products? How can they be made more equitable and efficient?

1.4 Natural resource economics and national accounting:

- How are natural resources reflected in national accounting, and other measures of national growth? How can this process be improved?
- Does the country have indicators (and means to measure) that reflect the value of the environment and natural resources in the PRSPs and the performance of all the MDGs?
- To what extent are natural resource assets reflected in national and regional marketing and trade? How can this be improved?
- Is Strategic Environment Assessments (SEA) used in a practical and function manner so that the different sectors (and programmes) responsibly integrate environmental aspects of direct relevance to the sector?

1.5 Emerging issues: There are a variety of emerging issues which have a potential important impact on the overall theme for the conference. These include Invasives, Climate change and adaptation, GMOs, Carbon trade, “food miles”, pandemics such as HIV/AIDS, effects of globalization, and conflict and insecurity.

- What are the key emerging issues in ?? {country}? How do they impact on, or are impacted by the environment and natural resource base?
- What strategies and actions can be suggested to better integrate these emerging issues into national development and environmental planning processes?
- The executive summary of the report should be in a format that can be extracted from the main report and be part of a short (approximately 2 pages, or four sides of A4) publication highlighting the main issues of the national report. This two page publication will be shared with the participants of the conference and be more widely available.
- In the conclusion section of the report (and also summarized in the executive summary) the consultant should suggest up to four main questions (based on his/her analysis of the situation in Sudan that could be suggested for the conference to deliberate on with a view to developing some concrete action points.
- To achieve these terms of reference, the consultant will be expected to consult with a variety of stakeholders (Government, NGO and Civil society). This will probably be confined to those in the country’s capital. Such consultations should be augmented by both the published and grey literature that relates to the issues being analyzed.

2 Outputs Expected

National Situation Report for Sudan ; and Draft of a stand alone 4 page document (comprising the summary of the report) which will be the basis of a short publication

3 Contractual Obligations

A draft National report shall be received by IUCN and IGAD during August 2007. These draft reports will be made available to the regional consultant who will compile a regional synthesis report. The executive summaries of the national report will form the basis for a short 2 page publication highlighting the main issues from the national report. The consultant will receive comment from IGAD and IUCN by the beginning of September 2007, and a final version of the national report will be received by IGAD and IUCN by the end of September 2007.

This will be a fixed fee contract for US \$ 6,300 with an indicative level of effort of approximately 20 days. This level of effort can be spread over the contract period which will be from May 2007 to the end of September 2007, with the draft national report being submitted not later than the end of August 2007.

Annex 2: List of Acronyms

MDGs..... Millennium Development Goals
NR Natural Resources
HCENR Higher Council for Environment and Natural Resource
GDP Gross Domestic Production
SDG Sudanese Pound
NGO's Non- Governmental Organization
CBO's..... Community Based Organizations
NAP..... National Action Plan for Combating Desertification.

Annex 3: Time schedule

- Draft National report shall be submitted to IUCN and IGAD during August 2007.
- Comments will be received from IGAD and IUCN by the beginning of September 2007
- Final version of the national report will be received by IGAD and IUCN by the end of September 2007

Annex 4: People consulted with

Prof. Mohamed Osman ElsammaniSoci-economist.
Dr. Mahgoub Zaroque.....Range specialist
Mr. Hassan Gaafer.....Head Poverty Reduction Unit-Ministry of Finance and National Economy.
Ministry of Environment and Physical Development.
Dr. Hassan Mohamed NourHead planning unit – Ministry of animal resources.
Dr. Moutasim NimirWildlife specialist.
Mr. Abdelhamid AdamNational Forests Corporation
Ministry of agriculture and forests
Ministry of irrigation
Rural Water Corporation
Wildlife Directorate- Ministry of Interior.

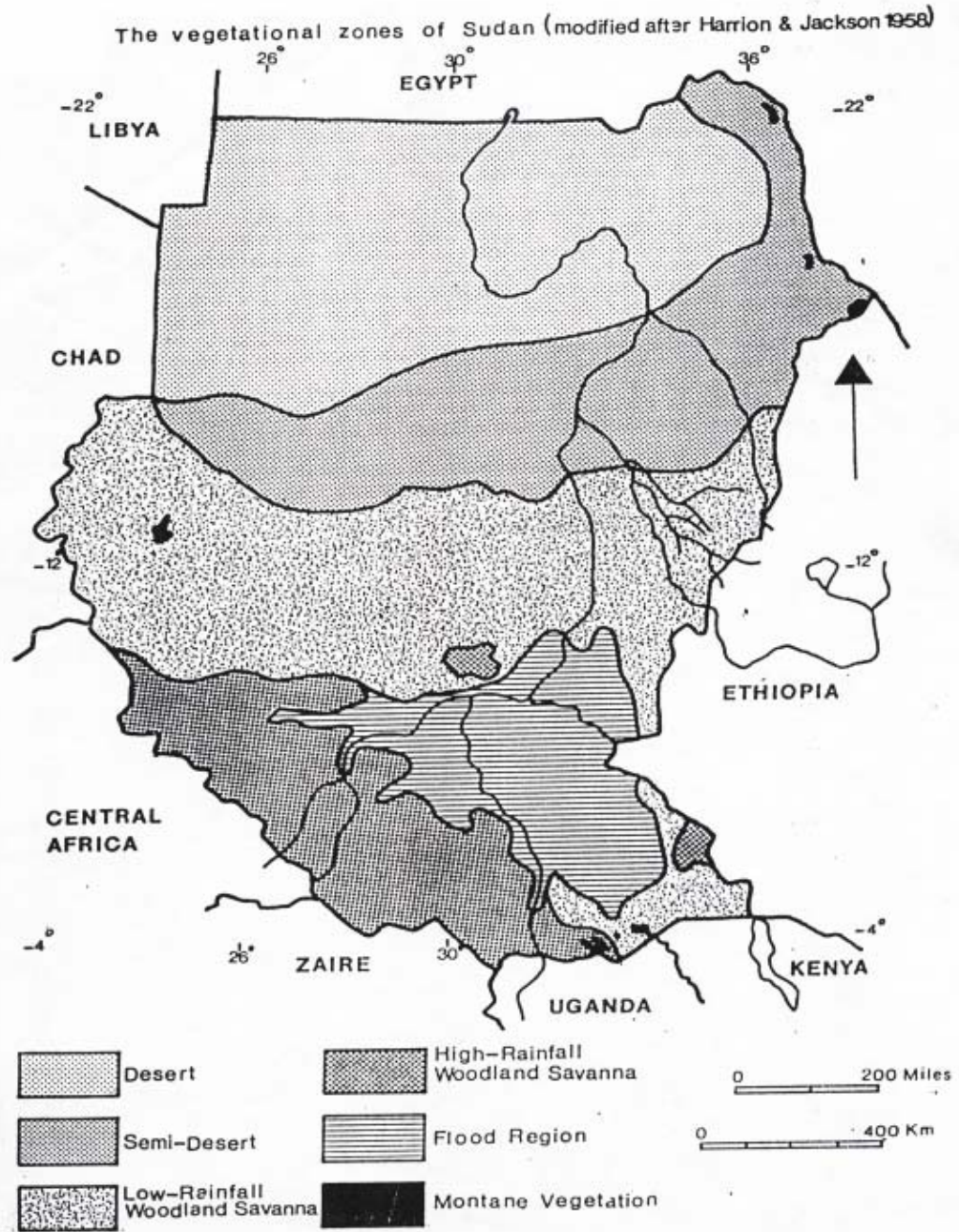
Annex 5: References

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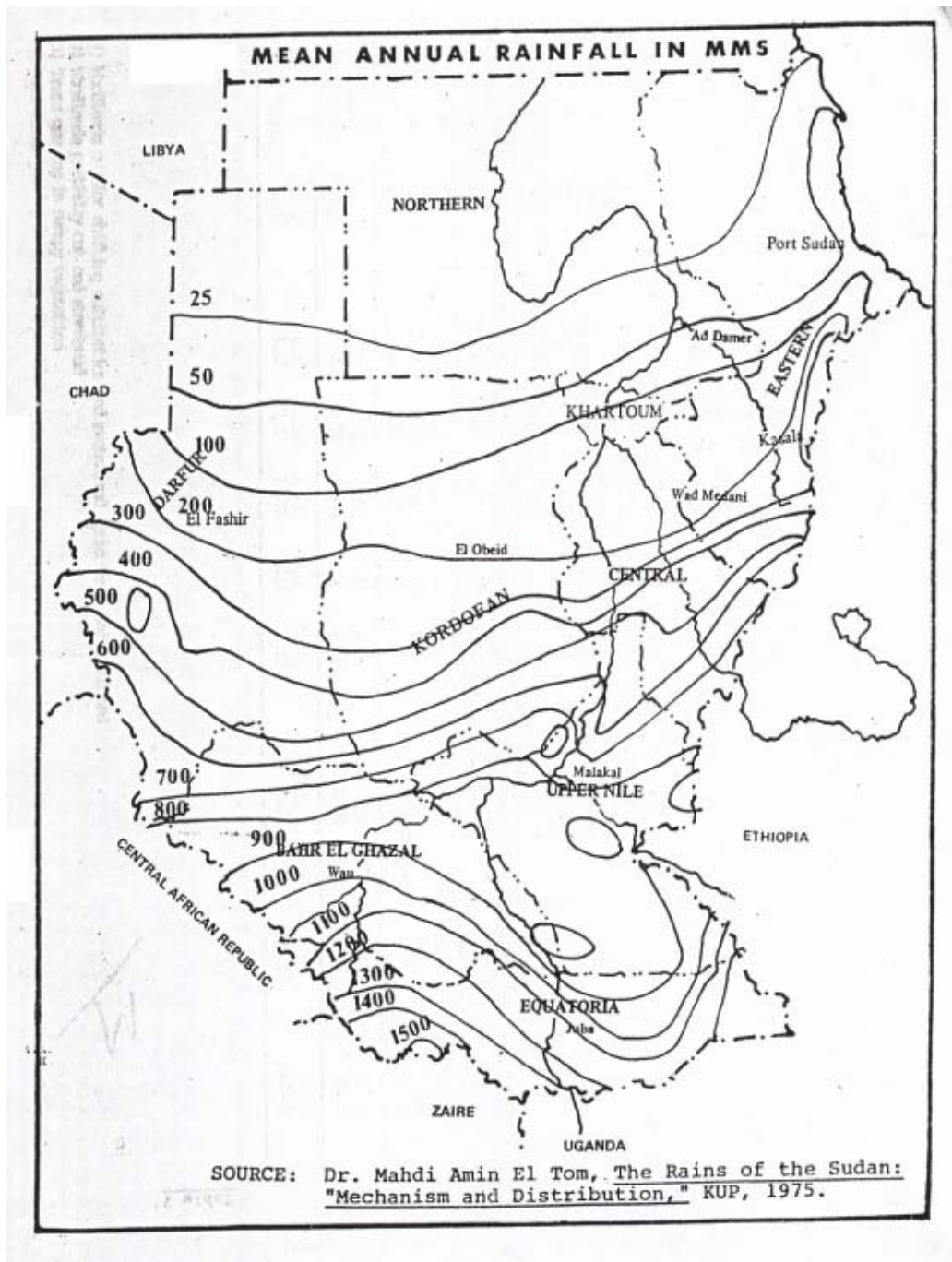
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6- Annexes: Tables and Figures

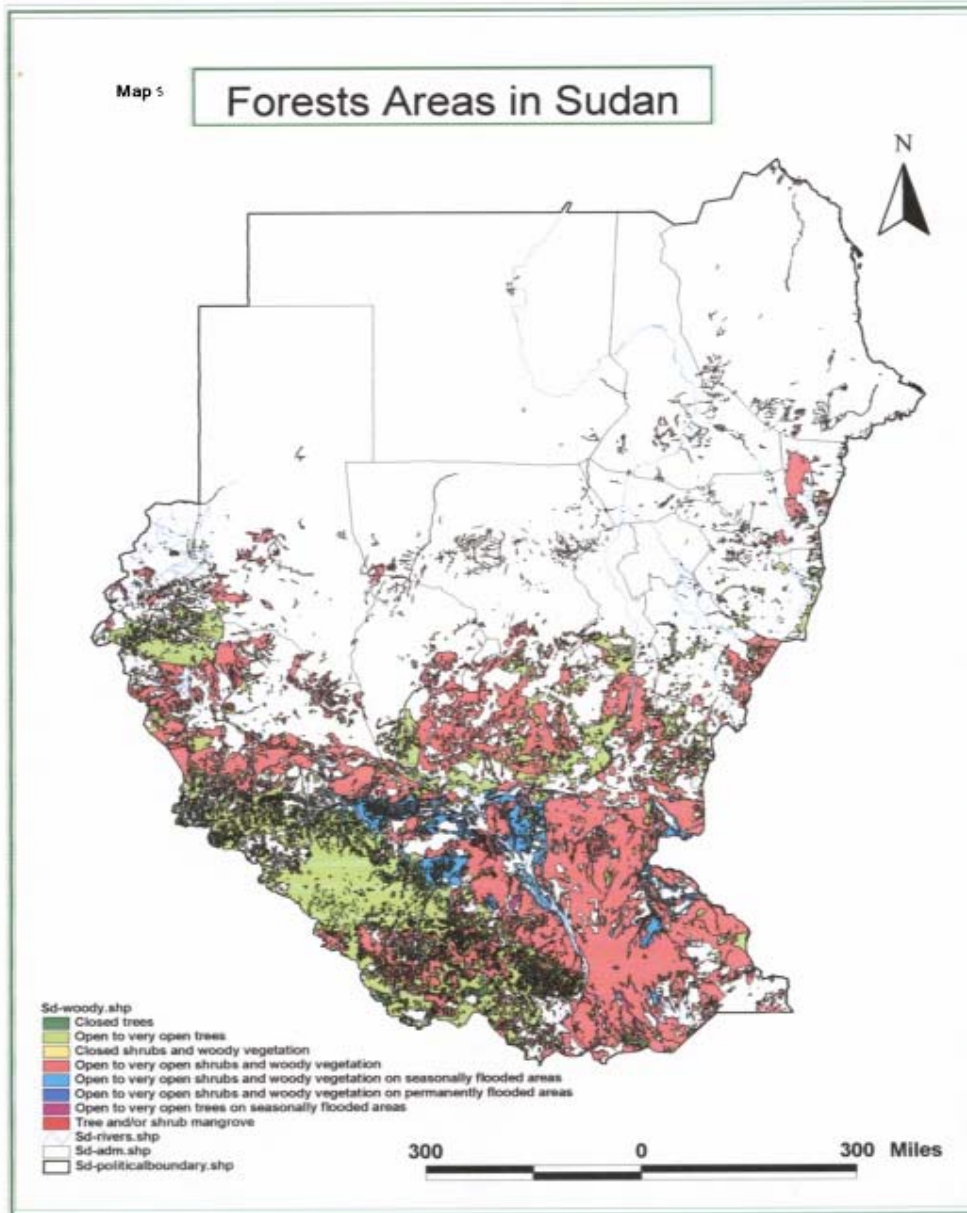
Annex 6.1 : Sudan Vegetation zones



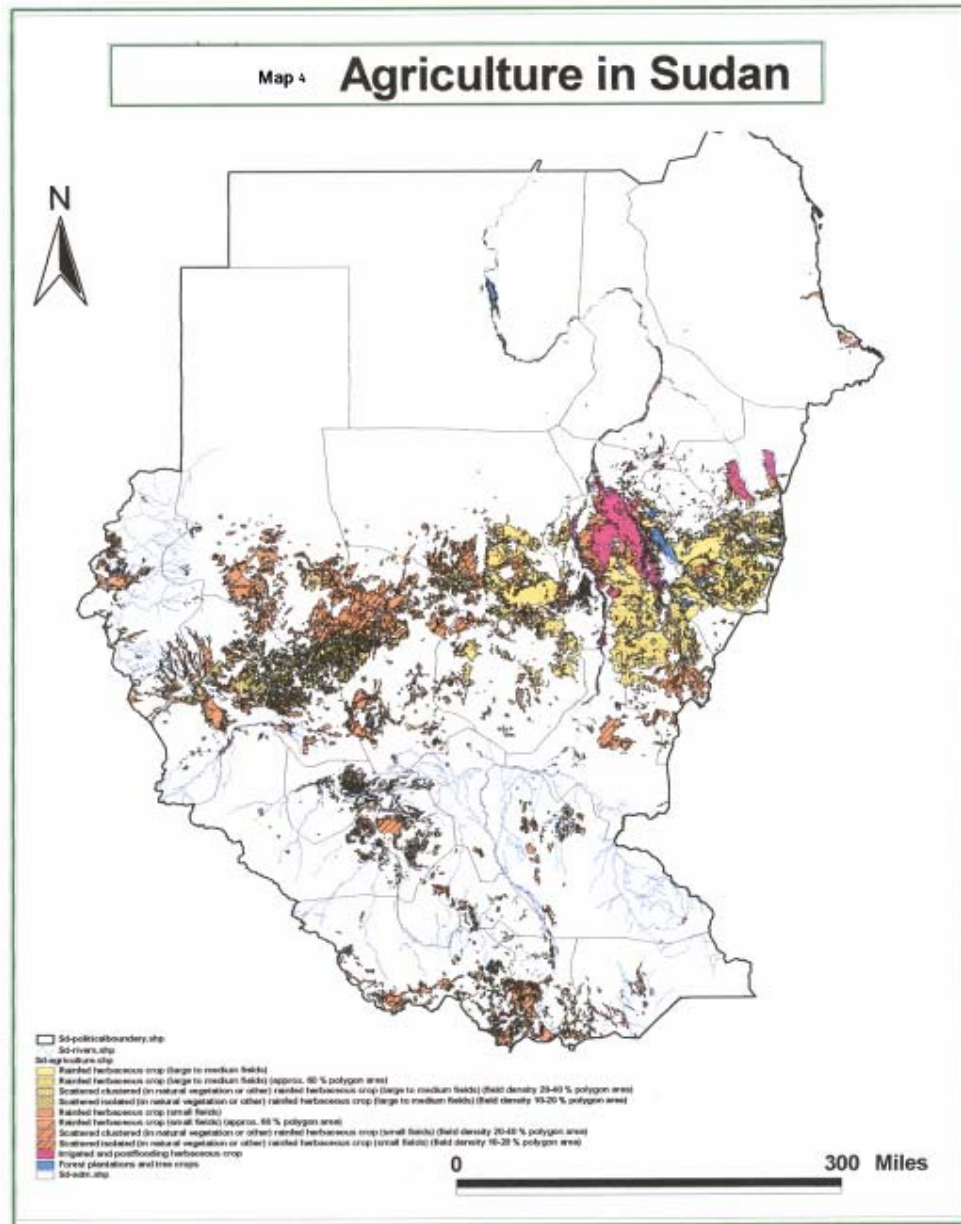
Annex 6.2: Mean Annual Rainfall



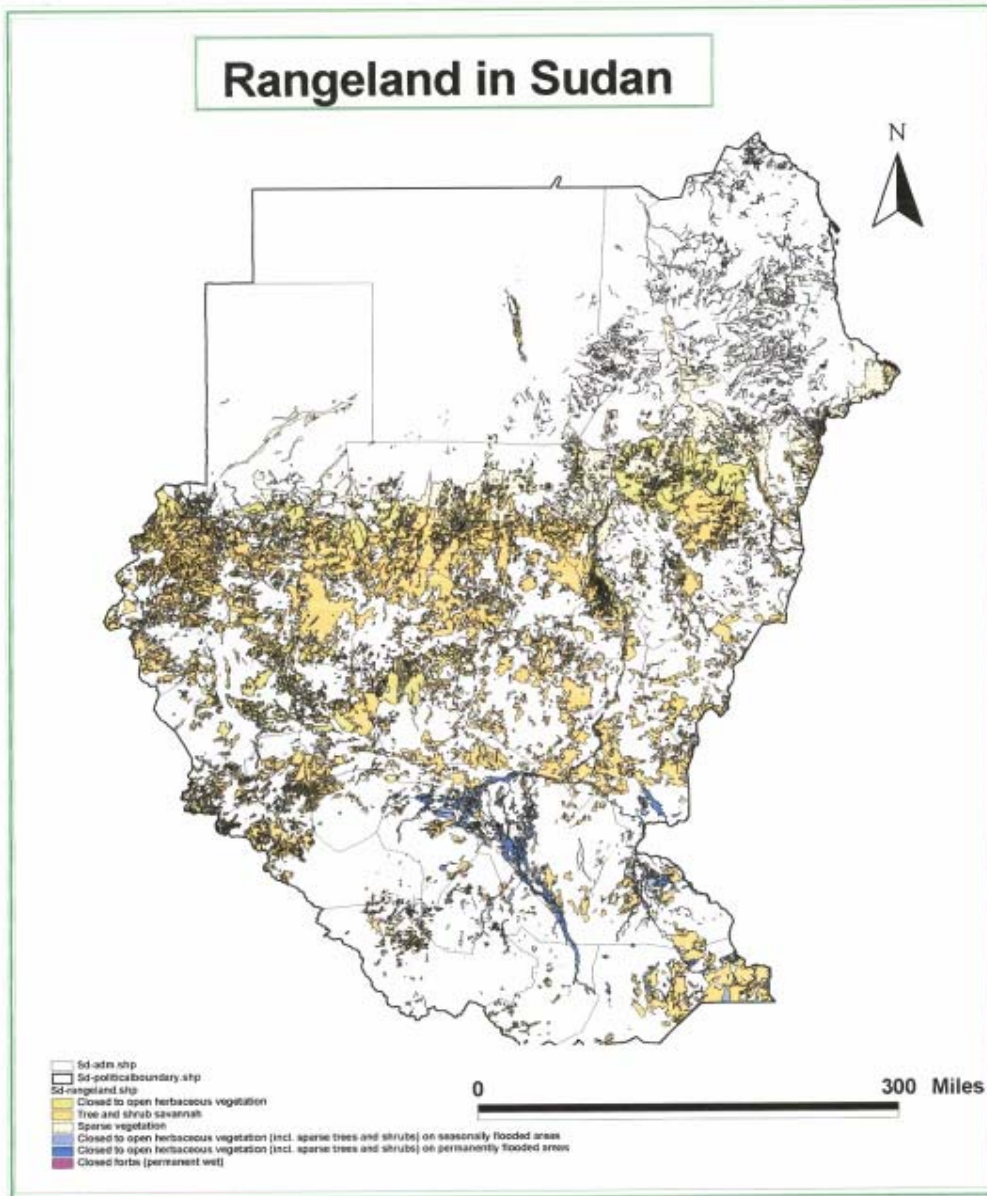
Annex 6.3: Forests Areas in Sudan



Annex 6.4 Agriculture in Sudan



Annex 6.5: Rangeland in Sudan



Annex 6.6: National and Foreign NGO's Running Development Programmes in Sudan

Organization	Date of Registration/foundation	Target Group	Coverage area	Interventions/Activities
1.The Sudanese Red Crescent	1956	Populations affected by man-made @ natural disasters	Khartoum Kassala Atbara PortSudan El Fasher El obied Kosti	-Health -Relief -Clean drinking water -Sanitation -First aid @ home nursing training -Vaccination -Advocacy (AIDS Control Program) -Income generating activities for women
2.Sudanese Popular Committee For Relief @ Rehabilitation (SPCR)	1984	Displaced @ destitute communities @ vagrant children	Kordofan Darfur Wadi Bulbul	-Emergency assistance to drought victims -Voluntary repatriation -Child vagrancy -Provision of agricultural tools @ seeds
3.Babikir Badri Scientific ass. For Women	1979	Rural Women	Khartoum State	-Training Centres for rural women @ rural women leaders
4.Women Training @ Development Ass. For Women (WOTAP)	1992	Displaced	Khartoum State	-Workshops @ seminars on women @ peace -Handicrafts -Literacy classes -Participate in environment enhancement @ conservation
5.Bawadyn Society for the Development f Rural Women	1996	Rural Women	Khartoum State	-Income generating activities at Umbadda (Improved manual stoves) -Research @ feasibility studies
6.Sudanese Society for the Development @ Promotion of Small Scale Enterprises @Handicrafts	1996	Artisans, laborers and small-scale businessmen	Khartoum State	-Training of Artisans @ small-scale businessmen on management of small-scale businesses, feasibility studies and approaching financial institutions
7.Sudanese Environmental Conservation Society	1975	Community at large with special interest in school pupils,teachers, decision makers @ the mass media		-Public awareness -Mass media:TV, radio @ newspapers @ information sheets. -Workshops, training, seminars @ lectures. -Environment conservation. -Pit-latrines (peripheral displaced settlements). - Turing garbage collection locations to public parks. -Energy saving improved stoves.
8.Environmentalists Society	1984	Community at large	Khartoum	-Seminars, workshops, and public talks. -Research
9.Sudanese society of female vets	1997	Women working in the field of animal production	Khartoum	-Women development -Animal hygiene -Animal production -Technical awareness
10.British Save the Children	1984		Khartoum	-Education

Fund (SCF)			El Fasher Diaen Wau Aweil	-Health -Water @ Sanitation -Child protection (adoption) -Food security
11.American Save the Children Fund (SCF)	1985		Khartoum Kadogli UmRuwaba Dilling Abu Gebeiha	-Education -Water -Reproductive health
12.ACORD	1974		Khartoum Kassala Red Sea Juba	-Donation to local NGO's @ governmental institutions working with street children
13.OXFAM (UK)	1983		-Khartoum -Red Sea -Darfur -Bahr El Jebel -Kassala	-Micro-finance -Training -Agriculture @ livestock -Peace building Education -Emergency
14.Ockenden International	1982		Port Sudan Kassala	-Training
15.Plan Sudan	1977		Khartoum Kassala White Nile N.Kordofan	-Education -Health -Water -Sanitation -Micro-finance
16.GOAL	1983		Khartoum Kassala	-Education -Health -Emergency
17.Care International	1979		Khartoum N.Kordofan S.Kordofan	-Water supply -Agriculture -Income generating activities -Primary health care
18.Al Da'awa Al Islamiya Organization	1980		-S.Sudan -Nuba Mountains -Ingessana -Displaced camps	-Relief -Health services -Literacy classes -Income generating projects -Food distribution
19.Al Bir International Organization	1956		Kadogli Bentu Malakak Khartoum	-Health, rehabilitation of public hospitals, treatment of Kalazar patients (treatment of leprosy patients) -Relief, food, clothing -Education services.

Annex 6.7: Administration Boundaries



Annex 6.8: CCD Programs Ideas, as Proposed by 11 States

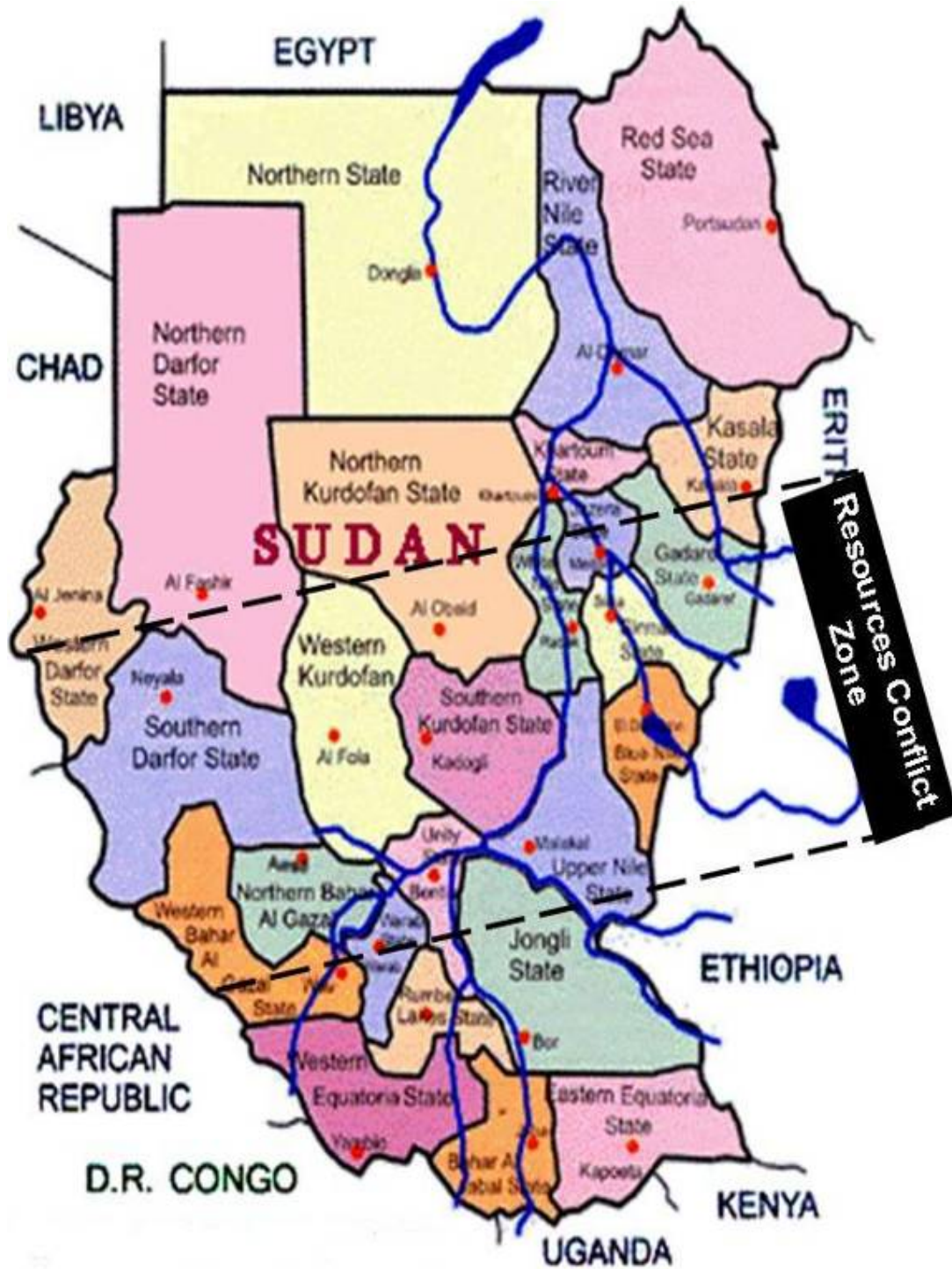
State	Program Ideas
1. Red Sea	Forest management, improvement of subsistence cultivation, range land management.
2. Kassala	Range land improvement, rehabilitation of forest, water harvesting.
3. N. State	Establishment of green belts, construction of irrigation canals, women poverty reduction, small-scale agriculture, goat breeding, poultry production.
4. Naher El Nil	Establishment of green belts, promotion of women community forests, development of surface and ground water source, rehabilitation of range and pasture, range conservation through establishment of fire lines, nomadic settlement on wadis, implementation of integrated veterinary services, establishment of town perimeters, sand dune stabilization, save the Nile through checking of gulley erosion, promotion of women education, women poverty reduction through gainful activities.
5. Khartoum	Development of water harvesting and spreading schemes, community range improvement, livestock production improvement, rehabilitation of Dahra forests, establishment of green belts, promotion of tree planting, raising of environmental awareness, cheese-making, poultry raising.
6. El Gezira	Combating desertification in northern and western parts of the state.
7. Sennar	Land reclamation, range improvement, rehabilitation of khor forests, promotion of settlement schemes.
8. White Nile	Establishment of shelter belts, rehabilitation of range lands, application of Intermediate Technology in farming, sand dune fixation.
9. N. Kordofan	Environmental conservation projects, forest rehabilitation and energy conservation, development of range lands, expansion of small-scale irrigated agriculture, and establishment of Early Warning System.
10. West Kordofan	Rehabilitation of hashab, rehabilitation of range lands, improvement of performance of water sources, conservation of wildlife.
11. N. Darfur	Rehabilitation of hashab, promotion of water harvesting, improvement of drinking water.

Source: National Action Plan to Combat Desertification

Annex 6.9: Government Institutions and Bodies Concerned With Natural Resources

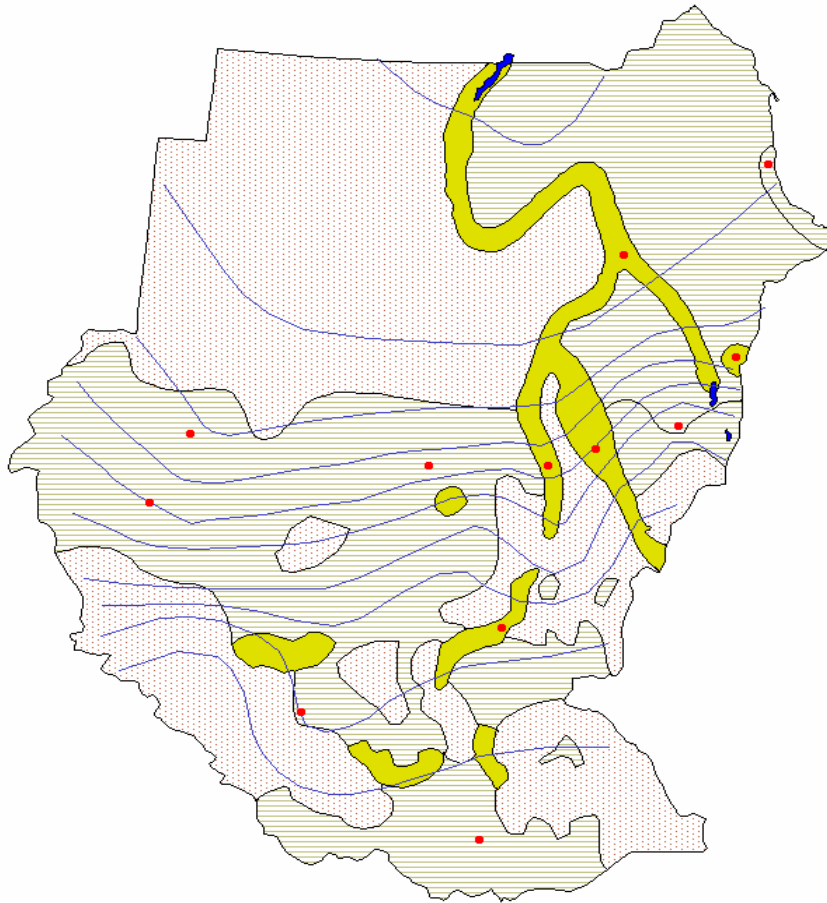
Agricultural Research Corporation
High Council for Agricultural Research
Energy Research Centre
Forestry Research Centre
Veterinary Research Centre
Fisheries Research Centre
National Remote Sensing Centre
Institute of Environmental Studies, University of Khartoum
Disaster Management and Refugee Studies Institute
Metrological Department
Faculty of Agriculture, University of Khartoum
National Centre for Research
El Rawakeib Dry Land Research Station
Shambat Research Station
Faculty of Forestry, University of Khartoum
Wildlife Research Centre
Desertification and Desert Cultivation Studies Institute
Faculty of Science, University of Khartoum
Food Research Centre
Faculty of Agricultural Studies, Sudan University
Animal Resources Research Corporation
Faculty of Forestry, University of Khartoum
Ministry of Planning
Ministry of Interior
Ministry of Energy
Ministry of Irrigation
Ministry of Agricultural and Forests
Ministry of Environment and Physical Development.

Annex 6.10: Fig.1 Resources conflict zone



Annex 6.11: Sudan Rainfall and Population Distribution
(Copied from Sudan 2000)

Sudan Rainfall and Population Distribution



Legend

- Towns
- Rainfall
- Water Body

Population/Km2

- <10
- 10-50
- >50