

ENTRO

**WATERSHED MANAGEMENT FAST
TRACK PROJECT IN EGYPT/SUDAN**

**Diagnostic Analysis for the Lake Nasser/Nubia
and Draft Project Brief for the Development and
Implementation of the LNMF**

**Stockholm 18 August 2007
SWECO International**

Project No. 1989152

Table of Content

PART 1: Transboundary Diagnostic Analysis

1	INTRODUCTION	1
2	THE SETTING	2
2.1	Bio-physical characteristics	2
2.1.1	Geographical and Meteorological Characteristics	2
2.2	Socio - Economic Characteristics	3
2.2.1	Population and Settlement	3
2.2.2	Social and Ethnic Diversity	5
2.2.3	Gender	7
2.2.4	Poverty aspects	8
2.3	Economic activities around the Lake	8
2.3.1	Agriculture	8
2.3.2	Nomadic and Sedentary Pastoralism	10
2.3.3	Fishery	11
2.3.4	Industries	11
2.3.5	Tourism	12
2.4	Key Transboundary Environmental Issues	13
2.4.1	Dune Migration, Encroachment and Windblown Sand	13
2.4.2	Sedimentation	13
2.4.3	Biodiversity	14
2.4.4	Water quantity and quality	14
2.4.5	Fishery	15
2.4.6	Growing population	15
3	OVERVIEW OF ONGOING DEVELOPMENT	16
3.1	Ongoing Development in Egypt	16
3.1.1	Resettlement and Foreshore Agriculture	16
3.1.2	Upland Agriculture in New Model Villages	18
3.1.3	Large Scale Commercial Agriculture	20
3.1.4	The Toskha Development Project	20
3.1.5	Fisheries	22
3.1.6	Infrastructure	23
3.1.7	Other Development Activities	24
3.2	Ongoing Development in Sudan	24
3.2.1	Resettlement, Land Development and Agriculture	25
3.2.2	Large Scale Commercial Farming	26
3.2.3	Fishing	27

3.2.4	Infrastructure	28
4	CURRENT INSTITUTIONAL FRAMEWORK	29
4.1	Bi-lateral and Regional Level	29
4.2	Management in Egypt	1
4.3	Management in Sudan	2
4.4	Joint Management Activities	4
5	RATIONALE FOR LNMF	5
5.1	Definition of LNMF boundaries and Implementing Partners	7
PART 2: DRAFT PROJECT BRIEF FOR THE LNMF PROJECT		
<hr/>		
1	BACKGROUND AND INTRODUCTION	1
2	SETTING AND STRATEGIC CONTEXT	1
2.1	Biophysical and environmental characteristics	1
2.2	Socio-economic characteristics	2
2.3	Existing focal point institutions and regional cooperation	3
2.4	Key transboundary issues	3
2.5	Rationale for trans-boundary management and LNMF	5
2.6	LNMF approach and principles	6
3	SUMMARY PROJECT OBJECTIVES AND COMPONENTS	8
3.1	Development Objective	8
3.2	Project Components	8
3.3	Key Performance Indicators	8
4	PROJECT ACTIVITIES AND EXPECTED RESULTS	9

5	IMPLEMENTATION ARRANGEMENTS	16
	ANNEX 1: TOC FINAL PROJECT BRIEF	
	ANNEX 2: TOC FINAL LNMF	
1	LNMF CONTEXT	2
2	OVERALL AND INTERMEDIATE OBJECTIVES OF LNMF	2
3	THE LAKE NASSER/NUBIA: STATUS AND THREATS	2
4	LAKE NASSER/NUBIA MANAGEMENT VISION	2
5	KEY TRANSBOUNDARY ISSUES AND RESPONSE SAP	2
6	INSTITUTIONAL MANAGEMENT FRAMEWORK, ROLES AND RESPONSIBILITIES	2
7	PRIORITY ACTIONS	3
7.1	Capacity Building, Training and Studies	3
7.1.1	Technical Investments	3
7.1.2	Investments in Sustainable Livelihood Improvements	3
7.2	Resources/inputs needed	3
7.3	Assumptions and Risks	3
7.4	LNMF implementation arrangements; and legal and institutional framework	3
7.5	Funding sources and strategies	3
7.6	Monitoring and Evaluation	3
7.7	Time Line	3
7.8	Lake Management Framework	3

PART 1: Diagnostic Analysis

1 Introduction

The objective of the diagnostic analysis is related to the "outline of a project brief to formulate a Lake Nasser/Nubia Management Framework". A review of existing data and information has been conducted and is presented in this diagnostic report of the existing baseline situation.

The applied methodology was a combination of literature review, site visits and semi-structured discussions with key stakeholders and local communities.

The Draft Project Brief to be discussed at the Interim Workshop is provided in Part 2.

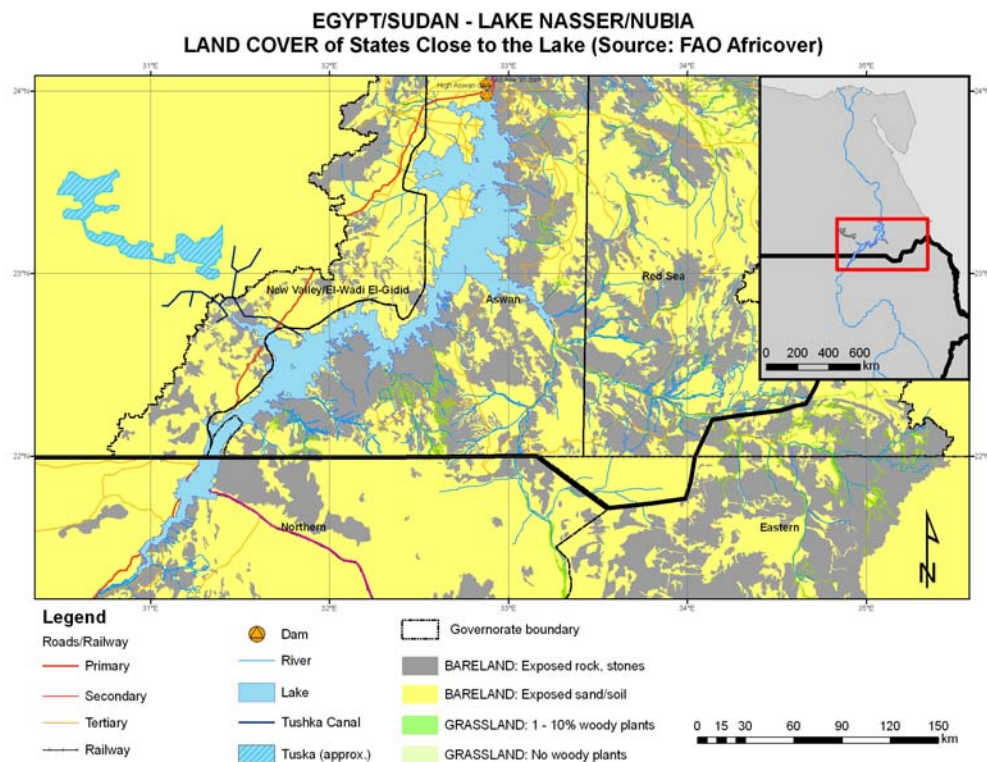


Figure 1 Lake Nasser/Nubia

ra02e 2005-01-17

2 The Setting

2.1 Bio-physical characteristics

Lake Nasser- Nubia comprises of Lake Nasser in Egypt and Lake Nubia in Sudan. It is a manmade lake formed by impoundment of the High Aswan Dam. The combined area of Lake Nasser- Nubia is 6216 km² of which 5248 km² is Lake Nasser, which is the Egyptian portion of the lake, and 968 km² is Lake Nubia, which form the Sudan portion of the lake.

The Aswan High Dam (AHD) which inaugurated in 1970, 7 km upstream the Old Aswan Dam, has created one of the largest man-made reservoir on earth (Lake Nasser and its Sudanese portion, Lake Nubia). The total length of the lake is approximately 500 km, about 350 km in Egypt, and the remaining 150 km is in Sudan. The Lake Nasser lies between latitudes 21° and 24° north and longitudes 31° and 33° east covering an area of about 6,600 km² out of which 5,600 km² in Egypt at a storage level of 182 m AMSL.

The lake was formed mainly to store water for irrigation and power generation but is also used as a source of water for domestic use.

2.1.1 Geographical and Meteorological Characteristics

The area west from the river to the south of Kharga Depression, mainly peneplaned, represents the area known as the Lower Nubian. The average height of this plain is about 300 m and its width is 100 km and its length is 300 km. It rises gently from the river valley and slopes down gently towards the south of Kharga Depression. It is penetrated by plains with isolated amphi-theatrical small hills consisting of Nubian sandstone.

To the east from the river valley the region is represented by a plateau-like area covered by sedimentary rocks up to 300 m altitude and deeply cut well-defined Wadis. Its boundary to the east is the metamorphic and igneous rocks of the Eastern Desert. The slopes of the East Plain rise gently from the river valley towards the east, except for the part between Tushka East and El-Madiq where the banks are steep and ridge-like. The dominant Wadi in the Eastern

ra02e 2005-01-17

Plain is Wadi El-Allaqi. The thick sedimentary section exposed in the area is classified into 10 main stratigraphic units ranges in age from Late Paleozoic to early Tertiary beside six Quaternary units recognized all over the area covering the older units.

In terms of climatic conditions, the Lake area lies within the climate zone of the southernmost part of Upper Egypt characterized by arid, hot and very dry desert climate. Hydro-meteorological factors play an important role in the development of Lake Nasser. Rainfall is extremely rare during winter season, but it occurs usually in very small amounts, and too rare in tangible amounts during the transitional seasons, due to the effect of the north oscillation of the Inter Tropical Frontal Zone.

Wind data analysis shows that the prevailing wind directions are north, northwest and west. The dominant component is the western component and it has a worse effect on the West Bank of the lake when it is accompanied by sand rise (see Table 1).

Table 1. Summary of the Meteorological Conditions in Lake Nasser Area (1961–1999)

Meteorological element	Mean Annual
Mean Temperature (C)	25.9
Maximum Temperature (C)	33.6
Minimum Temperature (C)	17.9
Relative Humidity (%)	23.5
Wind speed (m/s)	4.5
Radiation (cal/cm ² /day)	561.4

Evaporation is one of the main components of the water and heat budget of reservoirs. Knowledge of evaporation from the Lake is important for the proper management of water resources. The annual evaporation was estimated at 10 BCM from the lake surface. However, evaporation is difficult to measure with high accuracy, specially in such a Lake, with length of about 500 km, depths vary from few meters to more than 90 meters and width varies between 5 and 25 km, in addition to highly irregular configurations surrounded by rugged areas.

2.2 Socio - Economic Characteristics

2.2.1 Population and Settlement

As a result of the construction of the Aswan High Dam and the reservoir, an estimated number of 100,000 to 120,000 Nubians had to be resettled of whom 50,000 lived in Egypt and 50.000 to 70.000 in

ra02e 2005-01-17



Sudan. The new resettlement location in Egypt was about three to ten kilometres from the Nile near Komombo 45 km downstream from Aswan. Irrigation was provided as well as housing and other infrastructure facilities in 47 new villages. However, the Nubians did not like their government-built, cement-block houses, which were uncomfortable and vastly different in design from their old homes. Further, their resettlement at Komombo disrupted family ties and relations between the three Nubian ethnic groups. The government also required the Nubian farmers to join agricultural cooperatives and pressured them to cultivate sugarcane, a crop that had not been part of their traditional culture. Dissatisfaction with the resettlement program led many to migrate to cities. A large number of migrants rented their land to sharecroppers and tenants from Upper Egypt. The first ten years were difficult with high death rates among children and elderly but today the situation has stabilised and the resettlement is officially considered a success.

The Sudanese resettlers were moved to the Khashm al Girbah dam area and the irrigated New Halfa Agricultural Development Scheme in the Upper Atbara region in Kassala about 700 km away from their area of origin south to the semi-arid Butana plain. The scheme comprises 25 planned villages in the upper portion with houses, medical facilities, schools, water and electricity. In addition, 50 unplanned villages in the lower portion were established with few services only. The latter villages were mainly for the settlement of the Shukriya nomads who grazed their livestock in the Butana area. The Halfawi resettlers experienced - and still do today - a number of hardships. They had to get used to a completely different climate with regular rainy seasons as opposed to their previous desert habitat and they had to deal with new diseases such as malaria, bilharzia, kidney diseases etc. Due to siltation of the dam (estimated at about 60-70% of its planned storage capacity), water supply became erratic and together with decreasing soil fertility, productivity of the Scheme declined and demoralised many settlers.

Originally, quite a number of people refused to move, especially in Sudan where 5.000 people remained in the area. In the meantime, new settlers have come to the area and some former resettled Egyptian Nubians have returned with the approval and financial support by the Egyptian government. Since the 80'ies there has been a continuous influx of new settlers and re-settlers into the lake area due to active promotion of land reclamation and resettlements as part of official development plans on the Egyptian side. In Sudan, the influx is mainly due to the return of the immigrants to New Halfa, and local initiatives by Wadi Halfa Locality, Wadi Halfa Administrative Unit and local cooperative societies to re-establish the old villages that were inundated by the reservoir. The intention is to exploit the good

ra02e 2005-01-17

prospects for agricultural production in view of fertile and sizable deposition of silt forming deltas in some areas.

This is primarily due to the siltation on the shores of the Lake which has attracted newcomers.

It has not been possible to obtain the exact number of people living around the lake. However, the population figures for the concerned governorates (Egypt) and the localities and administrative units (Sudan) provide an indication of the current size as the major part of the population is concentrated along the lake shores and river beds.

<i>Country</i>	<i>Administrative unit</i>	<i>Population</i>
Egypt	Aswan Governorate	1.059.784
	Aswan Administrative District (2 towns*, 3 Local Units, 10 villages, 60 minor villages/settlements)	302.447
	Town of Abu Simbel	5.000
	Town of Aswan	200.000
Sudan**	Northern State	1.179.399
	Wadi Halfa Locality	80.000
	Wadi Halfa Administrative Unit	20.000

Source: CRA Country Reports; Aswan Governorate/Environmental Management Unit: Environmental Profile of Aswan Govern.
 * Aswan town and Abu Simbel
 ** Northern State Governorate

2.2.2 Social and Ethnic Diversity

The major ethnic groups in the Lake area are listed below:

<i>Country</i>	<i>Ethnic group</i>	<i>Origin</i>	<i>Livelihood characteristics</i>
Egypt	Nubians	Original inhabitants along the Nile from Aswan southward to about 500 km inside Sudan	Agriculture; no tradition for fishing
	Saiyidis	Upper Egypt	Long tradition for fishing immediately north of Aswan

ra02e 2005-01-17



	Arabic speaking beduins (nomads)	Western and Eastern Dessert	Grazing and watering of animals
Sudan	Nubians	Original inhabitants along the Nile from Aswan southward to about 500 km inside Sudan	Agriculture; no tradition for fishing
	Others	Only a small portion	Seasonal fishermen Pastoralists, seasonal presence

Apart from the nomads and semi-nomads, the different population groups practice a mixture of river/lake shore agriculture and fishing with a limited number of livestock.

In Egypt, the population today is relatively homogenous linguistically and culturally. Nevertheless, approximately 3 % of the Egyptians belong to various minority groups comprising Armenians, Greek, Berber, Nubians and Beduins (nomads). The two latter inhabit the lake area.

About 160,000 Muslim Nubians lived in Egypt in 1990. In the past, Nubians had lived in villages along the Nile from Aswan southward to about 500 kilometers inside Sudan. Before the construction of the Aswan High Dam forced their resettlement, three linguistically separate groups of Nubians lived in this region - the Kenuzi in northern Nubia; the beduin-descended Arabs in central Nubia; and the Fadija-speaking people in southern Nubia. Isolated geographically and politically for centuries, the Nubian Valley was only rarely under the control of any central government but had persistent economic ties to the rest of Egypt. Since at least the nineteenth century, Nubian men have migrated to the cities of Lower Egypt, where they typically worked for several years at a time as merchants and wage labourers.

With the construction of the Aswan High Dam, Nubia disappeared as water inundated the Nubian Valley and approximately 50,000 Nubians were resettled (see above). The Nubians were dissatisfied with their resettlement for several reasons; housing, cooperatives, crop selection etc. as specified above. Dissatisfaction with the resettlement program led many to migrate to cities. A large number of

ra02e 2005-01-17



migrants leased their land to sharecroppers and tenants from Upper Egypt. After the Aswan High Dam was completed in 1971, a handful of Nubians left the resettlement area and returned to Nubia, where they established farming villages along the shores of Lake Nasser/Nubia.

Egypt's largest minority group (between 500,000 and 1 million in 1990) consists of several tribes of beduins who traditionally lived in the Eastern and Western Deserts and the Sinai Peninsula. The beduins have historically been nomads, but since the nineteenth century, most tribes have adopted sedentary agricultural life-styles, in response to various government incentives. Among the beduins, traditional tribal social structure comprised segments linked to specific territories, water, and pasture. A family's livelihood depended on its sheep, goats, and camels. Inheritance customs usually kept the family herds in the hands of fathers, sons, brothers, and cousins related through the male line. The Aswan High Dam submerged some summer pasture and disrupted some migratory routes along the Red Sea coast that beduins customarily used in bringing their herds to Nubia during that season. As Beduin herds encroached on cropland, friction between agriculturists and pastoralists intensified.

In Sudan, the lake area is populated primarily by Nubians who have resisted resettlement or have returned from the new resettlement area/New Halfa Development Scheme (see above). Their conditions are similar to the ones described for the Egyptian Nubians above, but with the difference that they were resettled very far away from their area of origin. Other groups are the seasonal workers within the fishery industry and the pastoralists passing the area to the camel and livestock markets in Egypt.

2.2.3 Gender

In both countries, due to a combination of religious and cultural beliefs and practices, women have limited access to the public sphere and also to societal and community decision making process etc. Unfortunately, even the most recent development interventions around the lake have failed to deliver adequate benefits to the women.

Against this background, the proposed interventions under the LNMF will have to take into consideration the differential needs of men and women and the degree to which the interventions benefit and impact women and men differently. There may be a need to devise special interventions for women to ensure their inclusion in the social and economic development.

ra02e 2005-01-17



2.2.4 Poverty aspects

The economy of the Lake Nasser/Nubia region is essentially rural, involving fishing, food fishing production, livestock rearing, agro-industry, and handcrafts. Industry and the service sectors are not well developed, and social services and other infrastructures are not well established and most indicators of socio-economic development lie below that of most developing countries. Social indicators such as life expectancy, access to health care, education, nutrition level etc. are all at level of low to moderate.

2.3 Economic activities around the Lake

Utilization and development of Lake Nasser and the surrounding area have not yet been fully realized. The present economic activities associated with the Lake region are minimal due to its distant location from the national centers, harsh climatic conditions and low fertility of lands (Egypt side).

2.3.1 Agriculture

2.3.1.1 Egypt

The available agricultural land around Lake Nasser/Nubia is currently estimated as follows:

Country	Total agricultural area around the lake (feddan)	Cultivated (feddan)	Uncultivated (feddan)
Egypt	12.970 (1)	6767.5	6202.5

(1) By 2017, additional 50.000 feddans are expected to be reclaimed for agricultural production

Cropping Pattern of cultivated areas around the Lake during 2005/06 winter season from October to May on the Egyptian side is as follows:

Crop type	Crop	Area
Field crops	Wheat	323.0
	Onion	28.5
	Faba bean	27.5
	Egyptian clover	50.0
	Fenugreek	7.0
	Lupin Termes	13.0
	Corn (Zea mays)	102.0
Vegetables	Tomatoes	323.0

ra02e 2005-01-17



	Eggplant	28.5
	Sweet Pepper	27.5
	Water melon	50.0
	Cucumber	7.0
	Squash	13.0
	Cantaloupe	102.0
Medical & aromatic plants		15.5

Productivity of different crops in the Lake area as compared to the average of Aswan Governorate during 2004/05 varies a lot. The yield of wheat, clover, pepper and cantaloupe are on average less than the average yield for Aswan governorate by 10%, 25%, 11% and 30% respectively. While that for corn, tomatoes, water melon and cucumber was higher than that for Aswan governorate by 11%, 50%, 4.3% and 11%, respectively.

As mentioned above, there is a huge potential of reclaimable land in both countries of varying quality, suitable for growing field, vegetable and some fruit crops, as well as date palms and olives and horticultural crops.

2.3.1.2 Sudan

Availability of arable land is estimated as follows:

Total potential on silt deposits on the on both shores*	64.000 feddans
Of this land under cultivation *	16.644 feddans (5.000 feddans were reported during a previous visit)
Land west of the Lake to be utilised by DAL Group* (as pilot project, then possibly to be extended to 1 million feddans)	100.000 feddans
Land availability on the western shore for large scale wheat production but threatened by sand dunes**	Undetermined, probably millions of feddans

Source: *Halfa Administrative Unit and Locality and **Faculty of Earth Sciences Dongola University, Halfa Br.

The land under cultivation is utilised for the following crops:

<i>Crop</i>	<i>Feddans</i>
Wheat	13.241
Foul (<i>Vicia faba</i>) and other legumes (such as peas, chick peas, lentils etc.)	(2516 and 503) 3.019
Vegetables (such as tomatoes, okra, cucurbits, eggplants etc.)	308
Fodder	36
Dates and fruit trees	40
	16.644

Source: Halfa Administrative Unit

With a few exceptions, the most common practice is foreshore agriculture irrigated by small scale floating pumped systems. Foreshore agriculture is also the main practice promoted for the envisaged resettlement through cooperative societies in the future. According to farmers and key stakeholders consulted production is generally free of fertilisers as the silt deposits provide the required nutrients. The team has met at least one farmer who produces sorghum and vegetable seed who admitted to occasionally use fertiliser. There are some upland irrigated small-scale farms on both sides of the Lake. Their main constraint is to deliver irrigation water from the Lake which is very costly. Some on the western side of the Lake had tried to pump ground water, but were faced by the enormous costs of pumping water. Upland irrigation is thus reserved for the planned large scale agriculture in the table above.

2.3.2 Nomadic and Sedentary Pastoralism

The table below shows that the total number of animal heads is 24.544. They include 15.279 heads of sheep (62.25%), 6.146 heads of goat (25%), 2.583 heads of camel (10.5%), 20 heads of cow and 9 buffaloes, as well as 197 donkeys.

Livestock wealth around Lake Nasser/Nubia (2006), Egypt side:

Type	Number	%
Sheep	15.279	62,25
Goats	6.146	20,04
Camels	2.583	10,50
Cow	20	
Buffalo	9	
Donkey	197	0.80
Total	24.544	100

About 78% of the animal heads are owned by Nomads, and 22% are owned by beneficiaries. Animals are fed on crop residuals and grazing on the natural plant cover in the area and around khors.

On the Sudanese side there is seasonally migrating animals since Wadi Halfa is a route for animals export to Egypt. About 5000-7000 camels monthly are passing the area on the route to Egypt markets.

2.3.3 Fishery

The Lake provides about 32 different fish species with Nile perch and tilapia being the most common fish. There is a considerable potential for fishing which is not yet fully exploited - among others due to simple fishing methods and inappropriate infrastructure.

In Egypt there are an estimated 6.000 fishermen making a livelihood from fishing. They are distributed on about 150 fishing camps and organised in four major Fishermen Associations. The Lake provided adequate supplies until the early 1980s, when production started to fall. Over the last two decades fishermen have proceeded with their work despite the steady decrease in the quantity of fish they produce - from 34,000 tons in 1981 to a mere 8,000 in 2000. Recorded total fish catch during 2004 was 12.434 tons, and 15.285 tons during 2005.

The formation of flood khors and lagoons on and around the lake shores provides natural habitat for Nile Tilapia breeding. Tilapia does not tend to migrate from this habitat, therefore, restocking the lake with Tilapia fingerlings is one way to increase production and to introduce the aquaculture technology to the lake.

As far as Sudan is concerned, in 2006 there were 1200 fishermen of which 798 have licenses. The Lake is rich in fish, but fish production is very modest, about 2,000 tonnes per year. An average fisherman catches about 3.5 tonnes of fish per year. Means of fish catch are primitive and there are no fishermen cooperative. Access to credit is limited as well as training options and extension work.

1.3.2 Industries

Mining and industrial activities are concentrated to Aswan City, with exceptions of some building materials production in Abu-Simbel, Kaolin mining in Kalabsha, marble and granites in El-Allaqi area. Aswan Governorate represents about 15 % of the entire country in terms of both mining production values and activities. The Governorate has some activities in mining, food, beverages, and

ra02e 2005-01-17

chemical industries. The quarries and mining products include granite, marble, clay, sandstone, aggregate, phosphate, kaolin, quartz, barite, feldspar, and limestone.

Food and beverage industries include sugar factories are in Idfu and Kom Ombo (a dairy products plant in Kom Ombo, and soft drinks plant in Aswan City). The chemical industry is in Kima factory in Aswan City. Other manufacturing activities are a pulp and paper plant in Idfu, a fiberboard factory in Kom Ombo, brick factories, wooden boat building, ice making, concrete tile manufacturing and macaroni and spaghetti production in Aswan City.

There is no major industrial development on the Sudan side of the Lake. However, Wadi Halfa has a unique position in the Sudan, being the northern gate and point of connection with Egypt. Its port can be a key for economic and social activities. Wadi Halfa will also be connected with roads with the rest of the Sudan through a paved road to Dongola by 2008.

1.3.3 Tourism

2.3.3.1 Egypt

There is a large potential of tourism in both countries due to the rich Nubian and Egyptian cultural heritage many of which are still undiscovered. The reservoir and the AHD are tourist attractions on their own merits.

Tourists have been visiting Egypt for centuries to see the unique and unsurpassed archaeological attractions of pharaonic temples, tombs and monuments. They are scattered along the Nile Valley from the Mediterranean coast to Abu Simbel. Lake Nasser and its surrounding areas are endowed with various tourist resources of historical, natural, recreational, contemporary and cultural attractions which can be grouped into three sub-regions: Aswan city, lake area and Abu Simbel Temples.

The natural resources in Aswan are the fabulous view over the first cataract and the peaceful and scenic panorama of the Nile dotted with sailing vessels. Aswan is well known by its healthy climate. Ancient Greek scientists advised people to benefit from the climate and sun of Aswan in winter. One of the contemporary resources in Aswan is AHD, which ranks as one of man's greatest engineering achievements.

2.3.3.2 Sudan

Sudan has not developed its tourism potential and this also true for the Lake Nubia region. Nevertheless, the region around Dongola boasts a number of archaeological sites pertaining to Nubian and Islamic eras. Historically, Old Dongola was the capital of a Christian kingdom. Dongola is connected to Khartoum by a recently constructed asphalt motorway and by rough land roads to other main towns of the State and Northern Kordofan.

2.4 Key Transboundary Environmental Issues

The environmental degradation of Lake Nasser has been manifested in the form of massive soil deposition, alteration of biological system (as reduction in number or eventual disappearance of indigenous fauna and flora), and alteration of stream morphology. Six key environmental issues are highlighted below.

2.4.1 Dune Migration, Encroachment and Windblown Sand

Dune migration and wind blown sand is a major problem for the communities in the region. The sand accumulations need to be destructed or stabilised in order to prevent their further migration and encroachment. The wind-blown sand around features would require stabilisation.

2.4.2 Sedimentation

Deposition in Lake Nubia differs between the Egyptian and the Sudan part of the lake. The areas of most intense deposition were at Gomi and Amka at the Second Cataract, in Lake Nubia. Until 1975, layers of 17 and 20 m, respectively, were formed, compared to only 2 m at Adindan and 1 m at Abu-Simbel within Lake Nasser (ABOUL-HAGGAG 1977). At the entrance of Lake Nubia, the Nile velocity and its related transporting power decreases and the river begins to drop its suspended load as sediment. Therefore, the Nile is building up a new delta at the southern part of Lake Nubia by the sedimentation of the relatively heavier and coarser parts of the material in suspension while the finer fractions settle down further north in the Egyptian part of the reservoir. The areas of most intense deposition (20 m) were at Amka (ABOUL-HAGGAG 1977) and at El-Dewishat (HDA 1982); 360 km and 431 km S. of the Aswan High Dam, respectively.

ra02e 2005-01-17



The new delta that is building up on the Sudanese part of the Lake has some good impact on the local environment. One of the positive impacts is the potential for an increased vegetation cover. There is today no forest in the area but with the fertile sediment deposits new vegetation is slowly getting established.

Another positive aspect of the deposits is that there is no need to use fertilisers in the agricultural sector.

2.4.3 Biodiversity

2.4.3.1 Egypt

The two protected areas of Aswan Governorate are found in connection with the River Nile and Lake Nasser. These are the small islands of the First Cataract, principally the two islands Saluga & Ghazal and the desert ecosystem Wadi El- Allaqi. The granite islands Saluga & Ghazal, of the First Cataract, are now expected to represent the only unspoilt remnants of what is thought to be typical riverine vegetation of the Nubian Nile and is the habitat for a wide variety of associated bird and insect species. Wadi El- Allaqi represents the largest khor of Lake Nasser.

2.4.3.2 Sudan

The Sudanese environment is characterised by harsh conditions and is also very susceptible to external pressures. The carrying capacity of the environment and the ecosystem is low, why sustainable planning and implementation of development projects is of paramount importance all over Sudan and the same is valid for the Lake Nubia region.

There is also a Bird sanctuary close to the Lake with an area of 100 km². The sanctuary is the home for many bird speices including the Freshwater lake Pharaoh eagle owl and the crowned sandgrouse.

2.4.4 Water quantity and quality

In the past, greater attention was given to assessing the quantity of water rather than its quality, because the quality had not normally been a constraining factor, especially before the construction of the AHD. The dependence of large proportion of the population of the

area on the natural resources is imposing an unprecedented pressure on the already dwindling resource base.

A fundamental challenge at present and in the future is to ensure high biodiversity and good quality water in Lake Nasser/Nubia. The growing population around the Lake will depend on this source for various purposes (drinking, irrigation, and fisheries) and secondly, the land around Lake Nasser is expected to be essential to encompass the population increase in terms of new settlement areas and production of food (irrigated crops and fisheries) for the growing population.

2.4.5 Fishery

Fishery is already today threatened by various external impacts e.g. sedimentation influx, turbulence and the construction of the Merowe dam which impacts negatively on the migratory fish population.

2.4.6 Growing population

The expected growing population around the lake is a major concern if not handled properly by the two Governments and the Local Authorities. The expected growing population and the need for intensification of economic activities around the lake calls for a strict guiding and regulatory framework which could assure a sustainable development of the region without major environmental harm to the lake and lake shore ecosystem.

3 Overview of Ongoing Development

3.1 Ongoing Development in Egypt

One of the top priorities of the Government of Egypt and the Governorate of Aswan is to develop the lake area for agricultural development to increase food security; to move the population away from the densely inhabited area in Upper Egypt; and poverty alleviation.

Several attempts were made at formulating comprehensive development plans for the area (see section 3.2). The principle development areas comprising agricultural and agricultural processing, fishing and mining activities are described in the following section.

The Government of Egypt plans to resettle 1 million people in the area around the lake by 2017. Total reclaimable land area is estimated at 150.000¹ to 200.000² feddans. By 2004, only 15,500 to 23,000³ feddans of these lands have been cultivated in addition to 3,000 feddans in the upland areas of Abu Simbel. The main crops grown around the lake are tomato and water melon.

In addition, the Government has initiated the Toshka project which would enable the reclamation of 540.000 feddans and the resettlement of about two million people⁴.

3.1.1 Resettlement and Foreshore Agriculture

Responding to the desire of some Nubians to re-colonize their former homeland, in 1977, Egypt's President Sadat approved their return to the shores of Lake Nubia and provided financial assistance. By 1980, several small Nubian communities of pioneers had been established using the drawdown area and pumping water from the reservoir on to the foreshore. The largest population consisted of 25 families living in

¹ JICA report, 1980

² Scudder, 2004

³ Environmental Management Unit, Aswan Governorate

⁴ According to the Aswan Governorate Draft Environmental Action Plan, July 2004, the Toshka project will reclaim over one million feddans and create new communities to absorb some five million Egyptians.

a community that the government helped to build approximately 25 kilometres from Abu Simbel⁵. Across the reservoir and near the Sudan border another community has been established which included about 20 men practicing pump irrigation in the early 1980s.

During the 1980s the drawdown of the reservoir under extreme drought conditions greatly increased the difficulties of the pioneers. A small community of Nubians on the edge of the reservoir above Aswan failed when government-supplied wells were unable to provide potable water. As the numbers of pioneers dropped at the other settlements, discussions in Komombo, Cairo and elsewhere about a return to Old Nubia declined.

After 1988 reservoir levels again began to rise, with full storage levels again reached during the 1990s. In 1989 the World Food Programme (WFP) agreed to launch a joint program with the Aswan High Dam Lake Development Authority whereby WFP would provide food for work to reclaim land along the lake shore for agriculture as well as for the eventual construction of 33,000 houses.

Environmental and social assessments⁶ that have been conducted of the resettlement schemes and agricultural practices discourage foreshore agriculture as it is a threat to the natural resources, in particular the lake, due to use of farm implements and because it involves substantial economic losses to the farmers as a result of fluctuations of the lake level. Instead it is suggested to replace foreshore land by stable land behind the lake boundary, to move communities away from the lake and to provide appropriate irrigation facilities as well as to introduce organic farming.

Some scientists totally advocate against settlement of the lake area due to concerns over fragility of the environment and they recommend that Lake Nasser and its shorelines be declared a protected area with stringent guidelines applied to settlement and development schemes.

It was found that the social conditions in the study area were generally poor and with inefficient social infrastructure. The education facilities are restricted only to a one-classroom primary school in each village. The housing situation was also poor and most families lived in reed huts or mud houses. Most of these houses have no electricity,

⁵ Scudder, 2003

⁶ E.g. Mohamed Ahmed Awad et al 2006

water supply or proper sanitary equipment. The farmers considered the housing conditions in the area as discouragingly unsafe. The health care in the study area is limited to irregular visits of a doctor and a nurse. The established health care unit lacks in all villages the proper equipments, facilities and more importantly; personnel

3.1.2 Upland Agriculture in New Model Villages

At the end of the 90's, in recognition of the need to keep settlers away from the shores and to improve their social conditions, a major multi-million pound initiative by the High Dam Lake Development Project under the Ministry of Agriculture and Land Reclamation was setting up 7 model villages for upland agriculture of primarily high value crops (subsistence crops are also grown). They are at least 6 to 10 km away from the shore line. Three villages are completed: Kalabsha, Garff Hussein and Bashayer El Kheir and the remaining villages are expected to be completed during the forthcoming years.

The Consultancy team visited Kalabsha village and collected the following information: The main target group are poor families from the congested areas in Upper Egypt and they are selected according to a number of selection criteria. The village has been constructed on a food-for-work basis with assistance from WFP and includes excellent beneficiary housing; a well equipped school (pre-school, primary and preparatory stages); shops; permanent irrigation from an irrigation channel connecting to the lake to enable year-round instead of seasonal cultivation of high value crops; and a well-equipped health unit with an ambulance in addition to community development centres. The villages are organised in agricultural cooperatives (tractor service, credit systems etc) and they have community development associations. Each village has a project manager (agronomist) and a number of extension staff who help the villagers to get familiar with new agricultural methods relevant for desert farming, and social workers are also attached to villages.

The total costs of houses and infrastructure per household is 27.000 pounds (equivalent to about EUR 3.500). The households pay 520 pounds per year during a period of 20 years and become the owners of the facilities. The village has a total of 750 feddans and each household has 5 feddans (average in Aswan Governorate is 2 feddans). The pumped irrigation is organised via a participatory irrigation plan in such a way that all fields are irrigated twice a week. The village produces primarily cash crops such as sesame, medical plants, spices, vegetables for sale and own consumption, wheat

ra02e 2005-01-17

(residue is use as animal feed) and fodder production. No chemical fertilisers are used only compost from own production.

Monitoring data are collected on a regular basis to assess economic and social sustainability but since the villages have become fully operational only recently, it is too early to draw conclusions. Studies are also conducted as part of the cooperation between Lake Nasser Development Authority and the Technical University of Cologne to further improve the resettlement approach and farming systems.

The consultancy team met a number of villagers during the visit to Kalabsha, and got the impression that they have indeed been able to improve their livelihood which is among others reflected in the fact that none of the resettled families have left (which was frequently the case in the old villages). However, a number of social and economic concerns have been raised, e.g. by the Centre for Development Services/Desert Development Centre in Cairo:

Government subsidy and support programs provide some of the much needed initial non-cash assets and safety nets, but these are far from being enough. There are enabling policies that encourage organic production of crops that have potential to fetch high prices in urban consumer markets in Egypt and abroad. At the same time, there are obvious constraints to rapid and sustainable growth. Although on the shores of the lake, the area must be considered remote. Located far away from Aswan, the communities have only recently become accessible by paved road. The area still awaits connection to the national electricity grid. There are some very limited social and health services, and only primary education is available locally.

Although services are expected to improve over time, the present inadequacy clearly dissuades permanent settlement of families in the area. Parents with children beyond primary school must send them to Aswan or beyond to further their education. Mothers generally accompany their school children. Consequently, adult females are a noticeable minority among settlers. Ironically, about 15% of the households are women-headed. This is result more of deliberate policy than demographic factors, and reflects the commitment of the World Food Program, a supporter of government settlement efforts, to provide land ownership and economic opportunities to widows and divorced women with children. In light of the limited knowledge available on gender relationships in rural Egypt, it is quite likely that women settlers are the least empowered in the country, with

ra02e 2005-01-17

extremely poor links to development efforts, opportunities and changes that are taking place in the region. Development actors have often failed to address gender issues adequately due to a lack of understanding of their dynamics and manifestations; a lack of capacity and shared experience; and entrenched inequitable relations that continue to exclude women from many development opportunities and decision-making processes. As a result, women remain marginalized, overburdened and undervalued. There is no evidence to show that the situation is any different in the Lake Nasser area.

3.1.3 Large Scale Commercial Agriculture

Areas in Wadi Al Amal, Qustul and Adindan have been opened for investment companies for large scale mechanised farming based on organic practices. No further details have yet been obtained.

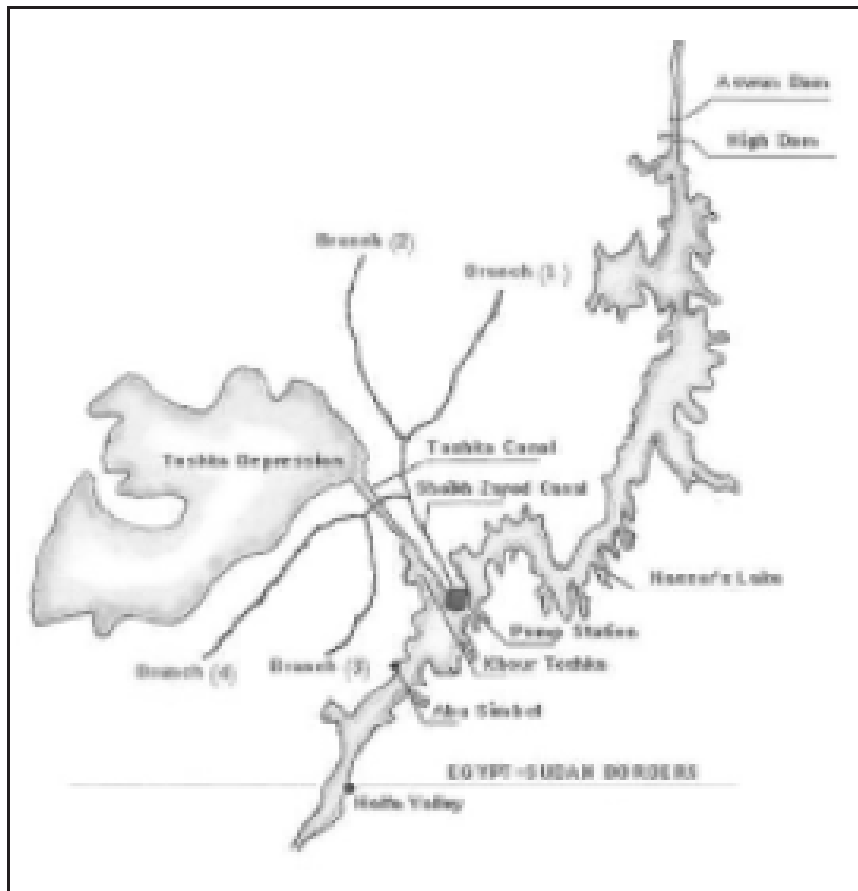
3.1.4 The Toshka Development Project

In 1996 the Toshka project was initiated. The main aim of the project is to reclaim and cultivate a vast area of the Western Desert using water from Lake Nasser from three sources: Lake Nasser, the wadis close to the Nile and subterranean wells. The project included the installation of the world's largest pumps, which carry water into a long canal, the former Toshka spillway. A spillway that was built as a safety measure to divert water from Lake Nasser to the Toshka Depression in case water exceeds the maximum level of 178 m.

In total four irrigation areas, totalling 540,000 feddans are being planned for agriculture. In addition to farming, industries focusing on agricultural products, energy production and mining will be established. The crops envisaged to be grown in the area include wheat, barley beans, mango, guava, dates, grapes, water melon, oranges, lemon and grape fruit. It is envisaged that the agriculture in the Toshka area will be based on organic farming in which application of inorganic fertilizers or pesticides will not be allowed.

ra02e 2005-01-17





The Toshka Project, 2001
Source: Wahby

The Toshka Project is an integral part of a much larger, mega project, the Southern Valley Development Project (SVDP) that aims at doubling the amount of cultivated land in Upper Egypt. The SVDP is not a mere irrigation or agricultural project. The SVDP is a multifaceted, multiphase, development project that mainly involves horizontal expansion and land reclamation projects in the southern part of the Nile Valley in Egypt. It is a national, integrated, massive development project, aiming mainly at creating a balanced, re-organized Egyptian map from the demographic, habitation, economic, and security points of view.

Total investments for implementing this project by 2017 are estimated at some US\$ 100 billion, of which 20% to 25% is pledged by the Egyptian government to construct the main canal and its four offshoots, the pumping station, major roads, and main electricity network. The remaining 75% to 80% is to be supplied by the private

ra02e 2005-01-17

sector. Agriculture in the SVDP is only a base for the integrated development planned. Industry, mining, alternative energy production—and possibly oil and gas production and storage— and tourism are other parts of the vision, with plans for desert safaris, car rallies (car rallies might enhance mobilization of sand dunes increasing sand encroachment to the Nile and other parts), conferences, and medical tourism.

There is agreement that the project would bring many advantages to Egypt but they have to be weighed against the disadvantages and risks. There is a risk of Egypt running short of water if other Nile Basin countries build dams and divert water and there may be negative effects on the River Nile ecology, particularly on wildlife, groundwater table, irrigation, urbanisation and pollution. The economic feasibility is also doubtful. One other consideration is that historically, Egyptians resist moving their homes to new settlements, so the project may not be feasible in social terms. Some observers say⁷ the real problem lies not in the specific project but in overall government policy that still encourages the development of agriculture. "It would be better to develop industry, and shift away from agriculture that consumes so much water. We have to expand into other sectors. We still export agricultural produce, even though we know we must conserve water; we grow rice, even though it consumes great quantities of water".

3.1.5 Fisheries

The shallow water in the khors supports the richest flora and fauna in the Lake and provides good breeding and feeding grounds for fish because of their shallowness and abundance of phytoplankton. The open and deep waters are nearly devoid of fish⁸. The most common fish are various Tilapia species. Three fishing harbours were built in Lake Nasser west, Garff Hussein, and Abu Simbel to receive the fish catch from the different fishing areas.

In Egypt there are an estimated 6.000 fishermen making a livelihood from fishing. They are distributed on about 150 fishing camps or live on their boats and they are organised in four major Fishermen Associations. Most fishermen are engaged in seasonal fishing and they do not reside in the area permanently. The lake provided adequate supplies until the early 1980s, when production started to fall - from 34,000 tons in 1981 to a mere 8,000 tons in 2000. Since

⁷ <http://www.islamonline.net/english/science/2002/11/article05.shtml>

⁸ Aswan Governorate Environmental Profile 2004

then fish catch has increased again and the recorded total fish catch during 2004 was 12,434 tons, and 15,285 tons during 2005⁹.

According to the Lake Development Authority, the decreasing fish productivity has not yet been sufficiently investigated but apparently is a combination of various factors:

- Overfishing
- Illegal fishing (small fish are caught)
- Lack of control
- Siltation of the lake
- Two months fishing moratorium not enough

LNDA's current strategy to improve fish stock in the lake is to release fingerlings which are produced in seven hatcheries in Sahary, Garff Hussein, Toshka, and Abu Simbel. In addition, Lake Nasser Development Authority has established a Fisheries Management Centre with the assistance of JICA to carry out all research and studies dealing with fisheries development in the lake and disseminate and implement the results and recommendations.

3.1.6 Infrastructure

Since the establishment of LNDA a complete trunk road network was developed, which extends on the western shore side to the Sudan border and comprises the following sections:

- Aswan-Allaqi-Sayalla on the eastern side of the lake (320km)
- Kalabsha-Garff Hussein-Amada-El Sibou-Abu Simbel temples on the western side of the lake (260km)
- Fourth Toshka Depression Road on the western side of the road (130 km)

Other major infrastructure works include:

⁹ Scudder, 2003 - other figures are higher, e.g. Aswan Governorate Environmental Profile reports 21,000 tons in 2002 and Lake Development Authority 30.000 tons at present

- 3 fishing harbours, 2 ferries to cross from Abu Simbel to Adindan and Qustul, and a mechanical floating quay to repair ships.
- Several villages, schools, clinics, and mosques were built in addition to the HQs for the Lake Development Authority, research centres and accommodation for employees and workers.

3.1.7 Other Development Activities

3.1.7.1 Mining

There are two major mining areas in the lake area, Aswan town and Wadi El Allaqi. To date LNDA has promoted the following mining activities:

- The majority of minerals and economic rocks around the lake region were located (granite, marble, talc, quartz, limestone, barite) and most of them are available in commercial quantities.
- A Geology and Mining Centre was established to carry out research and studies on minerals, rocks and underground water.
- Geophysical investigations were conducted using modern instruments to determine the quantity and quality of the groundwater and best locations to drill wells.
- Approval was given to 250 quarries that are in operation.
- A cement factory in Aswan town is under construction with a capacity of 750.000 tons per year.
- Studies on industrial processing of alum from kaolin and glass from sand were completed and submitted for investment.

3.1.7.2 Tourism

Tourism is one of the major sectors in the area but is restricted to Aswan and Abu Simbel.

3.2 Ongoing Development in Sudan

Development of the Sudanese part is characterised by the area's marginal status within the country's and Northern State's overall priorities. Therefore, development efforts in Wadi Halfa Locality have been very slow compared to the development efforts on the Egyptian

side of the Lake. The institutional preconditions for regional planning and management are not well developed as the level of development interventions is much lower than in Egypt. Comprehensive and coherent plans do not exist and it appears that ongoing development efforts are poorly documented and the result of informal and local initiatives by Halfa Locality and Halfa Administrative Unit.

3.2.1 Resettlement, Land Development and Agriculture

The overall objective by the Locality, Administrative Unit and the local cooperatives is to re-establish Old Halfa and make necessary land and other resources available for people's livelihoods. This is primarily based on the precondition that silt deposits that have formed in the reservoir delta can be utilised for agricultural production.

The Wadi Halfa local authorities currently plan to re-establish 21 of the villages that were inundated by the reservoir on the original sites above the lake with the original names. Three have already been established. Each village will have a cooperative, most of which have already been established and organised in an apex cooperative organisation. The apex organisation is the driving force in the ongoing development in Wadi Halfa. Each cooperative will be given 250 feddans each. The cooperatives mainly comprise people who have or will return from New Halfa.

The reclaimable land is much larger than what is needed for the 21 villages and one could expect that in the future more villages might be re-established and more settlers might return to the area, in particular if prospects in Wadi Halfa continue to be seen as better than in New Halfa. The proposed large scale irrigated mechanised farms could also attract people who are in search of paid labour.

The current development activities are unplanned and informal. Unlike in Egypt, no studies have been conducted so far of the environmental and social impact of the human activities in the area. Since 2001, Sudan has an environmental protection policy that requires that new projects that may have an influence on the environment be assessed by an EIA to obtain an environmental compliance certificate. In the case of the planned development in Wadi Halfa, this has not been requested by the officials so far.

The current attempts at "restoring Old Halfa" are based on the utilisation of silt deposits through foreshore agriculture and resettlements close to the shoreline. The negative economic,

ra02e 2005-01-17

environmental and social effects of foreshore agriculture at Lake Nasser have been studied and are well known from the Egypt side and are now in the process of being repeated on the Sudan side. However, in contrast to Egypt which is now promoting upland agriculture and settlements some distance away from the shorelines, alternative settlement patterns and types of agricultural production do not appear to be an option, as the rationale is to utilise the silt deposits. Although organic farming and environmentally sensitive planning would keep negative environmental impacts on the lake at a minimum, it would not be possible to avoid completely, especially if the population increases in the future.

Foreshore cultivation is a simple very low-input agriculture, which is practiced along the Nile and its tributaries since time immemorial. This type of agriculture is one of the easiest ways of alleviating poverty and promoting food security in the area. Before arriving at a final conclusion, further assessments of this practice in Wadi Halfa (and all along the Nile and its tributaries) are required with a view to improve it to minimise negative environmental impacts and devise suitable monitoring arrangements.

Ongoing developments elsewhere in Sudan may have a negative impact on the current development efforts. The Merowe dam will capture large quantities of silt which were previously deposited in the lake delta and in the long term reduce agricultural productivity in Wadi Halfa. This tendency may even be reinforced, should further dams be built such as the projected Kajbar dam between Dongola and Wadi Halfa. However, in the short term this will not be a problem as the amounts of silt that have already been deposited around the lake are appreciable, particularly in the southern part where in some places over 40 m of silt are found.

3.2.2 Large Scale Commercial Farming

On the West bank, DAL Group plans to reclaim about 100.000 feddans as pilot for wheat production and there is a potential of 1 million feddans for expansion. The western part of the lake is a major pastoralist route for camel herds coming from the South (Darfur/Kordofan) moving to Egypt. It is estimated that about 5000 to 7000 heads of camels monthly are exported to Egypt. Unless care is taken, conflicts between herders and large scale farmers similar to those seen in other places of Sudan may be triggered. The consultancy team was also informed that in contrast to what was before, more nomads come to the area to graze on the Lake shore

ra02e 2005-01-17



grasses which puts a risk to the environment and local animals which so far have been kept free of deceases.

3.2.3 Fishing

According to the Fisheries Inspector of Fisheries Administration, Northern State, Wadi Halfa Branch , in 2006 there were 1200 fishermen of which 798 have licenses. There are about 10 permanent fishing sites (see map below).



Map: Location of 10 fishing sites in Halfa

ra02e 2005-01-17

The Lake is rich in fish, but fish production is very modest, about 2,000 tonnes per year at present and 900 tons in 2000. An average fisherman catches about 3.5 tonnes of fish per year. Means of fish catch are primitive and there are no fishermen cooperative. Access to credit is limited as are training opportunities and extension work.

After 2000 a fishing moratorium was introduced on advice by Egyptian experts and productivity has increased again as can be seen in the figures above. According to the Fisheries Administration, Northern State, Wadi Halfa Branch, productivity could be increased by 1. modernization of fishing, methods are of low efficiencies, 2. an extended moratorium since two months are not enough, 3. introduction of deep water fishing , 4. artificial fertilisation/fingerling production; 5. environmental awareness raising and attitude change and dissemination of extension material, 6. fill gaps in research (latest research is from 1985) and knowledge of the lake (e.g. the lake has three seasons which need three different methods).

Most of the fishermen are non-Nubian temporary settlers from up-stream areas as Nubians traditionally did not engage in fishing. They are poorly integrated in to the existing communities, which constitutes a conflict potential especially if Nubian farmers in the future engage in fishing, as mentioned by the Fisheries Inspector.

The State Government owns a fish factory in Wadi Halfa which has 46 workers and processes about 500 tons fish per year which is far below its capacity. Major markets are Dongola and Khartoum and there are daily transports in "iced" trucks. The factory manager explained production shortfalls by decreasing fish catch caused by declining stock. Poor management could also be the reason: The factory has contracts with 131 seasonal fishermen who get all equipment free of charge from the factory. In turn, they are obliged to sell at fixed prices which are generally lower than on the open market. This de-motivates fishermen from selling to the factory and although they have the contractual obligation they sell a part of their catch on the market. The Wadi Halfa cooperatives have raised funds to buy the factory and run it on their own but the State Government was not willing to sell.

3.2.4 Infrastructure

The road and other transport infrastructure are poorly developed. A road from Dongola to Wadi Halfa is currently being constructed and this will improve market access. The different production areas also

ra02e 2005-01-17

need to be interlinked to enable produce to reach the markets. Most importantly, as a basis for improved local cooperation and local trade between Egypt and Sudan, the ferry transport between Wadi Halfa and Aswan should be upgraded to at least one daily departure/arrival.

4 Current Institutional Framework

A multiplicity of governmental and non-governmental institutions is directly or indirectly involved in the Watershed Management Project. The Ministry of Agriculture and Land Reclamation is responsible for the conservation and development of cultivated crops, wildlife, livestock, and fishery. The Ministry of Water Resources and Irrigation, on the other hand, deal with development, conservation and utilization of the water and other aquatic resources. Egyptian Environment Affairs Agency (EEAA), National environmental protection agencies, universities, research institutions, Non Governmental Organizations (NGO's), other Ministries, and Federal, and Regional organizations (e.g., Aswan High Dam Authority) are dealing with different aspects of watershed management.

The primary focal point institutions for the LNMF are described below and there interrelations visualised in Figure 1.

4.1 Bi-lateral and Regional Level

As part of the *Agreement for the Utilisation of the Nile Waters* signed by Sudan and Egypt in 1959, it was agreed to establish a Permanent Joint Technical Commission. The objective of PJTC is to ensure technical co-operation between the Governments of the two Republics, to continue the research and study necessary for the Nile control projects and the increase of its yield and to continue the hydrological survey of its upper reaches. The PJTC has an equal number of members from the two countries who are representatives from the Ministry of Irrigation and Water Resources in Sudan and the Ministry of Water Resources and Irrigation in Egypt. The nature of the PJTC is technical. The main tasks are: drawing the basic outlines of projects to increase the Nile yield - supervision of the execution of the approved projects by the two governments of Egypt and Sudan - upgrading the gauging stations along the River - cooperating with various International and Regional Organizations in the field of International Waters.

The PJTC is a good example of cooperation between the two countries which is continuing for 47 years.

With regard to cooperation on trans-boundary waters within the Eastern Nile Region (Egypt, Sudan and Ethiopia) a regional body has been established, i.e. the Eastern Nile Technical Regional Office (ENTRO). ENTRO is a sub-regional body that is linked to the Nile Basin Initiative (NBI), responsible for coordination and overseeing of the Eastern Nile Subsidiary Action Plan (ENSAP). At country level ENTRO has National Focal Points (NFP) and National Coordinators within the Ministries responsible for water resource management undertaking to coordinate the action program. ENTRO has a distinct role and profile in working for the sustainable integrated development of the Eastern Nile under the umbrella of the NBI.

ENTRO is the contract partner for the project preparation assignment to formulate a project brief for a Lake Nasser/Nubia management framework and the current report is part of this assignment.

SWECO

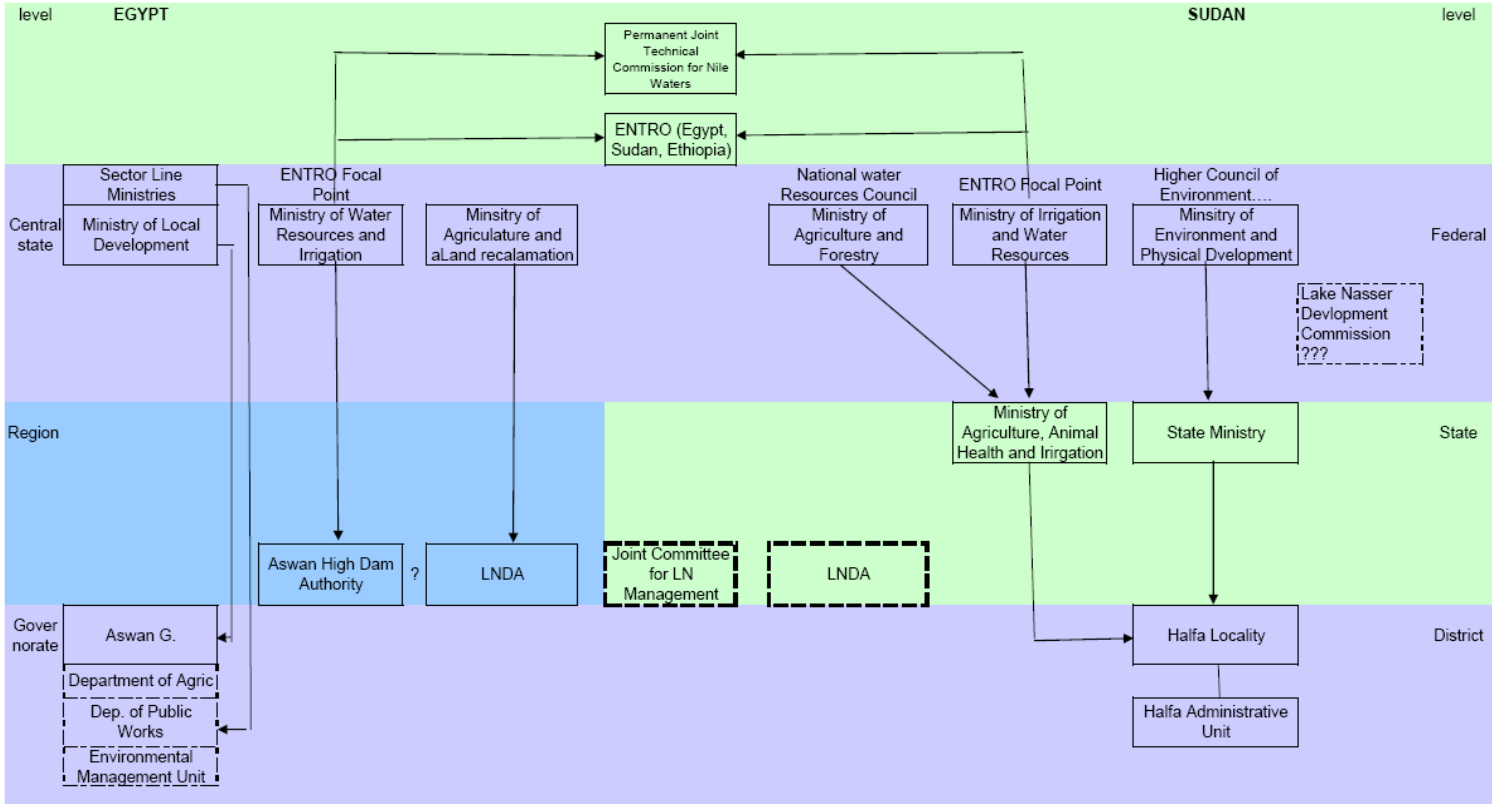


Figure 1 ENTRO Organisation Chart



4.2 Management in Egypt

Lake Nasser Development Authority which was founded in 1975 is overall responsible for the development and management of the lake area with the exception of the Toshka channel and the Toshka depression. It is an organisation under the Ministry of Agriculture and Land Reclamation. The responsibility of the High Dam/Lake Nasser Development Authority is to:

- Conduct research and determine the various natural resources in the lake area;
- Establish and implement a plan of action for the proper management and utilisation of these resources,
- Enforce environmental regulations and provide permissions for the utilisation of the natural resources in the lake area.

A summary report received from the LNDA provides an overview of completed work during the last thirty years (see Appendix 3).

In addition, Aswan Governorate is responsible for the development and management within its area, but it appears that there is a kind of division of work between the two organisations whereby the Governorate concentrates on the areas downstream of the dam whereas LNDA focuses on the lake area. Due to their different mandates, there is some overlap. It also appears that cooperation is not always smooth, as e.g. the UNDP supported comprehensive development plan for Aswan and Lake Nasser did not involve the LNDA and is not available in their office. On the other hand the different Governorate Departments refer to their line ministries at the central level just as LNDA which could be expected to facilitate cooperation in particular between the Department of Agriculture and LNDA as both are under the Ministry of Agriculture and Land Reclamation.

Planning has continued into the present century, with the latest socio-economic plans for the Aswan area and the reservoir being prepared with UNDP assistance during the 2000-2004. Also, studies are being conducted and concepts and strategies developed in cooperation with the technical University of Cologne in Germany.

The most important attempts at to formulate development and management plans are the following:

1. The JICA supported High Dam Lake Area Integrated Regional Development Plan dated 1980 has identified and mapped potential development areas and specific development approaches and activities within agriculture, fisheries, mining etc.
2. The Lake Development Authority has published a work plan in 2000 (only available in Arabic);
3. The Lake Development Authority has entered a cooperation contract with Technical University of Cologne in 2002 to develop a holistic, and nationally and internationally sustainable development plan for the lake area. The objective is to establish optimal living and production conditions for the settlers with intensive utilisation of agricultural and fisheries potentials while concurrently assuring Lake Nasser's current high water quality levels and protecting the environment through economic activities free of waste.

In addition, the Governorate of Aswan has a number of planning and management initiatives that include the lake area:

4. The UNDP supported Comprehensive Development Plan for Aswan and Lake Nasser 2002 to 2022¹⁰, which was the outcome of the Lake Nasser Development Project.
5. The Aswan Governorate Draft Environmental Action Plan, July 2004, also covers the lake area and has devised environmental measures for the protection of the lake.

4.3 Management in Sudan

The Aswan High Dam Lake Development Authority maintains an office in Wadi Halfa but in Sudan no institutional mechanism has been established for the environmental and social management of the lake area. However, some regulatory functions are carried out by different institutions along sectoral but not integrated lines such as Fisheries Administration under the State Ministry of Agriculture, Animal Resources, and Irrigation who monitors fishermen movements, issues licenses and follows up on law implementation. Likewise, the Forestry National Corporation has staff at all administrative levels to guide forestry activities.

¹⁰ This plan is not available in the High Dam Development Authority!

The development and management responsibility has primarily been assumed by the Wadi Halfa Locality and Wadi Halfa Administrative Unit¹¹ together with local cooperatives. These organisations are well functioning and the staff is highly committed which was not experienced in the other places in Sudan where the consultancy team also works. In contrast to Egypt, the development of the Lake Nubia area in Wadi Halfa lake does not attract the same level of attention by neither the Federal Government nor the Northern State and is therefore not supported by the necessary financial resources which are crucial for local government as their own revenues are insufficient. Discussions with Locality and Administrative Unit officials also confirmed that the human resource capacity for planning and implementation of the above mentioned re-establishment of Old Halfa is limited, e.g. there are too few agricultural extension staff and they do not have the required qualifications in organic farming, irrigation etc.

As a result of this, the ongoing development activities lack professional back up and appropriate extension and are not based on environmental principles and regulations (which are not available nationally as Sudan environmental management policy has not been translated in operational environmental regulations and guidelines¹²).

On the initiative of the Federal Ministry of Agriculture and Forestry, the Nubia Lake Development Commission has recently been established and is administratively located under the President's office to support the development in Wadi Halfa. However, Wadi Halfa officials and population know little of this organisation and what exactly it is supposed to do. According to the commissioner "we want to rehabilitate our motherland and try to design projects that can bring back the people from New Wadi Halfa". They seek support from international companies, among other DAL Group which is one of Sudan's biggest food processing companies and for which the commissioner works as agricultural adviser. They want to introduce new production methodologies such as drip irrigation and organic farming and intend to invest in more than 100.000 feddans wheat production on the western side of the lake as well as large scale fishing. They plan to open an office in Aswan for regular meetings with the Aswan High Dam Lake Development Authority. It appears,

¹¹ During the mission a visit was planned to Dongola to consult with relevant state ministries on management activities and perceptions, but this had to be cancelled due to social unrest in connection with planning of a new Kajbar dam.

¹² Khitma and Higher Council for Environment and Natural Resources

however, that the commission is rather a means for the private sector to get established in the Wadi Halfa region than a channel for comprehensive development planning and improved environmental management of the ongoing development efforts.

4.4 Joint Management Activities

At the operational and local levels, joint management by the two countries is limited to a few activities:

- The High Dam Lake Development Authority maintains an office in Wadi Halfa.
- The Federal Government of Sudan maintains a monitoring station with the High Dam Authority mainly to control Egypt's water abstraction and whether it is in accordance with the water sharing agreement
- There is cooperation between Aswan town and Wadi Halfa town concerning business development and the hospital of Aswan is open to people from Wadi Halfa
- The annual water surveys by the High Dam Authority are conducted jointly with Sudanese experts

According to the Social Scientist on the Team her impression from her mission –during which only a relatively small group of stakeholders was met - is that there is still a problem with confidence between the two countries in regard to cooperation and coordination on the Lake Nasser/Nubia.

5 Rationale for LNMF

The need for sustainable development around the Lake is the key driving force for the joint development and implementation of the Lake Nasser/Nubia Management Framework.

Due to the growing population, among other reasons, there is a pressure from the key stakeholders both in Egypt and Sudan to develop and intensify economic activities around the Lake Nasser/Nubia in order to support economic growth and the poverty alleviation. The LNMF is hence necessary to assure that development around the lake is planned and implemented in an integrated, sustainable and cooperative manner.

The overall aim of the framework would be to ensure that the general quality of water and the aquatic and adjacent terrestrial eco-systems are not hampered by the development of the area (incl. settlements, industrial and farming activity) and the use of the natural resources (fishing, mining etc) and to ensure that the water quality complies with standards drinking water.

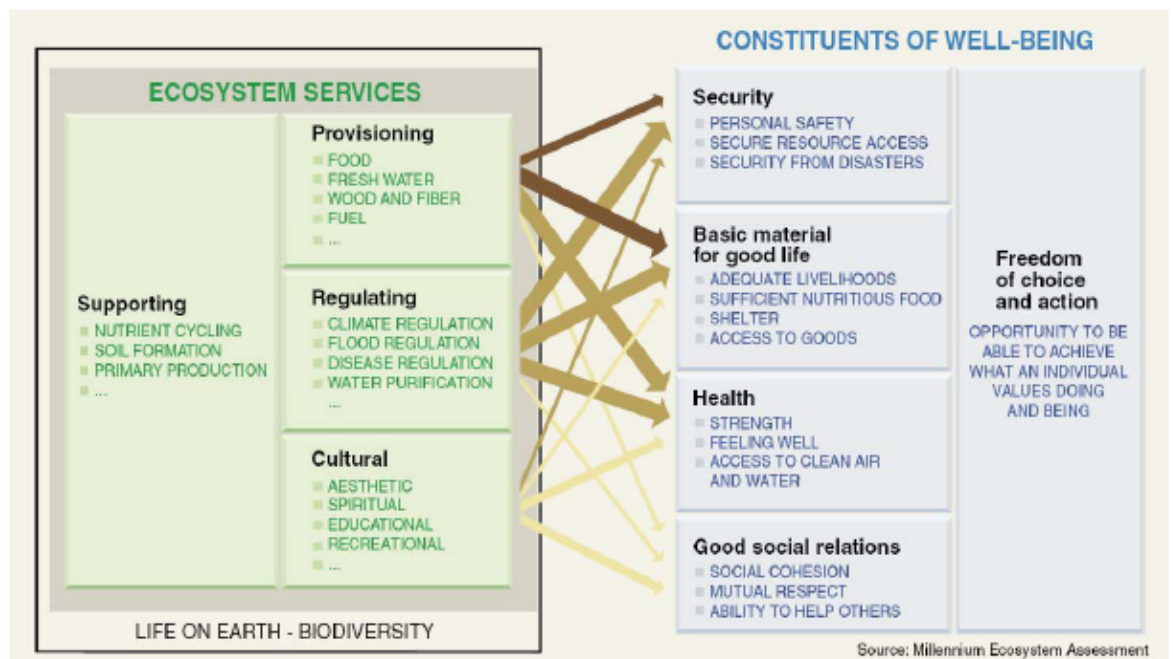


Figure 2.1. The links among ecosystem services and human welfare (MA 2005)

At bi-lateral and regional level functional institutional frameworks have been set up to facilitate dialogue and technical cooperation between the governments of Sudan and Egypt and their respective sector

ra02e 2005-01-17

ministries and cross-cutting working groups. However, this has not been translated into dialogue, technical cooperation and joint management in the lake area and local levels. Egypt has comprehensive plans and strategies for the development of the lake area that are backed up nationally and supported by research. The country also maintains a specialised organisation charged with the responsibility to oversee and promote environmentally sound interventions. But they only deal with the Egypt part.

In Sudan this is not the case. Although a state responsibility, in actual development is the responsibility of Wadi Halfa Locality, Administrative Unit and local cooperatives and a result of local informal initiatives rather than a comprehensive plan that is informed by appropriate research and environmental regulation.

Dialogue, technical cooperation and exchange of experience and "joint management initiatives" at the operational level are very limited. E.g. it would be useful to have a dialogue on Egypt's experience with foreshore agriculture and settlement so that the Wadi Halfa people could learn from this. Wadi Halfa people in turn may need to develop a better understanding of "down stream problems" and environmental awareness.

It is therefore suggested that any "project" to be financed under ENSAP to improve the management of Lake Nasser/Nubia should focus on the local level.

It is furthermore suggested that the proposed project facilitates a process towards improving the relationship between local stakeholders in Egypt and Sudan through capacity building, awareness raising, exchange of experience, and trust making as the basis for participatory development of management action plans and institutional mechanisms for joint management.

Hence, there is a need to support dialogue, joint formulation of principles and procedures for sustainable development, technical cooperation and exchange of experience and "joint management initiatives" which clearly justifies the development of the LNMF.

5.1 Definition of LNMF boundaries and Implementing Partners

The Lake area to be governed by the LNMF is extended to include any present and coming habitation along the lake shores, which in any way makes use of the lake or is affected by the Lake.

In case, an intervention is assessed to have an impact on the Lake the project planning must undergo the agreed processes of the LNMF and comply with its requirements.

A number of local focal point institutions will be responsible in one way or another –together with the national level- for the implementation and compliance with the LNMF.

Appendix 1: List of Potential Stakeholders in Aswan Governorate

Table 1: Potential Stakeholders in Aswan

Stakeholder category (Aswan)	GOVERNORATE	MARKAZ & CITY	LOCAL UNIT	VILLAGE & BELOW
Governorate Administration	The Office of the Governor	City and markaz City Council	Local Units (LU), also called mother villages	Village Chiefs <i>Omdas</i> , Sheikh El Balad
EMU	EMU (Referred to by gov. organisations as Environmental Affairs Office) Environmental Committee	EMU members of City/Markaz LUs (Locally referred to as Environmental Affairs Office)	Environmental Representative in the LUs Environmental committees ¹³	
Governorate Technical Departments/ Directorates/Line Ministries¹⁴	Social Affairs Village Development Department (VDD) Police Department Health Education Information Agriculture Irrigation Youth and Sport	Social Affairs VDD 4 Water Resources and Environment Police Departments.: Aswan, Kom Ombo, Edfu, High Dam Port Health Education Information Agriculture Irrigation Youth and Sport	11 Social Affairs Administrations in LUs (1 in Aswan, 1 in Daraw, 2 in Kom Ombo, 2 in Nasr al-Nuba, 5 in Edfu) VDD representative in the LU Health Education Agriculture Irrigation Youth Centers in most	Social Affairs (Social Units in 76 villages, women coordinators in each village) Health (female health workers), Rural Health Unit in most Schools in most villages Agric. Service Cooperatives (110) Irrigation observer

¹³ EMU reported that an environmental committee is under establishment in LUs to consist of five members. Head, LU; Head, Popular Council, community leader, woman representative, and CDA representative

¹⁴ The Arabic word "*Mudiria*" is most of the time translated as directorate but some organizations call it department. A directorate is a representative office for a ministry, such as the social affairs directorate that represents the Ministry of Social Affairs in Cairo. The directorate together with its administrations in the Markazes and its units in the villages are considered a line ministry.

Stakeholder category (Aswan)	GOVERNORATE	MARKAZ & CITY	LOCAL UNIT	VILLAGE & BELOW
	<p>Waqfs (Religious Affairs)</p> <p>Ministry of Tourism Office</p>	<p>Waqfs (Religious Affairs)</p> <p>Administration of the Industrial Zone (Aswan)</p>	<p>Waqfs Representatives in most mosques</p>	<p>Waqfs Representatives in most mosques</p>
Semi-Governmental Organizations	<p>Lake Naser Development Authority</p> <p>Aswan High Dam Authority</p> <p>Environmental Detection Centre</p> <p>Environment Committee as mentioned in the Governor's decree for the establishment of the EMU</p> <p>Aswan Water and Sanitation Authority (AWSA)</p> <p>National Organization for Potable Supply and Sanitary Drainage (NOPWASD)</p>	<p>Centre established to ensure protection of the Lake</p> <p>Water & Sanitation Department</p>		
Civil Society Representatives	<p>Popular Council</p> <p>The Church</p> <p>Regional Federation for NGOs</p> <p>National Council for Population</p> <p>National Council for Motherhood and Childhood</p> <p>National Council for Women</p>	<p>Popular Council</p> <p>Churches</p> <p>Development associations working in the markaz, such as:</p> <p>Center for Egyptian Family Development (CEFD), Kom Ombo</p>	<p>Popular Council</p> <p>Churches</p> <p>Development associations working in the LU such as:</p> <p>-Kima Environment Protection CDA</p> <p>-Naser Environmental Protection CDA</p>	<p>Popular Council</p> <p>Churches</p> <p>Development associations serving mother village, # of satellite villages/kafrs such as:</p> <p>Al Nasria CDA</p>

ra02e 2005-01-17

Stakeholder category (Aswan)	GOVERNORATE	MARKAZ & CITY	LOCAL UNIT	VILLAGE & BELOW
	Women Associations	Women Associations	Women Associations in some	<p>Women Associations in some</p> <p>Women Clubs (established by/ registered with Health, Social Affairs/NGOs, Youth & Sports)</p> <p>1 women centre established by ICA in Maniha, Kom Ombo</p> <p>Women committees (usually established by NGOs)</p> <p>Informal leaders and representatives of the communities such as Sheikh El Balad, most senior persons, Dayas (traditional midwives)</p>
Relevant Projects of National & international NGOs and other donors	<p><i>Shrouq</i> (Government program implemented thru the VDD)</p> <p>SFD (Social Fund for Development)</p> <p>Secondary Cities Project (USAID)</p>	<p><i>Shrouq</i> (Government program implemented thru the VDD)</p> <p>SFD</p> <p>Daraw, Nasr El Nuba, Kom Ombo</p>	<p><i>Shrouq</i> (Government program implemented thru the VDD)</p> <p>SFD</p>	<p><i>Shrouq</i> has a committee in every village.</p> <p>SFD</p> <p>Environet (CARE Egypt + Danida) villages in Edfu and Kom Ombo</p> <p>Positive Participation (CARE Egypt + ESDF) villages in Edfu and Kom Ombo</p> <p>Loans for Water Supply & Sanitation (ICA) in 10 villages in Daraw and Kom Ombo</p>

ra02e 2005-01-17



Stakeholder category (Aswan)	GOVERNORATE	MARKAZ & CITY	LOCAL UNIT	VILLAGE & BELOW
		Support to AWSA: Institutional Development (Danida)		Revolving Fund Program in Edfu (Danida) EACID implements Small & Micro Credit project in villages in all markazes Support to AWSA: Rural Water Supply & Sanitation (Danida) Settlers at Wadi Al-Sa'a'ida (AfriCare)
	Healthy Mother, Healthy Child (JSI)	Solid Waste Management Project (GTZ) Aswan, Edfu, Kom Ombo Healthy Mother, Healthy Child (JSI)	Healthy Mother, Healthy Child (JSI)	Healthy Mother, Healthy Child (JSI)
Higher Educational Institutions	Faculties of: Education, Science (Environmental Section), Social Work Higher Institute of Social Work			
Industries	As relevant for project activities Chamber of Commerce Aswan Businessmen Association (ABA)	As relevant for project activities	As relevant for project activities	As relevant for project activities
Communities	Population of the governorate	Population of the markaz	Population of the LU	Population of the village

Appendix 2: List of Potential stakeholders in Wadi Halfa

Stakeholder category	Locality Level	Administrative units level	VILLAGE & BELOW
Federal level			
	Aswan High Dam lake development authority in Wadi Halfa Nubia Lake Development Commission		
State Level			
	National Forestry Corporation Fisheries Administration Ministry of Agriculture, Animal Resources and Irrigation, Northern State, Wadi Halfa Branch	Extension staff Extension staff	
Locality Level			
	Wadi Halfa Locality Wadi Halfa Administrative Unit Social Affairs Sub-Unit Livestock Section, Halfa Adm. Unit Agriculture and Forestry Section , Halfa Adm. Unit	Extension staff	VPC
Semi-Governmental Organizations			
Civil Society Representatives	Cooperative Union		Individual Cooperatives
Relevant Projects of National & international NGOs and other donors	Egypt: SVDP/Toshka project HDLDP-New model Villages LNDA/Fishery management Centre Sudan: Resettlement of Old Halfa DAL/Commercial farming		
Higher Educational Institutions	Faculty of Earth Sciences, Dongola University, Wadi Halfa Branch		
Industries	Fish factories Commercial farming		
Communities			Pastoralists Farmers Fishermen Women Groups

ra02e 2005-01-17

Appendix 3: Lake Development Authority in Egypt- Progress of Work

A summary report received from the AHDLDA accounts for progress made during the last thirty years and the completion of the following activities:

Agricultural Development

- Most of the agricultural lands around Lake Nasser were estimated and classified on the basis of maps, aerial photographs and field trips and were plotted on maps (shoreline 50.000 feddans and uplands 140.000 feddans)
- Soil classifications were carried out to determine land class and type
- Most of the reclaimable shoreline lands are cultivated now through WFP supported projects
- The upland lands are presented to the investment companies (Wadi El Amal, Qustul and Adindan)
- 2500 feddans are cultivated in Abu Simbel
- An Agricultural Development Centre has been established to carry out all research and studies around the lake and disseminate results to the farmers

Fisheries Development

- Lake Nasser produces about 25% of the national fish produce
- A Fisheries Management Centre was established with the assistance of JICA to carry out all research and studies dealing with fisheries development in the lake and disseminate and implement the results and recommendations
- Three fishing harbours were built in Lake Nasser west, Garff Hussein, and Abu Simbel to receive the fish catch from the different fishing areas
- Seven hatcheries were constructed in Sahary, Garff Hussein, Toshka, and Abu Simbel to produce fingerlings for the lake to cope with over-fishing

Mining Resources Development

- The majority of minerals and economic rocks around the lake region were located (granite, marble, talc, quartz, limestone, barite) and most of them are available in commercial quality
- A Geology and Mining Centre was established to carry out all research and studies on minerals, rocks and underground water
- Geophysical investigations were conducted using modern instruments to determine the quantity and quality of the groundwater and best locations to drill wells
- Approval was given to 250 quarries that are in operation
- A cement factory (in Aswan town) is under construction with a capacity of 750.000 tons per year
- Studies on industrial processing of alum from kaolinite and glass from sand were completed and submitted for investment

Infrastructure

- The road network in the lake area was completed and extends to the Sudan border on the western side: Road works include the following:
 - Aswan-Allaqi-Sayalla on the eastern side of the lake (320km)
 - Kalabsha-Graff Hussein-Amada-El Sibou temples on the western side of the lake (260km)
 - Fourth Toshka Depression Road on the western side of the road (130 km)
- 3 Fishing harbours, 2 ferries to cross from Abu Simbel to Adindan and Qustul were, mechanical floating quay to repair ships were made viable
- Several settlements, villages, schools clinics, and mosques were built in addition to HQs for the Lake Development Authority, research centres and flats for employees and workers

ra02e 2005-01-17



Environmental Detection Centre

The centre was established to ensure conservation and protection of the lake water quality through the following:

- Continuous lake water analysis to detect any sort of pollution or contamination;
- Chemical analysis of soil and plants to detect contamination through chemical fertilisers in agriculture, especially on the shore lines;
- Ensure application of environmental standards and conduct of environmental impact assessments on all projects such as quarries etc.
- All sewage into the lake has been stopped;
- Coordination with all sector institutions to ensure environmentally sound development activities.

GIS Centre

- GIS and field investigation database;
- Maps covering all activities in the lake area are available now.

Appendix 4: Aswan Governorate Environmental Action Plan

Chapter 2.7 Sustainable Management of Lake Nasser and River Nile (and protectorates nearby)

2.7.1 Why Actions? - What are the problems?

The River Nile runs through Egypt, with Aswan Governorate being the first governorate to receive the water. Lake Nasser, one the world's largest man-made lakes and Egypt's strategic water reservoir, is found at the southern part of the Governorate, and is the result of the construction of the High Dam completed in 1969.

The two protected areas of Aswan Governorate are found in connection with the River Nile and Lake Nasser. These are the small islands of the First Cataract, principally the two islands Saluga & Ghazal and the desert ecosystem Wadi El- Allaqi. The granite islands Saluga & Ghazal, of the First Cataract, are now expected to represent the only unspoilt remnants of what is thought to be typical riverine vegetation of the Nubian Nile and is the habitat for a wide variety of associated bird and insect species. Wadi El- Allaqi represents the largest khor of Lake Nasser.

A fundamental challenge at present and in the future is to ensure high biodiversity and good quality water in Lake Nasser and the River Nile. The purpose of protecting the water is twofold, first Egypt is dependent on this source for various purposes (drinking, irrigation, and fisheries) and second the land around Lake Nasser is expected to be essential to encompass the population increase in terms of new settlement areas and production of foods (irrigated crops and fisheries) for the growing population.

In the Egyptian National Water Policy for the year 2017, the three main themes are (i) optimal use of available water resources; (ii) development of water resources; and (iii) protection of water quality and pollution abatement. Thus only through sustainable use and development, protection and awareness raising the future use of the River Nile and the Lake Nasser will allow coming generations to enjoy the richness of the aquatic biodiversity and clean water.

2.7.2 What to do? - Objectives

The overall aim of the actions is to ensure that the general quality of water and the aquatic and adjacent terrestrial eco-systems are not hampered by the development of the area (incl. settlements, industrial and farming activity) and the use of the natural resources (fishing, mining etc) and to ensure that the water quality complies with Egyptian standards.

For sustainable management around and in Lake Nasser and the River Nile, the following five principles should be respected:

1. Maintenance (of high and stable levels) of economic growth and employment;
2. Social progress that recognizes the needs of everyone;
3. Effective protection of the environment;
4. Prudent use of natural resources (e.g. water, fish and land);
5. Monitoring and strict enforcement of compliance with regulatory frameworks and laws that foster 1 and 4.

2.7.3 How to do it? – Action elements

This section illustrates that sustainable use of resources must be based on planning and an integrated approach. The actions presented, therefore, deal with many different issues and types of activities, including creating new economic activities, development of new settlements, protection of natural reserves and endangered species as well as monitoring and research and awareness creation among the communities.

The action elements presented in relation to planning & management [1&2], awareness raising [3] and technical intervention [4&5] are the following:

1. Developing management plans for protected species (fauna and flora), as well as improving and developing management plans for protected areas;
2. Developing income generating projects (fisheries, agriculture and water hyacinths);
3. Awareness campaigns (awareness rising);

ra02e 2005-01-17

4. Research and monitoring;
5. Reducing negative impacts from Nile cruises.

These elements have resulted into the following actions or project ideas:

1 Species Management Plans

There are several species of plants, birds, reptiles and mammals found in/ or around Lake Nasser and the River Nile. Many are endangered, protected and or found in internationally important numbers. These species include:

- Nile crocodile
- Dorcas gazelle

Likewise it may be stated, that the protected areas are endangered, as they are not yet managed and, therefore, with the risk that unplanned development occurs.

The management of the protected areas includes:

- Developing a management plan for the Wadi El- Allaqi natural reserve
- Improving the touristic and informational value of the Saluga and Ghazal protected area.

To ensure that both the species and habitats will exist in the future, management plans should be made for all.

2 Sustainable development plan for new settlements

Several Project ideas are being developed by the Egyptian - German Research Cooperation with LNDA. These include:

- Environmental monitoring in Lake Nasser area;
- Pilot project on an integrated urban centre at Kalabsha;
- Increased fish production by dispersing enclosures for fishermen of Lake Nasser;
- Developing ice units with the use of solar energy.

3 Awareness programs

- Sustainable water use; water conservation methods and protection of the River Nile and Lake Nasser from polluting human activities;
- Biodiversity and protected areas concepts (for school children);

4 Research and Monitoring programmes

- Protecting River Nile and Lake Nasser from the decomposition of aquatic plants
- Studies on the self-purification process in the River Nile and Lake Nasser

5 Reducing negative impacts from Nile Cruises

- Protecting River Nile and Lake Nasser from the impacts of the Nile Cruises

2.7.4 Project ideas with High, Medium and Low priority

The table below gives a number of project ideas that have been developed, according to their priority

High Priority Projects	Medium Priority Projects	Low Priority Projects
<ul style="list-style-type: none"> • Awareness Campaign for Protecting the River Nile and Lake Nasser from Pollution • Protection of the River Nile and Lake Nasser from Nile Cruise pollution through Community Participation and NGO Involvement • Monitoring and Study: Protecting the Vitality of the River Nile and Lake Nasser through Self-Purification Process 	<ul style="list-style-type: none"> • Management Plan for Wadi El- Allaqi Natural Reserve 	<ul style="list-style-type: none"> • Feasibility Study on: Protecting River Nile and Lake Nasser from Pollution Resulting from Water Hyacinth Decomposition and Developing an Income Generating Activity through the use of the Water Hyacinths • Developing an Action Plan for the Protection and Management Nile Crocodile (<i>Crocodylus niloticus</i>) in Lake Nasser, Aswan Governorate

ra02e 2005-01-17



PART 2- PROJECT BRIEF for the LNMF Project

1 Background and Introduction

This Interim Report deals with the preparation of the project brief to formulate a Lake Nasser/Nubia Management Framework.

The objective of this task is to prepare a project brief leading to development and implementation of the LNMF, including outline of transboundary activities e.g. for sedimentation and wind erosion control in the Main Nile Basin.

The first step in the preparation process was to outline existing challenges, issues and opportunities in a diagnostic report. Based on the Diagnostic report and the feed-back from the interim workshop the Consultant has prepared the project brief.

2 Setting and Strategic Context

2.1 Biophysical and environmental characteristics

Lake Nasser/Nubia, one of the world's largest man-made lakes and strategic water reservoir is the result of the construction of the High Dam completed in 1969. Lake Nasser- Nubia comprises of Lake Nasser in Egypt and Lake Nubia in Sudan. The combined area of Lake Nasser- Nubia is 6216 km² of which 5248 km² is Lake Nasser, which is the Egyptian portion of the lake, and 968 km² is Lake Nubia, which form the Sudan portion of the lake.

The total length of the lake is approximately 500 km, about 350 km in Egypt, and the rest 150 km is in Sudan.

The lake was formed mainly to store water for irrigation and power generation but is also used as a source of water for domestic use.

The environmental degradation of Lake Nasser has been manifested in the form of massive soil deposition, alteration of biological system (in the form of reduction in number or eventual disappearance of indigenous fauna and flora), and alteration of stream morphology. Six key environmental issues are highlighted below.

A fundamental challenge at present and in the future is to ensure high biodiversity and good quality water in Lake Nasser/Nubia and the surrounding ecosystem. The purpose of protecting the water and the surrounding ecosystem is twofold, it is an important source for various purposes (drinking, irrigation, and fisheries) and secondly the land around Lake Nasser is expected to be essential to encompass the population increase in terms of new settlement areas and production of foods (irrigated crops and fisheries) for the growing population.

The economic potential of the region is dependant on the lake basin and its natural resources.

2.2 Socio-economic characteristics

As a result of the construction of the Aswan High Dam and the reservoir, an estimated number of 100,000 to 120,000 Nubians had to be resettled of whom 50,000 lived in Egypt and 50.000 to 70.000 in Sudan.

Originally, quite a number of people refused to move, especially in Sudan where 5.000 people remained in the area. In the meantime, new settlers have come to the area and some former resettled Egyptian Nubians have returned with the approval and financial support by the Egyptian government. Since the 80'ies there has been a continuous influx of new settlers and re-settlers into the lake area due to active promotion of land reclamation and resettlements as part of official development plans on the Egyptian side. In Sudan, the influx is mainly due to the return of the immigrants to New Halfa, and local initiatives by Wadi Halfa Locality, Wadi Halfa Administrative Unit and local cooperative societies to re-establish the old villages that were inundated by the reservoir. The intention is to exploit the good prospects for agricultural production in view of fertile and sizable deposition of silt forming deltas in some areas.

This is primarily due to the siltation on the shores of the Lake which has attracted newcomers.

The economy of the Lake Nasser/Nubia region is essentially rural, involving fishing, food fishing production, livestock rearing, agro-industry, and handcrafts as well as pastoralist activities. Industry and the service sectors are not well developed, and social services and other infrastructures are not well established and most indicators of socio-economic development lie below that of most developing countries. Social indicators such as life expectancy, access to health

care, education, nutrition level etc. are all at considered as low to moderate.

Utilization and development of Lake Nasser and the surrounding area have not yet been fully realized. The present economic activities associated with the Lake region are minimal due to its distant location from the national centers, harsh climatic conditions and low fertility of lands (Egypt side).

Still, the lake, lake shore and basin are obvious engines for economic growth in a country where poverty alleviation is of high priority.

2.3 Existing focal point institutions and regional cooperation

Summary from Diagnostic report.

Figure

2.4 Key transboundary issues

Thematic Area	Key Transboundary Issues
Ecosystems and Natural Resources	<p>Water quality degradation caused pollution of the Lake from agricultural and industrial activities</p> <p>Water quality degradation caused by sedimentation</p> <p>Loss of aquatic biodiversity (Fish)</p> <p>Sand dune encroachment</p> <p>Terrestrial biodiversity : Lack of vegetation and forests</p>
Population and demography	<p>High rate of poverty and marginalized people</p> <p>Influx of new settlers to the Lake area</p>

ra02e 2005-01-17

<p>Living conditions, production and income generation</p>	<p>Poor access to health facilities</p> <p>Inadequate water supply and sanitation services</p> <p>Inadequate rural infrastructure</p> <p>Inadequate use and adoption of appropriate technologies and research</p> <p>Poor access to markets</p> <p>Declining fish catches</p> <p>The economic potential is dependant of the lake basin and its natural resources</p>
<p>Governance, Institutions and guiding strategies</p>	<p>Low level of environmental governance e.g. Weak compliance with environmental regulation</p> <p>Conflicting development and environmental policies/strategies</p> <p>Lack of integrated and sustainable development and spatial planning</p> <p>Lack of transboundary enabling framework for sustainable development and environmental protection of the Lake and surrounding ecosystem and natural resources</p> <p>Lack of involvement of Local Government administration and communities in sustainable lake management</p>

ra02e 2005-01-17



2.5 Rationale for trans-boundary management and LNMF

As with any transboundary water body, the management of Lake Nasser/Nubia is an international concern, which must be managed in a jointly manner within an agreed framework.

Furthermore, as listed above there are a number of transboundary issues which can not be addressed without joint response strategies.

Due to the growing population, among other reasons, there is a pressure from the key stakeholders both in Egypt and Sudan to develop and intensify economic activities around the Lake Nasser/Nubia in order to support economic growth and the poverty alleviation.

Hence, the need for sustainable development and environmental protection is probable the most important key driving force for the joint development and implementation of the Lake Nasser/Nubia Management Framework.

The LNMF would assure that development around the lake is planned and implemented in an integrated, sustainable and cooperative manner. The future LNMF is expected to provide the overall framework for integrated watershed management and sustainable development in and around Lake Nasser/Nubia. It is envisioned to marry potentials, opportunities, priorities, constraints and tradeoffs.

The overall aim of the framework would be to ensure that the general quality of water and the aquatic and adjacent terrestrial eco-systems are not hampered by the development of the area (incl. settlements, industrial and farming activity) and the use of the natural resources (fishing, mining etc) and to ensure that the water quality complies with standards drinking water.

There is also a need, as seen from the above list, for joint prioritisation and implementation of poverty alleviation interventions in the area.

Hence an important step is to go from awareness and capacity building to an intervention that uses the information and capacity developed to promote environmentally and socially sustainable economic development.

The LNMF will build on existing institutions.

ra02e 2005-01-17

2.6 LNMF approach and principles

It is assumed that both countries share a common desire for the sustainable management of the natural resources and biodiversity of the Lake Nasser/Nubia for the benefit of present and future generations, and recognize their role and responsibility in conserving the global value of the natural resources. They have thus when developing this document.

The approach and guiding principles for the development and implementation of the LNMF are recommended to consider and take into account, where appropriate, the following principles and values:

Sustainable development

The activities implemented (and decisions made) shall ensure prudent support and rational utilization of living resources and the preservation of the rights of future generations to a viable environment. Development planning should be based on integrated and participatory approaches and sound technical studies.

Economic growth and employment is important however the area should not be a centre for economic growth however modest and sustainable development of the area for poverty alleviation should be allowed.

The precautionary principle

Measures shall be taken when there are reasonable grounds for concern that any activity may increase the potential hazards to human health, harm living resources or aquatic and terrestrial ecosystems, damage amenities, or interfere with other legitimate uses of the LVB, even when there is no conclusive evidence of a causal relationship between the activity and the effects; and by virtue of which, greater caution is required when information, including scientific information, is uncertain, unreliable or inadequate.

The polluter pays principle

The cost of preventing and eliminating pollution, including clean-up costs, shall be paid by the polluter.

Anticipatory action

Contingency planning, environmental impact assessment and strategic impact assessment (involving the assessment of the environmental and social consequences of governmental policies,

programmes and plans) shall be undertaken for the future development of the Lake.

The preventive action

Timely action shall be taken to alert the responsible and relevant authorities of likely impacts and to address the actual or potential causes of adverse impacts on the environment before they occur. Many adverse impacts are irreversible or, if they can be reversed, the cost of remedial action is higher than the costs associated with prevention.

Environmental and health considerations

All relevant policies and sectoral plans and programmes, including, *inter alia*, urban planning, industrial development, fisheries, aquaculture and tourism shall take into consideration environmental and health considerations.

Clean technology

Clean technology should be promoted when replacing or phasing-out high waste and waste generating activities.

Integrated approach

Development and environmental planning and processes should be integrated to the maximum extent. The use of economic instruments that foster sustainable development shall be promoted through, *inter alia*, the implementation of economic incentives for introducing environmentally friendly technologies, activities and practices; the phasing-out of subsidies which encourage the continuation of non-environmentally sound technologies, activities and practices; and the introduction of user fees.

Accessibility of information

Information on the pollution of the environment in the Lake as well as on the best practices and lessons from the countries shall be provided with the maximum possible amount.

Public participation and transparency

All stakeholders, including communities, individuals and concerned organizations shall be given the opportunity to participate, at the appropriate level, in decision-making and management processes that affect the Lake Basin. TPublic authorities shall widely disseminate information on the work proposed within the Lake Basin.

ra02e 2005-01-17

3 Summary Project Objectives and Components

3.1 Development Objective

The proposed broad development goal of the LNMF project is the formulation a strategy for sustainable socio-economic development for the region without endangering unique ecosystems, identifying and piloting priority interventions and developing an enabling framework for its implementation.

3.2 Project Components

In order to achieve the above objective the project is proposed to be divided in three project components, explicitly:

1. Participatory development of a Strategic Action Plan for addressing transboundary concerns in the Lake Nasser/Nubia Basin;
2. Build capacity and create a regional institutional framework for the effective management of the Lake Nasser/Nubia Basin
3. Initiate and pilot national and regional priority measures and interventions as a response to the prioritized key transboundary concerns.

3.3 Key Performance Indicators

To be added

4 Project activities and expected results

Component 1: Participatory development of a Strategic Action Plan for addressing transboundary concerns in the Lake Nasser/Nubia Basin

Objective:

Harmonize the visions, response strategies and priority actions for the lake basin management (environmental protection and sustainable development) of stakeholder groups across sectors, countries and levels of governance.

Agree on principles for socio-economic development in the lake area

Activities:

1. Finalize and agree on the final, geographically specific, quantitative Transboundary Diagnostic Analysis (TDAs) with clear socio-economic development targets and environmental quality objectives
2. Develop National Plans of Action (NAPs) that address issues of priority transboundary concerns
3. Formulate in a participatory manner and endorse a Joint Lake Management Vision and Strategic Action Plan (LMV and SAP) with concrete investments identified to address priority transboundary problems with a on integrated and participatory planning for optimal living and production conditions for the Basin population while concurrently ensuring environmental quality criteria of the lake
4. Legal and Institutional review of and harmonization of relevant national policies, legislation and regulatory framework and Enhance and develop legal basis and policy framework to sustainably manage the basin

Results:

1. Finalized Detailed TDA
2. Joint LMV and SAP developed and endorsed by the countries

3. Concrete national policy/legal/institutional gaps identified and processes established for correcting these gaps
4. NAP's prepared and endorsed, including both legal and regulatory reform, as well as concrete investments
5. Management plans for addressing priority transboundary concerns developed
6. SAP endorsed by countries with National and donor commitment to funding SAP and Workplan elements

Component 2: Build capacity and create a regional institutional framework for the effective management of the Lake Nasser/Nubia Basin

Objective:

An institutional framework for the Lake Nasser/Nubia framework established involving the various levels of governance and Lake basin population

Activities:

1. Establish a project management and coordination mechanism through a LNMF project coordination unit hosted by ??? and comprising of Project Coordinator ; Establish a project steering committee and national focal points/coordinators (to be nominated by governments); and Establish Inter-Ministerial Coordination Committee in each country.
2. Determine and satisfy awareness building and training needs for SAP implementation and addressing priority transboundary concerns
3. Establish stakeholder forums
4. Institutional mechanism for lake management established in Sudan and cooperation and coordination with Lake Nasser Development Authority consolidated.

ra02e 2005-01-17



5. Through building on existing institutions, establish a Lake Management Framework by drafting the framework document for the Joint Lake Basin Commission/Authority (the framework document should include clarification of the division of roles at national level and possible establishment of new institution in Sudan) and obtaining national endorsements for the Commission/Authority
6. Develop joint databases and GIS (Today the joint databases and monitoring comprise mainly of water quantity and sedimentation data), and monitoring systems to evaluate effectiveness toward reaching the SAP targets (both Environmental quality and poverty alleviation objectives)
7. This component concentrate on creation of the enabling environment and the institutions that are requires for long term sustainable management of the Lake Basin.

Results:

1. Established LNMF Project Coordination Unit
2. Established LNMF Project Steering Committee, including National Focal Points, and Inter-Ministerial Coordination Committees
3. Developed and implemented public involvement plan
4. Increased knowledge and awareness by local stakeholders of the importance of sustained environmental health of the lake basin
5. Institutional framework for long-term management of the Lake Nasser/Nubia Basin developed
6. Training programs developed and conducted in Egypt and Sudan
7. Framework document agreed upon and completed
8. Database and environmental monitoring system protocols developed

ra02e 2005-01-17

9. Improved national and regional capacities for effective environmental management of land and water degradation

Component 3: Initiate and pilot national and regional priority measures and interventions as a response to the prioritized key transboundary concerns

Objective:

To go from awareness and capacity building to an intervention that uses the information and capacity developed to promote environmentally and socially sustainable economic development, there is a need for demonstrating results on the ground through pilot activities.

Component 3 is composed of a number of sub-components with their own specific objectives, activities and results. Examples of proposed sub-components are given below.

Sub-Component 3a: Local Information exchange and Confidence building

Objective:

Awareness raising on both side of the Lake

To establish mechanisms to transfer experience build in Egypt on integrated and sustainable development of the lake area

Activities:

1. Negotiations with WFP on possible expansion of their support to the development of model villages in Sudan
2. Extend cooperation between Lake Nasser Development Agency and Technical University of Cologne to the Sudan part of the lake area;
3. Exchange visits between local stakeholders to share experience in different methods of settlement, agriculture and fishing ;

ra02e 2005-01-17



4. Promote exchange visits between CBOs as well as local authorities/governorates from the two countries;
5. Involve NGOs in process facilitation and ensure cooperation between NGOs from the two countries;

Studies:

- Improve foreshore agriculture in Sudan to be more sustainable and environmentally sound and if necessary determine alternatives
- Make silt available for agricultural production
- Develop fish catch and processing
- Improved lake transport system

Sub-component 3b: Investments in Sustainable Livelihood Improvements in Wadi Halfa Administrative Unit.

General objective

To design and establish model villages in Wadi Halfa Administrative Unit to settle displaced people and enhance their livelihoods.

The immediate objective of project is to improve the living conditions of the people, enhance agricultural productivity, without compromising the sustainability of Lake Nasser/ Nubia environment and its aquatic ecosystems.

Activities

1. Local authorities to settle disputes on land, if any, and demarcate crop lands and residential lands.
2. Distribution of agricultural and residential lands to members of the cooperative societies in the high terrace area.
3. Involve Wadi Halfa Locality and the Administrative Unit, and build on and revitalize the cooperative societies in the management of the proposed activities.
4. Technical assistance and capacity building provided to the Cooperative Societies, and enriched by the Egyptian experience in the irrigation of desert land and conversion of desert into agricultural production.

ra02e 2005-01-17

5. Provide training and build capacity for enhanced fish catch, processing and marketing in collaboration with the Egyptian counterparts.
6. Use new technologies that will raise crops yields and increase farmers' income, and use high technology irrigation systems to increase water use efficiency.
7. Introduce new cash crops in the area such as potatoes and temperate region vegetables for local markets and export to other parts of the country.
8. Encourage establishment of fruits gardens, and maintain Wadi Halfa Locality-specific dry date varieties from extinction.
9. Integrate livestock as part of agricultural system.
10. Establish shelterbelts around agricultural and residential lands to combat sand encroachment of the Lake and improve environment.
11. Enhance agricultural services (land preparation, improved seeds, fertilizers, pesticides etc.).
12. Monitor crops performances and follow-up production systems.
13. Improve harvesting, storage, processing, distribution and marketing of products at local and national levels.

Results:

1. Strengthened relevant local institutions, stakeholders and systems at all appropriate levels for the integrated and sustainable management of water and land resources.
2. Integrated and sustainably managed water and land resources to stimulate appropriate development-oriented investments in Wadi Halfa Administrative Unit that would contribute to poverty reduction and environmental sustainability.
3. Improved and diversified agricultural products and increased farmers income

ra02e 2005-01-17

4. Enhanced fishing industry through improved fish catch, processing and marketing.
5. Fish catch raised from current catch of 2,000 tonnes to the potential catch of 5,000-7,000 tonnes/ year.
6. Poverty alleviated and improved alternative livelihoods.
7. Part of the Sahara desert transformed into agricultural land.
8. Enhanced environment through the establishment of shelterbelts and increased agricultural lands in Wadi Halfa Administrative Unit.
9. A variety of birds and other wildlife, which could encourage tourism, flourished as a result of the establishment of shelterbelts.
10. Decreased sand encroachment and increased land productivity.
11. Increased availability of timber, alternative fuel sources, and non-wood products of forests.
12. Increased levels of engagement and consultations on sustainable management of lake Naser/Nubia ecosystems between Sudan and Egypt.
13. Foundations for economic prosperity, poverty alleviation and social and political stability laid down.

Component 3c: Stabilization of sand dunes

Activities:

A combination of the methods may be used to accomplish the stabilisation:

Trenching: cutting of transverse or longitudinal trenches across dunes destroys their symmetry and may lead to dune destruction.

Excavation of pits on the lee-side of sand mounds or on the windward side of features to be protected will provide temporary locations for accumulation.

Planting of appropriate vegetation, designed to stop or reduce sand movement, bind surface sand and provide surface protection. Early stages of control may require planting of sand-stilling plants, protection of surface (e.g. by mulching), seeding, and systematic creation of surface organic matter. Planting is permanent and attractive, but expensive to establish and maintain.

Paving is designed to increase the saltation coefficient of wind-transported material by smoothing or hard-surfacing a relatively level area, thus promoting sand migration and preventing its accumulation at undesirable sites. Often used to leeward of fencing, where the wind may deposit the sediment, and paving prevents its recharge. Paving may be with concrete, asphalt or wind-stable aggregates (e.g. crushed rock).

Panelling, in which solid barriers are erected on the windward side of areas to be protected, is designed either to stop or to deflect sand movement (depending largely on the angle of the barrier to wind direction). In general, this method is inadequate, and expensive, although it may be suitable for short-term emergency actions.

Fencing: the use of relatively porous barriers to stop or divert sand movement, or destroy or stabilise dunes. Cheap, portable and expendable structures are desirable (using, for example, palm fronds or chicken wire).

Oiling: involves the covering of aeolian material with a suitable oil product (e.g. high-gravity oil) which stabilizes the treated surface and may destroy dune forms. It is, in many deserts, a quick and rather cheap method but is environmentally unfriendly.

5 Implementation Arrangements

Organization responsible for the LNMF project and Responsibilities of the implementing agencies and other stakeholders to be discussed in the workshop.

ToC for the final Project Brief

Implementation Arrangements

- Background and Summary of project scope and objectives.
- Detailed project description: financial and economic analysis of the project, including description of assumptions; description of main project risks (internal and external); critical factors that could affect the project's success, and an assessment of the project's sensitivity.
- Detailed financing plan (budget by activity)
- TORs for preparation of environmental and social impact assessments, EMPs, and other documentation required for future financing

Implementation Arrangements

- Organization responsible for the project
- Implementation agreement required between the borrower and implementing agencies
- Responsibilities of the implementing agencies and other stakeholders
- Relationship of the implementing agency with other entities (ministries, project beneficiaries, etc.); participation plan
- Role of project financiers during project implementation.
- Administrative arrangements for project implementation.

Implementation Schedule Plan

- Implementation chart (indicating project months) for each project component activity, including technical assistance and training.
- Specific actions required achieving the project's development objectives (including implementation of environmental and social actions).

Monitoring and Evaluation

- Project log-frame and monitoring matrix
- Key development impact indicators for measuring progress in reaching project development objectives.
- Key progress indicators for monitoring delivery of project inputs and achievement of project outputs.
- Key financial indicators to assess the project's budgetary and financial health.

TOC for the final LNMF to be endorsed by the countries

1 LNMF context

Nile basin initiative; national political and economic context etc.

Planning philosophy and approach

This section will include the guiding principles for the Lake Nasser/Nubia. It will discuss international TIWRM principles

2 Overall and intermediate objectives of LNMF

3 The Lake Nasser/Nubia: Status and Threats

Technical, Socio-economic and institutional challenges and appropriate strategies to address these

4 Lake Nasser/Nubia Management Vision

5 Key Transboundary Issues and response SAP

National requirements and the possibility of setting specific criteria for the Lake Nasser/Nubia. Guiding principles for data monitoring, environmental protection, Transboundary EIA and SIA, disaster management, crosscutting/social issues and stakeholder participation will be covered.

The Legal and Institutional Preconditions and Framework for LNMF will provide an assessment of the **current legal and institutional conditions and necessary adjustments** for the purpose of transboundary management. Alternatives for Institutional set-up, Roles and responsibilities at different levels will also be discussed

6 Institutional Management Framework, Roles and Responsibilities

7 Priority actions

7.1 Capacity Building, Training and Studies

- *Trans-boundary organisations*
- *National government institutions*
- *Research organisations*
- *Local authorities, civil society and local communities*
- *Equipment support*
- *Other*

7.1.1 Technical Investments

- *Sedimentation control*
- *Wind Erosion control*

7.1.2 Investments in Sustainable Livelihood Improvements

- *Agriculture (land reclamation, recover silt as fertiliser)*
- *Forestry (community nurseries and community forestry)*
- *Animal husbandry*
- *Fisheries (dam brug)*
- *Non-agricultural income generation*
- *Social development including gender issues*

7.2 Resources/inputs needed

7.3 Assumptions and Risks

7.4 LNMF implementation arrangements; and legal and institutional framework

7.5 Funding sources and strategies

7.6 Monitoring and Evaluation

7.7 Time Line

7.8 Lake Management Framework