Logistics Capacity Assessment For the Republic of Sudan

Northern Sector

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Map 1

Map of Sudan with States & State Capitals
Egypt
Libya
Chad
C.A.R.
Democratic Republic of the Congo
Uganda
Kenya
Ethiopia
Eritrea
RED SEA
PORT SUDAN
NORTHERN
DONGOLA
RIVER NILE
ED DAMER
KHARTOUM
KHARTOUM
KASSALA
KASSALA
NORTH DARFUR
AL FASHIR
AL GENAINA
WEST DARFUR
NYALA
SOUTH DARFUR
NORTH KORDOFAN
GEZIRA
WAD MADANI
GEDAREF
GEDAREF
WHITE NILE
EL OBEID
RABAQ
SINJA
SINNAR
El Nuhud
WEST KORDOFAN
SOUTH KORDOFAN
KADUGLI
DAMAZIN
BLUE NILE
UPPER NILE
MALAKAL
NORTH BAHR AL GHAZAL
AWEIL
BENTIU
UNITY
WARAB
WARAB
WEST BAHR AL GHAZAL
WAU
JONGLEY
LAKES
RUMBEK
BOR
WEST EQUATORIA
EAST EQUATORIA
JUBA
KAPOETA
YAMBIO
BAHR EL JABEL

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SUMMARY

Logistics Capacity Assessment (LCA) for the Republic of the Sudan responds to the demand initiated from WFP Kharotum Logistics Unit. The country covered in this assessment is Sudan , from the northern sector.

This assessment has been carried out by a consultant (Logistics) from 2nd November 2003 to January 2004 on the basis of the terms of reference and guidelines given from WFP.

The main objectives of the LCA can be summarized as follows:-

- Support for WFP contingency planning activities;
- Preparation of Emergency Response Operational plans;
- Improving resource requirements assessments at planning stage of an emergency response ;
- Reducing overall response time in the delivery of food aid;
- Increase access to all beneficiaries;
- Decrease cost of transportation at onset and over the course of the operation;
- Facilitate the transition from Relief to Rehabilitatin and Development;
- Provide detailed briefing material for relief staff unfamiliar to the region.

This report covers six chapters plus associated appendices:-

- Chapter 1 & 2 provide details of geographical background , ethnic groups, religion, political history, WFP operations , sub offices , cooperating partners potential calamities , borders, and seasonal effects on transport .

- Chapter 3 is the major part of this report and presents the available logistics capacity in Sudan. It provides detailed discussion of the Port Sudan, the river transport, airfield , road transport, rail transport and storage capcities in the Republic of the Sudan. It examines in detail the capacities and emphasizes on the bottlenecks on this logistic links and at the end of each part presents recommendation to overcome the problems and upgrade the existing capacity.

- Chapter 4 presents assessment of flour mill at Port Sudan. Chapter 5 discusses the communication system available in Sudan, telephone network, the internet service providers , satellite and radio communication.

- Chapter 6 presents conclusive comments and recommendation .

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Country:	**REPUBLIC OF THE SUDAN**
Region:	**AFRICA**
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Date LCA Prepared:	**November 2003 - January 2004**

1 BACKGROUND AND GENERAL INFORMATION:

1.1 Geographic Location:

Sudan is located at Geographic coordinates 15 00 North and 30 00 East of Africa, bordering the Red Sea, between Egypt and Eritrea. Egypt borders Sudan in the North, Red Sea, Eritrea and Ethiopia in the East, Kenya, Uganda and Congo in the South and Central Africa, Chad and Libya in the west.

1.2 Language:

Languages spoken in Sudan fall into four language super stocks. Three of them are – Afro-Asiatic, Niger-Kordofanian, and Nilo –Saharan. Each is divided into groups that are in turn subdivided into sets of closely related languages.

The number of languages and dialects in Sudan is assumed to be about 400, including languages spoken by an insignificant number of people. Moreover, languages of smaller ethnic groups tended to disappear when the groups assimilated with more dominant ethnic units.

Arabic is the country's official language and the language of Islam. Despite Arabic's status as official national language, English was acknowledged as the principal language in Southern Sudan in the late 1980s and it is widely spoken in the South.

1.3 Country Size:

The Sudan is the largest country in Africa dominated by the Nile and its tributaries and embracing 2,505,813 squares Kms of northeast and central Africa. Out of this area 129,813 Square Kms. is covered by water while the remaining 2,376 million square Kms. is covered by land. Sudan has a length of 2250 Km. from North to South and width of 1730 Kms. from East to West.

1.4 Population:

Population information for Sudan has been limited and population estimates were complicated by census difficulties.

Since independence there have been three national censuses, in 1955-56,1973, and 1983. No census has been carried out since the resumption of the civil war in 1983.

According, to the 1993 population census, the total population was estimated at 24.9 million with annual growth rates of 2.6%. Total Population in 2003 is estimated to be 33.6 million.

1.5 Ethnic Groups:

Sudan is a nation of numerous ethnic groups, with historically distinct division in the country between the predominantly Arab/Muslim North and the predominately African /Animist /Christian South.

Sudan's ethnic and linguistic diversity remained one of the most complex in the world. It has nearly 600 ethnic groups, speakingre than 400 languages and dialects, many of them intelligible to only a small number of individuals. In the 1980's and 1990's larger groups absorbed some of these small groups, while migration often caused individuals reared in one tongue to converse only in the dominant language of the new area. Some linguistic groups had been absorbed by accommodation, others by conflict. At present it is believed that more than 252 ethnic groups exist in Sudan.

1.6 Religions:

The religion of most of Sudan's population is Muslim since the 1990's.Most Muslims, perhaps 90% lived in the north, where they constituted 75% or more of the population. Sudanese Muslims are adherents of the Sunni branch of Islam, sometimes called orthodox, by far the larger of the two major branches; the other is Shia, which is not represented in Sudan. A uniform body of belief and practice does not mark Sunni Islam.

Data on the Christians was less reliable; estimates ranged from 4 to 10 percent of the population. At least one-third of the Sudanese are still attached to the indigenous religions. Most Christian Sudanese and adherents of local religious systems lived in Southern Sudan.

Christianity is most prevalent among the peoples of Al Istiwai State – the Madi, Moru, Azande, and Bari. The major churches in the Sudan are the Roman Catholic and the Anglican.

Each indigenous religion is unique to a specific ethnic group or part of a group, although several groups may share elements of belief and ritual because of common ancestry or mutual influence. The concept of high spirit or divinity, usually seen as a creator and sometimes as ultimately responsible for the actions of lesser spirits, is common to most Sudanese groups. Often the higher divinity is remote, and believers treat the other spirits as autonomous, orienting their rituals to these spirits rather than to the high God.

The main religions are Sunni Muslim 70% (in north), indigenous beliefs 25%, and Christian 5% (mostly in South and Khartoum).

1.7 Cultural habits:

Sudan has two distinct major cultures--- Arab and Black African – with hundreds of ethnic and tribal divisions and language groups, which makes effective collaboration among them a major problem.

The northern states cover most of the urban centers, Arabic Speaking Muslims, though the majority also use traditional non-Arabic mother tongue (i.e. Nubian, Beja, Fur, Nuban, Ingessana, etc.)

Among these are several distinct tribal groups:

- the Kbabish of northern Kordofan, a camel- raising people;
- the Ja'alin and Shaigiyya groups of settled tribes along rivers;
- the semi-nomadic Baggara of Kordofan and Darfur;
- the Hamitic Beja in the Red Sea area

- Nubians of the northern Nile, some of whom have been resettled on the Atbara River; and
- the Negroid Nuba of Southern Kordofan and Fur in the western reaches of the country.

The southern region has a population predominantly rural, subsistence economy. Here the Sudanese practice mainly indigenous traditional beliefs, although Christian missionaries have converted some. The south also contains many tribal groups and uses many more languages than in the north.

The Dinka is the largest of the Black African tribes of the Sudan. Along with the Shilluk and the Nuer, they are among the Nilotic tribes. The Azande, Bor, and Jo Luo are "Sudanic" tribes in the west, and the Acholi and Lothuhu live in the extreme south, extending into Uganda.

1.8 Political History:

The Anglo-Egyptian Condominium (1899 – 1956)

Sudan was a collection of small, independent states from the beginning of the Christian era until 1820-21, when Egypt conquered and unified the northern portion of the Country. Although Egypt claimed all of the present Sudan during most of the 19th century, it was unable to establish effective control of Southern Sudan, which remained an area of fragmented tribes subject to frequent attacks by slave raiders.

In January 1899, Anglo –Egyptian agreement restored Egyptian rule in Sudan but as part of a condominium, or joint authority, exercised by Britain and Egypt. Sudan was then proclaimed a condominium under British - Egyptian administration. While maintaining the appearance of joint administration, the British Empire formulated policies, and supplied most of the top administrators.

Independence: (1956)

On December 19,1955, it was decided unanimously by the Sudan Parliament that the Sudan should become " a fully independent sovereign state". British and Egyptian troops left the country on January 1,1956. Sudan achieved independence on January 1,1956.

The post independence: (1956-2003)

Sudan's post independence history has been shaped largely by the southern civil war. This conflict has retarded the country's social and economic development, encouraged political instability, and led to an endless cycle of weak and ineffective military and civilian governments. The country has been in a state of civil war for many years and human right abuses are widespread.

Military dictatorships promulgating Islamic governments have mostly run the country since independence.

Over the past two decades, a civil war pitting black Christians and animists in the South against the Arab – Muslims of the North has cost about two million lives in war and famine related deaths, as well as the displacement of over four million people internally.

Civil Strife:

The Sudanese conflict predates the birth of modern Sudan in 1956. The conflict between the North and the South erupted in 1955 with a mutiny in the Southern town of Torit. From 1955 until 1972 for 17 years, the southern region experienced civil strife, and various southern leaders agitated for regional autonomy or outright secession.

Civil war was fought between the government in the North and the rapidly expanding Ananya Forces seeking independence for the South. The peace agreement signed in 1972 in Addis Ababa ended the first civil war after independence, and some movement towards federalism.

The agreement granted the South qualified autonomy, far less than parity within a federal structure demanded by the South.

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Chronology of rulers (post independence):

Lt.Gen. Ibrahim Abboud (1958 - 1964)

On 17 November 1958 two years after independence following a period of economic difficulties and political maneuvering that paralyzed public administration, Chief of Staff Lt. General Ibrahim Abboud overthrew the parliamentary regime in a bloodless coup.

On assuming power, General Abboud declared that he would rule through a thirteen-member army junta and that democracy was being suspended in the Sudan in the name of "honesty and integrity".

General Abboud did not carry out his promises to return Sudan into civilian government. However popular resentment against army rule led to a wave of riots and strikes in late October 1964 that forced the military to relinquish power.

Provisional Government (1964-1969):

A provisional government followed Abboud's regime until parliament elections in April 1965 led to a coalition government of the Umma and National Unionist parties under Prime Minister Muhammad Ahmad Mahjoub.

From 1966 - 1969, Sudan had a series of governments that proved unable either to agree on a permanent constitution or to cope with problems of factionalism, economic stagnation, and ethnic dissidence.

Trouble in the South:

In 1966, Sadik al-Mahdi, the 30-year-old president of the Umma Party, took over as Prime Minister. Internally the security situation in the southern Sudan continued to cause anxiety; successive Prime Ministers visited the South in April and October but neither threats nor blandishments succeeded in curbing the rebels.

The Ministry for Southern Affairs sought to restore normal life to those parts of the southern provinces under government control, but there was little or no security in Equatoria Province and the armed forces launched a major offensive against the rebel camps there in October 1970.

The war ended officially in March 1972, when Colonel Numeiry signed a peace pact with Major General Lagu, the leader of the Anya-Nya rebels in the south.

Col. Jaafar Muhammad Numeiry (May 25,1969 –April 6,1985)

Dissatisfaction culminated in a second military coup on May 25,1969. The coup leader, Col. Jaafar Muhammad Numeiry, became Prime Minister, and the new regime abolished parliament and outlawed all political parties**.**

In September 1983, President Jaafer Mohammed al-Numeiry announced his decision to incorporate traditional Islamic punishments drawn from the Shari'a (Islamic Law) into the penal code. The penal code had been revised in order to link it "organically and spiritually" with Islamic Law (Sharia).

Theft, adultery, murder and related offences would hence forth be judged according to the Koran, and alcohol and gambling were both prohibited; non-Moslems, however, would be exempt from koranic penalties except when convicted of murder or theft.

Early 1985 saw serious shortages of fuel and bread in Khartoum, a growing insurgency in the South, drought and famine, and an increasingly difficult refugee burden.

Gen. Suwar el Dahab (April 6,1985-April 1986)

In early April, during Nimeiriy's absence from the country, massive demonstrations, first triggered by price increases on bread and other staples, broke out in Khartoum. Discontent with Numeiry's regime had been growing and while in his visit to the USA, on April 6,1985, senior military officers led by Gen. Suwar el Dahab mounted a coup. Lt.Gen.Swar Al Dahab, after a period, passed the reigns of government to civilian rule, headed by Sadiq Al Mahadi.

Sadiq Al Mahadi (April, 1986 – June, 1989)

Elections were held in April 1986, and the transitional military council turned over power to a civilian government as promised. Prime Minister Sadiq al Mahdi of the Umma Party headed the government. The government consisted of a coalition of the Umma, and several southern parties. This coalition dissolved and reformed several times over the next few years, with Sadiq al Mahadi and his Umma party always in a central role. During this period the economy continued to deteriorate. In February 1989, the army presented Sadiq with an ultimatum: He could move toward peace or be thrown out.

Brig. Omar Hassan 'Ahmed El Bashir' (June 30,1989 until present)

Following further discontent in the country and within the military, another bloodless coup d'etat took place on June 30,1989. Colonel Omar Hassan 'Ahmed El Bashir' replaced the government with the Revolutionary Command Council for National Salvation, a Junta comprised of 15 military officers assisted by a civilian cabinet. General al Bashir became president and chief of state, Prime Minister and chief of the armed forces.

The military regime led by Lt. General Omar al Beshir was dominated by the National Islamic Front led by Hassan al Turabi, speaker of the 400 seat National Assembly. Following the 1989 coup the war against the SPLA intensified. In March of 1991, a new penal code, the Criminal Act of 1991, instituted harsh punishments nationwide, including amputation and stoning. In mid October 1993 Brig. mar Hassan Ahmed El Bashir dissolved the Revolutionary Command Council; and on October 30 announced the formation of a new government. Further changes took place until the last reshuffle in the Cabinet in December 1996.

Sudan has experienced a long –running conflict between the Arab Muslim of the north, (the base of the Government), and the black Africans of the south, who are mainly Christian or animist.

Negotiations between the government and the political wing SPLM– the Sudan People's Liberation Movement- occurred in 1988 and 1989, but they were overtaken by events, when General Omar Hassen Ahmad al –Bashir took power in a military coup in June 1989, banning all political parties in the country. In January 1991 his government gave the southern states a non- – Sharia legal system, and considerable autonomy in internal affairs. However, non-Muslims living in the north of the country were still subject to Sheri'a law.

1.9 Current Political Situation:

Peace Negotiations:

Peace negotiations have been attempted in the past but with no success. The renewed efforts by the Intergovernmental Authority for Development (IGAD) and key governments have reactivated peace negotiations in late 2001.

The first major achievement of the renewed political /diplomatic efforts is represented by the Nuba Mountains cease-fire agreement between the government of the Sudan and SPLM/A in January 2002 and recently renewed until July 2003. This marked the end of 13 years of conflict and isolation of the Nuba inhabitants.

In June 2002 a new round of peace negotiations began under IGAD and the Government of the Sudan and SPLM/A restarted peace negotiations. International observer countries (United Kingdom, Norway, Italy and The United States of American) were also associated with the talks. The session ended on July 20th when parties signed the Machakos Protocol, which provides a framework for broader negotiations. Key provisions of the Machakos Protocol include a six-year interim period, after which a referendum on self-determination will be held in the south. This will offer a choice between United Sudan and secession. The parties are also in agreement that Sharia law will continue to be applied only in the North.

On 15th October 2002, the two parties agreed to create a conducive atmosphere for negotiation through signing a Memorandum of Understanding. This Memorandum of Understanding called for a complete cessation of hostilities and ensuring a military stand down in all areas of Sudan for three months until outstanding issues in the conflict are resolved. It also made a provision for unimpeded humanitarian access to all areas and people in need, in accordance with the Operation Lifeline Sudan (OLS) agreement.

On 25/26 October 2002, the Government of the Sudan (GOS), SPLM/A and the UN met in Kenya and agreed on implementation modalities for unimpeded humanitarian access permitting the humanitarian community to provide assistance to new areas previously denied access.

The peace process is in progress at present. It is hoped that the peace talks will end the civil war and bring peace to the country.

1.10 WFP Operations

Table: -1Details of ongoing WFP operations in the Sudan

Type & project No.	Type of intervention	Description
Sudan Emergency Operation (EMOP) No.10048.2	" Emergency Assistance to Populations Affected by War and Drought"	Supports some 3.89 million beneficiaries including those in Darfur affected by recent conflict. The operation costs $180 million dollars.
WFP Country Program (CP) 10105.0 Activity 1	"Educational and Nutritional Support" The total number of school children benefiting from the Activity will average about 330,000 per year.	This is assistance from WFP for the purpose of implementing a feeding Activity for primary school girls and boys, for girls and nomadic children at secondary schools and for malnourished pre-school children and women. This program consists of two activities: School Feeding and Food for Work.
WFP Country Program (CP) 10105.0 Activity 2	"Water Harvesting and Educational Infrastructure"	This is assistance from WFP for the purpose of implementing an Activity concerning the construction and rehabilitation of improved "hafirs" (ponds to store rain - water) in North and West Darfur, North, West and South Kordofan and Red Sea States.
Protracted Refugee operation in Eastern Sudan (PRRO) 10122.0	"Assistance to Eritrea Refugees"	93,357 refugees of whom 92,754 are Eritreans and 603 are Ethiopians. The PRRO will be extended for another 24 months as PRRO 10122.1.

Source: WFP Khartoum – Country Office

1.10.1 Sub-Offices

WFP has one Country Office, 2 Operational Hubs, 14 Sub Offices and 5 Satellite Offices to handle WFP operations in the Sudan. Details are as follows:

- WFP Country Office - located at Khartoum.
- Two Operational Hubs – located in El Obeid and in Lokichokio (Kenya)
- Sub Offices - at Rumbek, Akon, Kauda, Pulmok; (for the Southern Sector)
- Sub Offices - at El Fasher, Nyala, Kassala, El Obeid, Kosti, Kadugli, Wau, Malakal, Bentiu, Juba, and Port Sudan; (for the Northern Sector) and
- Satellite offices –at El Geneina, Ed Daien, Showak, En Nahud and El Damazeen.

1.11 Cooperating Partners

The UN family is led by the office of the Resident and Humanitarian Coordinator for the Sudan and the UN partners include Resident Coordinator, UNICEF, FAO, UNHCR, WHO, UNDP, UNCHR, UNIDO, UNFPA, UNAIDS, and OHCHR, UNOCHA and OIM.

There are over 40 National and International NGO's operating in the Northern Sector. CARE, DED, FAR, GOAL, OXFAM, IRC, IFRC, SCUS, SCUK, MSF and CONCERN are among them.

1.11.1 Government Ministries

The main cooperating government Ministries in relation to WFP activities are the following:

- Ministry of Foreign Affairs in relation to WFP Basic agreements and Diplomatic matters.
- Ministry of International Cooperation - in relation to development programs,
- Ministry of Education in relation to educational activities
- Ministry of Humanitarian Affairs – the Humanitarian Aid Commission (HAC) - in relation to emergency operations and
- Commission For Refugees - for activities related to refugees.

The nature of the cooperation is in the provision of administrative support.

1.11.2 Military and Civil Defense Assets

There is no use of military and civil defense assets currently applied in the ongoing relief operations. The country is under a civil war, which has taken a long time. WFP stays neutral in such situations and avoids use of these assets in order to extend its relief operations to the needy people. WFP uses other assets available, commercial entities in order to reach the beneficiaries. This has left WFP operations independent and neutral from government intervention and influence.

Under the present political situation the use of military and civil defense assets should not be used and avoided even under emergency because of the following reasons.

- Most of the internally displaced people are either victims of natural or man made calamities and mainly are the results of the civil war. These people are located in different areas and some of the areas are under the control of the SPLA, which makes it difficult to use the military or civil defense assets for relief operations.
- Humanitarian assistance could possibly be diverted according to government priorities and real beneficiaries identified by WFP might not be reached as per programs.
- Looting and theft could be faced as a sign of resistance from the anti-government parties
- Impartiality of WFP may be questioned and as a result movement of relief food supplies to the needy hindered.
- The "Opposition Groups and Parties" would question the neutrality of WFP and this will have far-reaching implications on WFP's operations.

1.12 Potential Calamities

1.12.1 Man-made

Civil war:

The 20-year civil war that has been going on between the Government of the Sudan and the Sudan People's Liberation Movement /Army (SPLM/A) in the south, as well as in Kassala in the northeast, has resulted in a massive population displacement, disruption of agricultural activities and destruction of Socio-economic infrastructure. This is the main cause of food insecurity in the Sudan. The fighting has drained vital government resources, caused large-scale internal

displacement, destroyed infrastructure (roads, railways, waterways, bridges...), and isolated large population.

The civil war has directly or indirectly affected most of the population of Sudan and accounts for all social and economic deterioration in the country

Armed and tribal Conflict and insecurity:

South Sudan has great potential for agricultural production and livestock rearing but the ongoing fighting, armed and tribal conflict, and insecurity have made the region unable to produce enough making the region the most food insecure area in Sudan.

The civil conflict has extended further north resulting in large number of displaced population into Kassala, Kordofan and Darfur. The most insecure places include areas close to the front lines, strategic towns such as Wau and areas close to the oil fields.

The West Darfur State suffers from frequent banditry and tribal conflict over water resources between the farmers and the pastoral nomads.

Limited access to land due to landmines:

Many places in the South are exposed to landmine problems as a result of the civil war that has taken place for more than 20 years, and this in turn has impact on the access to the land for agricultural production. Natural

Recurrent Drought

Most of the Sudan falls in the Sahelian belt and suffers from recurrent droughts. Rainfall varies from zero in the North to 1,800 mm in the South. Western Sudan and the Red Sea State are the worst drought affected areas. The worst drought in the Sudan was that of 1983/1984. Recurrent drought in the past decades has depleted the asset holdings of over 60% of the population in North Darfur State. Water scarcity becomes a critical problem and the worst affected areas by water shortage are the northern provinces of Northern Kordofan and Northern Darfur. Western Sudan and the Red Sea State are chronically food insecure as a result of recurrent drought and pest attack.

Poor climatic conditions:

Poor climatic conditions including late, erratic, inadequate rainfall coupled with prolonged dry spells have undermined and greatly reduced household's ability to produce enough food to support their food requirements. The WFP-led Annual Need Assessment (ANA) of December 2002 established that in Upper Nile, Jongley and across most of the region of Bahir El Ghazal, insecurity combined with erratic rains, dry spells and heavy population influxes continued to threaten livelihoods of the population. Central and Eastern Equatoria remain vulnerable due to prolonged dry spells, bird attacks and escalated fighting between SPLM/A and Government of the Sudan. Areas in Red Sea, Kassala, pockets of Greater Darfur and Kordofan States have been affected by erratic, uneven and minimal rainfall. Extensive River flooding in the South during the wet season makes movement difficult.

1.12.2 Long term

Desertification:

Drought:

Most of the Sudan falls in the Sahelian belt and suffers from recurrent droughts.

1.13 Types of food consumed

Types of food generally consumed; (staple and protein)

1.14 Food Stocks

It is a normal practice by WFP to maintain food stocks in the country for ongoing program implementation. WFP food stocks maintained in Sudan include cereals, pulses, corn Soya blend, vegetable oil, salt, sugar, and dried skimmed milk.

2 AREA OVERVIEW:

2.1 Geography

Sudan is the largest county in Africa; dominated by the Nile and its tributaries. It embraces 2,505,813 square kilometers of northeast and central Africa. It consists of a huge plain bordered on three sides by mountains: to the east the Red Sea Hills, to the west the Jabal Marrah, and on the southern frontier the Didinga Hills and the Dongotona and Imatong mountains. Jutting abruptly in the south-central region of this vast plain are the isolated Nuba Mountains and Ingessana Hills, and far to the southeast, the lone Boma Plateau near the Ethiopian border.

Spanning eighteen degrees of latitude, the plain of the Sudan includes from North to South significant regions with distinctive characters – northern Sudan, Western Sudan, the central clay plains, Eastern Sudan, the Southern clay plains, and the Jabal Hadid, or Ironstone plateau, and southern hill masses.

Northern Sudan: Lies between the Egyptian border and Khartoum, has two distinct parts, the desert and the Nile valley. To the east of the Nile lies the Nubian Desert; to the west, the Libyan Desert. There is virtually no rainfall in these deserts.

Western Sudan: It is a generic term describing the regions known as Darfur and Kurdufan that comprise an area of 850,000 square Kms.The dominant feature throughout this immense area is the absence of perennial streams; thus, people and animals must remain within reach of permanent wells. Consequently, the population is sparse and unevenly distributed.

Northeast of the central clay plains: Stretches eastward from the Nuba Mountains to the Ethiopian frontier, broken only by the Ingessana Hills, and Khartoum in the north to the far reaches of Southern Sudan. Between the Dindar and the Rahad rivers, low ridge slopes down from the Ethiopian highlands to break the endless plains provide the backbone of Sudan's economy because they are productive where settlements cluster around available water.

Northward beyond the Gash- lies eastern Sudan, which is divided between desert and semi desert areas and includes Al Butanah, the Gash Delta, the Red Sea Hills, and the coastal plain. Al Butanah is an undulating land between Khartoum and Kassala that provides good grazing for cattle, sheep and goats. East of Al Butanah is a peculiar geological formation known as the Gash Delta. Northward beyond the Gash lie the Red Sea Hills. Dry, bleak, and cooler than the surrounding land, particularly in the heat of the Sudan summer, they stretch northward into Egypt, a jumbled mass of hills sprawls the coastal plain of the Red Sea. The coastal plain is dry.

The Southern clay plains - can be regarded as an extension of the northern clay plains, extend all the way from northern Sudan to the mountains on the Sudan-Uganda frontier, and in the west from the borders of Central African Republic eastward to the Ethiopian highlands. This plain has distinctive features. First the White Nile bisects the plain provides large permanent water surfaces such lakes as Fajarial, Lake Nou, and Shambe. Second as Sudd, the World's largest swamp, provides lakes, lagoons, and aquatic plants, whose area in high floodwaters exceeds 30,000 Kms. The Sudd swamp with its extreme rate of evaporation consumes on average more than half the waters that come down the White Nile from the equatorial lakes.

The land rising to the south and the west of the southern clay plain is referred to as the **Ironstone Plateau (Jabal Hadid).** The land is well watered, providing rich cultivation. To the east of Jabal Hadid and the Bahr al Jabal rise the foothills of the mountain ranges along the Sudan- Uganda border—the Imatong, Didinga, and Dongotona- which rise to more than 3,000 meters. These mountains form a contrast to the Great Plains to the north that dominate Sudan's geography. The lowest elevation point is 0 meters at Red Sea and the highest elevation is 3,187meters at Kinyeti.

2.2 Climate and Seasons

The country lies wholly within the tropics, and as the greater part of it is far from the ocean and less than 1500 ft, above the sea it is extremely hot. The heat is greatest in the central regions, least in the desert zone, where the difference between summer and winter is marked. Even in winter, however, the day temperatures are high. Nevertheless, the dryness of the air renders the climate healthy.

2.3 Disaster (flood/drought) prone areas

2.4 Borders

Nine countries border Sudan: Central Africa Republic 1,165 Km, Chad 1,360 Km, Democratic Republic of the Congo 628 Km, Egypt 1,273 Km, Eritrea 605 Km, Ethiopia 1,606 Km, Kenya 232 Km, Libya 383 Km and Uganda 435 Km. The total perimeter of Sudan is 7,687Km.

Port Sudan is the major entry port to Sudan in the North.

2.5 Seasonal effects on Transport

- A major logistics problem of the Sudan is its transportation infrastructure. With an area of over 2.5 million square Kms the country has only 3,599 Km of paved road covering mainly the North and East of the country. There are no paved roads in the west and in the south. The roads are mainly earth tracks or in some places gravel roads. Asphalt all-weather roads and gravel roads are usable all year round while the remaining roads are little more than fair-weather earth and sand tracks. Most of the un-surfaced dirt tracks become completely impassable after rain. Hence transportation could be totally interrupted during the rainy seasons i.e. from mid May to October with dry spell in June and September)

- Most of the rail tracks are liable to be washed out especially during the rainy season, which adversely affect the operational capacity of the network. The speed goes down from 40 km/ hour up to 20 Km / hour during the rainy season in fear of accident and this takes considerable amount of time between El Obeid to Nyala or any other destination.

- The White Nile to the south of Khartoum has also shallow stretches that restrict the carrying capacity of barges, especially during the period of low water, and at points where the river has sharp bends.

- The White Nile and The Blue Nile are the main rivers that meet in Khartoum to make the River Nile. Fortunately, these two Niles are free from cataracts, but some sections of these rivers and some of their tributaries suffer drops in water level during the dry season that restricts navigation in that period. So some of the rivers are not navigable all the year round. (Sobat River, the Zeraf River and the River Bahir El Ghazal)

- Water Hyacinth in the southern region affects the river navigation, especially during the flood season (rainy season). The accumulation of the hyacinth slows down the speed of the push tugs and some times damages the propellers of the tug.

- Other constraints: Moving sands in some river sections make it difficult to operate the service during the night. There are also some sharp bends, which need attention.

- Poor visibility for air navigation could be caused due to the following reasons:-

1. The haboob, a violent dust storm, can occur in central Sudan when the moist southwesterly flow first arrives (May through July to September). The moist, unstable air forms thunderstorms in the heat of the afternoon. The initial down flow of air from an approaching storm produces a huge yellow wall of sand and clay that can temporarily reduce visibility to zero.

2. Dangerous clouds (cumulonimbus clouds)

3. Poor visibility due to pressure difference

- Landing problem during the rainy seasons in the South because most of the airstrip surface is earth. This prohibits flights during the rainy season

2.6 Seasonal effects on miscellaneous commodity handling

- Rub halls have been damaged by floods and taken by winds.

3 LOGISTICS CAPACITY:

3.1 Port Assessment

3.1.1 Port Sudan

3.1.1.1 Description:

Port Sudan is main port city, on the Red Sea. It is a town and harbor on the West Coast of the Red Sea.

Port Sudan is located on latitude 19^0 53' North and longitude 37^0 13' East on the middle of the Red Sea Cost. It is the main entry port into Sudan. The port has 17 berths and consists of two main Quays and the new "Green Port "area.

- The Main Quay (the North Quay) is on the northern side of the inlet. It comprises of 10-general/bulk cargo and one berth for bulk cement discharge. The North Quay is allocated for handling general cargo, edible oil and molasses through 11 berths with total length of 1663 meters and depths from 8.7 to 10.7 meters.

- The South Quay consists of 4 berths and extends for 768 meters where depth indicates 10.7 up to 12.6 meters - two container berths, one RORO/Oil tanker berth and one bulk grain silo berth that can also be used to discharge self-sustained general cargo ships.

- In addition a Bulk grain discharge berth " The Green Port "which was recently completed and became functional exclusively for bulk carriers. This berth has 400meters length and has 14meters-draft berth. It has the capacity to park two vessels at a time. In terms of bulk carriers - vessels with loading capacity up to 60,000 tones can be received at this berth. The berth has a rail siding and is constructed in such a way that it could fit for installation of modern bulk discharge equipment in the future.

Sketch of Port Sudan

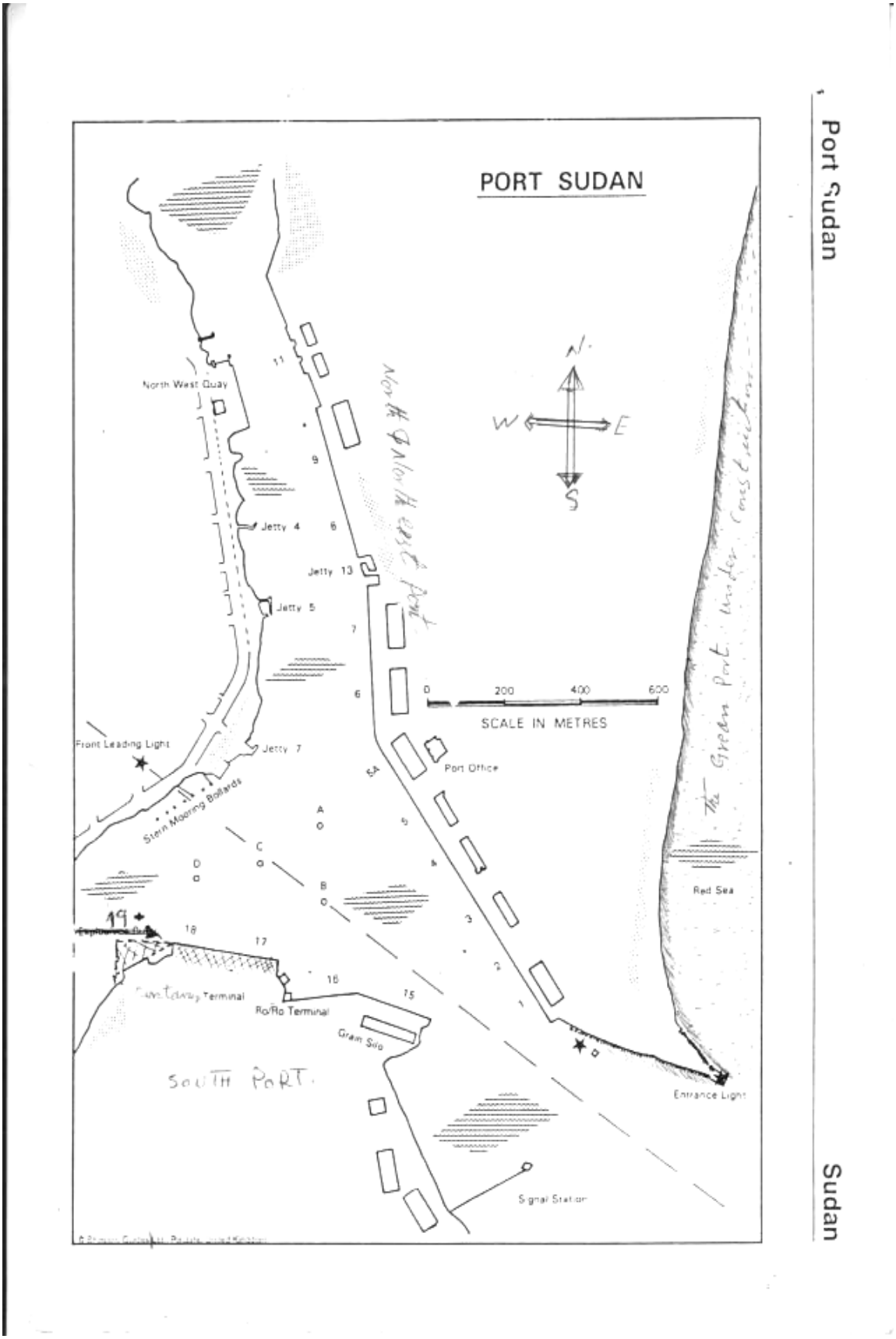

Table2: Summary of the Quays and Berths in Port Sudan

	BERTH NO.	LENGTH	DEPTH	USAGE
MAIN QUAY	1 to 5A	825 M.	8.7M. to 10.7M.	It is used for General Cargo and Molasses.
(NORTH QUAY)	6 & 7	365 M.	10.7M.	It is used for General Cargo and edible oil.
	8 & 9	375 M.	10.7M.	It is used for General Cargo and edible oil.
	11	98 M.	8.7M.	It is used permanently for discharging cement in bulk to sea bulk Bagging terminal.
Sub total	11 berths	1663 M.	8.7 – 10.7	
SOUTH QUAY	15	205 M.	10.7 M.	"The Silo Berth" is mainly used for discharging/loading bulk grain and sorghum in bulk. Two evacuators serve it. The Silo has a capacity of 50,000 Metric Tones bulk grain. It can also be used for receiving self-sustained container vessels(vessels equipped with ship's gear).
	16	143 M.	10.7 M.	It is used for RO/RO ships and oil products.
	17 & 18	420 M.	12.6 M.	It is dedicated terminal for containers.
Sub total	4 berths	768 M.	10.7 –12.6	
The GREEN PORT	21 & 22	400 M.	14 M.	The quay is located east of Port Sudan harbour entrance. This new facility was opened in July 2003 and is geared for receiving dry bulk cargo and general cargo. It has the capacity to park ships having 50,000 to 60,000 Metric Tones. There are no shores – side cranes.
Sub total	2 berths	400 M.	14 M.	
TOTAL	17 Berths	2831 M.	From 8.7 to 14 M.	

Average monthly activity: -

The average monthly activity is calculated in terms of cargo traffic (import and export); number of ships; and in terms of container traffic. Port performance data for the years 1998 to 2002 is taken for analysis. (See tables 3 to 6)

Table3: Cargo Traffic Import and Export Cargo Handled in Port Sudan (1998 – 2002) in Metric Tones)

Year	1998	1999	2000	2001	2002
Import Cargo	1,707,537	1,737,718	2,073,485	2,624,227	2,638,025
Export cargo	659,541	871,711	542,497	391,569	475,644
Total Import & Export	2,367,078	2,609,429	2,615,982	3,015,796	3,113,669
Average Monthly	197,257	217,452	217,999	251,316	259,472

Source: - Ministry of Transport – Sea Port Corporation's Annual Statistical Reports for the years 1998 to 2002.

Table 4: Number of Ships that Called Port Sudan by Type (For the years 1998 to 2002)

YEARS	1998	1999	2000	2001	2002
GENERAL CARGO SHIPS	370	334	293	328	299
RO/RO	44	78	51	85	78
TANKERS	131	128	104	87	85
CONTAINER VESSELS	268	299	313	304	332
LIVE STOCK CARRIERS	324	284	130	0	252
CAR CARRIERS	20	18	38	42	44
BULK CARRIERS	45	68	88	92	118
OTHERS	58	49	18	24	98
Total number of Ships	1260	1258	1035	962	1306
Average number of vessels	105	105	86	80	109

Source: - Ministry of Transport – Sea Port Corporation's Annual Statistical Reports for the years 1998 to 2002.

Table 5: Container Traffic to Port Sudan (for the years 1998 to 2002)

YEAR	1998	1999	2000	2001