

Republic of Sudan

National Action Plan

for

**The implementation of the Great Green Wall for the
Sahel and Sahara initiative**



September, 2015

Contents

Summary	4
Abbreviations and Acronyms	6
Introduction	8
Chapter I. Background to resources in Sudan	10
1.1. Biophysical, social and economic features of Sudan	10
1.2. Sudan Ecosystem	10
1.3. Socio-economic features	13
1.4. The status and trends of natural resources in Sudan	14
1.4.1. Agriculture	14
1.4.2. Forestry Sector	15
1.4.3. Wood Energy Use in Sudan	16
1.4.4. Rangeland and Pasture Resources	17
1.4.5. Wildlife	17
1.4.6. Water Resources	17
Chapter II. Threats, opportunities and constraints	19
2.1. Major threats to natural resources in Sudan	19
Desert and Drought in Sudan	19
2.2. Opportunities and constraints	22
2.2.1. Opportunities	22
2.2.2. Constraints	24
Chapter III. Great Green Wall in Sudan	26
3.1. Background information	26
3.2. Great Green Wall and the policies and strategies in Sudan	26
3.3. Shared Vision and scope	29
3.4. Harmonized Regional Strategy	29
3.5. Objectives and vision of the Great Green Wall in Sudan	30
3.5.1. Objectives	30
3.5.2. Vision	31
3.6. Great Green Wall Program intervention zones in Sudan	31
1) North Darfur	31
2) Northern Kordofan state	31
3) Kassala state	32
4) River Nile State	32

5) Northern state	33
6) Khartoum State	33
3.7. Similar experiences in Sudan and in the sub-region	33
Chapter IV. Action plan for the implementation of the GGWSSI - Sudan	36
4.1. Introduction	36
4.2. Description of the main priority intervention areas or components of the Action Plan	36
4.2.1. Rehabilitation of degraded lands	36
4.2.2. Forest and rangeland sustainable management and restoration	37
4.2.3. Support to livelihoods and resilience of local communities	38
4.2.4. Capacity development through research and knowledge management and dissemination of best practices	38
4.2.5. Implementation framework	39
4.3. Logical framework	39
Chapter V. Implementation strategy	53
5.1. Approaches	53
5.2. Coordination, Monitoring and Evaluation of the implementation	53
5.2.1. Coordination	53
At national level	54
At local level	55
Stakeholder's involvement	55
5.2.2. Monitoring and evaluation	56
5.2.3. Monitoring and Evaluation Framework	57
5.3. Risks and Mitigation	58
5.3.1. Risks	58
5.3.2. Mitigation	59
Chapter VI Communication and resource mobilization strategy	60
6.1. Communication	60
6.2. Financing mechanism	60
Conclusion	62
Bibliography	63
Annex 1: Policy and legal Framework at national level	68
Policy	68
Legal Framework	72
International Conventions and Regional Protocols	75
Links to the national laws and policies and international conventions, protocols and treaties	77

Annex 2. Proposed project ideas	79
Annex 3. Acknowledgements	89
Annex 4. People Met in Khartoum and during the field tour to River Nile state and Northern state (Officials and sample of community members)	90
Annex 5. Term of Reference for National Consultant	92
Annex 6. Term of Reference for International Consultant	97

List of tables

Table 1. Sudan Land Cover Classes in Hectares.....	11
Table 2: Reduced rainfall in zones between latitude 10 – 18° N for the periods (1931 – 1960) and (1961 – 1990) for the arid - savanna part of the Nile basin area in Sudan (Source: FAO 1996)-----	19
Table 3: Logical framework of the Great Green Wall Initiative in Sudan.....	39

List of figures

Figure 1: Sudan Land Cover.....	11
Figure 2: grain production as affected by rainfall deficit in Sudan.....	12
Figure 3. Rain fall isohyets (left) of Sudan during 1931 – 1990 (NDDU 1990); (right) east Sudan (Elhag 2006).....	19
Figure 4. Drought areas in Sudan, 1987.....	20
Figure 5. Sahel and Sahara countries contained in the GGWSSI -----,,	25
Figure 6. Location of SSNRMP in relation to isohyets: Source Abdalla, 2012.....	27
Figure 7 NAPA projects within ecological zones of the dry lands (Zakieldin and Elhassn 2007).....,,	27
Figure 8: Map of Sudan showing the 6 most affected states and linking Chad in the West and Eritrea in the East.....	32

Summary

The Great Green Wall for the Sahel and Sahara Initiative is an initiative for Africa by Africans. It is a noble idea which emerged around 2005 and concerned 20 countries including Sudan. Each country has to develop and implement its national component of the Great Green Wall in line with the adopted Harmonized Regional Strategy for the Great Green Wall (GGW). The present document is the action plan for the implementation of the GGW in Sudan.

The document was developed through a situation analysis conducted through consultations and literature review of existing documents on natural resources, policies and legislations both at national, regional and international levels. Consultations with stakeholders and field visits were carried out in some of the 6 states which constitute the selected intervention zones of the GGW in Sudan. The States are: North Darfur, Northern Kordofan, Kassala, River Nile, Northern State and Khartoum State.

Based on the situation analysis, 5 components or strategic intervention areas have been identified. These are:

1. Restoration of degraded lands;
2. Forest and rangeland sustainable management;
3. Support to livelihoods and resilience of local communities;
4. Capacity development through research and knowledge management and dissemination of best practices
5. Implementation and monitoring framework (implementing agency and institutional mechanism).

Each one of the component and strategic intervention area has a set of outputs and activities to be conducted as well as a provisional budget.

The total provisional budget for the action plan is estimated to be USD 228,620,000 (Two Hundred and Twenty Eight Million, six Hundred and Twenty thousand).

The summary of the components and budget per output is presented below.

Components	Outputs	Budget (USD)
1. Rehabilitation of degraded lands	1.1.	11,740,000
	1.2.	2,020,000
	1.3.	8,620,000
Total 1		22,380,000
2. Forest and rangeland sustainable management	2.1.	45,120,000
	2.2.	39,120,000
Total 2		84,240,000
3. Support to livelihoods and resilience of local communities		
	3.1.	22,500,000
	3.2.	49,000,000
	3.3.	36,000,000
Total 3		107,500

4. Capacity development through research and knowledge management and dissemination of best practices	4.1.	7,000,000
Total 4		7,000,000
5. Implementation and monitoring framework	5.1.	7,500,000
Total 5		7,500,000
Total budget		228,620,000

Abbreviations and Acronyms

Abbreviation	Explanation
AfDB	African Development Bank
AU	African Union
AUC	African union Commission
CBD	Convention of Biological Diversity
CBOs.	Community Based Organizations
CEN-SAD	The Community of Sahel-Saharan States
CIDA	Canadian International Development Agency
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNSs	Comprehensive National Strategies
CRFP	Climate Risk Finance Project
EAC	East African Community
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act
FAO	Food and Agriculture Organization of the United Nations
FNC	Forests National Corporation
FRA	Forest Resources Assessment
GAPAs	Gum Arabic Production Associations
GDP	Gross Domestic Product
GDP	Gross Domestic Products
GEF	Global Environment Facility
GGW	Great Green Wall
GGWSSI	Great Green Wall for the Sahel and Sahara Initiative
GHGs	Green House Gases
GM	Global Mechanism of the UNCCD
GPS/ GIS	Global Positioning System/ Geographical Information System
HCENR	Higher Council for Environment and Natural Resources
IDB	International Development Bank
IFAD	International Fund for Agricultural Development

IK	indigenous knowledge
ILO	International Labour Organization
INC	Initial National Communication
IUCN	International Union for Conservation of Nature
LPG	Liquid Petroleum Gas
MENPD	Ministry of Environment, Natural Resources and Physical Development
MFC	Mechanized Farm Corporation
MWRE	Ministry of Water Resources and Electricity
NAPA	National Adaptation Plan of Action
NBSAP	National Biodiversity Strategy and Action Plan
NCS	National Comprehensive Strategy
NDDU	The National Drought and Desertification Unit.
NEPAD	The New Partnership for Africa's Development
NGO	Non-Governmental Organization
NWFPS	Nonwood Forest Products
PRA	Range and Pasture Administration
Ramsar	Convention on Wetlands of International Importance
REDD	Reducing Forest Deforestation and Degradation
RPA	The Range and Pasture Administration
SAWAP	Sahel and West Africa Program
SDGs	Sustainable Development Goals.
SECS	Sudanese Environment Conservation Society
SLM	Sustainable land management
SNAP	Sudan National Action Plan
SOS	Sahel International Organization
SSNRMP	Sudan Sustainable Natural Resource Management Project
TOE	tones of oil equivalent
UNCCD	United Nations Convention for Combating Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Culture Organization
UNFCCC	United Nations Frame work Convention for Climate Change
WCGA	Wildlife Conservation and General Administration
WMO	World Meteorological Organization
WRC	The Wildlife Research Center
WWF	World Wild Fund for nature

Introduction

Sudan is the second largest country in Africa with a land area of approximately (188) million hectares located under dry land conditions. The vegetation consists of annual grasses and scattered bush steppe and short trees in the north gradually merging into savannas with perennial grasses and scattered trees and woodlands.

Sustainable land management (SLM) in Sudan is conceived as a strategic approach to facilitate environmental protection and fulfillment of local and national objectives, including combating desertification, conserving biodiversity, improving agricultural productivity, reversing the declining trend of natural systems and contributing to carbon sink. However, some challenges face the approaches towards (SLM) including changes in climate conditions, social conflicts, poverty increasing pressure on degrading resources. These factors exacerbate the undergoing extreme conditions and fragility of the dry lands living them with limited options for resilience.

Sudan recognized the problem of desertification and land degradation during the twentieth century. The desert is progressively growing southward threatening the other dry land zones and the livelihoods throughout these zones. Climate changes are aggravating the problems of desertification and land degradation in Sudan. Climate change is reflected in an isohyets shift in the southwesterly direction, resulting in land degradation, increasing desert conditions and losses in agricultural lands leading to declining crop yield. The international and regional concern about desertification is well recognized, but provided limited support contained in some projects implemented with specific objectives for sand dune stabilization in the north and west Sudan which can provide some success experience.

Analysis of the current situation has been made with regard to institutional arrangements, structure, mandate and cross-sector coordination that is relevant to the GGWSSI and implementation of a coherent and successful Strategy. However, failure of the present practices of agriculture and failure in managing the land and the natural resources (forests, rangelands, and wildlife and water resources) in a sustainable manner has been indicated in spite of the sound policies and legal frameworks of the different components of land use. The reason may be contained in financial crisis, but the major reason is that the political support is different, more oriented to agricultural support than other land use types. Even the mechanized and irrigated farming are not politically and financially supporting appropriate approaches or practices.

Policies in some sectors have undergone some changes to accommodate desertification control. The 1986 Forest Policy was sanctioned in response to the drastic decline of the forest cover and the growing threat of deforestation. However, policies are sectorally oriented despite the comprehensiveness of the constitution and the National Comprehensive Strategies (1992 – 2002 and 2003 – 2007). The economic crisis resulting from losses in oil returns caused by the division of Sudan in two countries aggravated the situation.

The economy of Sudan is predominately agricultural including cropping, livestock production and forestry which together fall close to 50 percent of the Gross Domestic Product. Fluctuations in agricultural growth are caused primarily by vulnerability of production to prevailing desert conditions, climatic variability and decreasing rainfall and import restrictions on Sudanese exports. Agriculture is the largest and most important sector in Sudan's economy, but it is also responsible for many of the most serious environmental problems as reflected in areas and rates of deforestation and land degradation as a result of land mismanagement.

Sudan is rich in forests and other natural resources of importance at national and local levels, because of the support they provide for the economy and livelihoods of communities, including values contained in wood and non-wood forest products (such as the gum Arabic) and the numerous economic services provided by forests in the enhancement of agricultural production, maintenance of hydrological cycles, recreational and amenity values and eco-tourism. The forestry sector contributes about 15% to GDP and would be much higher if deforestation and forest degradation caused by mechanized agriculture expansion and illegal harvesting of wood used by the rural households is taken into account. Increasing investment in forestry and other natural resources and improvement of the sector policies towards coordination would reduce the losses and improve their role in environmental conservation.

Sudan developed considerable experience and capacity in natural resources development, management and assessment through local training and international support. Sudan is capable of conducting efficient inventories and assessing its resources situation based on the combination of intensive ground measurements and remote sensing facilities. Efficient mapping and classification are providing good practice in forest resource assessment and detailed management plan preparation.

Water used in Sudan is derived almost exclusively from rainwater and the surface water resources brought by the Nile and tributaries descending from the Ethiopian Highlands and Congo watershed area. Groundwater is only used in very limited areas, and then mainly as a domestic water supply and limited use of agricultural cropping and very limited ground water is used for tree and fodder planting. It is expected that water deficit will be noticeable unless some measures are considered to lead to water harvesting practices and efficient water use.

In the light of the increasing land degradation and advancing desertification numerous initiatives have been developed in Sudan. The Great Green Wall for the Sahara and the Sahel (GGWSSI) is a major initiative embraced in Sudan involve more than 20 countries (North Africa, Sahel and the horn) The initiative has been politically backed by a number of African Heads of states in the region and has been accepted adopted by the African Union in 2007. Delegation of some responsibilities has been given to ministerial committees and translated in the involvement of the concerned institutions and stakeholders in Sudan. With the support of partners, the GGWSSI is developed for:

- Raising awareness on drylands development issues
- Developing a mosaic of integrated actions at landscape level with sustainable land management and restoration practices
- Finding long term solutions to Desertification, land degradation and drought, climate change and biodiversity loss, poverty and food insecurity.

The Initiative is expected to lead to the sustainable management of land, water and vegetation in large areas of croplands, rangelands, and dry land forest ecosystems in Sudan (and the other Sahelian countries), in addition to the protection of threatened dry land biodiversity. The initiative contributes to climate change mitigation and adaptation through improved practices.

This document presents the strategy and actions plan for the implementationof the GGWSSI in Sudan.

Chapter I. Background to resources in Sudan

1.1. Biophysical, social and economic features of Sudan

Sudan is a vast country with an area of 1.8 million km². It lies between latitudes 10° and 22° N and longitudes 22° to 38° E. Its landscape consists primarily of gently sloping plain, with the exception of Jebel Marra, Massif Red Sea Hills, and Nuba Mountains. Mean annual temperatures vary between 26°C and 32°C across the country. The northern part is almost desert and semi desert with average annual temperatures around 30°C and average annual rainfall about 150 mm/year. The central area is semi-desert to savannah with average annual temperatures that are around 27°C, and rainfall averaging to about 200 mm/year. Rainfall, which supports the great majority agricultural activity, is erratic and varies significantly from the northern to southern ranges of the country (HCENR. 2013).

Sudan lies within the tropical zone between latitudes 3° and 22° North and longitude 22° to 38° East. Mean annual temperatures vary between 26°C and 32°C across the country. Rainfall, which supports the overwhelming majority of the country's agricultural activity, is erratic and varies significantly from the northern to southern ranges of the country (see figure at left). The unreliable nature of rainfall, together with its concentration in short growing seasons, heightens the vulnerability of Sudan's rain-fed agricultural systems.

The most extreme temperatures are found in the far northern part of the country, where summer temperatures can often exceed 43°C and sandstorms blow across the Sahara from April to September. These regions typically experience virtually no rainfall. In the central area around and just south of Khartoum, average annual temperatures are around 27°C, with rainfall averaging about 200 mm/year and rarely exceeding 700 mm/year.

1.2. Sudan Ecosystems

The ecosystem classification and the vegetation distribution closely follow the isohyets that run across the country from west to east. The effect of topographical changes and soil variation on vegetation zones is much less pronounced than that of rainfall levels. According to the classification by Harrison and Jackson (1958) which are followed by other ecologists, five ecosystem types may be identified in Sudan based mainly on rainfall and to some extent on soil and topography as below:

- i. Desert: (0-75 mm of precipitation)
- ii. Semi-desert: (75-300 mm)
- iii. Low rainfall savannah on clay and sand: (300-800 mm)
- iv. High rainfall savannah (800-1500 mm)
- v. Mountain Vegetation: (300-1000 mm)

Sudan is endowed with a wide range of ecosystems and species diversity. The ecological zones extend over a wide range from the desert in the extreme north to the savannah. According to the recently published, Land Cover Atlas of Sudan, FAO (2012), Forests together with Rangeland represent 35.6% of the total country area (Table 1 and Figure 1).

Sudan is rich in biodiversity within diverse environmental systems, making it endowed with flora and fauna which are being subjected to a number of threats as a result of natural factors and human activities.

Table 1. Sudan Land Cover Classes in Hectares

Land Cover Class	Area (Ha)	%
Agriculture in terrestrial and aquatic/regularly flooded land	23,710,025	12.6
The trees closed-to-sparse in terrestrial and aquatic/regularly flooded land	18,733,182	10
Shrubs closed-to-sparse in terrestrial and aquatic/regularly flooded land	22,231,327	11.8
Herbaceous closed-to-sparse in terrestrial and aquatic/regularly flooded land	25,982,720	13.8
Urban areas	730,331	0.4
Bare Rocks and Soil and/or Other Unconsolidated Material(s)	95,277,727	50.7
Seasonal/perennial, natural/ artificial water bodies	1,290,000	0.7
Total Sudan area	187,955,312	100

Source: FAO, 2012: Land Cover Atlas of Sudan

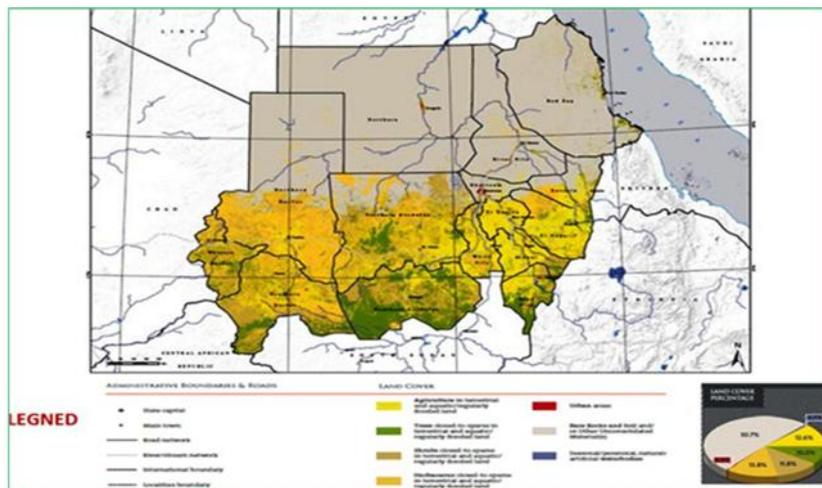


Figure 1: Sudan Land Cover

Higher temperatures (average of 40 degrees Celsius) and high radiation produce a large atmospheric demand for moisture. In view of the low rainfall levels and high temperatures and the high evapo-transpiration, most parts of the country are considered arid. The climatic characteristics make land use at a vulnerable situation resulting in risks and uncertainty in production forecasts. Sudan is characterized by rich natural resources. The Sudan's population, according to 2008 census, amounted to 33,419,625 people.

Sudan is confronted with multiple stresses resulting from changes in environmental conditions and aggravated by other factors, including political and social conflicts, poverty, a series of disasters,

ecosystem degradation, and limited access to capital and technology. These factors constitute major reasons that render conditions under dry lands vulnerable to fragile situations and reduce people's resilience to disasters. Desertification and land degradation are major environmental changes that affected peoples' livelihoods and their security in food production.

1.3. Socio-economic features

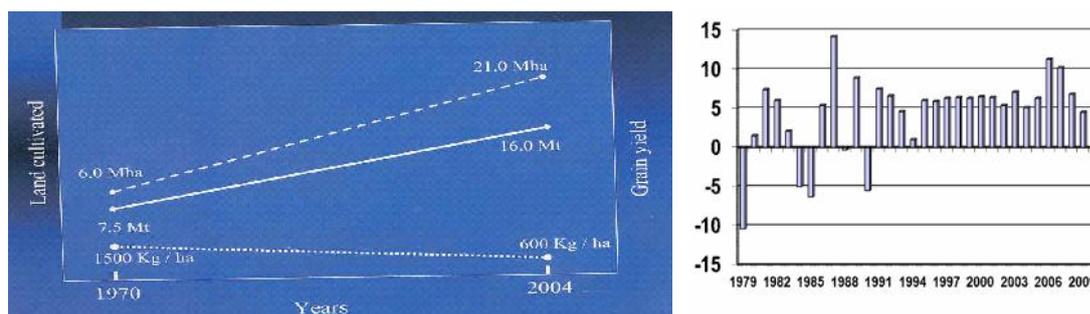
Sudan has rich natural resources within the (188) million hectares. The most recent Population and Housing Census was carried out in 2008 and, since then, the Central Bureau of Statistics (CBS) extrapolates the country's population size using specific growth rates at state level. By mid-2015, overall population in Sudan is officially estimated at 38.435 million people. In accordance with the quotes of the Ministry of Finance, the country's GDP in 2014 is estimated at about 476 billion SDG, to which the primary sector contributed to about 31 percent. In real terms, the GDP grew by 3.6 percent in 2014 compared to 2.1 percent in 2013, as the local economy is steadily absorbing the distress of the loss of about 75 percent of oil production in 2011 following the secession of South Sudan. Nonetheless, the low levels of transfer fees paid by South Sudan as a result of the effects of the current conflict in Greater Upper Nile states on oil production, together with low oil international prices, are projected to hinder Sudan's GDP growth rates in 2015 (Anon, 2015).

The agriculture performance is affected by rainfall fluctuation since early 1970s (Figure 4 left) and so the GDP was fluctuating (Figure 4 right). The stability of the GDP during 1995 – 2006 was a result of oil production, but was fluctuating again since the secession of the south Sudan and the decline of oil production. However, there is increasing rate of deforestation and forest degradation. There is also huge reduction in the range resources and forests cover while the livestock population is increasing.

Agriculture yield affected

Fuad 1984 data of yield in Darfur

Period	Area under cultivation Ha	Total yield (1000) tons/year	Average yield Kg/Ha/year
1960 - 1962	396 000	240	610
1973 - 1975	1 091 000	391	330



Grain production, (left) Source: Elsiddig 2006: Second informal dialogue on the role of LULUCF in the CCR Spain 19 – 21 April 2006; GDP (right) HCENR 2009)

Figure2: grain production as affected by rainfall deficit in Sudan

The bio-physical and socio-economic indicators of desertification in the Sudan can be monitored in the destruction of soil productivity, erosion of top soil, gullyng, dust storms, moving sand dunes, declining crop yields, loss of biodiversity, diminishing of surface water resources, localized areas of food

insecurity, poverty, mal-nutrition, conflicts and mass migration. The situation has been aggravated by the devastating droughts of 1984 and 1990 which came after a long period of average or even above average rainfall conditions (Karrar, 2002; Ayoub, 1997; SNAP, 2009). Therefore it is vital obligation to begin realistic programmes to control desertification and mitigate drought. The study of the National Program to Combat Desertification reported that 44 thousand square kilometers of territory of the Sudan between latitudes 10 and 18 degrees north is desertified and the danger does not end by these areas, but also extends to the belt adjacent to its south. This is in addition to the presence of other sites in the depth of the country having been degraded for reasons of abuse.

1.4. The status and trends of natural resources in Sudan

1.4.1. Agriculture

Agriculture is the backbone of the Sudanese economy constituting the main source of livelihood for Sudan's rural inhabitants and provides 90% of the national food requirements. It is the largest and most important sector in Sudan's economy, but it is also responsible for many of the most serious environmental problems as reflected in areas and rates of deforestation and land degradation because of land mismanagement. The arable agricultural land is approximately 40% of the total land area of Sudan. The cultivated land at present approximates 11% of irrigated and traditional rain fed agriculture.

Crop production in Sudan is practiced under three patterns; irrigated agriculture, semi-mechanized rain-fed agriculture and the traditional rain-fed agriculture. Irrigated area in Sudan is estimated at some 1.68 million hectares; of which federal schemes total 1.26 million hectares. This sector uses most of the imported agricultural inputs. Irrigation is mainly from the River Nile and its tributaries either through flow irrigation by means of gravity, pumps or by flood irrigation. These semi-mechanized rain-fed farming is mostly practiced in the clay plains of eastern and central Sudan, where farmers use agricultural machinery for land preparation and partially for harvesting of crops. The broad belt of mechanized farms in the east stretching from the Atbara River west to the Blue Nile is the warehouse of the country with sorghum, sesame, sunflower and millet grown as the main crops. Sorghum is the main crop in this sector which covers an area of about 80 percent of the cultivated land, followed by sesame 16 percent, cotton, millet, sunflower and guar in small areas. Mechanized rain-fed agriculture constitutes about 45 percent of sorghum production and 53 percent of sesame in Sudan. (UNEP 2006; Anon, 2015). The future growth of the country's agriculture, however, continues to depend to a large extent on mechanized rain-fed farming in a broad belt running from the northeastern portion of the country to the south-southwest.

The majority of farmers in Sudan are engaged in farming in the traditional rain-fed sector which is predominantly found in Western Sudan and partially in central and limited parts in Eastern Sudan. The area of this sector is estimated at more than 9 million hectares. The importance of this sector is accredited to its contribution in the national agricultural production by 90 percent of millet, about 35 percent of sorghum and 100 percent of gum Arabic besides other crops. The present practices of the agricultural system has failed to manage the land and the natural resources in a sustainable approach in spite of the sound policies and legal frameworks of the different components of the land use (section 3) and the political decisions and promises.

1.4.2. Forestry Sector

Forests represent the major source of wood for fuel, building material and small-scale saw milling for domestic use and income generation. Non-timber forest products are also of importance for income generation and livelihood support (Abdel Magidet *al*, 2015). Gum Arabic is the second largest important forest product in Sudan. Since late 1980s, gum Arabic has become the second largest export after cotton, amounting to about 11% of total exports and constituting 80% of world production. Other non-wood forest products include honey, beeswax and other fruits and nuts.

Since early 1900s the value of forests in combating desertification and land degradation has been recognized. The major part of gum Arabic production area falls in the semi-desert zone, where the *Acacia senegal* belt constitute the defense front against desert creep. Forests also play a significant role in soil conservation, protecting agricultural crops from erosion, in addition to other uses such as grazing and browsing and for landscape development and environmental protection. Recently, the values of forests on carbon and climate change mitigation approaches have been identified through the GHGs inventories (Sudan National Communication Report 2001; 2009).

Because of these important services, forest ownership has attracted public attention as reflected in the process of forest reserve under the title of the government, agricultural schemes, communal, private and investing companies. Forests are better managed under forest reserve system which is considered as a successful approach for sustainable forest management. Natural forests outside reserves are controlled by royalty collection, when wood is extracted for market use, but such management is not efficiently and sustainably conserving the natural forests. Although licenses are required to clear forests for agriculture particularly for mechanized farming, this policy has not been effective in forest conservation and protection against vast expansion of agriculture. Hence, mechanized farming destroyed vast areas of the natural forests.

However, low levels of investment in forest establishment, protection and management have been responsible for deforestation and forest degradation in forest reserves and natural forests outside reserves in Sudan.

The National Constitution (1998) emphasized the importance of forests in environmental conservation and as a source of goods and services for the country as a whole. More support to the forestry and other natural resources development has been reflected in the Comprehensive National Strategies (CNSs 1992 – 2002; 2003 - 2027) where the statements targeted up to 25% of the country area required to be under reservation. As a result, an ambitious reservation strategy was implemented but still far below the target of the CNSs and the policy of the FNC.

These institutional and policy reforms resulted in increased levels of forest conservation, protection and afforestation/reforestation at state-owned, communal and private levels. At present, Sudan possesses (11.0) million hectares of government and communal forest reserves and (11.0) million hectares of nature reserves all equivalent to 11.7% of Sudan area.

One of the factors confronting the implementation of the forestry legislation and sustainable forest reserves management is the difficulty of ascertaining or identifying forest reserves boundaries on the ground because of agricultural encroachment and illegal access of people. While forest reserves are clearly shown on maps, their boundaries are generally not visible on the ground at present. In fact limited area of the Forest reserves has been put under management plans with prescribed activities and sustainable management. Almost 90% of the forest reserves area is under management system which is not prescribed but limited to guarding and preventive measures against illegal felling which could not succeed in maintaining the forest cover sustainable.

Although many social studies indicated the willingness of communities in participating in collaborative management of government and community reserves, forestry professionals are still conservative in applying such type of management. The professionals assume that the communities still need preparedness and capacities for the collaborative system application, meaning that they need more extension and capacity building (Abu-sin and Elsammani 1986; Abdelmagid and Elsiddig 2003; Abdalla, 2012).

Sudan developed considerable experience and capacity in forestry resources development and assessment through local training and international support. Sudan is capable of conducting efficient inventories and assessing its forest resources and evaluating their productive capacities in different zones at local and national levels. However, recent surveys and detailed inventories for forest management planning included the combination of intensive ground measurements with remote sensing that facilitated efficient mapping and classification providing good practice in forest resource assessment and detailed management plans preparation. These experiences helped in assessment of the extent of forests cover and evaluation of deforestation and forest degradation within large tracts of forest reserves and forests outside reserves. The annual rate of deforestation in North Sudan is estimated to be around 2.2% (World Bank 1985, FRA 2005, Daak 2007, Elsiddig *et al.* 2007).

1.4.3. Wood Energy Use in Sudan

The major use of wood in Sudan continues to be for energy. The major part of fuel wood is used in the rural areas in the form of firewood and charcoal reaching 84.8% of the total fuel wood consumed as energy, construction and furniture. The change towards improved cook stoves leads to reduction in wood energy consumption. Accordingly more effort should be directed towards energy saving as priority particularly in rural areas.

These initiatives may require supporting plans such as awareness campaigns specifically in the rural areas. The Integrated Carbon Sequestration Project in Sudan (Butana area) a joint IFAD/FNC project (2011) has an energy saving component based on the use of improved cook stoves in over a thousand households in Gezira state and (Butana locality, Gedaref and Kassala states) within REDD project. The area covered by IFAD/FNC project falls within the Sudan Sustainable Natural Resource Management Project (SSNRMP) of the GGWSSI in Sudan. Collaboration between these two projects is possible and useful particularly that in both projects FNC is a key institute. The use of energy alternatives such as LPG and kerosene may be important to reduce wood energy consumption and therefore to be one of the priority measures to be implemented within the GGWSSI in Sudan.

1.4.4. Rangeland and Pasture Resources

Pastoral people of the nomads and settled categories use and spontaneously manage the naturally occurring range land as their major grazing resource. The major part of the dry lands used to be natural pasture of annual and perennial grasses with scattered shrubs, short trees and wood lands. During summer, they use browse trees and agricultural residues on cultivated areas as additional fodder to the range resources. On the other hand, nomads who rely on natural pasture move from their homeland in June-July to the rainy season grazing lands in the semi-arid areas and move back in October-November to the summer grazing. These management systems of the grazing resources, is a coping mechanism which assists the pastoralists to manage their resources in a sustainable approach. For some time, this type of land management facilitated sustainable management of the nomadic routes network having route width basically five Km wide and rich with diverse pasture and browse trees. The management system was well supported by the social fabrics when no conflict was experienced

In their attempts to improve and develop the range using good practices, the Range and Pasture Administrations(RPAs) in many states practice manual seed broadcasting in the grazing areas and along nomadic routes but limited to small scale activities during the rainy season.

However, it is necessary to develop some approaches for solving the problems existing at the national level and to get use of the experience of land allocation and increasing route width policy adopted in a joint approach with some states like Sennar and Blue Nile States in collaboration with the nomads and mechanized farmers unions to allocate nomadic routes in 2.0 Km width but also limited to short length in pilot areas.

1.4.5. Wildlife

Forests in Sudan are of high significance for biodiversity and wildlife management as reflected in the rich components of the Nature Reserves, one of them is a Natural World Heritage Sites (The Dinder biosphere) registered as a CITES site. The Wildlife Administration has significant partnership with respect to the management and assessment of Nature Reserves and the status of forest and tree habitats. Nature Reserves have well recognized levels of endemism in fauna and flora providing good habitats for animals. Villagers living near Nature Reserves also have a close association with the fauna and forests based on their belief of numerous living deities from forest and wild animals that play an important part in their daily lives and health related customs.

1.4.6. Water Resources

Waters in Sudan are available in four sources:

- Rain water (contribute to 80% of agricultural sector and domestic use)
- Perennial streams
- Flood water
- Ground aquifer

Water used in Sudan is derived almost exclusively from rainwater that falls within Sudan and surface water resources brought by the Nile and tributaries descending from the Ethiopian Highlands and Congo watershed area. Groundwater is only used in very limited areas, and then mainly as a domestic water

supply. Much of the ground water is used for agricultural cropping and very limited ground water is used for tree and fodder planting.

According to a report of the Ministry of Irrigation and Water Resources (Abdalla and Mohamed 2000) the annual available water from the Nile is 20.5 bcm, wadis waters equal to 5 – 7 bcm; renewable ground water is 6.0 bcm resulting in a total of approximately 30.0 bcm. The expected water from reclamation is 6.0 bcm raising the total to 36.0 bcm. The demand is expected to increase up to 52.0 bcm by 2027.

It is reported that large quantities of rains annually fall in the Sudan. However, the annual amount of rains is steadily decreasing since the middle of the 1970s. Drought is becoming more frequent resulting in noticeable deterioration of the natural resources and disturbance of the farming system.

The annual average flow of the River Nile as measured at Aswan in southern Egypt is 84 bcm. According to the Nile Water Agreement between Sudan and Egypt (1959), Sudan's share (annual abstraction) equals 18.5 bcm while its present average annual use of Nile Water ranges between 14 - 15 bcm and about 95% of it is used for irrigation purposes, 4 -5 % for domestic water supply and less than 1% for industrial and other purposes.

There are other seasonal water resources obtained from about 300 streams and wades which bring sizable amount of water in east, south and west Sudan. Their total annual yield of water is in the range of 2 - 3 bcm. Their use for irrigation purposes is very limited due to their seasonality and neglect of their development (Mohammed, 1998). The Sudan shares the Nile with nine countries, the Wadis waters with three countries and ground water with three countries. The Nile Basin is shared by ten riparian countries, namely: Burundi, D. R. of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. Sixty three percent of the Nile Basin falls within Sudan and more than seventy percent of the area of Sudan lies within the Nile Basin. Groundwater investigations and development in Sudan are still embryonic. Given the size, complexity and cost of groundwater investigations, information on availability of groundwater resources in the country as a whole is imprecise. Renewable groundwater estimates are within 4 bcm. Groundwater is found in Nubian Sandstones (28.1% of the area of the country), Umm Ruwaba Formation (20.5% of the area) and alluvial deposits. Basement Complex Formations (42.3% of the area), despite their impermeability nature, may also contain groundwater in fractured or weathered zones.

One of the problems that may arise in the near future is water scarcity and conflict within the Nile Basin which will have negative impacts on agriculture, forestry, range, industry and on the economy of Sudan.

Chapter II. Threats, opportunities and constraints

2.1. Major threats to natural resources in Sudan

Desertification and Drought in Sudan

Sudan recognized the problem of desertification and land degradation since 1912 when the Soil Conservation Committee was established to look into problems of soil degradation. The committee submitted its report, which indicated the need for actions to combat deforestation and environmental degradation. Progressive reports referred to previous records and publications that give some indications of increasing desertification in Sudan (Stebbing 1953); advancing Sahara (Arnell 1955) and migration of important tree and plant species from their habitats southward (Stebbing 1953; Gassas 1964). The history of drought in Sudan is long and became serious since 1972-1984 (The National Drought and Desertification Unit, NDDU 2006).

UNEP (2006) reported that the boundary between semi-desert and desert in Sudan has shifted southward by an estimated distance of 50 to 200 km since 1930s and attributed this to the declining precipitation. The southward movement of desert conditions is expected to put the semi-desert and low rainfall savannas at considerable risk of further desertification and significant drop in food production by approximately 20 percent (UNDP 2006).

Desertification and degradation expand outwards from focal points, usually associated with human or livestock concentrations, especially, around watering points. A study in western Sudan has shown a steady increase of bare soil around boreholes over time, increasing from 20% to 55% in 30 years (Al Awad, 1985; Redfernet *al*, 2005; Epaphraset *al*, 2008). It also showed that in the east Kordofan district of western Sudan, with an area of about 29,000 square km, there were 150 boreholes, many of which supplied overlapping grazing areas, which have had great impact on the deterioration and degradation of the ecosystem. In the case of the Sudan, population pressure is increasing in areas with very limited natural resources. Colonization of the Sudan also brought about urban development and roads, transport, education, hospitals, and piped water. This resulted in a slow migration of people away from rural areas in order to take advantage of urban services. This increased the concentration of people and livestock around urban areas and considerably increased the pressure on the adjacent land for cropping, grazing, and fuel.

The aspects of desertification and drought threat appear in the declining trend of annual rainfall amount and the southward shift of isohyets (Figure 2). The isohyets (300 mm) which was almost passing along the latitude 17°N (Harrison and Jackson 1958) was passing along the 16°N as stated by ILO (1984). Elhag (2006; Figure 2 right) stated that the isohyets (100, 300, and 500 mm/annum) shifted southward by 89 km, 50 km and 30 km respectively during the period 1930 – 2000.

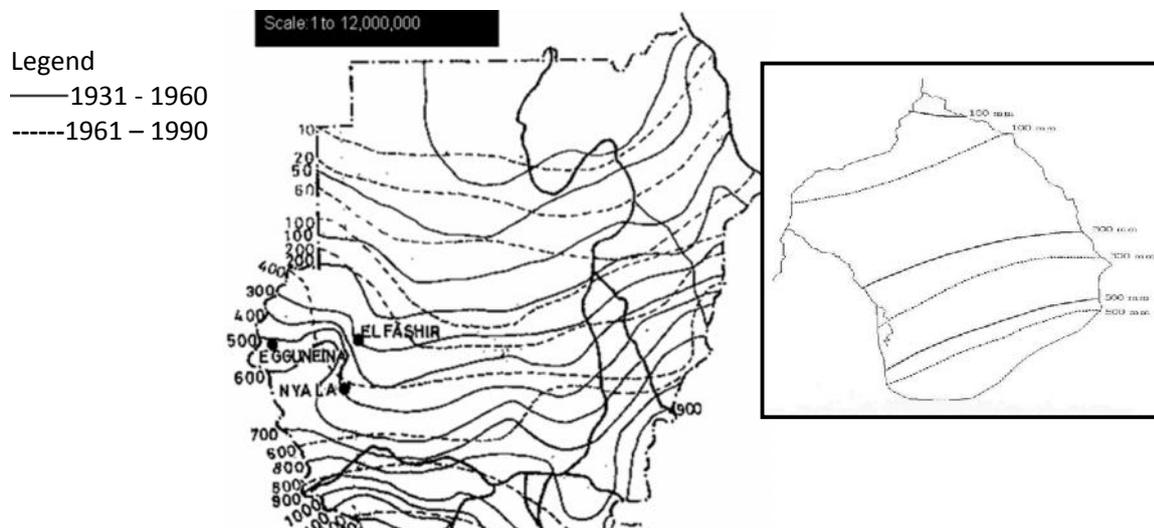


Figure 3. Rain fall isohyets (left) of Sudan during 1931 – 1990 (NDDU 1990); (right) east Sudan (Elhag 2006)

Climate changes are aggravating the problems of desertification and land degradation in Sudan. Climate change is reflected in an isohyets shift in the southwesterly direction, resulting in land degradation, increasing desert conditions and losses in agricultural lands leading to declining crop yield. Table (2) indicates the extent of agricultural land losses in relation to the extent of shifts in isohyets in semi-arid region.

The international and regional concern about desertification is well recognized, but surveys, studies and records on its extent and impacts are indisputably considered necessary. However, some projects were designed and implemented with specific objectives for sand dune stabilization in north and west Sudan. SOS has developed successful practices in relation to sand dunes stabilization in the Nile and Northern States at village and on the farm.

Table 2: Reduced rainfall in zones between latitude 10 – 18° N for the periods (1931 – 1960) and (1961 – 1990) for the arid - savanna part of the Nile basin area in Sudan (Source: FAO 1996)

Rain fall zone mm/annum	Amount of isohyets shift in sq km	Percent of area lost in the zone
100 – 200	91894	7.3
200 – 400	77128	6.1
400 – 600	89020	7.1
600 – 800	100686	8.4
800 – 1000	35321	2.8
Total	399411	31.7

However the UNCCD has been ratified within the African region during the 1990s and politically supported by almost all affected countries, but received limited support from the international community. Sudan is among the countries that ratified the Rio conventions, and has since participated in many initiatives with regard to combating desertification; conserving bio-diversity and climate change mitigation and adaptation. Policies at some sectors have undergone some changes to accommodate desertification control within the activities. The 1986 Statement of Forest Policy was approved in response to the drastic decline of the forest cover and the growing threat of deforestation which aggravated desert conditions. The past few decades have witnessed a major assault on wildlife and their habitats. In northern and central Sudan, the greatest damage has been inflicted by habitat destruction and fragmentation from farming and deforestation. Larger wildlife numbers have essentially disappeared and are now mostly confined to core protected areas and remote desert regions.

Degradation of grazing resources is one of the major livestock production problems as result of drought coupled with other factors namely overgrazing and the expansion of large scale mechanized farming on marginal grazing lands (Figure . 4). Land sat STM map of 1983/84 showed that the semi desert (455,000 sq. km) and some parts of the northern fringes of the low rainfall wood land savannah were severely affected by drought and environmental degradation (Abdelrahman, 2008).

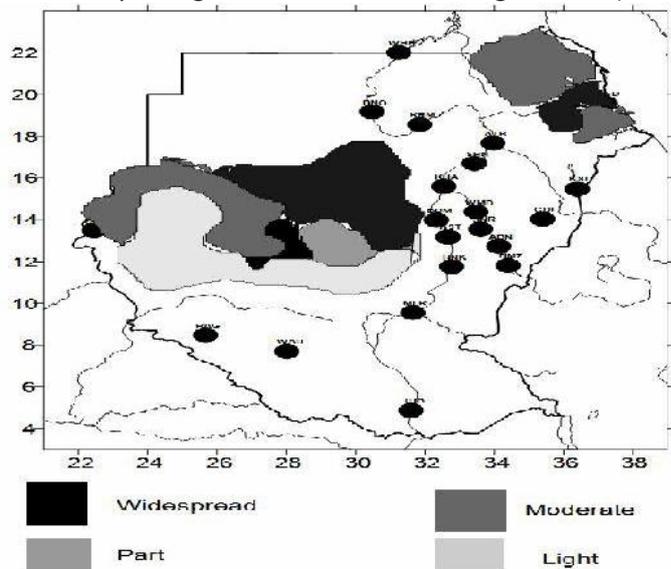


Figure 4. Drought areas in Sudan, 1987

The GGWI initiative is expected to develop activities in Sudan which addresses the root causes of desertification and land degradation and can contribute to poverty alleviation in the long term. Moreover, the initiative involves countries which have collectively embraced the proposal as a platform to mobilize partnerships with the aim of positively affecting an environmental and development transformation in the region that will mitigate the risk of desertification and land degradation while at the same time alleviating poverty.

The Sustainable Natural Resources Management project (SSNRMP) is part of the Sahel and West Africa Program (SAWAP) in support of the Great Green Wall Initiative (GGWI). It has been conceptually perceived to cover areas considered as priority areas with regards to natural resources degradation. It is

located in three states (Kassala, Gezira and White Nile), contained between isohyets 100 mm/annum and 400 mm/annum the area most affected by climate change. That means when addressing desertification and land degradation in these areas, the issues of natural resources and climate change will have to be addressed. That is where the synergy between the UNCCD and UNFCCC is possible and indispensable. In this regard, any action in combating desertification and environmental degradation should achieve:

- Halting desert creeping and stop land degradation
- Supporting sustainable management of natural resources
- Protecting biological diversity
- Contributing to environmental sustainability
- Contributing in poverty reduction.

2.2. Opportunities and constraints

2.2.1. Opportunities

The policy and legal frameworks are enabling factors for putting actions of land and resource management according to the requirements of the national framework for development. Contradictions and conflicts between the components of policy and legal framework of the different land use categories will lead to mismanagement of the resources and disturbance of sustainable management of the land. Hence compatibility and coordination between the different components of the policy and legislation make it possible for sustainable management of the resources.

Sustainable development and efficient use of the natural resources have been perceived as important components of the strategic policies and legislation in Sudan. The conception of integrated natural resource management in Sudan has been in the thinking of policy makers since the middle of the 1970s. The earliest reference to conservation and development objectives in natural resources assumed that sustainable management is a central issue. In this respect, statements on the need for natural resource management planning in Sudan may be found in the Six-year Development Plan (1977-1983), which considered conservation of the country's natural resources as one of the methods for attaining the objectives of the plans, (Tolentino, 1994). A number of strategies, policies and programs were adopted in the wake up of the Salvation and Recovery Development Program to increase the speed of development and enhance rapid implementation.

The Comprehensive National Strategy for Development (1992 to 2002), the on-going Quarter Century Comprehensive National Strategy (2002 to 2027), considered the environmental development in more depth, comprehensiveness and integration than being stated in previous sector strategies. The Quarter Century Strategic Plan for Development (2002 – 2007) has highlighted fifteen goals as the most important “National Challenges” to be addressed. Four of these are of significance within the realm of the environment and include:

- Achievement of integrated human resources development;
- Conservation of natural resources as reserves within 25% of Sudan area;

- Emphasizing and achieving rural development;
- Achievement of protection and development of natural resources, their rehabilitation and sustainable management.

In this respect rural development through participation has been placed as important tool in the development strategies of natural resources. Water development has been stressed upon in the strategy noting that environmental changes coupled with population increase may create scarcity in water. These goals are compatible with the goal of UNFCCD and with the goals of the GGWSSI.

Since 1992, and associated with the NCS 1992 - 2002, Sudan has developed several strategies, policies and programmes which also aimed at environmental protection and sustainable development (The Executive Programme for Agricultural Revival (Green Revival) 2007 and National Plan for Environmental Management, 2007, REDD+ Strategy, 2014). In this context and in compliance with its national and international commitments, Sudan developed national action plans and strategies for achievement of the goals of UNFCCD, UNFCBD and UNFCCC. These include:

- National Biodiversity Strategy (2001), (2015);
- National Action Plan to combat Desertification (2007);
- Climate Change Enabling Project (2002);
- National Environmental Action Plan Capacity 21 Sudan, (2007);
- National Adaptation Program of Action (2007).

In 1991, Sudan adopted the federal system as an approach to decentralization which resulted in establishment of sixteen States in North Sudan that assumed responsibility for local administration. The objective behind decentralization is to transfer responsibilities and to re-divide power and revenues among Sudanese people. The federal system policies relating to environment protection, in general, are perceived as joint responsibilities between the federal and state governments aiming at coordination of policies and fulfillment of sustainable development. The system is an enhancement to achieving the strategic policies and plan in a participatory approach between the federal, state and civil organizations.

The main opportunity for integrated sustainable development has been embraced in the Environmental Protection Act (EPA) (2001 Act) which is structured to harmonize the different sector environmental laws, sets environmental standards and states the importance of environmental impact assessment for development projects and raising environmental awareness and popular participation in decision-making process and setting policies.

However, the present practices of the agricultural system in Sudan is perceived to have failed to manage the land and the natural resources in a sustainable approach in spite of the sound policies and legal frameworks of the different components of the land use. The bottleneck may be related to the financial crisis and the political constraint. The political support to land use is differential, more oriented to support agricultural than other land use types including irrigated and mechanized farming than other

types of agriculture. Even the mechanized and irrigated farming are not politically and financially supported in appropriate approaches.

An important and urgent priority action for governments is the political and financial support in equal weights for all land use options rather than concentrating more on agriculture alone as a food security option at the expense of other land use options. Looking to the food security issue from various angles makes it impossible to separate forestry and animal resources from being items of food security. Animals are sources of food and income and forestry represents a source of food from edible fruits and energy in addition to indirect enhancement of agriculture.

The political situation in Sudan is faced with conflicting parties. It is evident that these aspects of political conflicts have some bearing on the economic situation and would result in negative impacts on aspects of land use and sustainable land management. Settlement of political disputes presently going on could make the situation better off upon agreement between conflicting parties.

2.2.2. Constraints

In spite of the efforts carried by Sudanese governments and institutions since the beginning of the 20th century to create a stable environment for sustainable development, Sudan still faces many challenges in its attempts to achieve sustainable and effective management of ecosystems and related natural resources.

Various constraints face the approach for proper implementation of the national strategies and international conventions constituting bottleneck for SLM. The sector domination of strategic policy implementation and the contradicting nature of sectors policies are clear. There is a lack of comprehensiveness and absence of effective coordination and failure in considering the national strategies objectives (NCS 2003 – 2027) in a perspective that makes sectors policies application and institutes activities deal with land use in an integrated way (Atta Elmoula 1985, Elsiddiget *al.* 2007). The lack of coordination resulted in serious impacts on the environment and the natural resources. Tolentino (1994) refers to the lack of legislation that specifically deals with land use and land management as a principal reason for the absence of environment and natural resources policies. Hence deforestation and land degradation are major results.

The absence of land use plans and a lack of laws governing land tenure and land use resulted in a situation which led to conflicts between land uses and land users. Land settlement is based on various approaches including old historical land settlement acts and traditional customary practices which are based on local leaders and elders. The conflicting interests of traditional rain fed farming with pastoralists and forest users at local, state and national levels may discourage proper forms of land management and might have caused social and environmental negative impacts. Examples of such conflicts can be cited in areas where previous rights of subsistence farming (traditional agriculture, forest uses and pastoral activities) are not presently respected and usually encroached upon in favour of the mechanized farming or state owned and private corporations.

Land use under government control, such as mechanized farming practices generally focuses on resource exploitation and use for income generation to national and state treasuries rather than efforts to improve local livelihoods and sustainable development. Agricultural policy supported horizontal expansion of mechanized farming at the expense of forests and natural resources conservation and management under conditions where coordination and integration are lacking. This has greatly influenced present day forest and range policies and practices and resulted in vast land degradation (Elsiddig 2004).

There is a varied range of stakeholders including some government institutions and public organizations not efficiently involved in managing the natural resources and not practicing management in an integrated approach because of a lack of coordination. In spite of opportunities stated in the constitution and the CNSs, generally there are difficulties in utilizing these opportunities for coordination and cooperation between sectors. The use and management of the ecosystem requires institutional structures that can effectively facilitate the necessary coordination within and between the various sectors and stakeholders in order to achieve sustainable natural resource use and maintain the balance of the ecosystem.

Chapter III. Great Green Wall in Sudan

3.1. Background information

In the light of the increasing land degradation and advancing desertification and their effect on people, many initiatives have been developed within the Sahel and Sahara countries, aiming at combating desertification and rehabilitation of degraded lands. A major initiative is embraced in the Great Green Wall for the Sahara and the Sahel (GGWSSI) that includes more than 20 countries around the Sahara.. Later on, the country's number reached twenty one.

The initiative was approved by the African Union in 2007 to become one of the most important priorities of the AU and a major strategy to stop desertification in Africa. The African Union then adopted a Plan of Action early 2009. In mid-2010, all eleven countries signed a convention to create the Great Green Wall Agency and nominate a Secretary to further develop the initiative. In 2012 a harmonized regional strategy for the Great Green Wall was adopted by AMCEN and then by AU assembly in 2013. 13 GGW countries have developed national Great green wall strategies and action plans with support of AUC, FAO, EU and the GM-UNCCD. All these political, governmental support are indicative of the desire of these countries to look for such an initiative, which gives hope for controlling the phenomenon of desertification which is threatening the majority of people in the region.

The political support of the heads of states is built on their understanding highlighted in their joined meeting in February 2011, to invest in an ambitious ecological buffer zone to help protection of productive land and preservation of waters from the damage caused by the desert.

Delegation of some responsibilities for GGWSSI implementation was passed to ministerial committees involving the ministers of environment of GGW countries to be concerned with logistics and financial priorities consideration. The many ministerial and stakeholders meetings held in different countries in the region, as well as programmes of support coordinated by the African Union commission with supported from FAO, EU., WB, GEF, UNEP, GM-UNCCD etc with comprehensive representation of stakeholders from each country including Sudan are indicative of political, institutional and public support to the Initiative. Such support is a driving force that makes the establishment of investment framework of the GGWSSI possible.

Further elaboration of support to the initiative is embraced in the organizational steps taken by defining a focal institution, other relevant institutions, national steering committee and staff for commitment to communication and processing for implementation. The objectives of the proposed framework of the GGWI for Sudan are to develop a country-wide program of immediate and urgent project-based program of activities, which address on the long term the current and anticipated adverse effects of desertification and land degradation.

3.2. Great Green Wall and the policies and strategies in Sudan

The development of a national sustainable strategic action plan for the GGWI in Sudan is needed to coordinate, build on and enhance successful actions that emerge from the national strategies, the National Adaptation Program of Action (NAPA), the National Action Plan on Desertification (NAP) and the National Biodiversity Action in addition to the national strategies. The SSNRMP (Figure 4) in Sudan stands at the beginning of other rural and national sustainable strategic action plan. The organizational structure of GGWI in Sudan and the project (SSNRMP Figure 5) can be seen similar to NAPA (Figure 6). NAPA is based on participatory and consultation exercises for the Sudanese in intense and genuine approach (Zakieldin and Elhassanldin 2007). It involved state and national workshops where in both areas key stakeholders were involved. The workshops, aimed to assess vulnerability and adaptation options as envisaged by stakeholder participation.

It is clear that all levels of stakeholders indicate their willingness to participate in the process of initiatives framework. The consultation in connection with the GGWI action plan considered the understanding of the vision of initiatives and procedures for the implementation and participation of stakeholders in the validation process. That also applied in the situation of the Harmonized Regional Strategy.

The project priorities and area selection of (SSNRMP Figure 5) tend to be compatible with NAPA (Figure 6) where five representative ecological zones were selected for the NAPA exercise in Sudan: desert, semi-desert, woodland savannah (clay), woodland savannah (sand). The SSNRMP organization program argued that Sudan faced serious desertification and climate-related challenges in the areas of agriculture and food security, water resources and human health. These sectors were also selected and targeted by the Sudanese NAPA. These were selected to capture most of the vulnerabilities characterizing this vast country.

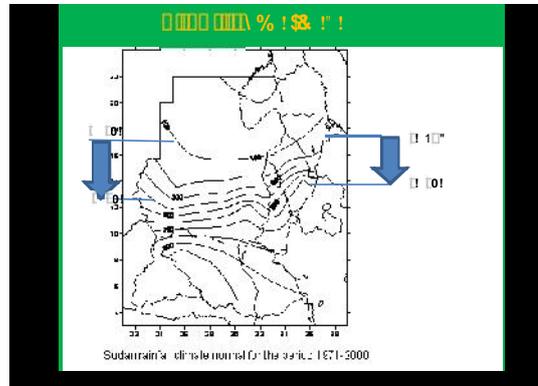


Figure 6. Location of SSNRMP in relation to isohyets: Source Abdalla₂ 2012.

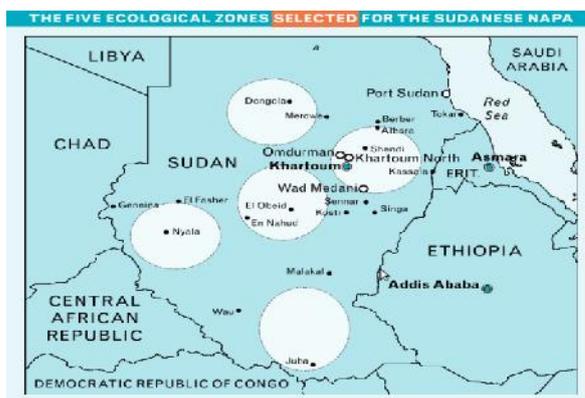


Figure 7 NAPA projects within ecological zones of the dry lands (Zakieldin and Elhasn 2007)

The consultation has been indicative of the possibility for capacity building with regards to innovative resource mobilization related to new and additional resources that contribute to Sustainable Land Management activities in case of NAPA and SSNRMP and future projects related to the GGWI. The presence of formal institutions and community-based civil society organizations is necessary for the democratic processes related to environmental protection. What is important is not how many organizations are there, but how effective is the role they play within the State structures, and how they are influential in the State decisions in the direction of sustainable development. Such development will provide the platform for decision makers to organize plans for good practices based on innovative resource mobilization. Countries and organizations perceive that investment by funding organizations like GEF will have a catalytic effect in enabling the GGWSSI countries to mobilize the additional resources they need at the regional and international levels.

Several other policies and legal frameworks are in place in Sudan which support the vision and the objectives of the GGWSSI in Sudan. These policy elements and legislative instruments are presented in annex 1.

3.3. Shared Vision and scope

The Great Green Wall for the Sahara and Sahel Initiative is a program which links over 20 countries in Africa from the Sahelo-Saharan region including Sudan. Its vision is aimed at addressing desertification, land degradation and drought in the Sahara and Sahel. Within this context the GGWSSI is supported by stakeholders at regional and international organizations, national institutions, local authorities, communities and civil society and development partners. The process of GGWI in Sudan will consist of a mosaic of sustainable land management and restoration based on the outcomes of the following: that includes:

- The scoping activities, through which available and pertinent information related to desertification and land degradation options will be collected, reviewed and synthesized;
- Consultation activities through which cutting edge viewpoints on pressing desertification and land degradation conditions and on promising options for a solution will be communicated;
- Prioritization activities, through which country-driven criteria will be applied to prioritize activities and actions.

Priority projects will include sustainable management of natural resources with components on forestry, agriculture, livestock and rangeland restoration, in addition to improved water harvesting. The Projects cover the dry land area between 100 – 400 mm/annum starting with SSNRMP in three states (Gezira, Kassala and White Nile). The project will extend in the specified zone to accommodate improving sustainable agricultural practices and environmental conservation and biodiversity restoration.

The GGWSSI in Sudan will ensure: Adequate stakeholder representation in the development and implementation of documents; Establishment of country-driven criteria by which to monitor and evaluate the progress; Development of capacity building functions and enhancement of policy, programme, and institutional integration, as part of the GGWSSI priority activities.

3.4. Harmonized Regional Strategy

There are various issues upon which the GGWSSI will be based in order to transform the GGWSSI vision in action. One of these issues is the understanding of the harmonized regional strategy, which is closely related to the strategic objectives of the UNCCD. Its understanding will support capacity development to facilitate development and mobilization of the resources and processing of projects at local and national levels, which enable the sustainable implementation of the programmes of the GGWI in Sudan in line with GGWSSI.

FAO and the GM with funding support of the EU, supported the African Union Commission in the preparation of the Harmonized Regional Strategy in collaboration with various stakeholders, considering the geographic coverage, the vision, the global strategic and operational objectives, the expected results, the implementation framework and the resource mobilization strategy, a communications and

capacity development strategies. The strategy has been validated through regional workshops on participatory approach, AMCEN in 2012 and AU assembly in 2013. It is understood that, the harmonized regional strategy will centre on the innovative new finance that can be mobilized in order to complement mobilization of the local and national resources and to bring them towards trans-boundary projects and good practices.

3.5. Objectives and vision of the Great Green Wall in Sudan

The Great Green Wall initiative was not designed as a wall consisting of trees planted along the band, but rather a set of actions and intersectoral interventions for the conservation, protection, sustainable management and restoration of natural resources and associated ecosystems with the objectives to achieve sustainable development, and, particularly poverty reduction.

The concept of the GGW could be defined as a series of actions for land planning and integrated development aimed at:

1. covering a given area , especially village lands and mainly of agrosylvopastoral nature;
2. being structured as a long-term investment (duration not determined) with the objective of combating desertification and towards protection and production;
3. being considered as a curative measure and / or preventive ;
4. being spatially discontinuous , with respect to the habitations ;
5. integrating or creating synergies with agricultural and socio-economic development programs at national, regional and local levels;
6. supporting alternative activities to natural resource exploitation such as trade , transport , energy, and many other income generating activities .

It is therefore possible to design a mosaic of integrated land use systems that have trees as an integral component such as agroforestry, covering a relatively large area, composed of a network of small green walls or mosaic patches established in places where the need is most urgent (curative) and / or give more priority (preventive). It may be extended gradually depending on needs and available resources.

3.5.1. Objectives

The overall objective of the Great Green Wall is to contribute to prevent and combat desertification, develop in an integrated manner degraded zones through sustainable management of natural resources and the fight against poverty. Specifically, it intends:

In the short and medium term: (i) conserve, restore and enhance biodiversity and soils; (ii) diversify the operating systems ; (iii) satisfy domestic needs and increase revenue by promoting income generating activities (iv) improving / installing basic social infrastructure;

Long term: (i) improve carbon sequestration capacities in plant and soil; (ii) reverse migration to restored areas; (iii) improve the living conditions of local communities.

3.5.2. Vision

In Sudan, the Great Green Wall for Sahel and Sahara Initiative involves the development of local communities through the establishment of an innovative and inclusive approach to synergize actions in the fight against desertification, land restoration and conservation of biodiversity, development of agricultural, forestry and pastoral sustainable production systems, development of basic socioeconomic infrastructure and wealth creation through income generating activities in order to contribute to a stable food security and recovery of sustainable economic growth.

3.6. Great Green Wall Program intervention zones in Sudan

The GGW intervention zones in Sudan are located in six states which are highly affected by drought and desertification and where livelihoods of local communities need to be improved. The States are: i) North Darfur; ii) North Kordofan; iii) Kassala; iv) River Nile; v) Northern state and vi) Khartoum State.

These states are characterized by the following features:

1) North Darfur

With a semi-desert climate, it is prone to drought, low rainfall and has a geological system that is unfavorable for groundwater storage. Vulnerability studies undertaken as part of Sudan's INC and NAPA processes confirm that increasing temperatures and decreasing rainfall will bring about not only a southward shift in agro-climatic zones but also reduced groundwater recharge rates. Under certain scenarios, rainfall is expected to decline by 9mm/year., North Darfur is already experiencing a downward trend in rainfall, effecting its limited sorghum and millet production, while climate projections suggest that crop failure due to inadequate highly variable rainfall could reach as high as 70% by 2050 in North Darfur (North Darfur State NAP Committee 2013). Erratic rainfall and drought have led to a series of maladaptive coping strategies.

For example, livestock overgrazing, aggressive agriculture and deforestation is degrading land quality. Maladapted practices stem from lack of awareness of best agricultural practices (i.e. crop rotation) and poor agricultural policy, which ties land ownership to frequency of use. Water tables have fallen rapidly in some areas—including by 10 meters around El Fasher since 2007, with eight IDP communities vulnerable to acute groundwater depletion (UNEP, 2007).

2) Northern Kordofan state

Northern Kordofan state is located in the central western part of Sudan on the northern edge of the savanna belt. The state's climate is characterized by low rainfall, sparse vegetation and extreme temperatures, which reach as high as 49 degrees C in the summer and as low as 1.5 degrees C in the winter (North Kordofan State NAP Committee 2013). Roughly 79% of the state's population depends on agriculture for their livelihoods, with agricultural production in Northern Kordofan contributing about 30% to the country's overall non-oil exports (North Kordofan State NAP Committee 2013). Within the sector, crop production comprises 53% of agricultural output, livestock 38%, and forestry and fisheries a combined 9%. Industry and service sectors are also developing slowly. However, this development is concentrated in urban centers leaving a large portion of the state's 3 million people living below the poverty line.

There are five types of geological formation that govern availability of underground water in the state (IFAD, 1999). These formations are:

- Basement complex: composed of granite, crystalline limestone and other igneous and metamorphic rocks.
- Nawa Formation: micaceous sandstones.
- Nubian Sandstone sediments: fill the base of Bara trough, with tapped thickness between 200 - 300 m.
- Um Ruwaba Formation: borehole logs consist of lat-lying, unsorted and unconsolidated gravel, sands, and clays.
- Bara aquifer complex: is the main water bearing resource. Groundwater occurs at 6 meters in the free water table at Bara.

3) Kassala state

Kassala State is located in the eastern part of the Country. It is bordered by Eritrea in the east, the Red Sea State from the north, Khartoum State and the River Nile State in the west and by Al-Gedaref State in the southwestern. Area: 42282 kilometers square. Population: 1527214 persons. Most important crops: fruits, cotton and oilseeds. Animal resources: 444515 heads. Kassala state extends across a semi desert zone as well as a low rainfall savannah zone in the south. Its population of 1.7 million is growing at an average 2.5% per year, with most inhabitants living in Kassala town and other semi-urban centers. The economy is dominated by agricultural activities. As a result, water and agriculture, and to a lesser extent health, were identified as the primary sectors of concern during the vulnerability assessment.

Given its location in the semi-arid north, Kassala is extremely vulnerable to climate change. Over the past decade temperatures have increased and rainfall has decreased. In particular, the range in annual rainfall has dropped to between 67 and 425 mm/year over the past decade, well below baseline rainfall conditions (Kassala State NAP Committee 2013).

4) River Nile State

The River Nile state straddles both desert and semi-desert zones. It contains the River Nile, the River Atbara and a number of seasonal streams that support wheat production. Agriculture is the dominant economic activity with irrigated cultivation concentrated around the River Nile and the River Atbara banks and delta area. Flood irrigation is concentrated mainly around the River Atbara while rainfed agriculture is practiced in other parts of the state remote from seasonal streams. From 1994 - 2005, significant increases in winter temperatures were recorded at the beginning and end of the growing season, shortening the growing season, reducing the productivity of winter crops (River Nile State NAP Committee 2013). Farmers in the lower River Atbara area are most vulnerable to these conditions. Animal husbandry represents the other major livelihood system in the River Nile state. However, rangeland productivity has been rapidly deteriorating, due to a variety of factors including increasing temperatures, recurrent drought, rising wind speeds, and over-grazing. The most vulnerable areas are north of Atbara.

5) Northern state

Located in the heart of the desert zone, the Northern state is characterized by low rainfall, extreme temperatures, and sparse vegetation. The local economy depends upon irrigated agriculture. Rising temperatures, decreasing rainfall, fluctuations in the River Nile, and increased wind speeds have combined to result in a mix of drought and flooding with adverse effects on crop yields, rangelands, animal production, and river bank erosion. While irrigated agriculture is vulnerable at all localities, hotspots for rainfed agriculture include forests and rangelands in Marawi and Adabah localities. Baseline climate (1971-2000)- Dongla Average annual max temperature: 37 °C Average annual min temperature: 19 °C Average annual rainfall: 11 mm/yr

6) Khartoum State

Khartoum, the capital of Sudan, is located in the tropical zone around the River Nile. During the rainy season, from July to September, Khartoum receives between 110 and 200 mm of rainfall on average, with the remainder of the year being fairly dry. Dust storms are regular occurrences and river fluctuations threaten riverbank erosion and flooding (Khartoum State NAP Committee 2013). Rapid urban growth combined with rising temperatures, rainfall variability, and river fluctuations have placed serious pressure on Khartoum's resources. Although studies are needed to assess existing and future climate change, if Khartoum follows the country-wide trend of an increasingly dry climate, then this will threaten crop yields, rangelands, and natural forests in the area. Baseline climate (1971-2000)-Khartoum Average annual max temperature: 37 °C Average annual min temperature: 23 °C Average annual rainfall: 121 mm/yr.

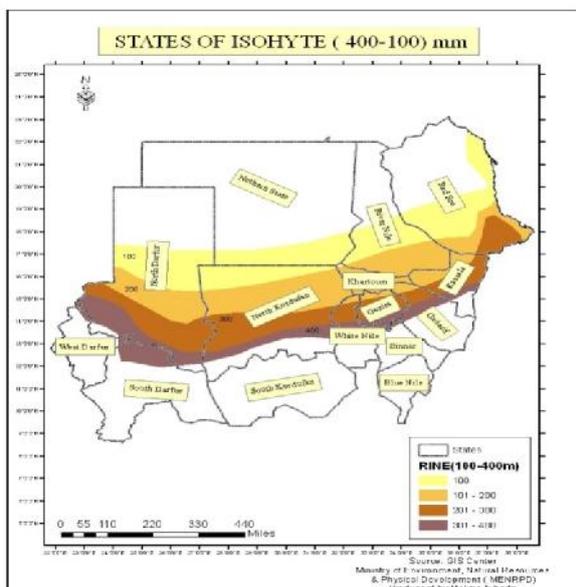


Figure 8: Map of Sudan showing the 6 most affected states and linking Chad in the West and Eritrea in the East

3.7. Similar experiences in Sudan and in the sub-region

Conservation and Management of Habitats and Species and Sustainable Community Use of Biodiversity (Dinder National Park)

The project attempted to create a balance between biodiversity conservation, sustainable use and fair equitable sharing of the benefits arising out of the utilization of genetic resources. Such approach requires the involvement of all sectors of the community in the conservation and management of natural resources. The project addressed the root causes of land degradation around the park through capacity building, development of local institutions capable of mobilizing local people, raise awareness and an attempt to devise land use plan. All these are to be implemented through the creation of community – based organizations built on existing structures, dialogue to respond to community needs and provision of income – generating activities. The main lessons learned from this project include:

- Establishment of responsible and committed leadership at local levels as a prerequisite for resource management.
- It proved the success of Village Development Committees as a model to mobilize local participation in resource management.
- It forged strong partnership between local communities, park administration and the state government.

The Role of Indigenous Knowledge in Supporting the Livelihood of Pastoralists and Agro-Pastoralists in the Red Sea

The project area includes two locations representing the semi-desert and low-rainfall savannah. Butana area of Kassala state represents the first mentioned ecosystem which is part of the clay plain; its total area is around 31500 hectares and about 38percent of this area is regarded as rangeland. The second location is Elodaya which lies in the south western part of North Kordofan state.

Osman (2013) conducted a comprehensive review of the project; the review included the indigenous knowledge (IK) related to pastoral calendar, human health, Animal husbandry, Agriculture, Ground water, range utilization, and food security. People of the Butana area of Kassala state have developed through their IK, some types of land and soil classification. Accordingly, they practice some patterns of use that suit each type of soil. They grow different local varieties of sorghum such as geshesh and korokolu in the Mahwa land while Mugad variety is usually grown in Elwadi land. Also some vegetables like watermelon, cucumber and Okra are grown by women under this type of land use. Because the direct rainfall is insufficient to secure a successful season in Mahwa land people use their IK in throwing small earth bunds that follow the contour lines in order to slow the sheet flow of water so as to enhance the soil moisture holding capacity. They call these small and temporary structures terraces and build them by using hand-hoes, currently some people use a disc plough to do this work.

Gireigikh Project-Northern Kordofan State

The community-based rangeland rehabilitation for carbon sequestration project, carried out in the Gireigikh Rural Council area in Sudan, it was designed specifically to promote climate change adaptation and mitigation actions through biodiversity conservation. The project is based on the premise that natural resource management actions such as re-vegetation of degraded or vulnerable lands and the promotion of sustainable agricultural practices are important components of an adaptation strategy. Mitigation actions include the re-vegetation of large tracts of land to help redress the balance between methane production by animals and carbon sequestration by vegetation. The social and economic well-

being of the communities throughout the Gireigikh rural Council is integrated into the project through the development of alternative livelihood options which reduce pressure on local biodiversity.

Revitalizing the Sudan Gum Arabic Production and Marketing Project

The Project is funded by Multi-donor Trust Fund and IFAD, Implementing Agency is Forests National Corporation (FNC), community activities implemented in different Localities in Blue Nile, Sennar, White Nile, North and South Kordofan states. The Project development objective is to increase the production and income of small scale gum producers in selected areas of the gum belt through improved performance of the production and marketing systems. Work with Gum Arabic Production Associations (GAPAs) is the fundamental aspect of the project's sustainability strategy. Building up GAPA members' technical, managerial and financial capabilities are the foundation stones to ensure long-term development of the concerned beneficiaries. The activities included: selection of participating GAPAs; capacity building of GAPAs; Operation of the loan mechanism for gum Arabic production; Operation of the matching grant mechanism for productive infrastructures.

Natural forest reserves rehabilitation

Rehabilitation of Elrawashda natural Forest Reserve (Eastern Sudan) Experience. There has been positive development towards successful involvement of the local people, living around Elrawashda reserve, in the rehabilitation and development process of the forest reserve. Two kinds of management systems dominated the land use activities inside the natural forest reserves in the Elrawashda area, known as the Elrawashda Model I and Elrawashda Model II, respectively. Both models have one thing in common, i.e. the partnership between FNC and a donor funded project on the one hand, and the local people on the other, in planting, protecting and deriving benefits from forest reserves (Glover 2005). The FAO project (FAO SUD/FDES) from its start in 1980 clearly defined the objectives of rehabilitation of the forest involving the local villagers. During the rehabilitation process, the villagers will have access to agricultural land, grazing land and water points. The land use practice adopted was known during the 1980s as "Village Taungya " which is an Agroforestry system involving crops and tree seed cultivation on the same piece of land. The system was found economically sound in establishment of forest crop resulting in the lowest expenses in execution of a reforestation programmes.

Increased Role of the Private Sector

El Mahi and Abdel Magid, 2002 reviewed the role of private sector in the implementation of the national forest programmes in the Sudan, noted that Local communities have traditionally been attached to nearby forests providing paid labour for implementation of programmes and getting free services from the forest as a bonus. They collect tree leaves, fruits, seeds, roots, tubers, and suckers as forest food and get engaged in income generating activities such as honey production, handcraft and collection and sale of resins and gums. Some towns, like Eddamer in Nile Province, are famous for marketing of Dom palm products (fruits and ropes), where men and women are involved in this activity (Abdel Magid, 2001).

Chapter IV. Action plan for the implementation of the GGWSSI - Sudan

4.1. Introduction

This action plan aims at translating the will of the Government to harmonize sectoral policies and strategies in a sustainable socio-economic development framework together with control and sustainable management of natural resources and the fight against poverty and at the same time, the willingness to adapt to changing international, regional and national contexts.

The action plan must also enable the selection and implementation of structural and concerted short and long term priority actions of the GGW primarily based on the realization of field activities along the 6 covered targeted States in Sudan.

The consultation with institutional partners and local stakeholders for evaluation, modification, ownership and control of criteria and the feasibility of actions, constitute an integral part of the construction process of this plan of actions. Finally, it will be necessary to facilitate the adherence of potential players and partners before the implementation of this plan.

This action plan will have duration of 5 years from 2015 to 2020.

Based on the situation analysis and consultation with key stakeholders, the following priority intervention areas (PIAs) or components were identified:

- i. Restoration of degraded lands;
- ii. Forest and rangeland sustainable management;
- iii. Support to livelihoods and resilience of local communities;
- iv. Capacity development through research and knowledge management and dissemination of best practices
- v. Implementation and monitoring framework (implementing agency and institutional mechanism)

4.2. Description of the main priority intervention areas or components of the Action Plan

4.2.1. Restoration of degraded lands

Land degradation is believed to be one of the major threats to natural resources development in Sudan. It is caused by natural and anthropogenic sources mainly drought and desertification as well as human activities. For decades, the Government of Sudan and international communities have embarked in the fight against this phenomenon. To date, the threat continues and there is need for continuous effort to overcome this problem. Rehabilitation of degraded lands is considered to be one of the priority area of

intervention in order to secure a productive land for agricultural and livestock as well as other means of livelihoods for human being.

Indeed, chronic drought is one of the most important climate risks facing Sudan. Recurring series of dry years has become a normal occurrence in the Sudano-Sahel region. Drought is threatening the existing cultivation of about 12 million hectares of rainfed, mechanized farming and 6.6 million hectares of traditional rainfed lands. Pastoral and nomadic groups in the semi-arid areas of Sudan are also affected.

In this plan of implementation of the national component of the GGW in Sudan, a set of activities have been identified to address land degradation and also desertification.

This component has three objectives:

Objective 1: Rehabilitate farmlands through promising techniques

Objective 2: Rehabilitate riverbanks through promising techniques

Objective 3: Rehabilitate sand dunes through promising techniques

A set of activities have been identified in order to achieve each objective.

4.2.2. Forest and rangeland sustainable management and restoration

The Sudan is rich in natural resources (Hinderson, 2004). Forests represent an important resource for Sudan at both national and local levels by supporting the national economy and livelihoods of the communities. In addition to the economic value contained in wood and non-wood forest products, there are numerous economic services provided by forests including enhancement of agricultural production by conserving soil and water and maintenance of hydrological cycles. The recreational and amenity values and eco-tourism importance of forests in Sudan is increasing in landscape and urban forests and at tourism components. Still very limited evaluation of the contribution of forests and forestry sector has been performed in relation to national economy in terms of NWFPs, fuel wood, biodiversity and pharmaceuticals values and ecosystem services.

Forests, trees and shrubs play a crucial role in the Sudanese economy and the lives of its people. They assume significant supportive functions to animal husbandry, rain-fed agriculture and village or urban life. The forestry sector contributes about 15% to GDP and would be much higher if the wood used by the rural households is taken into account. The forestry sector provides 15% of job-opportunities available in the rural areas and 30% of the feed of the national herds (Elsiddig et al. 2007).

The vegetation of the grazing area is characterized by a diversity of indigenous range plants and browse tree species. The range resources and nomadic routes were managed by the coordination practiced by local governments, local forces and tribal organizations based on local order maintaining the range in rich composition and structure.

The situation of the range resources and nomadic routes have been negatively affected by the expansion of the large scale cultivation, basically mechanized farming in the semi-arid and savannas. The mechanized farms crossed the nomadic routes, resulting in blockage of the nomadic movement. These practices resulted in decreasing grazing areas and in disappearance of many of the palatable plant species. The changing climatic conditions exacerbated the bad conditions.

In this regard, activities have been identified in the action plan to address these changes. These activities are contained in two objectives as follows:

Objective 1: Restore degraded forest areas

Objective 2: Restore degraded rangelands

4.2.3. Support to livelihoods and resilience of local communities

Traditional subsistence agriculture dominates the Sudanese economy, with over 80% of the population dependent upon crop production and/or livestock husbandry to support their livelihoods. Agricultural activities account for nearly half of GDP, and are responsible for the vast majority of employment.

The agricultural sector is dominated by small-scale farmers. Typically, such farmers are living in conditions of persistent poverty and rely on rain-fed and traditional practices. This combination renders them highly vulnerable to climate variability, as evidenced by the widespread suffering in rural areas during past droughts.

Numerous other development challenges are taking place simultaneously with increasing climate risks. For example, land degradation and desertification, brought on by human land-use pressures and recurrent drought, has degraded large areas of area and continues to threaten already vulnerable arable zones. Depletion of forests – primarily for household fuel use – threatens biological diversity, human communities, and reduces other valuable services forests provide. The industrial and human waste has negative impact water quality for communities that are already water-stressed.

The eradication of poverty through improved agricultural production is among Sudan’s primary development objectives. Poverty is deeply entrenched in rural areas, home to over 20 million people living on less than US\$1 a day. Sudan’s diverse agro-ecological zones and abundant surface water offers the potential to produce a range of crops, as well as livestock. Yet, production remaining consistently quite low due in large part to an agricultural system that is not well adapted to rainfall variability and prolonged drought events.

In order to complement the government effort in addressing people’s livelihoods, a number of activities have been identified in this component of the action plan. These activities are contained in the following objectives:

Objective 1: Improve the income of local community

Objective 2: Improve food security

Objective 3: Improve the resilience of local communities

4.2.4. Capacity development through research and knowledge management and dissemination of best practices

Great Green Wall countries including Sudan are facing numerous challenges to address land degradation, among which the prevalence of sectorial approaches, the lack of coordination from the local to the national level, the lack of communication and access to information, the lack of institutional continuity and government commitment, and the politicization of decision making.

These challenges call for better capacities at different levels: individuals, organizations and the enabling environment. Capacity Development (CD) is therefore one of the keys to combat land degradation and is at the heart of GGWSSI approach. It focuses on strengthening technical capacities, such as in sustainable land management, but also on functional capacities, or “soft skill” which are needed to sustain change, such as knowledge and information sharing, creating partnerships, advocacy and resource mobilization.

Capacity development is « the process whereby individuals, organizations and society as a whole unleash, strengthen, create, adapt and maintain capacity over time». It has traditionally been associated with knowledge transfer and training of individuals, yet it is a complex, non-linear and long-term change

process. A renewed framework for capacity development has been adopted by FAO, which focuses not only on technical capacities (in areas such as forestry or agriculture), but also on capacities to lead, manage, adapt and sustain change. It is driven by country actors, consistent with national priorities and the local context, and anchored in national systems and local expertise.

In particular, this would involve focusing capacity-building efforts to involve stakeholders in the identification and use of specialized tools for planning and implementing adaptation activities.

Considerable efforts are being made on agricultural and forestry research in Sudan ; but these efforts need to be pushed further into nontraditional areas such as participatory approaches, socio-economics of rural development, with gender, conflict resolution, eco-tourism, non-wood forest products management, utilization, and processing for value addition, livelihood improvement, and environmental sustainability. Demand driven research should be conducted to provide answers to real development concerns of people, including rural people who traditionally have not been able to voice out their research needs for sustainable rural development. Research needs in areas such as wealth creation, production systems dynamics, agricultural intensification through integrated agro-forestry technologies, rationalization and intensification of livestock management models, and the development and promotion of small scale aquaculture through stocking of water for fish farming. The component is important for the GGW-Sudan and deals with cross-cutting issues of research capacity building in support of the ground activities in all Regional States covered in Sudan.

The development of capacity building focuses on implementation of best agricultural practices and techniques, environmental measures, and diversification of crops. This should also cover strengthening farmers' local organizations and networks as well as improving marketing of local produces. It also concerns awareness raising among farmers and all actors to actively engage them in the long process of strategic planning and institutional arrangements.

In water resources, the focus should be to establish rainfall and water catchment basis to enhance communal water storage systems and to supplement rainfed agriculture, improve already poor designs for water storage, plant trees around water storages, raising awareness and capacity building. These activities are already in the objectives stated above focusing on capacity assessments in the targeted states and production of a capacity development and its implementation.

4.2.5. Implementation framework

The implantation framework is important in the technical and administrative management of the national component of the GGWSSI in Sudan. This should entail the creation of a coordination Unit for the implementation of the GGWSSI with representations in each of the intervention States as well as an institutional mechanism.

The national implementing agency or coordination unit should provide avenue for the overall oversight of the implementation of the GGWSSI at national level as relayed by State representations at local level in the 6 States.

4.3. Logical framework

The expected outputs and planned activities within each component of the action plan of the Great Green Wall Initiative in Sudan are shown in the table below. The different categories of indicators,

including outputs and activities indicators have been determined and may be more detailed during the implementation phase.

Table 3: Logical framework of the Great Green Wall Initiative in Sudan

Narrative summary		Objectively verifiable indicators	Sources of verification	Major assumptions/risks	Budget (USD)
Component 1: Restoration of degraded lands					
Outcome 1. Lands suitable for production					
Objective 1.1. Rehabilitate farmlands through promising (suitable) techniques					
Output 1.1.	farmlands rehabilitated with suitable practices	400,000 ha	Reports of activities	Risk: Availability of fund to conduct the activities: Mitigation measures: Mobilize other resources	11,740,000
Act.1.1.1	Promotion of agroforestry practices	200,000 ha	Reports of activities	Risk: Availability of fund to conduct the activities: Mitigation measures: Mobilize other resources	120,000
Act.1.1.2.	Creation of shelterbelts to farmlands	400 km	Reports of activities	Risk: Availability of fund to conduct the activities: Mitigation measures: Mobilize other resources	1,500,000
Act.1.1.3.	Promotion of water harvesting practices	500,000 ha	Reports of activities	Risk: Availability of fund to conduct the activities: Mitigation measures: Mobilize other resources	5,000,000
Act.1.1.4.	Promotion of farmer-managed natural regeneration	200,000 ha	Reports of activities	Risk: Availability of fund to conduct the activities: Mitigation measures: Mobilize other resources	120,000

Act.1.1.5.	Improvement of irrigation efficiency for agricultural production	100,000 ha	Reports activities	of	Risk: Availability of fund to conduct the activities: Mitigation measures: Mobilize other resources	5,000,000
Objective 1.2. Rehabilitate riverbanks through promising (suitable) techniques						
Output 1.2.	Riverbanks stabilized with promising (suitable) techniques	500 km of riverbanks stabilized	Reports activities	of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources	2,020,000
Act.1.2.1.	Fixation of River bank through biological and mechanical techniques	500 km of riverbanks stabilized	Reports activities	of	Same as above	1,500,000
Act.1.2.2.	Awareness raising	120 sessions	Reports activities	of	Same as above	120,000
Act.1.2.3.	Training of farmers on the new introduced techniques	240 sessions	Reports activities	of	Same as above	500,000
Objective 1.3. Rehabilitate sand dunes through promising (suitable) techniques						
Output 1.3	Sand dunes stabilized with promising (suitable) techniques	1,000 ha of sand dunes stabilized	Reports activities	of	Same as above	8,620,000
Act.1.3.1	Fixation of sand dunes through biological and mechanical techniques	1,000 ha of sand dunes stabilized	Reports activities	of	Same as above	8,000,000
Act.1.3.2	Awareness raising	120 sessions	Reports activities	of	Same as above	120,000
Act.1.3.3	Training of farmers on the new introduced techniques	240 sessions	Reports activities	of	Same as above	500,000

Component 2. Forest and rangeland sustainable management and restoration						
Outcome 2. Functional and productive forests and rangelands						
Objective 2.1. Restore deforested and degraded forest lands						
Output 2.1.	Deforested and degraded forest lands restored	100,000 ha	Reports activities	of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources	45,120,000
Act. 2.1.1.	Development of concerted management plans / restoration	12 concerted management plans	Reports activities	of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources	12,000,000
Act. 2.1.2.	Establishment and sustainable management of community forests	12 community forests established	Reports activities	of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources	12,000,000
Act. 2.1.3.	Management of Prosopis indigenous spp	500 ha of Prosopis indigenous sp sustainably managed	Reports activities	of	Risk: Availability of fund to conduct the activities: Mitigation measures: Willingness of local communities to collaborate	4,000,000

				Mobilize other resources and conduct sensitization campaigns	
Act. 2.1.4.	Carry out enrichment planting with indigenous species	50,000 ha	Reports of activities	Risk: Availability of fund to conduct the activities: Mitigation measures: Willingness of local communities to collaborate Mobilize other resources and conduct sensitization campaigns	10,000,000
2.1.5	Put in place a sustainable system for sustained native seeds provision and supply	1 national tree seed centre and its representations	A national tree seed centre established	Risk: Availability of fund to conduct the activities: Mitigation measures: Mobilize resources	2,000,000
Act. 2.1.6.	Protection of natural regeneration	50,000 ha	Reports of activities	Risk: Availability of fund to conduct the activities: Mitigation measures: Willingness of local communities to collaborate Mobilize other resources and conduct sensitization campaigns	5,000,000
Act. 2.1.7.	Awareness raising –	24 sessions	Reports of		120,000

	extension		activities		
Objective 2.2. Restore degraded rangelands					
Output 2.2.	Rangeland restored	100,000 ha	Reports activities of	Risk: Availability of fund to conduct the activities: Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	39,120,000
Act 2.2.1.	Development of concerted management plans	12 concerted management plans	Reports activities of	Risk: Availability of fund to conduct the activities: Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	12,000,000
Act 2.2.2.	Carry out enrichment planting with indigenous species	50,000 ha	Reports activities of	Risk: Availability of fund to conduct the activities: Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	12,000,000

Act 2.2.3.	Protection of natural regeneration through establishment of enclosures	3,000 ha	Reports of activities	Risk: Availability of fund to conduct the activities: Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	10,000,000
Act 2.2.4.	Awareness raising – extension	24 sessions	Reports of activities	Risk: Availability of fund to conduct the activities: Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	120,000
Act 2.2.5.	Reseeding rangelands with favorable native fodder species	47,000 ha	Reports of activities	Risk: Availability of fund to conduct the activities: Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	5,000,000
Component 3. Support to livelihoods and resilience of local communities					
Outcome 3. A resilient community with enough resources for their wellbeing					
Objective 3.1. Improve the income of local community					
Output 3.1.	Income of local community improved				22,500,000

	through diversification of income generating activities				
Act 3.1.1	Development of (jubraka) home trees nurseries for women	1,000 nurseries	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	500,000
Act 3.1.2	Development of Phoeniculture – date and doum palm cultivation and transformation (using byproducts):	1,000 new date and doum farms 10,000 women involved	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	500,000
Act 3.1.3	Promotion of small trade through sale of the local produces	10,000 women empowered	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	1,500,000
Act 3.1.4	Production and commercialization of gum Arabic	30,000 gum Arabic producers organized	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize	16,000,000

				other resources and conduct sensitization campaigns	
Act 3.1.5	Development of legumes production through small scale irrigation schemes	9,000 farmers	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	4,000,000
Objective 3.2. Improve food security					
Output 3.2.	Food security of the community improved				49,000,000
Act 3.2.1	Diversification and increase of agricultural production	Agricultural production increase by 10%	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	15,000,000
Act 3.2.2	Use of efficient irrigation techniques	Efficient irrigation increases by 10%	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	9,000,000
Act 3.2.3	Diversification and increase livestock production	Livestock production increase by 10%	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local	15,000,000

					communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	
Objective 3.3. Improve the resilience of local communities						
Output.3.3	Resilience of local community improved					36,000,000
Act 3.3.1	Provision of efficient energy sources	180,000 households	Reports activities	of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	12,000,000
Act 3.3.2	Provision of efficient cooking stoves	180,000 households	Reports activities	of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	6,000,000
Act 3.3.3	Provision of drought resistance crops	6 different drought resistant crops	Reports activities	of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	3,000,000

Act 3.3.4	Promotion of water harvesting techniques	48 sites covered	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	15,000,000
Component 4. Capacity development					
Outcome 4: Stakeholders enabled to manage their resources					
Objective 4.1.Capacitate the local stakeholders in managing their resources					
Output 4.1.	Local stakeholders capacitated in managing their resources	3 groups	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	7,000,000
Act 4.1.1.	Capacity needs assessments conducted and a capacity development plan is prepared tailored to needs and target audiences	Surveys in various institutions and regions	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	1,000,000
Act 4.1.2	CBOs: Training on techniques and technologies: irrigation	48 training sessions	Reports activities of	Risk: Availability of fund to conduct the activities Willingness of local	2,500,000

	techniques, nursery establishment and maintenance, water harvesting techniques, farmer managed natural regeneration, enclosure techniques, improved agricultural techniques, etc			communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	
Act 4.1.3	Extension agents: Training on methods and techniques for community mobilization, awareness raising, conflict resolution techniques, etc	48 training sessions	Reports of activities	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	2,500,000
Act 4.1.4	Members of parliament at local level: Awareness creation on the concepts of land degradation, land rehabilitation, forest and rangeland management and restoration issues, natural resource management laws and policies, etc	24 training sessions	Reports of activities	Risk: Availability of fund to conduct the activities Willingness of local communities to collaborate Mitigation measures: Mobilize other resources and conduct sensitization campaigns	1,00,000
Component 5. Implementation and monitoring framework					
Outcome 5: A functional national agency					
Objective 5.1. Establish a functional national agency					

Output 5.1.	A national agency established and functional	1 established and functional agency	Reports of the activities	Risk: Availability of fund to conduct the activities Mitigation measures: Mobilize other resources and conduct sensitization	7,500,000
Act 5.1.1	Implementing agency	1 national agency and regional representations in the 6 States	Reports of the activities	Risk: Availability of fund to conduct the activities Mitigation measures: Mobilize other resources and conduct sensitization	5,000,000
Act 5.1.2.	Institutional mechanisms established for the governance of the initiative (involving different sectors)	Institutional mechanisms put in place	Reports of the activities	Risk: Availability of fund to conduct the activities Mitigation measures: Mobilize other resources and conduct sensitization	1,500,000
Act 5.1.3.	A monitoring framework established for the initiative	Monitoring framework in place	Reports of the activities	Risk: Availability of fund to conduct the activities Mitigation measures: Mobilize other resources and conduct sensitization	1,000,000
Total budget					228,620,000

Chapter V. Implementation strategy

5.1. Approaches

Strong support is essential to be directed to the Quarter Century National Comprehensive Strategy (2002 to 2027) which considered the environmental development in more depth, comprehensiveness and integration than being sector stated in previous strategies. A holistic approach in policy review is necessary in order to design a national comprehensive strategy and build the capacity of concerned institutions and organizations to understand the synergies between the national and sectors policies and between these policies and strategies and the Rio-conventions.

The review of national policies and plans and regional protocols and international conventions will therefore assist in streamlining the local and national programs within the national objectives so that they are consistent with the principles of sustainable development and the holistic ecosystem management of the dry lands in Sudan. The streamlining and coordination between sector policies in national programs will enable the Government to manage the natural resources in a sustainable approach and in a manner that is in harmony with the regional best practice.

In pursuit of the objectives of sustainable management and the use of the natural ecosystem resources, it has been realized that sector policies that currently drive execution of the various sector programs in Sudan are often not formulated or implemented in harmony whether with one another or with the principles of sustainable development. The existing policies are frequently at odds with each other and promote sections interest at the expense of inter-sectors coordination. The agricultural policy is strong and sound but is conflicting with the forest policy in spite of the fact that the latter is also sound and strong. The challenge is how to implement agricultural plans which support the conservation of forests and range resources.

The challenges and gaps, necessitates an urgent and quick review and streamlining of existing policies as part of the national Strategy, Policy and Planning towards sustainable management of the resources in order to enhance sustainable implementation of the GGWI in Sudan.

5.2. Coordination, Monitoring and Evaluation of the implementation

5.2.1. Coordination

Delegation of some responsibilities to ministerial committees involving the ministers of environment of the countries to be concerned with logistics and financial priorities consideration is an institutional opportunity for the success of the initiative. Further elaboration of the institutional support of Sudan to the initiative is embraced in the organizational steps taken by defining a focal institution involvement of relevant institutions, national steering committee and staff for commitment to communication and processing for implementation.

It is believed that the GGWSSI fits very well with the implementation of the 10-year strategic plan and framework for the Implementation of the Convention for combating desertification (2008-2018). The strategy stands on the basis of country efforts to organize its institutional structure and find the technical personnel and financial resources to support the relevant activities and develop coordination

between stakeholders. This means that the African Union Commission should assist the country to develop the scientific capacity and technical ability.

At national level

The Great Green Wall Initiative in Sudan is under the Ministry in charge of Environment. The different bodies for the effective implementation of the activities in the GGW are:

- **A National Guidance Synergy Framework for the GGW - Sudan** assimilated to the Inter-ministerial Steering Committee (ISC) (including member ministers from relevant ministries chaired by the Minister of Environment) taking into account all the other principals of ministries and directors of ministerial departments (as extended committee) involved in the activities of the GGW. During meetings involving these levels, the committee put major issues of policy. The committee is chaired by the Minister for Environment. Its main responsibility is the Policy statements and Policy Coordination of the Great Green Wall Initiative in Sudan and its essential role is to provide guidance and mobilize financial resources for the implementation of the GGW activities. It is also responsible for ensuring the synergy of interventions and coordination of actions on the ground; The extended committee continues to look into policy statements and implementation and take the responsibility of the coordination:
- **A National Agency of the Great Green Wall** composed of a light structure, responsible among other things, mobilizing financial resources, monitoring of the implementation of field activities.
- **At the establishment of agency**, the team responsible for implementing the action plan will consist of experienced managers, a bilingual secretary, a driver and a maintenance agent. This staff will be reinforced depending on the nature and extent of activities at both national and States level offices. All staff will be availed and supported by the Government, and will benefit with a responsibility allowances paid by the program. The method of recruitment will favor the call for applications with curriculum vitae and subject to approval by the ISC.
- **A National Steering Committee** chaired by the Secretary General of the Ministry for Environment. This committee is responsible, among others to:
 - ✓ Contribute to the exchange of information and consultation among actors;
 - ✓ Contribute to the development of the action plan and update the strategic directions of the GGW - Sudan;
 - ✓ Contribute to the monitoring and evaluation of the GGW - Sudan;
 - ✓ Provide necessary guidelines for improving the conditions of implementation of the GGW - Sudan;
 - ✓ Provide the necessary adjustments and provide any useful contribution to improving the conditions of implementation of the GGW - Sudan.
- **A Scientific Committee** to provide scientific and technical guidance on the research / development and responses to questions raised during the implementation of the GGW activities. It is chaired by a researcher and composed of representatives of all concerned institutions at national level.

At local level

At State level, the coordination of the activities is under the technical supervision of relevant authorities at the state level including forests, range, water and wildlife in a state steering or technical committee. Regional Directors of Environment ensure coordination of the execution of field activities. The monitoring / supervision of work are provided by the Regional Technical Monitoring Committee / Supervision;

At district level, the officers in charge of Environment coordinate the implementation of the activities.

Stakeholder's involvement

Stakeholders related to natural resources management and use are diverse and important, including Local and national country representatives from relevant ministries, NGOs, private sector, trade unions and other civil organizations. Other relevant and important actors like the Ministry of Environment Natural Resources and Physical Development and affiliated institutions, Ministry of Agriculture and affiliated institutions, Ministry of Finance and many others can play critical roles in promoting coordination and integration of activities related to sustainable land management.

In addition, sub-regional organizations; regional development banks; technical and financial partners and international organizations are important because they will be useful with respect to financing, training and technology transfer. The African Union and its supporting units as the African Union Commission (AUC), the Pan-African Agency for the great green wall, GGWI focal point, institutions in charge of coordinating the GGWI implementation at the regional and sub-regional levels, technical and scientific institutions supporting countries to develop their GGWI action plans, organizations in charge of implementation of the initiative at local level (through different projects, programmes and resource persons), the Economic Community of West African States (ECOWAS), the Intergovernmental Authority on Development in Eastern Africa (IGAD) and the Community of Saharan and Sahelian States (CEN-SAD) and the Trans African Institute for Development.

In addition to the abovementioned stakeholders, other organizations include the Global Mechanism (GM) for the UNCCD, the European Union, the Food and Agriculture Organization of the United Nations (FAO) and GEF are important partners and stakeholders within the context of GGWI. Other regional and development partners include the Interstate committee for drought control in the Sahel (CILSS), the Sahara and Sahel Observatory (OSS), the World Bank, the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP), World Agroforestry Centre in Kenya (ICRAF), World Overview of Conservation Approaches and Technologies (WOCAT) and African Forest Forum (AFF).

These stakeholders should develop common vision and appropriate framework, which brings all actors with different interests and intentions together to adopt activities in harmony with sustainable land management. Many examples of successful practices which stand as pilot projects can be seen by these stakeholders so as to contribute in developing strategies and procedures for up-scaling these activities and to bring experiences to actors at local and national levels. The action plan should accommodate the participation of the different stakeholders in programmes activities and practices each according to the relevance of relation to the GGWI.

5.2.2. Monitoring and evaluation

The overall purpose of monitoring and evaluation is to measure and evaluate the performance of the implementation of the GGW - Sudan to better manage the effects (intermediate results) and impacts (final results or development). Here the use of efficient technical procedures will facilitate successful monitoring and evaluation. Ground measurement combined with remote sensing will be useful tools. In addition, questionnaires are also of use.

Also, the monitoring / evaluation system set up will focus on monitoring and evaluating the effects and impacts of the GGW-Sudan. Monitoring and evaluation of the effects related to the systematic collection of, and data analysis to track changes from baseline to the expected effects of the program and to understand why there was or no change. Monitoring is in this sense a means of controlling forecasts compared to accomplishments and a management tool, as well as enables the reorientation of actions and activities can adapt to the changing environment. Monitoring activities are used to compare the performance expected with the performance achieved.

The assessment should report on lessons learned from experiences in the framework of the implementation of the GGW activities in Sudan. It will therefore be selective operation that aims to assess systematically and objectively the progress in achieving the expected effects of the Great Green Wall program. There will be no one-off activity, but an operation that involves a series of different assessments as to their purpose and level of detail. The assessment must be performed several times to meet the changing needs in critical knowledge and learning throughout the realization of the effects of GMV in Sudan.

From the above, the following instances of monitoring / evaluation recommended in the framework of this program, namely:

1. Mid- term review of the initiative should focus on the effectiveness, efficiency and favorable character (favorable aspects of the process) of the program implementation. It must be undertaken towards the end of the first half of the life of the program. If properly conducted, it should highlight the constraints and propose operational solutions and learn from the design, implementation and management of the program.
2. Performance Monitoring of the initiative based on the database confrontation (which describes the situation at the beginning of the program or starting position to a time T₀) and data collected at a time T₁ and measure the change. Baseline data should be collected from the start of the implementation of the program. The collected data on the performance of the program (not data collection to be specified) used to report the results achieved in relation to expected results and those of the baseline.
3. Final assessment which must take place at the end of the activities of the initiative. Beyond the aspects covered by the mid-term evaluation, final evaluation also covers signs of impact and sustainability of results, including the support to capacity building and the achievement of global environmental goals. The final evaluation also helps determine the realization or not of a complementary phase of the program.
4. Evaluation retrospectively for identifying the impact of the initiative in Sudan. It could be achieved two years or more after the completion of the first five-year plan of the Great Green Wall Sudan. This evaluation should focus on the sustainability of program results and lessons learned (best and worst

practices, anticipated and unanticipated costs, applying lessons at the sector, thematic and cross-border) as a basis for developing policy and forward planning.

5. The collection and analysis of performance data during the monitoring / evaluation operations will provide an opportunity to the implementers of the initiative to see:

- ✓ if the action plan is on schedule and planned use of resources;
- ✓ if the risk management strategy is effective ;
- ✓ if there is difficulty that requires a redefinition of the expected results or reallocation of resources ;
- ✓ lessons learned to improve program management practices, adjustments as needed to ensure that the program is achieving the desired results and make proposals for the future;
- ✓ the effectiveness of the intervention of the Great Green Wall .

The frequency of collection of such data must be realistic taking into account the capabilities of the program while providing the information required for decision-making. At the beginning of the program, one must collect data and periodically at intervals to get rather close timely information is needed. Over time, the frequency of data collection is reduced; reports should primarily focus on the achievement of outputs or immediate results and effects (interim results).

6. Preparation of periodic reports (annual or biannual) on the results informing stakeholders on the degree of achievement of results and the differences between expected results and results achieved, if any. They also offer the opportunity to review necessary inputs to update the information related to the context of the program and risk management. Some progress reports must describe the actual results achieved during the period at each level of the chain of results and the differences between planned and actual results explaining the situation and how to handle the issues involved because of these differences. The progress reports provide an opportunity to take stock of the achievements, analyze the challenges that must be faced, and adapt strategies to achieve goals. They also facilitate communication and thus help to ensure transparency in the program's decision-making bodies.

7. Information / Communication: the information collected / during the monitoring and evaluation should be shared by a broad communication of information. This is to provide systematic and timely vital information at regular intervals to expect feedback, a process by which information and knowledge are disseminated and used to assess overall progress towards achieving the results or to confirm the achievement of results.

5.2.3. Monitoring and Evaluation Framework

The monitoring and evaluation system must involve and encourage broad participation of all stakeholders, hence the need to design in a participatory and ownership at all levels.

Internal monitoring and evaluation: A monitoring and evaluation unit has to be set up under the management of the implementation of the action plan. Monitoring internal assessment of the activities and defined indicators will be provided by the monitoring and evaluation unit to be set up under the management of the implementation of the action plan. The internal monitoring and evaluation activities will aim at the operational level to ensure perfect control of the parameters related to establishing

partnerships and implementation of services, in order to respect at best the estimated timing. The system will identify, plan and track all tasks unit regularly needed to complete each activity. The monitoring will also ensure the optimal use of financial, material and human resources for the program. A quarterly evaluation of program performance will be made and sent to the National Coordination Committee and donors, together with the activities report.

Concerning the results and impact indicators, a special emphasis will be targeting the most relevant parameters that can be monitored and collected internally, with the help of technical services and other partners, and the definition of those specifically relating to the communities. Monitoring will include:

- (i) the rate of infrastructure completion,
- (ii) developed areas and the rate of recovery of planted trees ,
- (iii) the level of production of irrigated crops,
- (iv) the effective organization of supervision and training of producers,
- (v) the degree of organization of concerted agro-pastoral area management,
- (vi) the involvement of women in decision-making and self-management in place ,
- (vii) land and landscaped areas security, etc. The measure of medium-term effects target specifically strengthening food security, reducing desertification and improving local governance.
- (viii) The change in livelihoods support

The monitoring mechanism involves producers and program partners, and will incorporate the results-based management principle, being promoted at national level, and taking into account the indicators specified in national strategies. This strategy, oriented towards the achievement of outcomes, will be subject to continuous monitoring of results, using information on performance to make the necessary changes.

External monitoring and evaluation: The external monitoring and evaluation will be provided by external operators within the authorized ministries with two missions per year. The mission reports are to be submitted and discussed with the National Agency before transmission to all partners including donors. Donors may also supervise periodically (every year 1 mission) setting implementation of the action plan through periodic missions and according to an outline to assess the rate of implementation of the program and the achievement of results.

The monitoring and evaluation system will also emphasize participatory monitoring and evaluation with grassroots organizations involved in the activities, and will bring particular attention to the impact monitoring actions of revegetation of integrated management of water and soil on productivity and resources natural.

5.3. Risks and Mitigation

5.3.1. Risks

The following major risks must be taken into consideration. These include:

Climatic hazards: frequent droughts in Sudan, insufficient and erratic rainfall and flooding could undermine the success of plantations established and built retention ponds;

The participation of local people: because of the prevalence and degree of poverty in the program intervention areas, local people could give more priority to actions on meeting their immediate individual needs rather than on sustainable actions of natural resources management. Thus the ineffective participation of the people in the work of restoration and protection of natural resources could threaten the achievement of program outcomes and is therefore a challenge;

The weak institutional and technical capacity: the weak organizational, technical, financial and logistic at national and local levels could jeopardize the implementation of the GGW-Sudan. The process of decentralization in Sudan still presents many challenges including: the strengthening of local governance, mobilization of financial resources at local level, the development and strengthening of citizenship, and the strengthening of inter-municipal and cross-border cooperation.

5.3.2. Mitigation

The following mitigation measures are proposed to reduce these risks:

- ✓ **The formulation of comprehensive National Policy:** This will help in solving the conflicts and will harmonize activities
- ✓ **The reduction of climate risks:** GGW-Sudan should focus on approaches and techniques for sustainable management of natural resources compatible with the prolonged drought and climatic variations. The relatively long duration of the program can also be seen as a mitigation measure. The collaboration program with other plans and programs for adaptation and mitigation to climate change and desertification developed and adopted by Sudan offers the possibilities of taking into account their performance in the actions and strategies of the GGWSSI.
- ✓ **The strengthening of local participation:** the participatory approach advocated by GGW-Sudan must ensure the mobilization of local populations. The implementation of income generating activities under this action plan could also encourage the involvement of people in the achievement of program outcomes.
- ✓ **The empowerment of local governance institutions:** the Great Green Wall Initiative will primarily focus its assistance on capacity- building in sustainable management of natural resources at local, state and national level with a special focus on addressing the challenges of decentralization:
 - (i) raising awareness of the challenges of environmental degradation and sustainable resource management approaches;
 - (ii) improving local income through the sale of ecosystem services and
 - (iii) strengthening local institutions making power on management and development of natural resources.

Chapter VI Communication and resource mobilization strategy

6.1. Communication

As part of improving the internal functioning and objectives of the action plan, an information and adequate communication system will be established. This will facilitate the flow of information at all levels of the program and partners with the beneficiaries in the first place, technical services, private operators and the public in general.

Internally, it will be privileged and systematized work meetings, dissemination of written documents, computer networking services, the organization of the documentation and archives, the acquisition of multimedia materials (digital cameras, multimedia projector, computers, laptops, etc.).

Externally, it will disseminate information as technical documents on paper and in digital format towards the institutional partners (government, development partners, etc.) and management operators (extension and awareness messages). An agency presentation brochure will be published. The most suitable channel target audiences will be identified and used: Internet, electronic messages, community radio, leaflets, etc. Furthermore, identification panels will be placed on the different sites in order to make the achievements more visible. As part of this visibility, a documentary film based on the achievements will be produced. The experienced service providers in information and communication will be involved in the implementation of some of these activities.

6.2. Financing mechanism

As part of the implementation of this strategy and its action plan, to secure the long-term financing, it is essential to establish an appropriate and sustainable funding mechanism. To do this the following options are proposed:

The Government: it must support through internal efforts to mobilize financial resources the Agency in charge of implementation of activities of the GGW. A budgetary allocation could be provided annually in the budget programming to support not only the operation costs but also the field activities.

The implementing agency of the GGW: it must develop bankable projects either sectoral or integrated thematic components identified in this strategy and its action plan and submit them to the government and the technical and financial partners.

Local authorities: they must include in their budget margins annual program to support the funding of certain activities of their localities.

Local communities: their contributions could be negotiated in a flexible way with the other stakeholders involved in the implementation of the GGW activities.

A synergy must be created with other projects or programmes in the intervention States.

List of current and in pipeline projects or programs in the 6 States which are very relevant to the GGWI can be found in the following documents.

1. National Adaptation Plan of Actions
2. National Adaptation Programme
3. East Nile Technical Regional Project ENTR Project
4. World Food Programme
5. United Nations Industrial Development Organisation
6. NCSA (National Capacity Self-Assessment)
7. Blue Nile Action Plan
8. NBSAP National Biodiversity Strategy and Action Plan.
9. The Sudan REDD+ initiative

It is understood that the harmonized regional strategy will centre on the innovative new finance that can be mobilized in order to complement mobilization of the local and national resources and to bring them towards good practices and to involve trans-boundary projects. The GGWI is not going to stand alone but needs to be integrated into other major programs and financing mechanisms to guarantee its successful implementation.

More concern of the eleven countries is reflected in the financial, administrative and executive responsibilities and in follow up of previous ministerial meetings decisions. These issues were tackled in regular Ministerial meetings. Efforts taken by ministers of environment for enhancement of financing systems stand as opportunity for possibilities of implementation of the initiative. FAO and the Global Mechanism (GM) of the UNFCCC prepared the draft Regional Harmonized Strategy, considering the geographic coverage, the vision, the global, strategic and operational objectives, the expected results, the implementation framework and the resource mobilization strategy. Meetings of the environment ministers and other stakeholders from the eleven countries including the Sudan developed ideas on how to prioritize the financing for the program of implementation. This action in itself reflects the concern of the region and the international community towards the GGWSSI framework.

Bilateral and multilateral donors, international financial institutions and other global organizations who participated in meetings and discussions supported by the United Nations Convention to Combat Desertification (UNCCD) and the Global Environment Facility (GEF) indicated their support. The Global Environment Facility expressed interest in supporting the proposed investment possibilities of what could be up to US\$115 million through its various financing windows – including the Least Developed Countries Fund, and other resources within the GEF that encourage sustainable development focal areas on biological diversity, sustainable land management and climate change. The GEF is presently processing financial support for FNC, Sudan under implementation of the World Bank, to develop Sudan project for Sustainable Management of Natural Resources within the GGWSSI initiative involving relevant institutions and covering three states including Kassala, Gezira and White Nile, [(FNC, RPA, Wildlife, Livestock Resources and other relevant stakeholders) Abdalla2 2012]. Other development partners also made pledges in support of the proposed investments which could ultimately reach US\$3 billion for sustainable development in these countries. The financial support of the international community is as well a platform that makes the implementation of the GGWSSI framework possible.

Financing mechanisms within the national and sub-regional levels should complement in supporting the initiative implementation at local and national levels. The Global Mechanism (GM), in partnership with the AUC and FAO and with European Union financing processes represents the supporting platform for

the issue of complementarity of the funding mechanism. The mechanism will be a useful tool in spearheading the development of a resource mobilization platform to mainstream the GGWI program into national development frameworks, and in elaboration of a resource mobilization approach for the GGWI harmonized regional strategy.

It is accordingly necessary that some efforts should be exerted at local and national levels in Sudan to press upon the government and concerned institutions and organizations to develop partnerships involving both state and non-state stakeholders for the successful implementation of the GGWSSI. Sudan has successful experience in development of participatory approach and enhancement of partnerships and power sharing in resource mobilization and management which are at pilot scale and need to be up-scaled in order to facilitate fulfillment of the GGWI vision and objectives.

However, in spite of the abovementioned financial opportunities, there are constraints facing the implementation of the GGWI. The Ministry of Finance and National Economy (MOFNE) is facing a revenue loss as a result of revenue reduction resulting from loss of oil revenues on the economy of Sudan due to separation of the South Sudan. This situation creates problems to land use leading to financial bottlenecks.

Conclusion

The developed action plan for the implementation of the GGW-Sudan is practical given the way it is structured in terms of components. These components are derived from a situation analysis which takes into account all the biophysical, socio-economic aspects of the country. It has also considered the peculiarities of the interventions zones. The components can be implemented as standalone projects or combined depending on what is set as objective. The budget may seem a bit high but given the situation on the ground and the problems to be solved, it is to some extent underestimated.

The actors for the implementation of this action plan should use the various opportunities that exist in mobilizing necessary financial resources to start implementing the action plan by developing the project ideas presented into bankable projects. The national government and its bilateral and multilateral partners can come together in the implementation of these projects. For efficiency, it is important to build synergy with existing projects and those in pipeline to actively join efforts in solving the problems in the same areas for the same people.

The main problem is the funding of these activities. The regional strategy for financing mechanisms should put into contribution to assist in funding these projects. Other programmes and initiatives at national level should be considered as well in tapping the resources necessary for the GGW-Sudan. Lastly, all key stakeholders should be involved in order to get their appropriation of the initiative. From this depends the success of the action plan.

Bibliography

Abdel Magid, Talaat D. (2001) Forest Biodiversity: Its Impact on Non-wood Forest Products. (Published by Forests National Corporation).

Abdel Magid, T. D; Gasim, M and El Mubarak, S. (2015), The State of Sudan's Forest Biodiversity for Food and Agriculture. Ministry of Agriculture and Forstry.

Al Awad, A. A. Ecotaxonomical studies on vegetation of Red Sea State, Sudan, Ph.D. Thesis University of Khartoum, Khartoum, 1985.

Al Basher;Abdullah Al Sayed 2012. In: Sudan Vision, Sudanow interview with Undersecretary of the Ministry of Environment, Forests and Human development (Mohamed, Babiker), July 2011.

Abdalla2 I.H. 2012.Sudan Sustainable Natural Resources Management Project. FNC, Khartoum.

Abdel Magid, T. D. and El Siddig, E. A. (2003) Social Forestry in Sudan, Its Current Status and Future Potential. Paper published in the 12th World Forestry Congress, Canada

Abdelnour, H. O. 1999 Implementation of National Forest Programme. A Case Study. Paper Presented at FAO- Turkey Workshop, Istanbul, Turkey.

Abdelrahman, Aisha (2010). Urban forest development in the three towns.MSc thesis, Faculty of Forestry, University of Khartoum.

Abu Sin, M. E. and El Sammani, M. O. (1986).Socio-Economic Aspects of Integrated Resource Management, With Special Reference to the Forest Resources of Kassala Province – Eastern Region.The Case of Rawashda and Wad Kabo Forests. Field Document No. 13, February, 1986. Fuelwood Development for Energy in Sudan.

Africover 2003.African Forestry Resource assessment report. Nairobi.

Ahmed Mohamed El-Hassan Fagiri. (2005) Institutional Reorganization Review Report. Assistance of the Revision of National Forestry Policy, Legislation and Institutional Reorganization. Project Document of FAO and Sudan, Ministry of Agriculture and Forests

Akhtar, M. ,Mensching, H. G. and Poertge, K. H. (1997). Effective techniques for monitoring and assessing desertification: in McGinty (ed.) International Symposium and Workshop on Combating Desertification: Connecting Science with Community Action, Tucson, Arizona, USA.

Ali, O.B.M. 2007. Assessment of changes in land cover and species composition and their impacts at Adar yale, and Paloicharea, Upper Nile. PhD.thesis, Faculty of Forestry, Shambat.130 p.

Anon. (2015). Annual Crop and Food Supply Assessment Mission, Sudan. Special Report. Republic of Sudan. Ministry of Agriculture and Irrigation. Food Security Technical Secretariat (FSTS).

Arkell, A. (1955). A history of the Sudan from the earliest times to 1821. London: The Athlone Press.

Atta ELMoula, M.E. (1985).on the problem of Resources management in theSudanEnvironment Monograph series, No.4, General Editor: Dr.Mahadi Amin Eltom.Institute of Environmental studies, University ofKhartoum.

Ballal ME, El Siddig EA, Elfadl MA, Luukkanen O (2005). Gum Arabic yield in differently managed Acacia senegal stands in western Sudan.Agro. Forum, 63: 237-245.Brown, L.R. and Wolf, E.C. 1985. Reversing Africa decline.World Watch Paper no. 85, 81pp.

De Wit, Paul. (2001): "Legality and Legitimacy: A Study on Access to Land, Pasture and Water," Food and Agriculture Organization, Khartoum.

Daak, A.A. 2007. Detection of vegetation cover change using remote sensing and GIS system. MSc. Thesis, Faculty of Forestry, Shambat.

Developing Darfur: A recovery & Reconstruction Strategy, 2013

Epaphras A. M., Gereta E., Lejora I. A., Ole Meing'ataki G. E., Ng'umbi G., Kiwango Y, Mwangomo E, Semanini F, Vitalis L, Balozi J and Mtahiko MGG, "Wildlife water utilization and importance of artificial waterholes during dry season at Ruaha National Park, Tanzania".

Wetlands Ecology and Management 16: 183-188. 2008.

ElhagM. M. 2006 Causes and Impact of Desertification in the Butana Area of Sudan. Thesis submitted in accordance with the requirements for the degree of Doctor of Philosophy in Agrometeorology. Department of Soil, Crop and Climate Sciences Faculty of Natural and Agricultural Sciences University of the Free State Bloemfontein, South Africa.

El Mahi, A. G. and Abdel Magid, T. D. (2002) The Role of the Private Sector and Civil Society in the Formulation and Implementation of National Forest Policies and National Forest Programmes in Sudan. Paper presented to the International Workshop organized by FAO and FNC.

Elsiddig, E.A. 1980. The prediction of stem and branch volume of Acacia nilotica in the Fung Region in the Sudan.A PhD thesis, University College of North Wales, Bangor.

Elsiddig, E.A. 2002. The management of Acacia nilotica L. Plantation along the Blue Nile flood basins in Sudan for Sustainable production: A Review. U. Of K. J. Agric. Sci. 10(1), 119 – 130.

Elsiddig, E.A. 2003.The importance of trees and forests for the local communities in dry lands of Sub-Saharan Africa. VITRI/ETFRN/IUFRO-SPDC workshop on trees, agro-forestry and climate change in dry land Africa (TACCDA). Finland 30/Jun – 4/Jul/2003. <http://honeybee.helsinki.fi>

Elsiddig, E.A. 2004.Community-based natural resource management in Sudan. In: Awimbo, J. Barrow, E. and Karaba M. 2004. Community-based natural resource management in the IGAD region. IUCN, Nairobi.

Elsiddig, E.A. 2006: Second informal dialogue on the role of LULUCF in the CCR Spain 19 – 21 April 2006.

- Elsiddig E.A. (2011). Improving traditional land use practices in dry lands of Sudan in contribution to adaptation to climate change impacts. *Nature & Fauna*, Vol. 25 Issue 1 (90 – 94)
- Elsiddig E A, Mohamed A G and Abdel Magid D. (2007) Sudan forestry sector review. Forests National Corporation. National Forest Programme Facility.
- FAO/FNC 1994. Forest products consumption survey. Final Report, Forestry Development Project in Sudan.
- FNC/FNI 1998. National forest inventory for Sudan. Forestry Development Project in the Sudan, Khartoum.
- FRA 1990. Forest Resource Assessment, FAO forestry paper
- FRA 2000 Forest Resource Assessment, FAO forestry paper
- FRA 2005. Forest Resource Assessment, FAO forestry paper
- FRA 2010. Forest Resource Assessment, FAO forestry paper
- Gorashi Mohamed Kanoan (2005) Revised Forestry Legislation in the Sudan. Assistance to the Revision of National Forestry Policy, Legislation & Institutional Reorganization. FAO.
- Glover, E. K., Tropical Dryland Rehabilitation: Case Study on Participatory Forest Management in Gedaref, Sudan. Doctoral Dissertation. University of Helsinki, HakaPaino Oy. 2005.
- Glover, E. K. Approaches to Halt and Reverse Land Degradation in Kenya: Agroforestry Development and Environmental Sustainability. Germany, VDM Verlag, Germany. 2010.
- Hashim M. El Hassan M. Osman. 2013. PR-325-Sudan- Working Paper on: Role of Natural Forage Plants Diversity in Pastoral and Agro-pastoral communities Livelihood. The Role of Indigenous Knowledge in Supporting the Livelihood of Pastoralists and Agro-Pastoralists in the Project Area in the face of climate change.
- Harrison, M. and Jackson, J.K. 1958. Ecological classification of the vegetation of the Sudan. Forest bulletin No. 2. Agricultural Publication, Khartoum, Sudan.
- HCENR, 2001. Climate Change: Sudan's First National Communications under United Nations Framework Convention on Climate Change.
- HCENR. (2013). Stocktaking and National Biodiversity Targets Setting Report (Mohamed, E. I. ed.). National Biodiversity Planning to support the implementation of the CBD 2011-2020 Strategic Plan in Republic of Sudan.
- Higher Council for Environment and Natural Resources (2015). Sudan National Biodiversity Strategy and Action Plan 2013-2020.
- Hinderson, T. (2004). Analyzing Environmental Change in Semi-Arid Areas in Kordofan, Sudan. PhD

thesis, Lund University, Geobiosphere Science Center.

Karrar, Gaafar, (2002). Long Term Plans for Drought Mitigation and Management in the Near East – A Policy Paper Prepared for the FAO Near East Regional Office, Cairo.

ILO, 1984. Project Identification Mission, Ministry of Agriculture, Sudan.

Le Houerou, H.N. 1980. The rangelands of the Sahl. *Journal of Range Management* 33: 41 – 43.

Ibrahim, A. M. (2000) Past, Present and Future Afforestation, Reforestation and Tree Management Models for Farmland in the Sudan. Workshop on Management of Trees for Farmland Rehabilitation and Development. Khartoum 27 Oct. – 7 Nov. 2000.

Luukkanen, o. pia Katila, ElnourElsiddig, Edinam, Glover, Huda Sharawi and Mohamed Elfadl, (2006). Partner between public and private actors in forest-sector development, options for dryland Africa, based on experiences from Sudan. A study commissioned by Ministry of Foreign Affairs of Finland, Department of International Cooperation, Helsinki.

MOHAMED KASSAS. 1964. ARIDITY, DROUGHT AND DESERTIFICATION. ARAB ENVIRONMENT: FUTURE CHALLENGES.

National Drought and Desertification Control Unit (NDDCU). Sudan National Action Programme (SNAP) a framework for combating desertification in Sudan In the context of the United Nations convention to combat desertification. Khartoum – March 2006

National Drought and Desertification Control Unit (NDDCU 1990) Map unit.

Nadir Ahmed Elagib and Martin G. Mansell. 2000. Climate impacts of environmental degradation in Sudan. *GeoJournal*. Vol. 50, No. 4 (2000), pp. 311-327. Published by: Springer.

Omar A. Abdi, Edinam K. Glover, Olavi Luukkanen, Causes and Impacts of Land Degradation and Desertification: Case Study of the Sudan, *International Journal of Agriculture and Forestry*, Vol. 3 No. 2, 2013, pp. 40-51. doi: 10.5923/j.ijaf.20130302.03.

Practical Action 2008. Traditional women innovations on energy efficiency. A workshop 2008.

Rockström, 1997. on-farm agro-hydrological analysis of the Sahelian yield crisis: rainfall partitioning, soil nutrients and water use efficiency of pearl millet. PhD thesis. Natural

Resources Management Department of Systems Ecology, Stockholm University, Sweden.

SKAP 1975. Southern Kassala Agricultural Development Project. Government of Sudan.

Redfern J. V., Grant C. C., Gaylard A. and Getz W. M "Surface water availability and the management of herbivore distributions in an African savanna ecosystem" *Journal of Arid Environments* 63: 406-424, 2005.

Seifeldin H. Abdalla and. Kamal A. Mohamed. (No date). WATER POLICY OF SUDAN: NATIONAL AND CO-BASIN APPROACH.

Shazali, S and Abdel Ghaffar M. Ahmed (1999) Pastoral Land Tenure and Agricultural Expansion; Sudan and the Horn of Africa. IIED Issue Paper No. 85.

Stebbing, E.P. 1953. The creeping desert in Sudan and elsewhere in Africa 15 – 30 degrees latitude, Khartoum.

Tolentino (1994). Environmental Legislations and Institutions in the Sudan.

UNDP, 2006. Nomads' Settlement in Sudan: Experiences, Lessons and Future action.

World Bank 1986. Sudan forestry sector review. Forests Administration, Khartoum.

White F. 1983. The vegetation of Africa, a descriptive memoir to accompany the

UNESCO/AETFAT/UNSO vegetation map of Africa. North western Africa, North eastern Africa and southern Africa, 1:5000000. UNESCO, Paris.

World Bank 2005

www.fao.org/in-action/action-against-desertification And <http://www.greatgreenwallinitiative.org/>

Wessel, M., Agroforestry Ecosystems. Course Reader, Department of Forestry, Wageningen University. The Netherlands. 1996.

Yagoub A. Mohamed (2003), The Role of Local Institutions in Disaster Preparedness and Prevention, Report prepared for FAO.

Annex 1: Policy and legal Framework at national level

Policy

Sudan has several policies and strategies at national and land use sectors levels covering natural resources that include agriculture, water, forests, range and wildlife aiming at the main objective of sustainable development.

Agricultural Policy

The general feature of the agricultural policy contains an approach for horizontal expansion in agricultural development for crop production to secure food, satisfy grain export and supply agricultural industries. Agricultural practice is also facing land tenure and land ownership problems. The policy includes statements on sustainable management of natural resources based on integration of land use but may need to be clearly understood and efficiently integrated. That may require looking at agricultural sector to accommodate all relevant sub-sectors of forests, range and agriculture-based industries. The policies that focus on integration highlight on various successful pilots of agricultural practices such as agro-pastoral and agro-forestry, shifting bush-fallow systems and shelterbelts establishment inside smallholding traditional agriculture, irrigated schemes and mechanized farming.

However rain-fed mechanized farming expanded rapidly from about 2.0 million hectares in 1969 (after the establishment of the Mechanized Farming Corporation) to over 7.0 million hectares in mid-1990s (Ahmed, 1999). An FAO report (De Wit 2001) stated that the mechanized farms area fall within 10.5 – 12.6 million hectares. The figures are estimates and many reports indicate that the actual area of mechanized farms is difficult to assess. All of the areas used for mechanized farms, as allocated to farmers on lease policy, are in fact government land based on the act of the 1970 which states that all un-registered lands are government land. However, there is an area of outside planned area and may be equal to the planned area leased to farmers. Present estimate of mechanized farms approximate 21.0 million hectares.

Forest Policy

The forest policies are strongly supported by the Comprehensive National Strategies (CNS) (1992 – 2002 and 2003 - 2027) both being concerned with the importance of forests in environmental conservation as well as a source of goods and services for the country and local communities. The CNSs supported an increase reservation of forests, range and Nature Reserves to an area equivalent to 25% (47 million hectares) of Sudan (188 million hectare) area. Presently the reserved area is equal to approximately 11.7% (21 million hectare) of Sudan area. However, the implementation of the CNSs with regards to forest development is constrained by agricultural expansion and lack of coordination and integration between sector policies and national institutions. In addition, its implementation has very much been

affected by the instability of the concerned government institutions as a result of changes in political affiliation.

The 1986 (and the revised version of 2006) Forest Policy Statement put emphasis on the multiple uses of forests, environment protection and the concept of popular participation. The Statement recognized new forms of forest and tree tenure including: institutional schemes, community, companies and private forests. The policy stressed upon creation of forest component in the mechanized farming equivalent to 10% of the mechanized rain fed schemes and (5%) of irrigated schemes in order to maintain or establish green belts within these schemes.

The prime objective of the forest policies was the reservation, establishment and development of forest resources to contribute to sustainable production and environmental protection. The policy emphasized the role of public participation in tree planting and sustainable management of forests and recognized the need for research in forest development and emphasized the role of forest extension. The forest policy stressed upon the utilization of tree stocks on land allocated for agricultural investment and not to be burnt into ashes. The Forest Policies indicates the role of the different actors in the development, conservation and management of forest resources. These components of the forest policies and strategies constitute approaches for good practices. These objectives are in line with the objectives of the GGWSSI and indicative of the role that sustainable management of the forestry resources will play, provided that it is coordinated and harmonized with other policies. The forestry sector review carried out by the World Bank and bilateral donors (World Bank, 1986, El Nour et al, 2007) emphasized the need for institutional changes. The review drew attention to the many un-quantified benefits arising from forestry and projected the magnitude of the grievous situation of the forest in the event of insufficient attention to conserve and manage forests in Sudan. A development programme was included in the review, giving priority to (i) activities that would conserve wood supplies, such as the introduction of fuel efficient stoves, (ii) protection and management of existing forest resources (combined with increased stumping), (iii) establishment of new fuelwood resources, (iv) agro-forestry and (v) industrial forestry management. The sectoral review emphasized the need for institutional changes and indicated support to sustainable forest management.

Range Policy

The National Comprehensive Strategy 1992 - 2002 (NCS) called for rehabilitation and maintenance of natural range of Sudan. Objectives include the consideration of the carrying capacity of the rangeland, improvement of pasture, adoption of suitable grazing systems (specialized and rotational system) and protection of rangeland against fires. These objectives have been stated to be developed within the reservation policy that has a target of 25% of the area of the Sudan for forests, range and wildlife.

For the animal sector welfare the NCS focused on the expansion of the modern sub-sector and improvement of the traditional sub-sector which host more than 80% of the animal population. This improvement aims at making radical change in the breeding and animal production systems,

encouragement of private sector investments, intensification of productions and integration of agriculture and animal production within the objectives of range and pasture improvement.

Wildlife Policy

For wildlife the NCS strategy concentrated on conservation of habitats, adoption of attractive economic policy, and enhancement of regional cooperation, establishment of more Nature reserves and national parks within the reservation policy that targets an area of 25% of the area of Sudan. The policy encourages research development in the field of wildlife.

An important aspect in the management of wildlife resources is the policy of conservation and sustainable use of biological diversity in an integrated approach with the policy of nature reserves and identification of key components of biological diversity. A systematic program of monitoring the components of BD becomes an essential national practice in order to follow up dynamic changes and species status. It is stated that priority should be given to those under threat and those with sustainable use potential. In addition, monitoring should contain identification of activities with expected adverse impacts on BD such as agricultural expansion, deforestation and unplanned grazing. To enhance sustainable management of the biological resource diversity, the maintenance and organization of data derived from identification and monitoring activities constitutes the basis for information technology and follow up. These activities are presently performed at small scale at limited nature reserves and should be up-scaled in order to bring the UNCBD in harmony with the program of activities of nature reserves management.

National Water Policy

Through a process of consultation with stakeholders the National Water Policy 2000 was prepared. Its main objective is to enhance the development and implementation of effective national water policies and strategies for integrated water resources management. National Water Policy Issues are stated in the NCS 1992 - 2002. The policy and NCS contains a strategy for irrigation and water management and domestic water strategy.

Strategic statement emphasized on efficient use of water for agriculture, in addition to more utilization of ground water for irrigation. The 2000 policy update stressed on the need for a balance between agricultural use and hydropower. The importance of increasing the water use particularly rain fed is stated in order to match with the available vast land area. The water policy stressed upon statement of regulation and coordination between the different water users in order to avoid fragmentation between government responsibilities and institutions particularly in the States. The water policy indicated the need for investment programs in the water sector. The policy also stressed on support for capacity building and proper management and environment protection.

The Water Policy considered international water issues such as treaties and protocols and their reflection on trans-boundary issues and maintenance of share of regional water resources such as Lake

Shad and Nubian sandstone aquifer and that is to develop, conserve and use shared water resources in an integrated and sustainable means in order to achieve environmentally sound management of water catchment areas. The policy stressed on the importance of protection of water quality and aquatic ecosystems in national and international water bodies and conservation of wetland and swamps.

The National Water Policy of 2007 is a document that covers many aspects of water resources management, utilization and protection in light of the lessons learnt from the implementation of the 1992 and the 2000 policies.

Higher Council for Environment and Natural Resources

The HCENR was established 1991 under the chairmanship and supervision of the Prime Minister, in order to make effective policies, laws, plans and institutions so as to solve problems of depletion of natural resources and degradation of the environment in Sudan. In 1995 after the creation of the Ministry of Environment and Tourism, HCENR was made part of it. Presently the HCENR is affiliated to the Ministry of Environment, Natural Resources and Physical Development. The HCENR is primarily established as a coordinating and advisory body. According to HCENR Act (1991) its functions include development and coordination of policies and long term plans for environment protection and sustainable development of natural resources between federal and governments' states and promotion of environmental awareness and education. Branches for HCENR are being established in the different States under the chairmanship of the State Governors, (Wali). The functions of these branches are delegated from the federal HCENR

HCENR represents Sudan as a focal point for most of the global conventions on the environment (UNFCCC, CBD) and responsible for ensuring Sudan's compliance with its obligations under these treaties. Hence, HCENR is implementing a number of capacity building projects to prepare Sudan to respond to the requirements of the conventions. With these functions, HCENR has to play an effective role in natural resources sustainable management.

The policy and functions of the HCENR qualify it for an important position in the coordination processes and effective implementation of policies of sectors at state and at national levels. Having responsibilities towards Rio conventions and being mandated to coordinate policies and protect the environment makes the HCENR a suitable body for bringing the synergies between national, regional and institutional policies with the Rio conventions functioning. However, the HCENR is handicapped by loss of its power to fulfill its mandate because its Board of Directors is no longer headed by the Prime Minister. It is headed by the Minister of Environment and accordingly the other Ministers as members of the Board of Directors may not be satisfied.

Land Tenure

Since the early 1970s and 1980s concern has been focused on development of policy issues in relation to land use categories and tenure rights. Most of the tenure rights for land and resources, including trees, pasture and water, come from customary practices and indigenous traditions usually based on tribal structure and customary laws even prior to the colonial era. Agricultural practices were based on

smallholdings allocated to households while pasture and range on large tracts were managed as common resources for grazing. Other resources uses like water and forest products are under the control and management of the tribal leaders.

However, the post-1970 land use policy gave the government the ownership over any unregistered land and unregistered forests thus reducing the rights of the local people. The un-registered land act of 1970 sets considerable amount of arable land under control of the government and vested with the Mechanized Agriculture Corporation to be planned in agricultural schemes and leased as large scale mechanized farms. This has caused a challenge to balance development with forest conservation. Accordingly the land tenure system in the post-1970 land use practices has some negative impacts on the natural resources because agriculture has been a priority over the other resources.

Three categories of land ownership systems emerged in association with the continuous issuance and amendments of the land use policies. These include: Government, community and private lands. Almost (90%) of the land is under government control and that brought the issue of Sustainable Land Management (SLM) under risk. The land tenure and land use rights are the most important challenges to sustainable resource use. However, since the issuance of the 1986 forest policy the government attitude has been improved towards supporting community and private forests reservation and development.

All lands under FNC, community, private and Wildlife are reserves and gazetted under the title of these owners in respect of the policies and laws of the respective institution and have the freedom to utilize them, as they deem fit. Laws and policies have periodically been revised to improve resource management.

Legal Framework

Forest Legislation

The forest legislation in Sudan is formed by several acts and the main relevant in our field are:

The 2002 Forests and Renewable Natural Resources Act

The Forests and Renewable Natural Resources Act, 2002, provides the framework for the management and protection of forests and renewable natural resources encompassing pasture and range. The Act deals with both forests and renewable natural resources based on an independent corporation to be established by the act and named the "National Forests and Renewable Resources Corporation". However, the act is not implemented yet. In a significant change from the past, both the 2002 and the 1989 acts, recognized new forms of forest ownership: national forest reserves, state forest reserves, private sector forest reserves, individually owned forests, communally owned forests and the forests of institutions, thus conceptualizing the concept of community forestry. Kanon (2005) and Fagiri. (2005) stated that, both the 2002 Act and the 1989 Act did not articulate a definition for the term "forest". However, a reserve area is defined to include an area or any part declared to be a national forest

reserve or state forest or other forests or enclosure whether covered with trees or not. One of the factors weakening the implementation and enforcement of the forestry legislation is the obscurity of determining or ascertaining forest reserves on the ground. Forest reserves are clearly shown on maps, but their boundaries are generally not detectable on the ground. Under 2002 Act, federal forest reserves are managed by FNC. State forest reserves are managed by the State in accordance with FNC's policies and technical plans and this is a marked departure from the 1989 Act. There are many criticisms to this Act, Ibid (2005), the 2002 Act does not recognize forest management plan as a legally binding instrument. There is a need to fill this lacuna in the law by obliging FNC to prepare and approve management plans and by requiring all owners and authorities responsible for forest reserves to act in accordance with the management plans.

Resolution No. 283 of the year 2015

Resolution No. 283 of the year 2015 issued by the Council of Ministers regarding the ratifying of the strategy and a national action plan for biodiversity for the year 2015-2020. The decree furthermore banned forest and tree cutting and the abolition of all received fees by the Forests National Corporation in return for granting licenses to cut forests and trees and enhance the state's efforts in preserving the environment and vegetation and to take the advantage of financing available for environmental programs to preserve the ecological balance and oblige agricultural entrepreneurs to cultivate 10% of their projects for the promoting of the forest and environment.

Rangelands Legislation, 2015

Act of Organizing of Pasture and Development of Fodder Resources for the year 2015.

The main features of the Act include:

- Curb the deterioration of pastures.
- Increase the production of pastures.
- The development of good governance in pastoral areas
- Planting of forage trees using water harvesting techniques
- The protection of pasture from overgrazing and grazing management and the development of productive capacities of pastoral resources.
- Natural and pastoral reserves
- The development of farming systems based on the cultures of the harvest in pastoral areas
- Awareness raising of public by following good behavior towards pastures
- The maintenance of natural pastures and focusing on the production of irrigated pastures
- Organization and management of water, according to the needs of livestock
- Coordination with the relevant bodies' in particular forestry, mechanized agriculture and water resources.
- Seed dispersal to improve pastures and diversity of vegetation

- The establishment of fire lines and control for the protection of grassland from fires and encroachment of unlawful and unplanned agriculture
- Identify routes and corridors of nomads, in coordination with the relevant authorities.
- The development of nomadic sector and concern of rural women
- Determines the seeds of pasture and its types allowed into Sudan in coordination with the competent authorities.

Wildlife Legislation

The Wildlife Conservation and National Parks Act 1986 aim at the conservation of wild animals, game areas and protection of national parks. The Act also describes the procedure of establishing natural parks and According to Tolentino (1994) the wildlife and National Park Act (1986) is mainly focusing on the conservation and protection of wild animals and neglects or excludes the statement on plants and trees but this point is mentioned in the CBD. However, the act does not provide for zoning of parks and classifications of areas capable of multi-purpose uses which are very important for management purposes and environmental conservation this aspect is considered in CITES that resulted in zoning of Dinder National Park and developed the park into a bio-sphere. An important aspect, which ought to be studied for possible inclusion in the law, is participation of people living inside or around national parks. However, CITES states the importance of local people participation in the sustainable management of Dinder Bio-sphere. Assigning rights and responsibilities for local communities that depend on national parks has been stated in the management plan for Dinder to be a factor that enables them to assume informed responsibility over the sustainable use of Dinder Bio-sphere resources.

Water Resources Act 1995 and Other Water Related Legislation

Prior to Rio, Sudanese legislation on water and water related sources albeit aimed at organizing the use of water resources, but they were isolated and not directed to common objectives like poverty alleviation, sustainable development, rural development or sanitation. Examples of these legislation include: River Transport Act 1923, Mining and Quarries Act, 1925, and the Irrigation and Drainage Act, 1990. In the aftermath of Rio, a number of legislation were promulgated such as the National Water Corporation Act, 1995, and the Water Resources Act, 1995. The former repealed the Rural Water Corporation Act and the Urban Water Act. It amalgamates Nilotic and Non-Nilotic water resources as well as ground water. The latter establishes the National Water Resources Council and made reference to stakeholders, research, pricing, river transport vessels and water abstraction. However, it fails to mention wetlands, erosion, drainage, standards, water harvesting, water borne diseases and the Red Sea and its plentiful marine resources. It seems the Act is a freshwater oriented to the exclusion of other waters.

Environmental Legislation

Environmental Protection Act (EPA) (2001 Act) harmonizes the different sectors environmental laws, sets environmental standards, and calls for the protection of biodiversity. It states the importance of

environmental impact assessment to be carried prior to implementation of any development project. The 2001 Act also calls for raising environmental awareness and popular participation in decision-making process and setting policies. The EPA of 2001 requires an environmental feasibility study to be carried out for all projects that may have adverse effects on the environment and natural resources. It defines its extent of coverage of impacts on the environment and natural resources. The study must be presented to and signed by a committee constituted by the Higher Council for Environment and Natural Resources (HCENR).

However there is no specific EIA legislation enforced and implemented yet. Preparations are ongoing, and a draft version of an EIA law is currently under development. EIA is an on-going practice under the supervision and monitoring of and approval by the HCENR before being implemented.

Local Government Act 2003

With the adoption of the federal system in Sudan some important legislation has been established to define administration units, divide power and to assign responsibilities. The Local Government Act (1989) established the structures and functions of local governments within the federal system. The act defines the localities (rural councils) their legal entity, powers and responsibilities. The Locality, according to the act, is an autonomous body with its main function contained in provision of services and development of the locality. To that effect, Legislative Council is to be established.

The Native Administration Act (1989) defines the different native administration levels (the traditional leaders) the act lists the powers of native administration, which include the conservation of forests, pastures, maintenance of livestock corridors, fire protection (forests and rangeland) and the environment. In addition, the Judiciary (Rural Courts) Regulations assign judicial powers to native leaders. In this respect, local leaders work in collaboration with local governments.

In this respect, the localities and administrative units should be complementary in responsibility to institutions like FNC, RPA, Wildlife and agriculture sectors and should be capable to coordinate with these sectors in the management of natural resources in an integrated manner.

Investment Encouragement Act 1999

The Act encourages investment in the fields of agricultural, animal, energy, mining; transport, communication, tourism, industrial activities and environment. Investment in these fields is deemed to be strategic investment, capable of enjoying tax-fees exemption and non-attachment, non-confiscation, and non-sequestration of the property of the project.

International Conventions and Regional Protocols

The international and regional agreements that are related to use and conservation of natural resources and land management and applicable to natural resources management in Sudan are listed below:

1. Desertification: UN Convention to Combat Desertification (UNCCD)
2. Climate: UN Framework Convention for Climate Change (UNFCCC)
3. Biodiversity: UN Convention on Biodiversity (UNCBD)
4. Wetlands: Convention on Wetlands of International Importance (Ramsar, 1971)
5. Convention on International Trade in Endangered Species (CITES) (Trade in species (wildlife and flora)).

UN Convention to Combat Desertification (UNCCD)

Sudan signed the UNCCD when it was opened for signature at Paris in October 1994 and ratified in 1995. The National Drought and Desertification Control Unit is a national focal point with a mandate to implement the UNCCD. It is to assume the coordination amongst different government institutions to ensure that different ministries and sectors consent upon a joint strategy. In 1998, supported by UNDP and UNSO, a National Action Plan (NAP) to combat desertification was completed for 13 states classified as degraded. A bottom-up approach was adopted in the formulation of NAP process. The NAP provides a description and analysis of the state of desertification in the Sudan and proposes some actions to be taken. It also proposes legislation for the establishment of a National Council to Combat Desertification, with a general secretariat at a federal level and councils at the state level, with monitoring and coordination units and local communities at the level of priority programme areas. Presently the Government sanctioned in 2009 the Act for Combating Desertification. Despite the popular participation in its formulation, NAP lacks cross-sectoral linkages and political will for its implementation.

UN Framework Convention on Climate Change (UNFCCC)

To meet the requirements of the UNFCCC Sudan embarked on the implementation of a project "Capacity Building for the UNFCCC". The project aims at building Sudan's capacity to prepare its first and second national communications. The project carried a number of activities: prepared informatics background of a national communication and the emissions of greenhouse gases, and defined the options for emission reduction net and methods for different sources. The project prepared the national strategy for climate change in Sudan. Like all Parties, Sudan needs to promote or carry out activities in relation to climate change that are directly or indirectly supporting natural resources conservation which in turn have positive impacts on rehabilitation of degraded lands and desertification control. The activities include regular national inventories of resources and GHGs, adoption of measures to mitigate climate change, transfer of climate change related technologies, and use mechanisms to adapt to the impacts of climate change. These aspects are not separable from issues in natural resources policies. They represent areas of synergy between the UNFCCC and sustainable natural resource management.

UN Convention on Biodiversity (UNCBD)

Sudan signed the CBD in 9 June 1992 and ratified in October 1995. Sudan's National Biodiversity Strategy and Action Plan (NBSAP) was completed in May 2000. The Global Environmental Facility (GEF)

supported the preparation of NBSAP and its formulation was built on wide consultation and participatory processes. The overall objective of NBSAP is to conserve and enhance biological diversity for the prosperity and development of the Sudan. NBSAP proposes actions to be taken for in situ and ex situ conservation, utilization, documentation, training and education, and institutional and legislative arrangement. Kanon (2005) argued that, the NBSAP deals only with the conservation of biological diversity and the sustainable use of its components, ignoring an important element: the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The NBSAP to Support the Implementation of the CBD 2011-2020 Strategic Plan in Sudan is an updated NBSAP for the coming period up to 2020. It is a project supported by GEF with partnership of UNDP, and the Ministry of Finance and National Economy (Sudan). It is being implemented by HCENR and sanctioned by the Council of Ministers in August, 2015.

The Convention on Wetlands (Ramsar 1971)

The wetlands conservation and wise use is based on their reservation as nature reserves and sustainable management on working plans and training of personnel. The convention is important for Sudan as semi-arid dry lands. However, wetlands have received little policy attention. The issues raised through the Ramsar indicate the synergy between this treaty and the other four conventions, listed above, in containing the objectives of sustainable development with regards to ecology, botany, zoology, limnology or hydrology including their conservation and sustainable management.

CITES Convention on International

Sudan has become a party to CITES on the 24th of Jan. 1983, and to implement its commitment the Wildlife Conservation and National Parks Act 1986 was promulgated. The Act fails to implement CITES thoroughly. National management authority and scientific authority to grant permits and ascertain the conditions and limitations on the export import and re-export of species have not been designated (Kanon, 2005).

Links to the national laws and policies and international conventions, protocols and treaties

The Republic of Sudan has ratified the Convention on Biological Diversity (CBD) and acceded to the UN Framework Convention on Climate Change to the United Nations Convention the fight against desertification as well as other international environmental conventions and treaties.

By adherence to these Conventions and international agreements, Sudan proves it's obvious desire to get involved internationally in issues relating to the problems of biological resources and conservation of the environment. Moreover, in the context of reducing climate change impacts and fight against desertification, the Republic of Sudan has developed its National Action Program for Adaptation (NAPA). Environmental legal protection is guaranteed by international conventions and protocols related to the environment that the Government adopted.

The Republic of Sudan is a partner of the majority of international institutions within the United Nations or not, which are interested in Environmental and socio-economic development issues: UNDP, UNEP, UNESCO, FAO, IFAD, World Bank, WMO; GEF, IUCN, WWF, etc.

The country is a member of several African organizations such as: AU, IGAD, EAC, CEN-SAD , NEPAD , Arab League , etc. several banking institutions (AfDB, IDB, etc. ..) participate in funding development projects and programs in the rural sector. Through all these organizations, Sudan shares the global, African and sub-regional environmental concerns.

So, achievements that will be made as part of the Great Green Wall will enable the three post Rio conventions (UNCCD, UNFCCC and CBD) to have elements ensuring their consolidation:

- The conservation of biodiversity.
- Rehabilitation of degraded lands;
- Socio- economic infrastructure.
- Development actions that could generate income and create jobs, stabilizing the local population, mainly young people who are tempted to rural exodus and migration.

This initiative therefore supports these mechanisms in planned and ongoing projects in order to improve their technical, economic efficiency and sustainability of their impacts but mainly to enable the country to achieve the Sustainable Development Goals (SDGs).

Annex 2. Proposed project ideas

I. sub-projects from the logical framework

Each component can be developed further to a big project.

In this regard, 5 projects are identified as follows:

1. Rehabilitation of degraded lands in the interventions zones
2. Forest and rangeland management in the intervention zones
3. Support to livelihoods and resilience of local communities in the intervention zones
4. Human capacity building through research and knowledge management
5. Implementation framework for the GGW - Sudan

II. Project ideas emanating from some ministries but relevant to this action

1. Integrated Management and Sustainable Use of Rangelands

Location	North Kordofan and in Kassala ,North Darfur
Duration	Ten (5) years
Budget	5 million
Development Objective	Establishment and development of pilot models for integrated and sustainable rangelands management.
Immediate Objectives	<ol style="list-style-type: none"> 1. Restore threatened natural forage plants species in their natural habitat. 2. To enhance and support efforts to form producer organization. 3. Assist H/Hs and communities to build capacities, enhance coping and resilience to regain production capacities. 4. Match investment and development efforts with long-term conservation of resources and socio-economic requirements of local communities.
Expected Outputs	<ul style="list-style-type: none"> • Efficient capacities of national institutions improved. • National cadre trained and skills improved. • Range productivity increased and forage quality improved. • Extension provided and awareness rose. • Rangelands, natural resources and climatic parameters databank for the project area were established. • In situ pastoral and agro-pastoral organizations and committees were established to share the responsibility of development of their local sources. • Threatened forage plant species Restored in their natural habitats. • A land use plan and map produced clearly delineating rangelands

	<p>and areas for other uses.</p> <ul style="list-style-type: none"> • A series of maps indicating current land use and other maps indicating alternative optimum uses in the different geographical zones.
--	---

2. Conservation and Utilization of Range Plant Genetic Resources for Rangelands Rehabilitation and Enhancing Food Security

Location	North Kordofan North Darfur
Duration	Ten (10) years in two phases
Budget	3 millions
Development Objective	Conservation and sustainable use of natural forage plants.
Immediate Objectives	<ol style="list-style-type: none"> 1. Raising awareness on natural forage plants diversity conservation. 2. Creating an enabling environment for natural forage plants genetic resources conservation and natural forage plants degradation. 3. Strengthening the Range and Pasture General Directorate technical capacity.
Expected Outputs	<ul style="list-style-type: none"> • Documentation of natural forage plants specimens at central and states herbaria using computerized system for training in plant taxonomy and reference • Increased diversity of natural vegetation cover • Seed of a variety of range plants made available for multiplication and for large-scale reseeding of degraded rangelands • Range reserves established and protected for sustainable use and controlled utilization by grazing animals

3. Community Forest Development and Sustainable Use for Food Security

Location	NaherEnielm Khartoum and Northern States
Duration	Ten (10) years in two phases
Budget	5 million
Development Objective	To contribute to food security to adapt to climate changes and improves local communities' livelihoods.
Immediate Objectives	<ol style="list-style-type: none"> 1. To enhance local environment and improve understanding of the contribution of herbaceous and woody species to local economies, food security and environmental protection 2. Increasing efforts for the conservation of FPGR for sustainable use strengthened and benefits to communities increased 3. Efficient communication and coordination among various entities engaged in in-situ conservation of plant genetic resources, natural resources and land use sustainable management established.
Expected Outputs	<ul style="list-style-type: none"> • Well-managed community forest established and existing ones

	<p>improved</p> <ul style="list-style-type: none"> • Efficient practices in community-based natural resources management adopted and implemented • Local community forest management committee formed and guided to perform its duties • Community forest serves multiple uses including edible products, forage, apiculture, fuel wood, and soil conservation established. • Households' incomes increased and nutrition improved.
--	---

4. Fodder Production for Livelihoods Improvement

Location	Kassala , NaherEniel and Northern States
Duration	Six (6) years
Budget	5 million
Development Objective	Promotion of fodder crops production under rain-fed and irrigated agricultural systems to enhance animal nutrition, increase animal production and improve incomes and livelihoods.
Immediate Objectives	<ol style="list-style-type: none"> 1. Dependence of pastoralists and agro-pastoralists on grazing provided by rangelands is reduced and grazing pressure on fragile ecosystems relieved. 2. Dry season feeding of livestock improved. 3. Fodder production and conservation.
Outputs	<ul style="list-style-type: none"> • Farmers are convinced on the economic value of introducing fodder crops and at least 90% of the targeted groups respond through devoting part of their farms for fodder production. • The targeted rain-fed semi-mechanized farmers incorporated fodder production in the crop rotation. • Treatment of agricultural by-products is appraised and practiced by farmers. • At least 20 Fodder Production Associations established at both locality and state levels. • Increased quantities of good quality fodder and hay. • Increased amounts of good quality fodder crops seed made available by progressive farmers.

5. Public Involvement and Forage Plants Genetic Resources Conservation

Location	Kassala , NaherEniel and Northern States
Duration	Five (5) years
Budget	7 million
Development Objective	Encourage the resource users and interested individuals and groups to form societies that will shoulder the responsibility to achieve the development objectives.
Immediate Objectives	<ol style="list-style-type: none"> 1. Raise the public awareness on the importance of the conservation of the forage plants genetic resources.

	2. Conservation of the genetic resources of selected forage plant species and improvement of desired traits.
Outputs	<ul style="list-style-type: none"> • Conduction of studies and researches to enable conservation and improvement of the plant species. • Increased awareness on the value of such plant species. • Establishment of societies where each is concerned with a certain range plant species.

6. Enhancing Resilience to Climate change through Rangeland Rehabilitation and Water Harvesting

Location	North Kordofan Khartoum and North Darfur
Duration	Six (6) years
Budget	5 million
Development Objective	To enhance the resilience of local communities in the area to current and future climate extremes.
Immediate Objectives	<ol style="list-style-type: none"> 1. Rehabilitation of range land. 2. Introduction of water harvesting techniques.
Outputs	<ul style="list-style-type: none"> • The environment is conserved and harsh conditions improved. • Incidences of wind storms reduced. • Additional sources of income provided. • Sand dunes stabilized

7. Pilot Project for Innovation of the Production System in the Marginal Areas.

Location	North Kordofan , Kassala,
Duration	(7) years in two phases
Budget	8 millions
Development Objective	The overall objective of the project is to improve the scio-economic status of the local farmers by adopting accepted friendly environmental activities that suits the area.
Immediate Objectives	<ol style="list-style-type: none"> 1. To stop cultivation north latitude 13⁰ N. and encourage animal production activity. 2. To develop practical rangeland management and improvement techniques for semi-desert zone. 3. To increase application of the practical knowledge for integrated rangeland development. 4. To create functional development committees for effective community participation.

Outputs	<ul style="list-style-type: none"> • Environment was conserved. • Poverty was reduced. • A pilot pastoral village is established. • Village cultivated land is converted to rangeland. • Multi-nursery is established
----------------	--

8. Integrating (Introducing) Livestock in Crop Production Areas for Livelihood Enhancement

Location	North Kordofan Khartoum and , Kassala,
Duration	(3) years in two phases
Budget	5 millions
Development Objective	The overall objective of the project is to improve food security and incomes of agro-pastoral, limited resource farmers as well as poor producers, including women-headed households (H/H). The project will promote integrated farming, enhance complementarity between different agricultural production activities and will diversify production. This approach should be a priority intervention to enhance adaptation of small holders in areas vulnerable to climate change.
Immediate Objectives	<ol style="list-style-type: none"> 1. Demonstration of improved management of cattle, small ruminants and poultry and their integration in the traditional farming system. 2. Introduction of small-scale irrigation for fruit and vegetable production and for extending farming activities into the dry season. 3. Encourage and support community organizations, local institutions, social solidarity and self-help mechanisms so that pastoralists and agro-pastoralists can cope with climate change.
Outputs	<ul style="list-style-type: none"> ✓ Improved income from sale of chicken, eggs, small ruminants and other products. ✓ Improved livestock nutrition and increased animal products. ✓ Positive impact on the environment by increasing tree population and adopting sound cultural practices. ✓ Improved skills through practical training and demonstration/extension activities. An integrated approach is required to accommodate all extension activities in the State including veterinary and forestry extension. ✓ Optimum use made of integrated extension service to produce education/awareness material to enhance sustainable use of available resources and increase the efficiency of crop and livestock production. ✓ Support to household food security and income generation. Women participating in this activity can generate income from sales of vegetables and secure vegetables for H/H consumption. ✓ Efficient on-farm storage of food and feed

9. Enhancing Agro-forestry Systems in Traditional Farming Areas Using Multi-purpose Trees and Shrubs

Location	North Kordofan , Khartoum and Kassala,
Duration	Ten (10) years in two phases
Budget	10 millions
Development Objective	To conserve resources and increase output of food, wood and other products thus improving livelihoods of targeted communities.
Immediate Objectives	<ol style="list-style-type: none"> 1. Restocking of a range of adaptable multi-purpose trees introduced in traditional farming areas to form shelter-belts and provide different products and benefits. 2. Conservation and improvement of soil characteristics.
Outputs	<ul style="list-style-type: none"> • Crop production and farm returns increased. • NWFPs increased. • Bee keeping and honey production activities introduced. • Wood for construction, energy, local tools and furniture produced. • Animal nutrition improved.

Northern State

10. Sand dune stabilization program

Programs are based on the results of study sites and trends in sand movement and place of creeping danger desert by using modern techniques of mapping the state. The program includes the establishment of shelter belts in the main outlets, which constitute a constant source of sand creeping into agricultural land and residential areas. The success of this program depends on the evaluation and proper understanding of the relationships between soil, water and vegetation in specific areas. The components of this program can be summarized in:

a) Industrial and mechanical fixation of the sand dunes

The implementation of this program will be in the areas of moving sand, which are difficult to plant trees due to the intensity of rigorousness of dune encroachment as step that help in the establishment of natural growth and planted trees. Local materials can be used for making enclosures and mechanical barriers to break the wind and protect the plantation from the sand. Remnants can be used from plants, weeds twigs, branches and palm leaves and other available materials which are cheap, in addition to any other material such as, drums, poles and rail way sleepers etc....

b) Biological fixations of the dunes

The activity includes planting of trees and other plant species as a mechanism to stabilize the active movement of sand dunes. This program depends on the availability of water (rain and irrigation), the direction and severity of the wind speed, temperature, soil depth, specifications and form of sand dunes and soil physical characteristics, in addition to the availability of groundwater and soil moisture content.

11. Rehabilitation and Establishment of Nurseries

Project Objectives:

1. Rehabilitation of the central nurseries and the establishment of new central nurseries
2. To provide seedlings for planting of tree belts around villages, residential complexes, public facilities for protection from sand encroachment.
3. Production of seedlings annually for the implementation of afforestation official, communal and private programs.
4. Provision of training for target groups in the area of forest programs and the production of nursery seedlings. The following sites are suggested for this programme. 1 - **Dongola nursery**; 2 – **Karima nursery**; 3 - **Halfa nursery**; 4 - **Merawi nursery**; 5 – **El debba nursery**; 6 - **Letti-nursery**; 7- **Burqeeq nursery**

12. Forest Reservation Programs

Goals:

1. Combating desertification through protection of natural forests in the state and their rehabilitation.
3. Development of management plans for the sustainable management of the existing forest reserves.

Program components:

1. Demarcation of forests that have been reserved to develop management plans for their sustainable management.
2. Complete reservation of forests that under reservation procedures.
3. Explore new natural forests and reservation.

13. Rational exploitation utilization of the date palms and non-timber forest products as a source of industrial services and construction materials

Each year under normal growth situation an average of 12 to 15 new leaves are produced by the palm and hence equal amount can be anticipated to be cut as part of the safeguarding of the palm, leaves offer the most varied end use opportunities. Midribs: the very base of the date leaf surrounds the palm as a fibrous cover and remains part of the trunk. Usually the leaf base is cut off and treated separately, whilst the remaining "stick" (still called midrib to simplify nomenclature) when stripped of the spines and leaflets is used for different purposes. The date palm's midribs of grown palms after being woven in mat using coir ropes are used in roofing. Crates for the transportation of vegetables and fruits are also made from the palm midrib, as well as furniture items and doors of gardens.

River Nile State

The following projects are proposed

14. Soil conservation and Planting of shelterbelts and wind breaks in agricultural farms.

The Forests Act 1989 and the Forests and Renewable Natural Resources Act 2002 of the Sudan have already stressed the need to practice agroforestry and obliged large-scale mechanized farmers to leave or to plant a percentage not less than 10% of the total area of a rain fed project, and a percentage not less than 5% of the total area of an irrigated project, in the form of wind breaks or shelter belts for the purpose of protection and production. This is an agroforestry practice. The aim of agroforestry and/or agrosylvopastoral systems to produce high value food cash crops, livestock and different forest products to rural communities, thus contributing to rural development

15. Improving sustainable agricultural practices in the River Nile State

Large groups of local people (small scale, subsistence farmers) are dependent on agricultural production to meet basic needs as well as to generate limited household income. The NAPA assessment of vulnerability to climate change finds that the most vulnerable are those who live in the area of the lower River Atbara. People there suffer from reduction of rainfall, which affects both the flow and amount of water carried by river Atbara. However, even in good rainy years, floodwaters have been found to cause a lot of damage and loss of lives and properties. As the state is part of the desert zone, they also suffer from high wind speed and shifting sand dunes that negatively affect the cultivated lands and cause blockage of irrigation channels.

Maximize the utilization of flood water for irrigation of more agricultural lands in order to reduce the food gap. Control flood water to reduce its negative impact on people and to store water for agricultural and domestic and animal uses

Northern Kordofan State

The NAPA consultation process revealed that, the most vulnerable groups in the state are those who live in the Bara, GabratAlsheikh and Sawdery localities. Many people were not even able to survive and were forced to migrate to towns as well as to irrigated agricultural schemes. The activities will include:

- Preservation of forests and establishment of grazing allotments
- Training of local people to manage their natural resources and to support the different activities of the project.
- Management of rangeland using water-harvesting techniques, reseeding of rich and favourable species.
- Establishment of nurseries
- Sand dunes fixation through planting of shelter belts and wind breaks
- Introduction of renewable energy sources

16. Rehabilitation of gum Arabic belt for the diversification of livelihoods and conservation of resources

Location: Alrahad locality (12 villages)

Human activity connected with unfavorable environmental conditions has led to the deterioration of the gum Arabic belt (*Acacia senegal* trees). Not only does the production of gum Arabic provide essential livelihood for traditional farmers, the *Acacia senegal* trees are also recognized for their ability to protect soil fertility, restrain sand dunes and they act as fodder for animals.

17. New livestock routes to increase resilience of pastoralists and conserve natural resources in northern Kordofan state

The Northern Kordofan state contributes significantly to livestock production both at local and national levels. Consequently the state is passed through several routes, which are utilized for animals based in the state as well as those of bordering states. These routes pass through vulnerable areas (scarcity of water sources, poor pastures etc.), which have been affected by drought and rainfall reduction. NAPA consultation revealed that, rehabilitating and developing stations on the routes as well as providing veterinary services will increase families' income, reduce competition overwater sources (i.e. resource conflicts) and stabilize production and prices.

18. Development of Gardoud lands for insurance of food security

Gardoud soil, which is typically tough and compact, entails a certain dependable amount of rainfall and a special type of treatment regarding water harvesting in order to be successfully cultivated. NAPA consultation revealed that, the development of Gardoud lands would bridge the food gap for people and their animals and reduce migration.

19. Development of GeraihAlserha area for rehabilitation of natural resources and poverty reduction

Migrating tribes are adversely affected by successive drought cycles and rainfall reduction. Some herders lose their animals and consequently their livelihoods, others settle in areas where the resources are scant and no services are provided, and some continue to travel in marginalized and fragile lands. The NAPA consultations proved that, there is a need for development of specific areas where services will be available and natural resources will be rehabilitated through the participation of the local vulnerable population.

Northern Darfur State

20. Rehabilitation of tree and Range cover.

- Water harvesting techniques.
- Training on optimizing the available biomass.
- Focus on planting indigenous quick maturing species to combat desertification.
- Introduction of alternative energy.

Darfur has witnessed the distressing consequences of desertification as valuable land comes into more demand. Whether crops are grown in Darfur's sandy or clay soils or the seasonal streambeds (wadi), the fertility of the land and regional rainfall determine the continued existence of the people. Darfur has witnessed the development of increasingly more dry conditions and extended periods of low rainfall since 1969. The stress between agriculturalists and pastoralists has been worsened by desertification that pushed individuals of northern Darfur south in search of new livelihoods, leading to armed conflicts over grazing fields and scarce water resources.

21. Traditional/Rural Livelihoods and Natural Resource Management

High value forest reserves and plantations have been destroyed by illegal loggers, firewood collectors, charcoal makers and town and camp expansion. The dependency on fuel-wood and charcoal for domestic consumption is another important issue to be addressed. The traditional community-based

natural resource management organizations and institutions have been severely weakened. Government institutions are weak and have lacked capacity for strong resource management, including the enforcement of environmental law or control. Thus, rational land use mapping is indispensable.

Annex 3. Acknowledgements

The consultants would like to express their sincere thanks to the FAO Jama, Abdi (FAOSD); Marchesich, Rosanne (FAOSD); Oshick, Aisha (FAOSD) Hamid, AbdelHamied (FAORNE); Berrahmouni, Nora (FOM); Mohamed Daldoum (FAOSD) and other FAO staff,. A special word of appreciation also goes to all government departments, General Manager, FNC; General Secretary, HCENR; Executive Manager, SECS; General Director, Natural Resources and, most of all to beneficiaries interviewed during individual meetings in the River Nile and Northern states.

We are particularly grateful to Mubarak Ginawi, the Focal Point for GGWSSI-Sudan, Dr. Muna Abdel Hafeez, Project Coordinator for the encouraging, support and managing our assignment to River Nile and Northern States and Dr. Osman yousif, the facilitator of the validation workshop. The particular statement of appreciation is intended for the staff of the FNC and Ministry of Agriculture in the two states with special reference to Director, FNC, River Nile State; Assistant Director, Shendi; Director, FNC Northern State; Assistant Director, Marawi; Assistant Director, Dongola for their assistance, support and for granting the opportunity to visit their states. A final word of appreciation to the FAO drivers, Mohamed and Shoieb

Annex 4. People Met in Khartoum and during the field tour to River Nile state and Northern state (Officials and sample of community members)

Name	Affiliation
Dr. Jama, Abdi	FAO Rep. Tel: 0912594856
Dr. Rosanne	Deputy -FAORS
AbdelHamied	FAORNE
Aisha Adam Sidi	FAO- Programme Officer Tel: 0912299259
Mohamed Daldoum	FAO- Khartoum Office
Dr. Babiker Abdalla Ibrahim	Under Secretary, MENPD Tel: 09122898337
Dr. Mohamed Ali elhadi	General Manager-FNC Tel: 0912834798
Mubarak Abdel Azim Ginawi	GGWSSI-Sudan Focal Point, FNC Tel: 0912280600
Muna Abdel Hafeez Daweil Beit	MENPD Tel: 0912909177
Abdel rahman Khalifa	MENPD
Hasabo Mohamed elhaj	Director Manager of Natural Resources, Ministry of Agriculture and Forestry
Alawaia Yousif Mohamed	Coordinator, Desertification Unit, Ministry of Agriculture and Forestry
Dr. Nadia Hassan	Acting General Secretary, HCENR
Dr. Nouredin Ahmed Abdalla	National Project Manager, CRFP Tel: +249121329559
Dr. Mutasim Bashir Nimir	Executive Manager, SECS Tel: 0919378857
Dr. Sayda Khalil	Coordinator, Sudan REDD+ Tel: 0922882329
Abdel moneum Abdel Hafeez	Pasture and Range Administration Tel: 09128811697
Motasim Ismail Amin	FNC Manager- River Nile state
Kamal Mohyeldin. M. Tahir	Assistant Manager –Shendi, River Nile state Tel: 0122261548
Kother	Agriculture Director, River Nile state
Hafiz Al Habib Hamad	Forest Extension, River Nile state
Al Rasheed Mubarak elmugrabi	Manager, NAPA, CIDA Project, River Nile state
Ali Gamer eldin Elfaki	Director, Range Department, Ed damer Locality,
Dr. Mohamed Awad	Veterinary Extension, Ed damer Locality
Dr. Mustafa Bashir Goda	FNC Manager- Northern state

	Tel: 0912595023
Idris Gafaar	Assistant FNC Manager, Marawi Locality, Northern State Tel: 0912708936
Mohamed Eltahir Abdel Gadir	Assistant FNC Manager, Dongola Locality, Northern State
Muawaia Mohamed Ahmed	Director, Agricultural Directorate, Marawi Locality, Northern State
Mustafa Abdel Fatah Abdel Magid	Head of the Committee of Agricultural lands, Marawi Locality, Northern State
Bushra Idris	Executive Manager, Marawi Locality, Northern State

Annex 5. Term of Reference for National Consultant



Food and Agriculture organization of the United Nations

Terms of Reference for Consultant /NPP

Minimum number of years of relevant experience required: 1yr 5yrs 12+yrs

Job Title:	National Consultant		
Division/Department:	FAO-Sudan		
Programme/Project Number:	FAO-SUDAN		
Location:	Sudan-Khartoum		
Expected Start Date of Assignment:	5 April 2015	Duration:	30 days
Reports to:	Name: Abdi Jama	Title:	FAO Representative

General Description of task(s) and objectives to be achieved

Background:-

The development of Action Plans for the implementation of the Great Green Wall is a participatory process that aims primarily at reaching a national consensus on the following:

- a) The concept of the Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI), the vision that all stakeholders have on its implementation and on the means to mobilize to this effect;
- b) Priority areas of intervention to effectively rehabilitate degraded lands, reclaim desertified lands and reverse land degradation, particularly through the removal of all barriers (political, legal, institutional, financial and technical) that limit the consideration of Sustainable Management Lands (TDM) as a major component of the development plans, including at local level;
- c) Roles and responsibilities of each actor in the implementation of selected measures, and
- d) Monitoring / evaluation mechanisms and tools that are appropriate and relevant to measure progresses made and identify corrective measures.

This process is articulated around five logical steps (FAO, TerrAfrica country support tools, January 2008):

1. The first step targets Commitment and Partnerships, describing how to set up a broad based SLM coalition, including the country team and other consultative bodies. Such a coalition will provide the foundation from which other actions on commitment and partnerships can follow. These actions would include the development of a common vision on SLM, ensuring political commitment from the highest level on land degradation and SLM, raising awareness for the need of a programmatic approach to SLM and developing a code of conduct to promote better

coordination, harmonization and alignment from all partners engaged.

2. The second step pursues Stocktaking and Diagnostics, targeting the main bottlenecks (from the technical, ecosystems, policy, institutional and financial perspectives) and opportunities for SLM up-scaling and mainstreaming. These analyses would be captured within a wide-ranging Diagnostic Study, performed in consultation with relevant stakeholders. This would logically lead the country team to a Strategy Note that identifies main thrusts, and subsequently to the SLM Investment Framework, the rationale for which will have originated from its responses to bottlenecks and opportunities.

3. The third step describes the Programming and Identification of the Investment Framework. The main thrusts identified by the Diagnostic Study (and captured in the Strategy Note) are assessed against national local development priorities for synergies, gaps, contradictions and links. These actions would be ranked to identify those offering highest synergies and complementarities, producing quick wins and supporting implementation in the right sequence. Prioritisation could be based on criteria that assess actions as technically sound, cost-effective, adequate for each ecosystem, coherent with national or local level priorities, having clearly defined implementation and financing mechanisms, and benefit from the support of local champions.

4. Step four (Investment Formulation and Costing) assembles activities and investments according to four main components, namely i) supporting on-the-ground activities for SLM scaling-up, ii) creating a conducive environment for the upscaling of SLM, iii) strengthening commercial and advisory services for SLM, and iv) developing SLM monitoring and evaluation as well as knowledge management and information dissemination systems. It is at this stage that detailed elaboration of the priority actions is undertaken.

5. The fifth step addresses Implementation, Monitoring and Evaluation. As far as possible, these would build on existing processes and methodologies at country level.

These terms of reference are related to the recruitment of a national consultant to help each of the participating countries to carry out Phase 2 of the planning process (inventory and analysis of constraints and opportunities for SLM (from the technical, ecosystems, policy, institutional and financial perspectives)) and to develop a strategy note indicating the methodological approach (roadmap) regarding the national context, as well as identifying the main investment priorities for the implementation of the GGWSSI (areas of intervention and priority actions).

2. Objectives of the consultation

2.1. Overall objective:

The overall objective of the study is to undertake a Stocktaking and Diagnostics analysis on SLM constraints and opportunities, and to propose a national strategy for the implementation of the GGWSSI, taking into account identified priorities in the NAP-CCD and the CAADP national investment plan.

The study aims also at providing guidance on how to promote national ownership of the GGWSSI implementation and alignment of development partners to national priorities.

2.2. Specific objectives

a) Proceed to a stocktaking analysis of Natural Resources Management in the country, through a systematic review of existing strategies, policies, institutions, programs and projects in the country and :

- a. Estimate at what extent they contribute or may contribute to the implementation of the GGWSSI;
- b. Identify key bottlenecks and opportunities to the mainstreaming of SLM activities in national and sectorial programming frameworks;
- c. Propose the main outlines of a coherent framework which should be the national vision of GGWSSI and strategic directions including actions / operational recommendations to remove barriers.
- d. Identify actions that could be major reforms to be implemented.
- b) Propose a roadmap / methodological approach for the national implementation of the GGWSSI;
- c) Where appropriate, provide an institutional platform justified by the comparative advantages of each institution and able to drive the GGWSSI agenda and identify the institution that should provide the leadership and the roles of the other institutions, including civil society organizations;
- d) Based on the activities of the Technical and Financial Partners (TFP) and their strategies, provide guidance on how TFP should be organized to support the process.

Under the overall supervision of the FAO Representative, and the Technical Officer and under direct supervision. In particular the incumbent will:

Tasks and duties:-

The Consultant will have to answer some key questions that determine the successful implementation of the initiative of GMV in the country, including its acceptance by all stakeholders:

- What is the current status of Desertification / Land Degradation / Drought (DLDD) in the country and the actions taken and underway to address the phenomenon?
- To what extent the establishment of an investment framework or action plan specific to/for the GGWSSI is possible, relevant and desirable, and how this investment framework will help decision makers in mobilizing new and additional resources for SLM activities?
- What is the current mapping of both sectorial and geographical investment and what are the gaps to fill?
- What is the current situation in terms of availability and adequacy of SLM techniques (assessment against (i) the different agro-ecological zones of the country, (ii) accessibility and use by rural people) and what are the measures that should be taken to ensure “mass use” of best practices and techniques, mainly those which are technically sound, cost-effective and adequate for each ecosystem?
- What activities are producing quick wins and are able to improve simultaneously (i) the status of ecosystem health, (ii) the living conditions of rural communities and their resilience to climate change (droughts and floods), (iii) trade and economic infrastructure in rural areas.
- Which are the relevant stakeholders that may be invited to participate in the consultation process towards the adoption and implementation of the GGWSSI national action plan?
- Facilitate consultation/ planning workshops with the identified stakeholders to discuss and agree on priority actions to be part of the Great Green Wall National Action Plan

- An indicative budget estimation of the action plan should be provided.

Consultant Profile

The consultant should meet the following criteria:

- Academic Qualification: Advanced degree in social sciences and / or environment;
- Experience of at least 5 years in analytical studies, project management and follow-up evaluation;
- Further qualification: A thorough knowledge of strategy and policy development, strategic and operational planning in Natural resources management and participatory approaches;

Skills:

- Have facilitation skills and an ability to communicate and especially to discuss with the technical and financial partners and with national institutions (governmental or not) to engage them effectively in the development and implementation of the program;
- Produce reports of high quality editorial;
- Good knowledge of environmental policies and MEAs;
- Good knowledge of procedures of Financial and Technical Partners of the country (main agencies of the UN system including UNDP and UNEP, the World Bank, the European Union, the Global Environment Facility, bilateral cooperation and others).

Duration of the mission

The total duration of the consultation is 30 days including the facilitation of the validation workshop for the proposed strategy and action plan.

Key documents (depending on the situation in each country):

- The Regional Harmonized strategy for the implementation of the GGWSSI;
- The capacity development strategy and action plan for the implementation of the GGWSSI;
- The GGWSSI communication strategy;
- The SAWAP project document in Sudan;
- The Strategy for Poverty Reduction;
- The National Program for Rural Sector Development;
- Investment Programs in the rural sector (Agriculture, Forestry, Water, Livestock);

- The National Action Programme to combat desertification;
- The national action program to adapt to climate change;
- The national strategy for capacity building for environmental management (ANCR);
- The national strategy for implementation of the UNFCCC;
- The national strategy for sustainable use and conservation of biological diversity;
- The National Public Expenditure Review.

Key performance indicators

<p>Expected output:</p> <ul style="list-style-type: none"> a. A concept note (in coordination with the International consultant) describing how the work will be conducted (from signature of contract) b. A first draft GGW National Action plan (one month after the start of the study) describing the situation and offering a first draft of recommendations. The draft report will include: c. An introduction and analytical description of political barriers, technical, institutional and financial bottlenecks to up scaling SLM practices, mainly in arid areas of the country; d. Options and recommendations for priority investments (geographical area and type of investments) and their estimated costing; e. supporting Mechanisms and measures (Institutional, policies, and financial) that may allow a rapid implementation of proposed options and recommendations; f. Activities that is able to produce quick results, and the conditions of their implementation. g. A Roadmap / methodology for the implementation of the GGWSSI at national level h. The list of documents that were consulted i. The list of interviewees and a verbatim exchange j. A final report (one week after receiving comments from the National Focal Point of the Great Green Wall and FAO). 	<p>15/05/2015</p>
--	-------------------

Annex 6. Term of Reference for International Consultant



Food and Agriculture organization of the United Nations

Terms of Reference for Consultant /NPP

Minimum number of years of relevant experience required: 1yr 5yrs 12+yrs

Job Title:	consultation to support the development of The National Action Plan for implementation of the Great Green Wall initiative		
Division/Department:	FAO-Sudan		
Programme/Project Number:			
Location:	Sudan, KHARTOUM		
Expected Start Date of Assignment:	01/07/2015	Duration:	18 Working Days
Reports to:	Name: Rosanne Marchesich	Title:	Deputy FAOR

General Description of task(s) and objectives to be achieved

Under the general supervision of the FAO Representative (FAOR) and the Deputy FAOR. The following is the expected sequence of activities to be performed by the consultant carrying out the assignment.

- The international consultant will provide overall guidance to the development of Sudan’s national action plan for the implementation of the GGWI. Specific tasks include;
- Review the concept note (to be developed by the national consultant), the national stock taking report and other relevant reports and guide the national consultant on the process of developing a strategy and a national action plan for the implementation of the GGWI (3 days).
- Review the first draft report and provide suggestions for improvement before its presentation at the Validation Workshop taking into consideration the following (4 days):
- Deepen the diagnosis on the integration of SLM into National Development Frameworks and adequacy of budget resources devoted to Desertification and Land Degradation control, as well as drought mitigation;
- Review and validate the design and costing of proposed investments by the national consultant;
- Analyse the national budgetary process and framework and propose a strategy that can influence better national resources allocation for SLM.
- Undertake a mission to Sudan to participate in the validation workshop and undertake face to face discussions with the national consultant (8 days),
- Review the semi-final report and provide suggestions for improvement before its finalization (3 days)

Background

The development of Action Plans for the implementation of the Great Green Wall is a participatory process that aims primarily at reaching a national consensus on the following:

- a) The concept of the Great Green Wall for the Sahara and the Sahel Initiative (GGWSSI), the vision that all stakeholders have on its implementation and on the means to mobilize to this effect;
- b) Priority areas of intervention to effectively rehabilitate degraded lands, reclaim desertified lands and reverse land degradation, particularly through the removal of all barriers (political, legal, institutional, financial and technical) that limit the consideration of Sustainable Management Lands (TDM) as a major component of the development plans, including at local level;
- c) Roles and responsibilities of each actor in the implementation of selected measures, and
- d) Monitoring / evaluation mechanisms and tools that are appropriate and relevant to measure progresses made and identify corrective measures.

This process is articulated around five logical steps (FAO, TerrAfrica country support tools, January 2008):

1. The first step targets Commitment and Partnerships, describing how to set up a broad based SLM coalition, including the country team and other consultative bodies. Such a coalition will provide the foundation from which other actions on commitment and partnerships can follow. These actions would include the development of a common vision on SLM, ensuring political commitment from the highest level on land degradation and SLM, raising awareness for the need of a programmatic approach to SLM and developing a code of conduct to promote better coordination, harmonization and alignment from all partners engaged.
2. The second step pursues Stocktaking and Diagnostics, targeting the main bottlenecks (from the technical, ecosystems, policy, institutional and financial perspectives) and opportunities for SLM up-scaling and mainstreaming. These analyses would be captured within a wide-ranging Diagnostic Study, performed in consultation with relevant stakeholders. This would logically lead the country team to a Strategy Note that identifies main thrusts, and subsequently to the SLM Investment Framework, the rationale for which will have originated from its responses to bottlenecks and opportunities.
3. The third step describes the Programming and Identification of the Investment Framework. The main thrusts identified by the Diagnostic Study (and captured in the Strategy Note) are assessed against national local development priorities for synergies, gaps, contradictions and links. These actions would be ranked to identify those offering highest synergies and complementarities, producing quick wins and supporting implementation in the right sequence. Prioritization could be based on criteria that assess actions as technically sound, cost-effective, adequate for each ecosystem, coherent with national or local level priorities, having clearly defined implementation and financing mechanisms, and benefit from the support of local champions.
4. Step four (Investment Formulation and Costing) assembles activities and investments according to four main components, namely i) supporting on-the-ground activities for SLM scaling-up, ii) creating a conducive environment for the upscaling of SLM, iii) strengthening commercial and advisory services for SLM, and iv) developing SLM monitoring and evaluation as well as knowledge management and information dissemination systems. It is at this stage that detailed elaboration of the priority actions is undertaken.
5. The fifth step addresses Implementation, Monitoring and Evaluation. As far as possible, these would build on existing processes and methodologies at country level.

These terms of reference are related to the recruitment of a national consultant to help each of the participating countries to carry out Phase 2 of the planning process (inventory and analysis of constraints and opportunities for SLM (from the technical, ecosystems, policy, institutional and financial perspectives)) and to develop a strategy note indicating the methodological approach (roadmap) regarding the national context, as well as identifying the main investment priorities for the implementation of the GGWSSI (areas of intervention and priority actions).

Objectives of the consultation

Overall objective:

The overall objective of the study is to undertake a Stocktaking and Diagnostics analysis on SLM constraints and opportunities, and to propose a national strategy for the implementation of the GGWSSI, taking into account identified priorities in the NAP-CCD and the CAADP national investment plan.

The study aims also at providing guidance on how to promote national ownership of the GGWSSI implementation and alignment of development partners to national priorities.

Specific objectives

Proceed to a stocktaking analysis of Natural Resources Management in the country, through a systematic review of existing strategies, policies, institutions, programs and projects in the country and :

- a. Estimate at what extent they contribute or may contribute to the implementation of the GGWSSI;
 - b. Identify key bottlenecks and opportunities to the mainstreaming of SLM activities in national and sectorial programming frameworks;
 - c. Propose the main outlines of a coherent framework which should be the national vision of GGWSSI and strategic directions including actions / operational recommendations to remove barriers.
 - d. Identify actions that could be major reforms to be implemented.
- b) Propose a roadmap / methodological approach for the national implementation of the GGWSSI;
 - c) Where appropriate, provide an institutional platform justified by the comparative advantages of each institution and able to drive the GGWSSI agenda and identify the institution that should provide the leadership and the roles of the other institutions, including civil society organizations;
 - d) Based on the activities of the Technical and Financial Partners (TFP) and their strategies, provide guidance on how TFP should be organized to support the process.

Key documents to be consulted (depending on the situation of the country):

- The Regional Harmonized strategy for the implementation of the GGWSSI;
- The capacity development strategy and action plan for the implementation of the GGWSSI;
- The GGWSSI communication strategy;
- The SAWAP project document in Sudan;
- The Strategy for Poverty Reduction;
- The National Program for Rural Sector Development;
- Investment Programs in the rural sector (Agriculture, Forestry, Water, Livestock);
- The National Action Programme to combat desertification;
- The national action program to adapt to climate change;
- The national strategy for capacity building for environmental management (ANCR);
- The national strategy for implementation of the UNFCCC;
- The national strategy for sustainable use and conservation of biological diversity;
- The National Public Expenditure Review.

MINIMUM REQUIREMENT:

- Advance degree in natural resources disciplines or in social sciences;
- Experience of at least 10 years in areas of strategy and policy development, strategic and operational planning;
- Good knowledge of environmental policies and MEAs;
- Working experience in developing countries, preferably in the Sahel and Sahara region of Africa;

- Good knowledge of English language.

key performance indicators

<p>Expected output:</p> <p>Complete the tasks timely and prepare accurate paperwork when required</p>	<p>Required Completion Date: 31 July 2015</p>
<p>Security:</p> <p>Before starting the mission/travel, the consultant must find out in what security phase the country of assignment is in and what this implies for his/her own security. As soon as he/she arrives at the duty station, through the FAO Representation or directly, he/she must contact the designated UN security officer to be briefed on all the recommended security measures. In case this procedure is not properly applied, the consultant may not be covered under the Malicious Acts Insurance Policy.</p> <p>Health:</p> <p>All consultants, on duty travel, must accept responsibility for their health and well-being as part of their official duties and also on their return. The following are the main responsibilities of the traveller:</p> <ul style="list-style-type: none"> • seek health advice, preferably four to six weeks before travel; • comply with recommended vaccinations and other prescribed medication and health measures; • ensure health precautions are taken before, during and after travel; • obtain a physician's letter pertaining to any prescription medicines, syringes, etc. being carried; • precaution to avoid transmitting any infectious disease to others during and after travel; <p>Report any illness on return, including information about all recent travel; and respect the host country and its population.</p>	