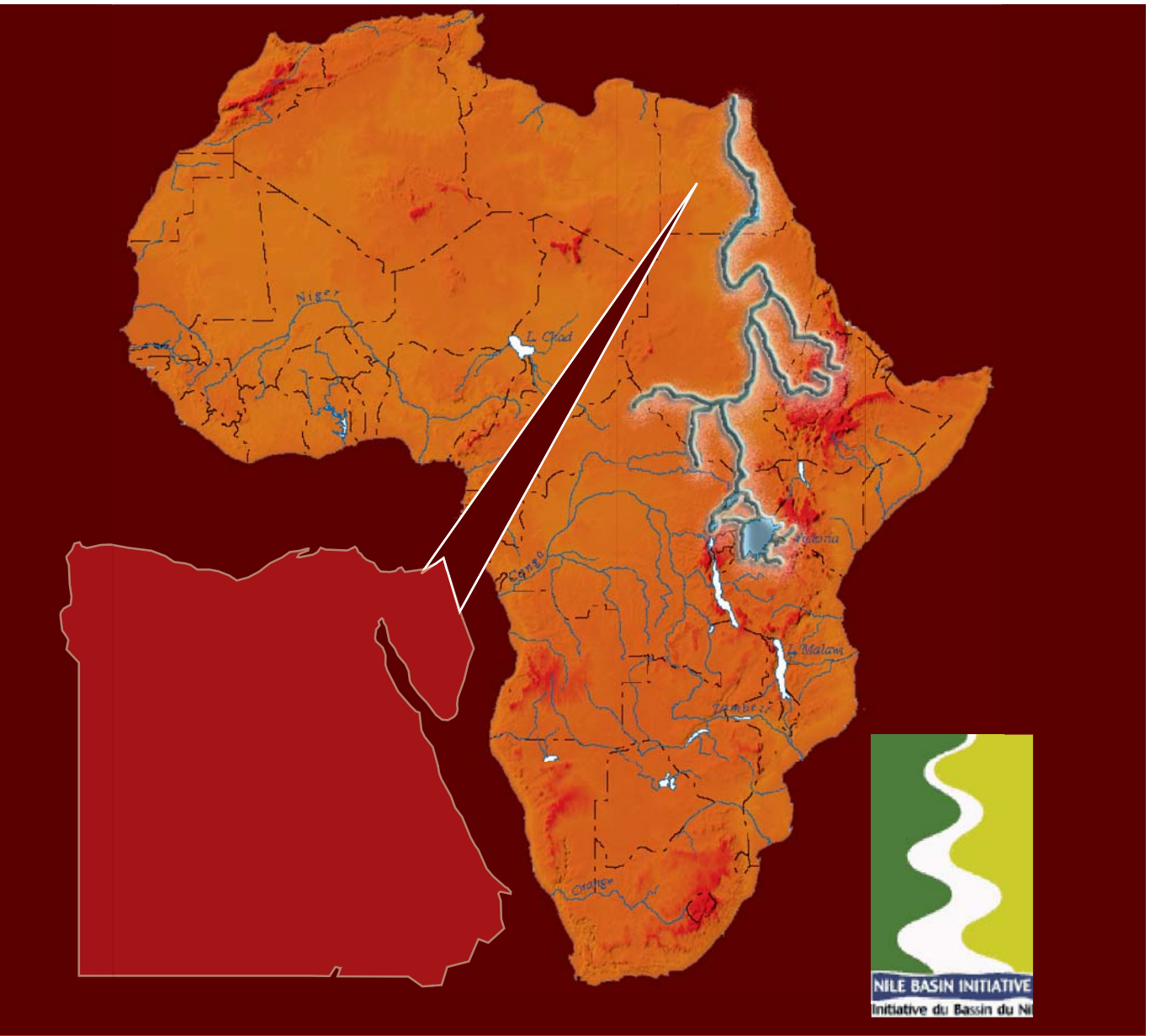
SOCIO-ECONOMIC DEVELOPMENT AND BENEFIT SHARING PROJECT [SDBS]

FINAL REPORT 2008

Physical and Non-Physical Barriers to Cross-Border Trade in the Navigation of the River Nile

EGYPT

PROJECT ID Number: P075952



PMU, SOCIO-ECONOMIC DEVELOPMENT & BENEFIT SHARING PROJECT
NILE BASIN INITIATIVE

SOCIO-ECONOMIC DEVELOPMENT AND BENEFIT SHARING PROJECT [SDBS]

Physical and Non-Physical Barriers to Cross-Border Trade in the Navigation of the River Nile

EGYPT

PROJECT ID NUMBER: P075952

This report was prepared by
Institute of National Planning Team
Supervised by the Director
Prof. Ola El-Hakim
and led by
Prof. Ahmad M. Farahat

Institute of National Planning
Salah Salem St. Nasr City
P.O. Box: 11765, Cairo, Egypt
Tel: 202-2627840, 2620247
Facsimile: 202-2621 151
Email: inplanning@idsc.net.eg
www.inplanning.gov.eg

PMU, SOCIO-ECONOMIC DEVELOPMENT AND BENEFIT SHARING
NILE BASIN INITIATIVE

Nile Basin Initiative
Plot 12 Mpigi Road
P.O. Box 192, Entebbe, Uganda
Tel: +256-414-321-424

First Published 2009

For further information contact: Project Management Unit

PMU, Socio-economic Development & Benefit Sharing
Nile Basin Initiative
Plot 12 Mpigi Road
P.O. Box 192, Entebbe, Uganda
Tel: +256-414-321-424

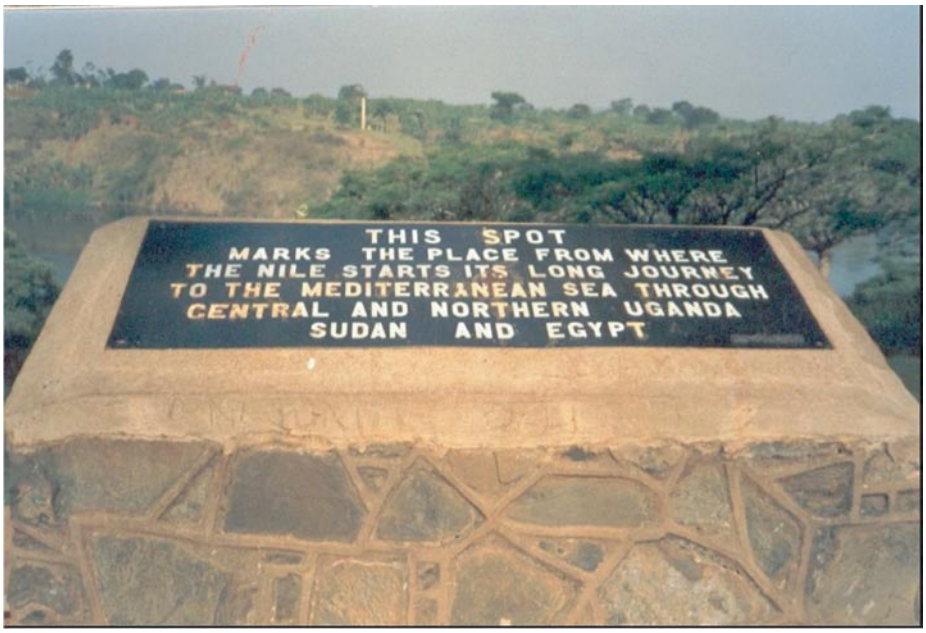
Hellen Natu
Tamene Tiruneh
John Bosco Bampabwire
Peter Nabende
Edith Mbonye
Callist Habaasa
John Baptist Byaruhanga

Contents

List of Figures

List of Tables

Figure 1: Speke's Monument at the Source of the Nile



List of Abbreviations and Acronyms

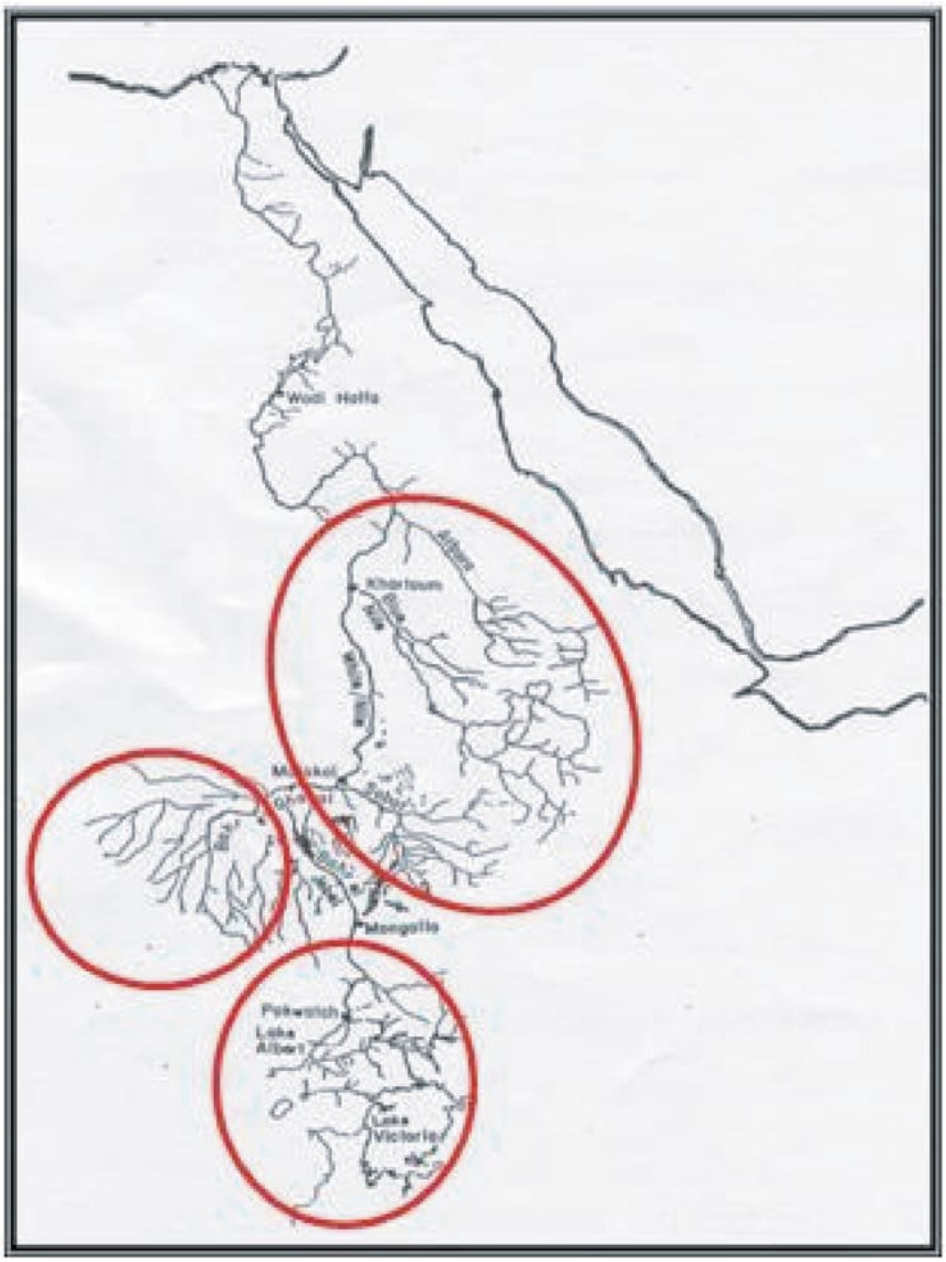
ADB	African Development Bank
BCM	Billion Cubic Meter
CBT	Cross-Bornder Trade
CC	Combined Cycle
CCGT	Combined Cycle Gas Turbine
CI	Collaborating Institution
CN	Concept Note
DRC	Democratic Republic of Congo
DSA	Daily Subsistence Allowance
EEHC	Egyptian Electricity Holding Company
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
EN	Eastern Nile
ENCOM	Eastern Nile Council of Ministers
ENSAP	Eastern Nile Subsidiary Action Programme
ENTRO	Eastern Nile Technical Regional Office
ENTRO PCU	Eastern Nile Technical Regional Office Power Coordination Unit
HPP	Hydro Power Plant
HV	High Voltage
ICCON	International Consortium for Cooperation on the Nile
ICS	Interconnected System
ICTs	Information, Communications Technologies
IDEN	Integrated Development of the Eastern Nile
IMF	International Monetary Fund
JMP	Joint Multipurpose Project
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
M&As	Mergers and Acquisitions
MDGs	Millennium Development Goals

MENA	Middle East, North Africa Countries
MIWR	Ministry of Irrigation & Water Resources (Sudan)
MWR	Ministry of Water Resources (Ethiopia)
MWRI	Ministry of Water Resources and Irrigation (Egypt)
NB	Nile Basin
NBCs	Nile Basin Countries
NBI	Nile Basin Initiative
NEC	National Electricity Corporation (Sudan)
NELCOM	Nile Equatorial Lake Council of Ministers
NELSAP	Nile Equatorial Lakes SAP
NELSAP	Nile Equatorial Lake Subsidiary Action Programme
NG	Natural Gas
NGO	Non-Governmental Organization
NPV	Net Present Value
O&M	Operations and Maintenance
OPEC	Organization of the Petroleum Exporting Countries
PBP	Pay Back Period
PHRD	Policy & Human Resource Development Fund
PI	Participating Institution
PIU	Project Implementation Unit
PSC	Project Steering Committee
RE	Rural Electrification
SAPP	Southern Africa Power Pool
SAPs	Subsidiary Action Programs
SDBS	Socio-economic Development and Benefit Sharing
SSD	Slow speed diesel (TPP)
SV	Shared Vision
TAF	Technical Assistant Fund
TPP	Thermal Power Plant
UA	Unit of Account
UNDP	United Nations Development Programme
WB	World Bank

Acknowledgement

The activities and subsequent results attained in this study would not have come to fruition without the invaluable contribution of various stakeholders. Notably, these include: colleagues in other Participating Institutions, the Nile Secretariat, Shared Vision Programme (SVP) Coordination Unit, SDBS-Project Steering Committee Members, other SVP projects, Subsidiary Action Programmes (NELSAP & ENSAP); the World Bank team, the United Nations Office for Project Services team and Department For International Development team. A word of thanks also goes to all stakeholders in the Nile Basin. Lastly, special appreciations go to the team at the SDBS-Project Implementation Unit for the tireless effort and time invested in guiding this study to a successful conclusion.

Figure 2: River Nile Sources



Executive Summary

In the first forum of the Socio-economic Development and Benefits Sharing (SDBS) project, SDBS Forum1, held in Entebbe, Uganda in the period from 29-31 October 2007, participating institutions of the five clusters presented their scoping studies conducted in 2007, and deliberated on their prospective work plans for 2008. Nine SDBS topics were identified as priority areas. The topics were proposed as a continuation of the scoping activities conducted in 2007 by the respective clusters. Trade Cluster in 2007 was composed of Burundi, Tanzania, Uganda and led by Egypt.

A new clustering scheme, however, was mandated for 2008 by the Project Steering Committee (PSC) in its 3rd Meeting in the period from 19-20 December 2007in Entebbe. This was made up of three clusters as follows:

- Food Security Cluster
  - Kenya, Ethiopia and Sudan
  - Lead PI: Kenya
- Cross-border Trade Cluster
  - Egypt, Tanzania and Uganda
  - Lead PI: Egypt
- Water and Natural Resources
  - Rwanda, DRC and Burundi
  - Lead PI: Rwanda

Specific assignments were allocated to every country within each cluster. For the trade cluster, these assignments were as follows:

- Physical and non-physical barriers to cross-border trade in the navigation of the River Nile– EGYPT
- The impact of regional power trade on poor communities along the interconnections in the Nile Basin Countries.– TANZANIA
- Gender mainstreaming in cross-boundary trade in the Nile Basin countries – UGANDA

Again, the cluster leading responsibility was entrusted to Egypt.

In addition to covering one of the designated SDBS priority areas, the new proposals were required, inter alia, to provide support to the SAPs investment programs. Based on the consultations conducted towards this latter end, it was agreed upon that the work plan of the Participating Institution from Egypt, the Institute of National Planning, should support the power trade interconnection projects of ENSAP administered by ENTRO by conducting a study on the "Implications of the International Fuel Prices on the Feasibility of ENSAP Hydropower Interconnection Projects. The Participating Institution from Tanzania, the Economic Research Bureau (ERB) of Dar Es Salam University, had to support NELSAP by conducting a study on "Rationalizing the use of discount rate for economic analysis of water resources and related projects in NELSAP". Last but not least, the Economic Policy Research Center (EPRC) of Makerere University, the participating institute from Uganda, had to prepare a study in support of NELSAP "Lakes Edward and Albert Fisheries (LEAF) Investment Programme".

Sections one and three of this Final Draft Report gives the SDBS priority as well as the ENSAP supporting studies assigned to INP respectively. Section two gives a Policy Brief based on the outcome of the first SDBS priority study. Section four gives an account of the CBT cluster workshop held in Cairo in the period from 26-27 June 2008 and an up to date status of the issues pursued by the cluster members.

As far as CBT is concerned, the SDBS priority study on the physical and non-physical barriers to navigation in the River Nile revealed that the navigational connectivity of the NB countries through the equatorial lakes might yield quicker results as regards promoting their CBT compared to the River Nile per se. River Nile transport, though very cost effective particularly for large shipments and low value cargo compared to other modes, is largely used for domestic trade inside the country rather than CB trade. CBT through navigation in the Nile would require intermodal ports to bypass physical barriers such as falls, cataracts and rapids. Hence it is believed that tapping

the navigational potentials of the River Nile for CBT development could best be achieved through a North-South multimodal corridor within an integrated normative infrastructural network.

The focus of the study was then directed towards the Equatorial Lakes region. Results based on field studies as well as secondary source information came to the conclusion that the poor state of the ports along the lake shores and landing beaches appears to be the most highly ranked impediment to the expansion of trade across the borders and on the lakes.

Hence, a policy brief to the effect of developing equatorial lake ports is presented in section two of this report. A two-stage implementation strategy is also suggested in this section. The strategy is based on establishing what could be referred to as Nile Basin CBT and Transport Facilitation Committees (NB CBT&TFCs) whose mandate, along the lines recommended by UNCTAD and the World Bank, would be to cooperate and coordinate the multi-faceted aspects of trade promotion and related non-physical barriers such as the non-homogeneity of the Rules of Origin.

In the first years of their operation, the NB CBT&TFCs will be devoted to the equatorial lakes development problem. A generic strategy to develop a sound investment proposal for ports development is suggested based on UNCTAD Handbook for Ports Development. This has to be customized based on the objective conditions of each port.

In support of ENSAP Hydro-Power Interconnection Project, a one day Round Table was organized by INP on 21 July 2008 to deliberate on the various aspects of the project. In their consensus, the Panel arrived at the conclusion that fuel price projections of the feasibility study of the project compared with the actual prices for the years 2007-2008 reveals a significant underestimation. This effectively validates further the viability conclusions arrived at by the consultant. The panel believes that the upward trend of average prices would most likely continue in the future, though at slower rates. The cost of externalities and their effect on the benefits were not properly

addressed in this phase. This would be another additional factor in support of the project viability. Section three of this report gives the consensus of the Panel in addition to a study on the prices of the Egyptian Natural Gas which was regarded by the consultant as a governing factor in the profitability of the project to Egypt.

In Section Four of the report, a highlight of the activities of the other CBT cluster members is given. The Economic Policy Research Center, the Participating Institute from Uganda for instance generated three key outputs. A study report on gender mainstreaming in cross border trade in the Nile Basin Countries, an integrated investment strategy to mainstream men, women and youth in cross border trade in the Nile Basin Countries, and an investment strategy to enhance livelihoods among the people of the Lakes Edward and Albert basins.

Economic Research Bureau of Tanzania had in their preliminary findings the lack of focus that had been given to the vulnerable communities benefit maximization of the power interconnections of the ENSAP. Focus had been on the cost minimization and risk reduction. Therefore, ERB in its Phase II contributed to the strategy for vulnerable communities benefit maximization in the ENSAP countries.

A detailed account of these outputs could be found in the respective reports of the other cluster members.

Section A

Physical and Non-physical Barriers to Cross Border trade in the Navigation in the River Nile

Figure 3: The old Egyptian Barque navigating the Nile

1

Introduction

1.1 Background

"Alleviation of Physical and Non-Physical Barriers to Cross-Border Trade" was one of the afore-mentioned nine SDBS priority areas scoped out in 2007 and discussed in the SDBS Forum1. During the ensuing consultations it was agreed to limit the research topic in 2008 to those barriers to the navigation in the Nile.

The Scoping Study of 2007 has pointed out that trade has long been claimed as the vehicle for development. Attention, however, should be directed towards the translocation of goods and services. Distribution of goods and services plays a key role in trade. The distribution potential, however, will not be triggered and materialized unless the physical and non physical barriers to trade flows are reduced and eventually eliminated.

Physical and non-physical barriers could alternatively be classified into hard and soft measures respectively. Hard measures are normally long–range capital intensive measures. Soft measures are not highly intensive in capital though they need a lot of government policies and administration. The former measures are directed mainly towards infrastructure to facilitate the physical flow of traded goods. Chief among these are transport infrastructure and power interconnection infrastructure. The latter includes measures/regulations that contribute to the smooth flow of cargo. They range from the international legal instruments that regulate cargo flow between and through countries to the national and regional measures serving this purpose especially the Rules of Origin.

1.2 Study Objectives

Based on the above and in view of the agreed proposal of this endeavor, the objectives of this study could be articulated as follows:

i Characterize physical and non-physical barriers to cross border trade in the navigation of the River Nile;

ii Identify and assess existing policies;

iii Suggest recommendations and policy interventions, making them relevant for the reduction of physical and non-physical barriers to cross border trade in the navigation of the River Nile

1.3 Suggested Methodology and Instruments of Analysis

The starting point in this research was desk work in an attempt to compile base information on the subject. Literature is abundant from credible sources on the net and encyclopedia. Some transport related initiatives and programs are administered by international and regional institutions.

The desk work together with a set of relevant detailed maps resulted in the identification of a list of obvious barriers on the Nile and Equatorial Lakes. Simple analytical tools were applied that aimed at determining the area of focus in the subsequent stages.

The CBT Cluster Workshop held in the 26th and 27th of June in Cairo was a good opportunity for reviewing and discussing with cluster members and PMU the preliminary results of the previous analysis and the road ahead.

Based on the above, a field survey plan was prepared to compile primary data and information on policies and practices on the ground. The field survey was conducted by a consultant from the region according to a specified TOR in the period from 10 August to 5 September[1]. Meanwhile more specific information was continued to be compiled to cover the relevant aspects of intended study.

1 Dr. Patrick Machyo, School of Economics, University of Nairobi, KENYA

2

Navigational Potential and Physical Barriers

2.1 The Main Nile Course

2.1.1 General Description

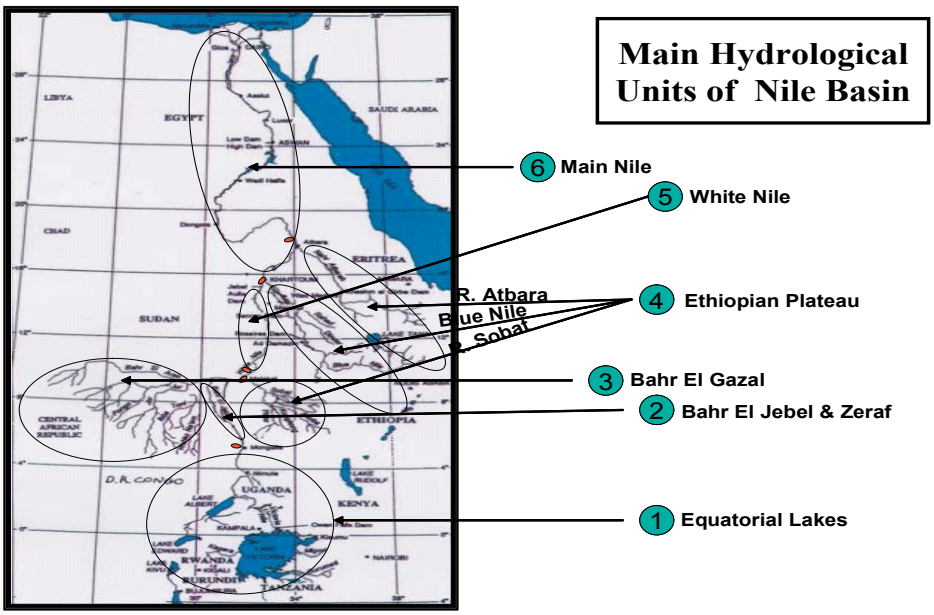
Main Hydrological Units of Nile Basin

The Nile River, with an estimated length of over 6800 km, is the longest river flowing from south to north over 35 degrees of latitude. It is fed by two main river systems: the White Nile, with its sources on the Equatorial Lake Plateau in Burundi, Rwanda, Tanzania, Kenya, Democratic Republic of Congo (DRC) and Uganda, and the Blue Nile, with its sources in the Ethiopian Highlands.

The sources are located in humid regions, with an average rainfall of over 1000 mm per year. The arid region starts in Sudan with fertile clay-plains where 400 to 800 mm of rain falls annually; and the desert northern third of the country where rainfall averages only 20 mm per year. Further north, in Egypt, precipitation falls to less than 20 mm per year.

For DRC, the Nile basin forms only a very small part of their territory. Other countries, like Burundi, Rwanda, Uganda, Sudan and Egypt, are almost completely integrated into the Nile basin. However, all the waters in Burundi and Rwanda and more than half the waters in Uganda are produced internally, while most of the water resources of Sudan and Egypt originate outside their borders: 77% of Sudan's and more than 97% of Egypt's water resources. Moreover, these latter two countries already use nearly all of the water currently allocated to them.

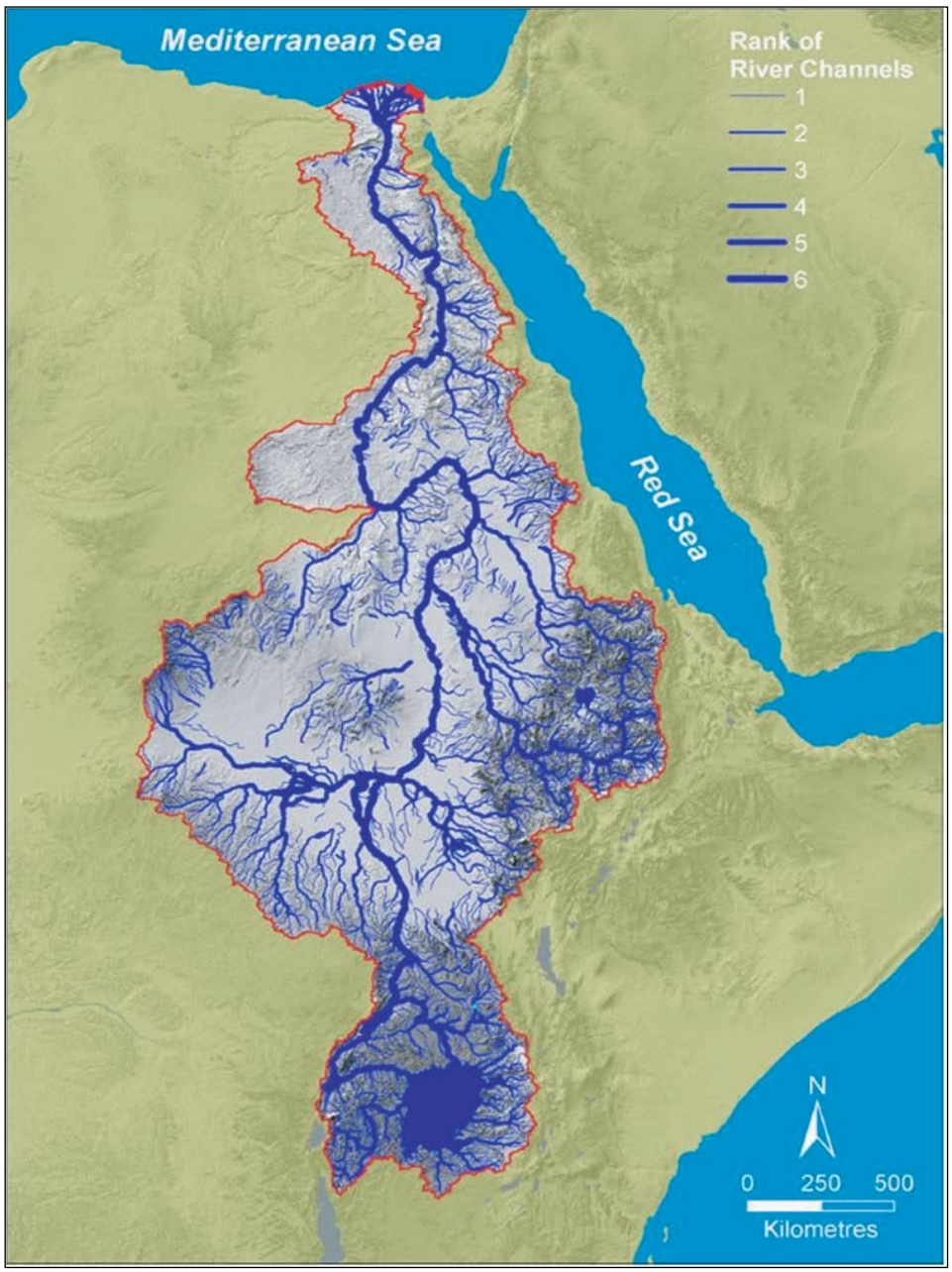
Figure 4: The Main Hydrological Units of the Nile Basin



The Nile River is principally sourced by two great rivers; the Blue Nile and the White Nile. The most distant source from the sea is the Luvinzora River in Burundi, a tributary of the Kagera River. The Kagera River forms the border between Rwanda and Tanzania, then between Uganda and Tanzania and then flows into Lake Victora, Total flow into the lake is about 20 km3/year, of which 7.5 km3 from the Kagera River, 8.4 km3/year from the forest slopes in the north-east (Kenya), 3.2 km3/year from the drier Serengeti Plains in the south-east (Tanzania) and from 1 to 2 km3/year from the swamps in the north-west (Uganda).

The contribution of the rivers of the Ethiopian catchment area (Blue Nile system) to the Nile is about twice the contribution of the rivers of the Equatorial Lake Plateau catchment area (White Nile system), but it is characterized by the extreme range in discharges between the peak and low periods, while the flow from the Equatorial Lake Plateau is more uniform. At its peak the former provides nearly 90% of all water reaching Egypt, the latter only 5%. During the months with low flow the contributions are nearer 30% and 70% respectively.

Figure 5: The Nile Basin



2.1.2. Navigation on the Nile

The Nile River is still a vital waterway for the transportation of people and goods, especially in the flood season when motor transport is not feasible; river steamers still provide the only means of transport facilities in most of the area.

Definitions[2]

Waterway

A waterway is any navigable body of water. These include rivers, lakes, oceans, and canals. In order for a waterway to be navigable, it must meet several criteria:

- The waterway must be deep enough to allow the draft depth of the vessels using it;
- The waterway must be wide enough to allow passage for the beam width of the vessels using it;
- The waterway must be free of barriers to navigation such as waterfalls and rapids, or have a way around them (such as canal locks);
- The current of the waterway must be mild enough to allow vessels to make headway.

Tidal Waterway

A tidal waterway is one open to the sea and far enough downstream to be subject to twice-daily reversals of flow and variation in depth. Non-tidal waterways are either far enough upstream to be beyond tidal effects, or are separated from the sea or the tidal stretch of the same waterway by a barrier (usually a navigation lock).

Canals

Canals are waterways that are constructed to provide a new path of travel for vessels (as opposed to improving a natural waterway along its current course). At one time, canals were built mostly for small wooden barges drawn by horses or other draft animals. Today, major canals are built to allow passage of large ocean-going vessels.

Vessels

Vessels using waterways vary from animal-drawn barges to immense ocean tankers and ocean liners, such as cruise ships.

2 http://en.wikipedia.org/wiki/Waterway

Navigable Areas[3]

The first navigable area is from Egypt's border to the southern end of Lake Nasser. The second portion is between the third and fourth cataract and the third goes from Khartoum south to Juba. The third navigable section is the most important.

Steamers on the Nile River[4]

Regular steamship service is maintained on the Nile between Alexandria and Aswan; the Blue Nile is navigable June through December from Suki (above Sennar Dam) to Roseires Dam; the White Nile is navigable all year between Khartoum and Juba in Sudan and between Nimule and Kabalega (formerly Murchison) Falls on the Victoria Nile. Steamers on the Nile River serve as the only means of transportation for goods and people during the flood season in parts of The Sudan. Between May and November road transportation is not possible in this region. In the Sudan alone, 2,400 miles are served by steamer service along the Nile and its tributaries. Portions of the Blue Nile are navigable only when the river's water level is high. Other sections of the Nile are served by steamers on a seasonal basis. In the Sudan the river is only navigable in three portions due to the cataracts that occur north of Khartoum.

As the Nile continues through Egypt its waters are utilized by shallow-draft steamers and sailing vessels as far as Aswan. Smaller boats are found throughout the remainder of the Nile and the delta waterways as they lead to the Mediterranean Sea.

2.1.3. The Cataract Nile and the Great Bend[5]

Two things define the Nile for almost 2000 km from Khartoum to Aswan: the cataracts and the great bend.

The cataracts hinder navigation of the Nile, and have done so for thousands of years. The ancients used the strong north winds to sail up the Nile in Egypt,

3 http://www.mbarron.net/Nile/navtrans.html
4 http://library.thinkquest.org/16645/the_land/nile_ntn.shtml
5 http://www.utdallas.edu/geosciences/remsens/Nile/CataractLoop.html

but this could not carry them over the cataracts. Instead, the boat would have to be dragged up the cataract by teams of men, often with great difficulty.

The cataracts are sections where the river tumbles over rocks and have long kept boats from going up and down the river from Equatorial Africa to Egypt. There are six classical cataracts, but there are really many more. The cataracts are also significant because these define river segments where granites and other hard rocks come down to the edge of the Nile. The floodplain is narrow to nonexistent here, and opportunities for agricultural development are correspondingly limited. These two reasons - navigation obstacles and restricted floodplain - are the most important reasons why this part of the Nile is thinly populated and why the historic border between Egypt in the north and Nubia or Sudan in the south is the First Cataract at Aswan.

The great bend is one of the most unexpected features of the Nile. For most of its course, the Nile flows inexorably north, but here in the heart of the Sahara; it turns southwest and flows away from the sea for 300 km before resuming its northward journey. This deflection of the river's course is due to tectonic uplift of the Nubian Swell over the past hundreds of thousands of years. This uplift is also responsible for the cataracts - if it were not for recent uplift, these rocky river stretches would have been quickly reduced by the abrasive action of the sediment-laden Nile.

2.1.4. The Cataract Nile

The cataracts hinder navigation of the Nile, and have done so for thousands of years. The ancients used the strong north winds to sail up the Nile in Egypt, but this could not carry them over the cataracts. Instead, the boat would have to be dragged up the cataract by teams of men, often with great difficulty.

The best description of cataracts comes from 'The River War', written in 1899 by Winston Churchill, then 25 years old. The book details the exploits of the British in 1896 through 1898 to return to the Sudan after they were chased out by the Sudanese people in 1885. The British tried to reconquer the Sudan by sailing in gunboats up the Nile, so they were very interested in how the water

flowed through the cataracts. They knew that the only time that ships could move upstream through the cataracts was during the summer flood, and then only with great difficulty.

Churchill describes the Second Cataract (now submerged beneath Lake Nasser) as being about 9 miles long and having a total descent of sixty feet. The river flowed over successive ledges of black granite. During the summer floods, the Nile flowed swiftly but with an unbroken surface, but the granite ledges were exposed when the annual flood abated. During this time, Churchill reported that the river tumbled violently from ledge to ledge, its entire surface for miles churned to white foam.

There are several other small cataracts between the Second and the Third Cataracts (Churchill shows cataracts near Semna, Ambigol, Tanjore, Okma, and Dal) but none of these posed any problems to the British moving upstream.

According to Churchill, the Third Cataract is "a formidable barrier." There is smooth water for 200 miles upstream from this in all seasons. The Fourth Cataract lies in the Monassir Desert, and Churchill reported the following about this portion of the Nile: "Throughout the whole length of the course of the Nile there is no more miserable wilderness than the Monassir Desert. The stream of the river is broken and its channel obstructed by a great confusion of boulders, between and among which the water rushes in dangerous cataracts. The sandy waste approaches the very brim, and only a few palm-trees, or here and there a squalid mud hamlet, reveal the existence of life." The British gunboats El Teb and Tamai in 1897 attempted to go up the river at the Fourth Cataract, but in spite of being helped by 200 Egyptians and 300 tribesmen, the Tamai was swept downstream and almost capsized in the great rush of water. Four hundred more tribesmen were assembled to help the El Teb, which capsized and carried off downstream.

The Fifth and Sixth Cataracts are regions of swift and rough water, but can be navigated all year round.

In Sudan there are four of the five Cataracts, which exist today. There used to be six of them, but the 2nd Cataract was flooded by the water of Lake Nasser when it was created. The 6th Cataract is about 70 km to the north of Khartoum. Here the Nile goes through an area with beautiful rocky granite and round formations, that gradually go into the desert, forming kilometres-long gorges called "Sabaloka gorges". The 4th Cataract is located more to the north along the Nile when the river flows southwards near the town of Karima. Rocky granite formations follow one another and among them the Nile flows forming several rapids that make navigation impossible. The rocks form several islands and the river is divided in different branches. On the banks among the rocks there are small villages whose inhabitants till small fields pulled away from the desert sand. The 3rd Cataract, the northern-most one, presents also interesting rocky formations. In ancient times this was the border between Egyptian and Nubian kingdoms.

Table 1: The Nile Cataracts in the Reach of Khartoum - Aswan

SITE	Distance In km From Khartoum	Length In km	Drop In ms
6th Cataract (Sabaloka)	80-90	15	Undefined
5th Cataract (Shurake)	415-435	20	8
Abu-Dees Cataract	520-532	12	5
Abu-Hamad Cataract	633-660	27	18
4th Cataract (Marawi)	705-805	100	33
3th Cataract	1150-1170	20	11
Kagbar Cataract	1210-1215	5	3
Dalgo Cataract	1230-1236	6	20
Abree Cataract	1305-1359	54	10
Dal Cataract	1378-1402	24	12
Tenger Cataract	1420-1432	12	10
Aygool Cataract	1436-1448	12	10
Kagnig Cataract	1468-1473	5	5
2th Cataract	1480-1495	15	15
TOTALS		327	160

2.1.5. Nile Transportation in Egypt[6]

The history of Egypt is totally dominated by the River Nile. At one time nearly all transportation was by boat along the river. Consequently it was always thought that gods would travel by boat - or barque as it was called. The souls of the dead also traveled by barque to the afterlife.

Four decades of neglect have left an indelible mark on the nation's once-vibrant river transport system. In the 1960s, the Nile carried about 20 percent of Egypt's inland transport[7] one of the country's largest freight shippers. Today, river transport accounts for less than one percent of the trade volume. By contrast, railways and roads carry 3.5 and 95 percent of total cargo, respectively.

Impediments to Navigation

The river has 1,770 kilometers of navigable waterway, yet no public ports or dry docks. Furthermore, the 42 cargo ports on inland waterways, most of which are very basic, are privately owned by factories and have no rail or road connections.

From Aswan to Cairo the Nile is wide and deep, allowing barges to travel with little hindrance. The problems begin just north of Cairo, where the Nile divides into smaller branches that flow through the Delta to the Mediterranean Sea. Shippers complain about the river's neglected condition, particularly on the segments from Cairo to Alexandria and from Cairo to Damietta. "There are rocks, sometimes dead animals and lots of [debris]" obstructing the route[8].

A series of locks has been constructed on these two segments to regulate water depth and allow ships to pass sections that would otherwise be too shallow. Ships must pass seven locks on the westerly route from Cairo to Alexandria, which uses the Nubariya Canal, a shipping and irrigation canal that intersects the Nile's Rosetta branch near Kafr Bulein. The naturally formed eastern route from Cairo to Damietta has three locks.

6 http://www.amcham.org.eg/Publications/BusinessMonthly/October%2007/coverstory.asp

7 Estimated by Hamdy Barghout, Business Development Director at EgyTrans

8 [8] Fathalla Mohamed Abdel Aziz, Vice President of National Shipping & Investment, an Alexandria-based shipper

Mechanical difficulties can delay a ship's journey. The locks are lots of trouble to pass. Normally, in each lock there are two entrances, but most of the time one of them is under repair or broken. Shippers also complain about the lack of navigational aids, beacons and lanterns, which restricts travel on the Nile to the daylight hours. At night, you put your ropes on a tree or something. There are no docks to berth for repair or to make storage for cargo.

As a result of these obstacles, the trip between Alexandria and Cairo can take up to three days. The 1,900-kilometer stretch between Cairo and Aswan can take nearly three weeks and it can be a lonely trip.

The government has a virtual monopoly on Nile logistics through the state-owned River Transport Company. Most private freight operators prefer to operate land transport from Egyptian seaports. Only shipments too large to fit on trucks are transported by barge.

Potentials for increasing Nile transport

The potential for increasing Nile transport is enormous, but so are the challenges. There are signs that the tide is changing. Policymakers seeking solutions to the dramatic increase in road traffic, accidents and pollution that have accompanied the increased reliance on land transport are reassessing the role of the Nile. River transport, it has been recognized, is a cost-effective, safe and environment-friendly alternative to trucking.

According to a recent United Nations Development Programme (UNDP) study on Egypt's transportation sector, river barges require 30 percent less fuel than trucks to haul the same payload. Less fuel translates into cleaner operation and cheaper costs. The study determined that hauling 1,000 tons one kilometer costs LE 0.05 by river, compared to LE 0.07 and LE 0.14 for railways and trucks, respectively.

The cost advantage is amplified when transporting large payloads, which can be loaded on a single barge rather than a small fleet of 40-ton trucks. "[The river] is suitable to transport [cargoes of] untraditional weights and dimensions[9]. For example, if the [cargo] weight is 400 tons you can't move it by truck; you

9 Karim Aboul Kheir, Chairman, River Transport Authority (RTA), Ministry of Transport

have to move it by barge. You can put 400 tons on one barge and move it. For this reason, the Nile is ideally suited for transporting bulk cargo from Upper Egypt to Cairo such as phosphate, clay, petroleum and construction materials, he says. Other common cargoes include coal, fertilizer, grain and timber.

The river is better suited for the transportation of high-value, non-perishable goods. "You can transport [fragile] goods because boats have a low mechanical effect compared to trucks[10]. Goods can be moved from one river port to another or from river ports to seaports, truck depots or rail terminals. With the river, you can distribute goods to certain points, and then move them onto the highways from there.

Existing Inter-modal Facilities

At present, however, no inter-modal facilities exist on the Nile. A July 2007 study, "Maritime Transport and Related Logistics Services in Egypt"[11] identified several obstacles to achieving river linkages to road and rail networks. One reason is that a standard legal framework for liability and insurance of intermodal carriers does not exist in Egypt. "Liability terms are still negotiated on a case-by-case basis in contracts between various parties involved in the door-to-door trips. This lack of standardization results in different interpretations of contracts and creates legal problems associated with uncertainty," the study noted.

Another wrinkle is an outdated customs regulation that requires that a separate letter of guarantee be issued if cargo is to change modes. This would lead to extra costs and extra loss of time. This situation overrides the principal aim of intermodal transport, which is to move goods to their destination on time, in good condition and at as low a price as possible. An intermodal system requires a high-quality fleet of trucks. Yet, the report describes Egypt's fleet as suffering from weak maintenance, overloading, old age, high prices and inefficient services. Furthermore, local fleets are not made for container transport. Instead, shippers use modified flatbed trucks, which the report calls an "unsafe and inefficient method."

10 Ghada Hamouda, Transportation Consultant
11 Ahmed Ghoneim and Omneia Helmy, Egyptian Center for Economic Studies (ECES), July 2007

Investment in the infrastructure of navigation

Fortunately, it is significantly cheaper to develop the infrastructure of river transport than road networks. According to one Ministry of Transport estimate, the cost of developing 1,500 kilometers of waterway would be around LE 840 million, whereas a road of similar length would cost LE 3 billion. In 2002, the Ministry of Transport allocated LE 750 million for river transport development projects under a five-year plan. Most of this has gone into improving the river's infrastructure by dredging channels, building and repairing locks and ports, and placing navigational aids on the river. Nearly 90 percent of these projects have already been completed while others are under construction or planned for a future date[12].

With infrastructure improvements under its belt, the RTA is now preparing to provide land for investors to build and manage a network of river ports. Calls for tender will be held for nine ports in February 2008: Qena, Sohag, Assiut, Minya, Tebbin, Qalioubiya, Daqahliya and two near Alexandria. There will be large ports, big enough for four or five barges to dock at the same time.

An international tender was held and EgyTrans was selected from 22 finalists to build and operate Athar Al Nabi port. A 20-year BOT concession agreement was signed between the company and the Ministry of Transport in July 2000. EgyTrans, an integrated cargo carrier, sought the contract because it recognized the worldwide trend towards containerization. This would be the first container port on the Nile, and its location would make it a contender for a slice of the capital's growing volume of container shipments. About 65 percent of incoming container cargo passes through Cairo, and 80 percent of outbound cargo, he points out.

The port's size – about 57,000 square meters on a narrow estuary – was relatively small but its capacity could increase significantly if the space were managed properly But development plans ground to a halt as a standoff ensued with a group of produce vendors who in the years since Athar Al Nabi had ceased to operate as a river port had turned the unused docks into a fruit and vegetable market. Attempts to remove the unlicensed vendors from the earmarked land failed.

12 Karim Aboul Kheir, Chairman, River Transport Authority (RTA), Ministry of Transport

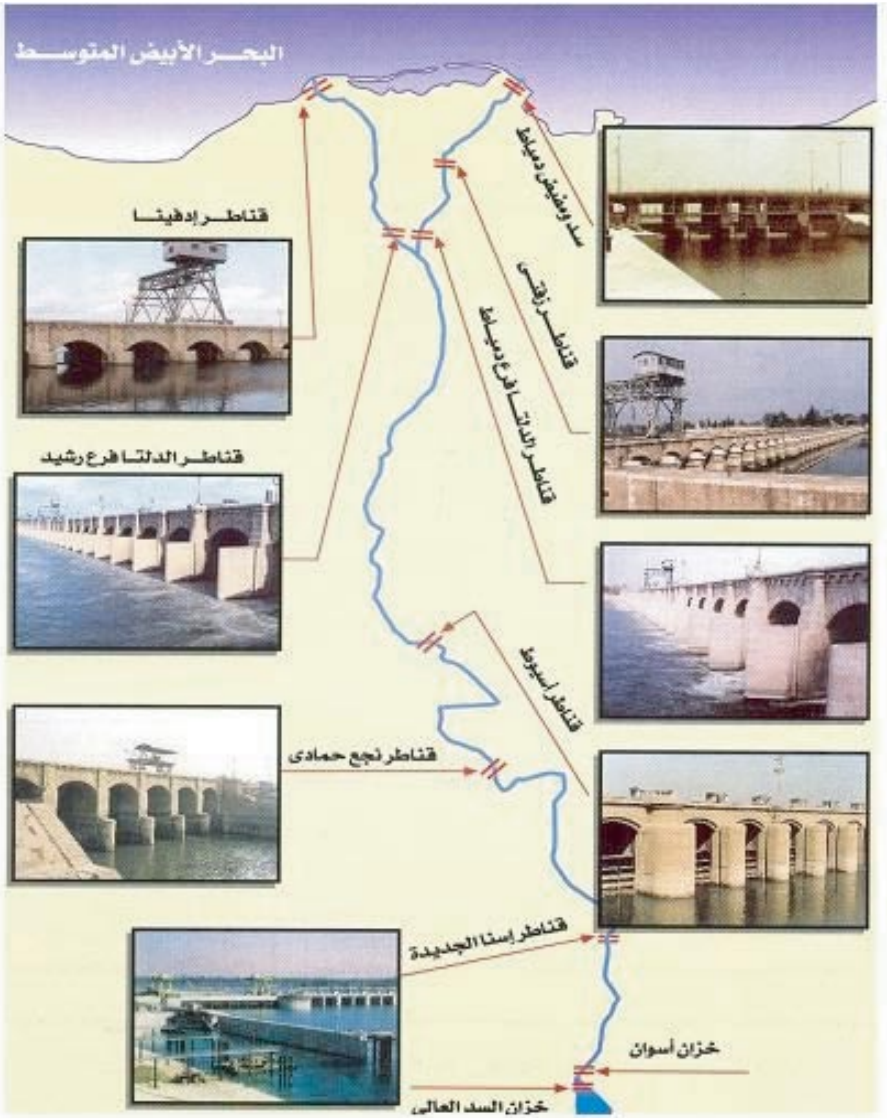
On the Cairo to Damietta route, dredging has deepened the river to 2.3 meters and new locks at Zefta and Delta have been built to replace the existing weirs and locks that date back to the 1930s. The projects were completed at a cost of approximately LE 260 million.

On the Cairo to Alexandria route, the RTA recently issued contracts for upgrading two locks. The Maleh lock is being elongated by Orascom Construction Industries to extend into the Mediterranean at a cost of LE 90 million. Arab Contractors, meanwhile, is building a three-gate lock 100 kilometers upstream beside the existing one on the Nubariya Canal at a cost of LE 322 million. Work on the two locks is expected to be completed within three years. The new locks are necessary to accommodate container ships, which are much bigger than the river barges currently in use. Each will be able to accommodate vessels up to 11 meters in width and 100 meters in length – large enough for the 1,000-ton barges the RTA hopes will one day transport goods up and down the river.

On the Cairo to Aswan route, where water depth is less of a problem, over 70 percent of the river channel has been cleared of obstacles at a cost of LE 116 million. The Dutch have provided LE 8 million in grants to install lighthouses, beacons and buoys to make this section of the river navigable 24 hours a day. Nearly 200 fixed lighthouses and 400 floating buoys are already in place between Cairo and Assiut, and work has now moved to the Assiut to Aswan stretch. See sketch of barrages and main canals along the Nile.

A similar project in the Delta has positioned nearly 300 lighthouses and 16 buoys on the Alexandria to Cairo route. Despite the new navigational aids, the ban on traveling at night has not yet been lifted as lanterns and batteries are being stolen from sections of the Nile Delta. RTA is discussing this problem with the police. Freight companies that have until now worked exclusively on Egypt's sea or highways are now carefully studying the Nile waterway. Investors see opportunities in barge building, port management and logistics – but are waiting for the government to put the infrastructure in place. The potential is there, they agree, but changes must be visible first.

Figure 6: The system of barrages along the Nile in Egypt



2.1.6. Nile Transportation in Sudan[13]

Steamers on the Nile River serve as the only means of transportation for goods and people during the flood season in parts of the Sudan. Between May and November road transportation is not possible in this region. In the Sudan alone, 2,400 miles are served by steamer service along the Nile and its tributaries. Portions of the Blue Nile are navigable only when the river's water level is high. Other sections of the Nile are served by the steamers on a seasonal basis.

13 http://library.thinkquest.org/16645/the_land/nile_ntn.shtml

In The Sudan the river is only navigable in three portions due to the cataracts that occur north of Khartoum. The first navigable area is from Egypt's border to the southern end of Lake Nasser. The second portion is between the third and fourth cataract, and the third goes from Khartoum south to Juba. The third navigable section is the most important. As the Nile continues through Egypt its waters are utilized by shallow-draft steamers and sailing vessels as far as Aswan. Smaller boats are found throughout the remainder of the Nile and the delta waterways as they lead to the Mediterranean Sea.

The Nile River, traversing Sudan from south to north, provides an important inland transportation route. More than 4,000 kilometers of navigable waterways centered on the Nile and its tributaries, but only about 1,700 kilometers are navigable year-round Its overall usefulness, however, has been limited by natural features, including a number of cataracts in the main Nile between Khartoum and the Egyptian border, variations in seasonal flow, a series of dams, and the Sudd, the vast papyrus-choked swamp on the upper part/course of the river.

The White Nile to the south of Khartoum has shallow stretches that restrict the carrying capacities of barges, especially during the period of low water, and the river has sharp bends. Most of these southern impediments have been eliminated by Chevron, who as part of their oil exploration and development programme, dredged the White Nile shoals and established navigational beacons from Kusti to Bentiu. Since the mid-1980s, security problems associated with the rebellion in the South have hindered navigation south of Malakal

A greater impediment has been the spread of the water hyacinth, which impedes traffic. Man-made features have also introduced restrictions, the most important of which was a dam constructed in the 1930s on the White Nile about forty kilometers up river from Khartoum. This dam has locks, but they have not always operated well, and the river has been little used from Khartoum to the port of Kusti, a railroad crossing 319 kilometers upstream. The Sennar and Roseires dams on the Blue Nile are without locks and restrict traffic on that river.

In 1983 only two sections of the Nile had regular commercial transport services. The more important was the 1,436-kilometer stretch of the White Nile from Kusti to Juba (known as the Southern Reach), which provided the only generally usable transport connection between the central and southern parts of the country. Virtually all traffic, and certainly scheduled traffic, ended in 1984, when the SPLA consistently sank the exposed steamers from sanctuaries along the river banks. River traffic south of Kusti had not resumed in mid- 1991 except for a few heavily armed and escorted convoys.

At one time, transport services also were provided on tributaries of the White Nile (the Bahr al Ghazal and the Jur River) to the west of Malakal. These services went as far as Wau but were seasonal, depending on water levels. They were finally discontinued during the 1970s because vegetation blocked waterways, particularly the fast-growing water hyacinth. On the main Nile, a 287-kilometer stretch from Kuraymah to Dunqulah, situated between the fourth and third cataracts and known as the Dunqulah Reach, also had regular service, although this was restricted during the low-water period in February and March.

Transport facilities on both reaches were operated after 1973 by the parastatal (mixed government and privately owned company) River Transport Corporation (RTC). Before that they had been run by the SRC, essentially as feeders to the rail line. River cargo and passenger traffic have varied from year to year, depending in large part on the availability and capacity of transport vessels. During the 1970s, roughly 100,000 tons of cargo and 250,000 passengers were carried annually. By 1984, before the Southern Reach was closed, the number of passengers had declined to less than 60,000 per year and the tonnage to less than 150,000. Although no statistics were available, the closing of the Southern Reach had by 1990 made river traffic insignificant.

Foreign economists have characterized the RTC's operations as inefficient, a result both of shortages of qualified staff and of barge capacity. The corporation had a virtual monopoly over river transport, although the southern regional government had established river feeder transport operations, and private river transport services were reported to be increasing until the resumption of

the civil war. Despite its favored position, the RTC and its predecessor (SRC) experienced regular losses that had to be covered by government appropriations. In the late 1970s, the corporation procured new barges, pusher-tugboats, and other equipment in an effort to improve services, but this attempt proved useless because of the warfare that had continued from 1983.

2.2 Equatorial Lakes

The previous chapter, chapter 4, was devoted to navigational potentials and physical barriers of the River Nile in Egypt and Sudan. This chapter is a continuation to the previous chapter as it focuses on the navigational potentials and physical barriers of Equatorial Lakes. The following sections describe the physical characteristics and main physical barriers of the six major equatorial Lakes: Victoria, Kyoga, Tanganiyika, Kivu, Edward and Albert.

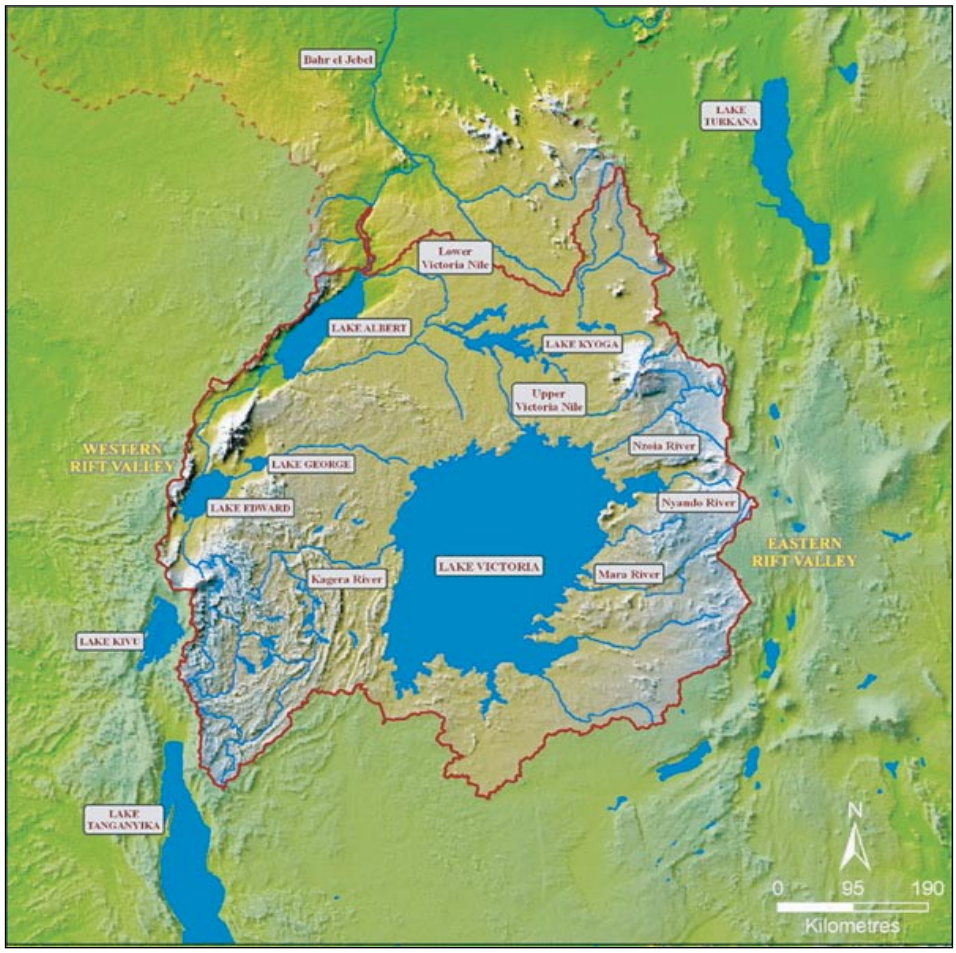
2.2.1 Lake Victoria

Description

Lake Victoria, the largest of all African lakes, is also the second widest freshwater body in the world covering 68,800 km2. The lake is shared by Kenya (6% by area), Uganda (43%) and Tanzania (51%). It has a mean depth of 40m, maximum depth of 84m, shoreline of 3,450km, a water retention time of 140 years and a catchment area of 194,200km2, which extends into Rwanda and Burundi. (LVFO, 2008)

Its extensive surface belongs to the three countries; the northern half to Uganda, the southern half to Tanzania, and part of the northeastern sector to Kenya. The lake occupies a wide depression near the equator, between the East and West Great Rift Valleys, but its drainage basin is relatively small, being slightly less than three times the lake's surface in area. The lake water is drained at a rate of about 600 m3 sec, at Jinja on the northern shore, into the Victoria Nile which flows northward via Lake Albert and the White Nile forming the uppermost reaches of the Nile River. (ILCEC,)

Figure 7: Equatorial Lakes Basin



The lake shore is highly indented, and there are many isles in the lake, some of which, especially the Sesse Group, are known for their beautiful landscape, health resorts and sightseeing places. There are a number of coastal towns such as Kisumu (Kenya), Entebbe (Uganda), Bukoba, Mwanza and Musoma (Tanzania), connected with each other by ship routes and also to the cities of the Indian Ocean coast by railways. (ILCEC,). Names of the main islands are: Ukerewe, Sesse, Ukara, Kome, Lolui and Mfanganu.

Lake Victoria (lying 0o 21'N – 3o 0'S) is, by area, the second largest lake in the world and the largest in Africa. It lies at an altitude of 1134m above sea level, and has a surface area of 68,800 km2 and a catchment area of 184,000 km2.

The lake is relatively shallow, with maximum depth of 80-90 m (Johnson et al., 2000). Kenya, Uganda and Tanzania border the lake and share 6%, 43% and 51%, respectively, of the Lake surface.

The lake region has two major rainy seasons: March to May and October to December, with, in some areas, a subdued rainfall peak in August (Nicholson, 1996). It also experiences a five to six year variability in rainfall related to the "El-Niño-Southern Oscillation" (ENSO) (Ropelewski and Halpert, 1987; Ogallo, 1989).

The lake is relatively shallow and has an intricate and highly indented shoreline of more than 3,500 km, as well as numerous islands, shallow bays and connecting channels, and extensive areas of wetlands. The water balance is dominated by rainfall on the lake and evaporation, and River Nile outflow, with river inflow making minor contributions (Spigel and Coulter, 1996). The Kagera River contributes about 7% of the total inflow. More than 80% of the water is derived directly from rain onto the lake surface, and evaporation from the lake itself accounts for a significant amount of its annual water loss (Johnson et al., 2000).

Ports on Lake Victoria

Lake Victoria has six main ports and various cluster ports. The main ports are Mwanza North Port, Mwanza South Port, Nansio Port, Bukoba Port, Kemondo Bay Port and Musoma Port. The cluster ports are Kinesi, Shirati (Sota), Nyamirembe, Chato, Buchezi, Bukondo, Nungwe Bay, and other cluster/calling ports include Kahunda, Maisome, Kome Ntama, Kome Mchangani, Lushamba, Irigamba, Luhama, Maharamba and Itabagumba. (TPA, 2005).

Figure 8: Ports on Lake Victoria

2.2.2 Lake Kyoga

Description

Lake Kyoga is a large shallow lake complex of Uganda, about 1,720 km² in area and at an elevation of 914 m. The Victoria Nile flows through the lake on its way from Lake Victoria to Lake Albert. The main inflow from Lake Victoria is regulated by the Nalubaale Power Station in Jinja. Another source of water is the Mount Elgon region on the border between Uganda and Kenya. While Lake Kyoga is part of the Great Lakes system, it is not itself considered a Great Lake. Lake Kwania is nearby.

The lake complex reaches a maximum depth at about 5.7 meters, and most of it is less than 4 m in depth. Areas less than 3 m deep are completely covered by water lilies, while much of the swampy shoreline is covered with papyrus and water hyacinth. The papyrus also forms floating islands that drift between a number of small permanent islands. Extensive wetlands fed by a complex

system of streams and rivers surround the lakes. Lake Kwania is a smaller lake but deeper.

The lake occupies a very shallow saucer-like depression. Depth does not exceed 5.7 m and the greater part is less than 4 m. Large areas less than 3 m are covered by a continuous growth of water lilies. Shoreline is everywhere fringed with papyrus and other swamps sometimes forming a belt of several miles width between land and the open water.

The lake is divided into three environments: the open water deeper than 3 m; the water less than 3 m deep which is covered completely with a growth of water lilies; the swamps, chiefly papyrus, which fringe the shoreline.

2.2.3 Lake Tanganyika

Description

Among the chain of lakes on the bottom of the Western Great Rift Valley, Lake Tanganyika is outstanding for its extraordinary north-south extension (670 km) and depth (1,470 m). (ILCEC) covers some 32,900 km2 shared between the DRC (45%), Tanzania (41%), Burundi (8%), and Zambia (6%). It is the second largest of African lakes, the second deepest (next to L. Baikal) and the longest lake of the world. (FAO,2001)

The surrounding areas are mostly mountainous with poorly developed coastal plains except on part of the east side. Especially on the western coast, steep side-walls of the Great Rift Valley reaching 2,000 m in relative height form the shoreline. The sole effluent river, the Lukuga, starts from the middle part of the western coast and flows westward to join the Congo River draining into the Atlantic.

Agriculture, livestock raising and the processing of these products as well as mining (tin, copper, coal, etc.) are the main industries in the drainage basin of L. Tanganyika. Fishery products, the "Tanganyika sardine" (Stolothrissa tanganikae, herring Family) in particular, are also important for the local economy. Well-developed regular shipping lines connect Kigoma (Tanzania),

Kalemie (Zaire) and other coastal towns as anessential part of the inland traffic system of East Africa. (ILCEC,)

The countries of Burundi, Democratic Republic of Congo, Tanzania and Zambia share Lake Tanganyika. Of the lake's shoreline perimeter, 9 percent is in Burundi, 43 percent is in D.R. Congo, 36 percent is in Tanzania, and 12 percent is in Zambia (Hanek et al. 1993). Situated between the latitudes of 03º20' and 08º48' South and the longitudes of 29º03' and 31º12' East, Lake Tanganyika is an elongate lake with a catchment area of 220,000 km2. At 673 km along its major axis, Tanganyika is the longest lake in the world and ranges from 12 to 90 km in width with a shoreline perimeter of 1,838 km (statistics from Hanek et al. 1993).

The lake's average depth is 572 meters, with a maximum depth of 1,310 meters in the northern basin and 1,470 meters in the southern basin, making it the world's second deepest lake, after Lake Baikal. Lake Tanganyika is fed by numerous small rivers and two major influent rivers, the Rusizi draining Lake Kivu to the north, and the Malagarasi, draining Western Tanzania south of the Victoria Basin. Only a single outlet, the Lukuga River, drains Lake Tanganyika, though the flow of this river has changed directions in historical times (Beadle 1981).

Lake Tanganyika has two wet seasons (March/April and December) in a year, with mean annual rainfall ranging from 1200 mm in the northern part to 1600 mm in the southern part (Nicholson, 1996). Most of Tanganyika's water loss is through evaporation. Calculations from Lake Tanganyika's water budget suggest a water residence time of 440 years and a flushing time of 7,000 years (Coulter 1991).

Significant ENSO teleconnections have been found with average air temperature, maximum and minimum air temperature, humidity, rainfall, winds, pressure and radiation through research conducted by the ENSO Project (from 1997-2000). The strongest teleconnections were found between monthly air temperature anomalies with the seas surface temperature anomalies in the west equatorial Pacific Ocean. A time lag of 4-6 months generally gave the strongest correlation (ENSO Project, 2003). ENSO events over the past approximately fifty years were characterized by average air temperature increase

(+0.26ºC) while extreme air temperature could reach ±0.8ºC during a strong El Nino. During ENSO events, winds decreased but air pressure and radiation increased; this seems to impact on mixing of the lake (ENSO Project, 2003).

Riparian governments have designated 'protected areas' (PAs) in several locations bordering the lake. Burundi has two PAs, the Rusizi Natural Reserve (recently downgraded from National Park) and Kigwena Forest; Tanzania has two PAs, Gombe Stream National Park and Mahale Mountains National Park; and Zambia has one PA, Nsumbu National Park. Congo currently has no protected areas along the lake. The Rusizi Natural Reserve is a site of international ornithological interest as it hosts a diverse resident and migrant bird fauna. Gombe Stream and Mahale Mountains National Parks, hosting chimpanzees and other primates, are the sites of the longest-running primate studies. Nsumbu National Park harbours elephants, lions, leopards, gazelles and other game, but in low densities. Both Mahale Mountains and Nsumbu National Parks provide some protection to the lake as their borders extend 1.6 km into the lake.

Ports on Lake Tanganyika

There are two ferries which carry passengers and cargo along the eastern shore of the lake-Lake Tanganyika ports have significant importance to the people living in these areas as the lake provides the only means of transport. It has five main ports: Kigoma Port (Cargo Terminal), Kigoma Port Marine (Passenger Terminal), Kigoma Oil Jetty; private ports in Kigoma and Kasanga Portin,

In addition to 19 cluster ports: Kirando (Tongwe), Sigunda, Hrembe, Kaperaresenga, Logosa, Kibweza, Kalya, Likola, Karema, Kabwe, Kirando (Rukwa), Kipili , Ninde, Msamba, Wampembe , Kala ,Kagunga, Mwamgongo and Mtanga) (TPA, 2005)

2.2.4 Lake Kivu

Description

Lake Kivu is one of the Great Lakes of Africa. Located between Rwanda and the Democratic Republic of the Congo (Zaire), it occupies 1,040 sq mi (2,700 sq km), is 55 mi (90 km) long and 30 mi (48 km) wide, and has a maximum

depth of 1,558 ft (475 m). Containing many islands, it was part of a larger body of water until volcanic outpourings along its northern shore created a dam that separated it from Lake Edward.

The lake covers 1,042 sq mi (2,699 sq km), 55 mi (89 km) long (CU, 2007); it is the highest lake in Africa (4,788 ft/1,459 m). Some 1 370 km2 or 58% of its waters lie within DRC borders. The maximum depth is 485 m and the water volume amounts to 500 km^3. It is drained by the Ruzizi River, which flows into Lake Tanganyika. Kivu is divided into three provinces, Nord-Kivu, Sud-Kivu, and Maniema.

The world's tenth-largest inland island, Idjwi, lies in Lake Kivu, while settlements on its shore include Bukavu, Kabare, Kalehe, Sake and Goma in Congo and Gisenyi, Kibuye and Cyangugu in Rwanda. Lake Kivu is a tourist center. The Ruwenzori Mountains, Kahuzi-Biega National Park, and part of Maiko National Park are in the region. Moreover, beneath the lake lie vast reserves of methane gas which have not been exploited.

Lake Kivu is shared by the DRC and Rwanda, and has an area of 2,699km^2 and a mean depth of 240m. Rwanda is divided into two hydrographical basins with a separating line called Congo/Nile Ridge, moving from the North to the South and perpendicular to the volcanic chain, making natural obstacles exchange between the catchments basins of the Northern Kivu and the southwest of Uganda and those of Rwanda (Twagiramungu, 2006).

To the west of that line there is the Congolese basin (33% of the surface of the national territory) that drains 10% of water resources of the country. It comprises rivers Sebeya, Koko, Rusizi, Rubyiro, as affluents of Lake Kivu (102800 ha on the Rwandan side, 473 m of maximum depth), Ruhwa and many other small rivers. To the east of the Congo/Nile Ridge there is the Nile basin which covers 67% of the national territory and drains 90% of Rwandan waters by two main rivers, namely Nyabarongo and Akagera. The latter is the main affluent of Lake Victoria with an average outflow of 256 m3/s at Rusumo station and thus is considered as the source of the Nile (Twagiramungu, 2006).

The biology of Lake Kivu has been strongly influenced by the fact that it is situated in an actively volcanic zone. It has relatively few species of fish and contains substantial, but as yet largely untapped, gas reserves (250 billion m3 of carbon dioxide, 55 billion m3 of methane, and 5 billion m3 of nitrogen).

2.2.5 Lake Edward

Description

Lake Edward is one of the Great Lakes of Africa lying in the western Rift Valley. Its length is about 65 km and the maximum width is 38 km. The deepest region is a trench only 5 km from the western shore from which the escarpment rises precipitously to highlands exceeding 2,500 m in altitude. The eastern side of this trench is much less steep and rises with an almost uniform gradient for more than 30 km under water to the Uganda shore. (ILCEC,).The 2,300 km2 area of Lake Edward is shared between the DRC (1 630 km2 or 71%) and Uganda (670 km2 or 29%). (FAO, 2001)

The main inflows to Lake Edward are the Nyamugasani River, which drains the southwestern end of the Rwenzoris, and Ishasha, Rutshuru and Rwindi Rivers from the Kigezi and Rwanda highlands and the Virunga volcanoes in the south. The annual contribution from the Kazinga Channel is probably small compared with that from the rivers.

The amount of water flowing through the lake, exclusive of evaporation, can be seen at the outflow via the Semliki River at Ishango in the northwest which is 30-40 m wide. The water leaves the lake as a rapid and turbulent stream about 3 m deep over rocks and boulders. It is so clear that the hippopotamus can be observed under water and large numbers of BaRbus are seen facing the current. (ILCEC,)

The eastern half of Lakes Edward and George is surrounded by the Rwenzori National Park of Uganda. The western half of Lake Edward, including the outflowing Semliki River, is encompassed by the Parc National de Zaire.

This whole vast region of national parks from Lake Albert to Kivu - the Great Rift Valley with its lakes, game plains and precipitous escarpments, the glaciated

Rwenzoris and partially extinct Virunga volcanoes, the tropical rainforests of Semliki Valley, the mountain forests above 3,000 m and the alpine highlands above 3,800 m - present some of the most dramatic and beautiful scenery in Africa and, with its great variety of organisms and of conditions of existence, is of extreme interest to land and water ecologists (ILCEC,)

Lake Edward is served by several ports and landing facilities, which have developed as traditional fishing and water transport landing sites. They include Kasindi, Muramba Kisaka and Musenda. Others include fisheries in Katunda and Lunyasenge, while smaller fisheries operate in Muyirimbo, Talihya and Kamandi. Most of these landing points have the potential to be upgrated to modern port facilies.

2.2.6 Lake Albert

Description

Lake Albert is a typical Rift Valley lake lying at an altitude of 615 m between two parallel escarpments, which on the western side rise abruptly to nearly 2,000 m above the water surface. (ILCEC,) Shared between Uganda (54%) and the DRC (46%), the broad waters of Albert (5 270 km2) are fed by the Semliki River from the south and the River Nile, which loops in and out of the northern tip of the lake(FAO, 2001)

The lake is about 150 km long, with an average width of about 35 km, and a maximum depth of 56 m within 7 km of the mid-western shore. The main inflow is at the south end via the Semliki River which comes from Lake Edward through the western edge of the great Ituri rain forest in Zaire, augmented by streams from the northern slopes of the Rwenzoris. On its course through the forest are several kilometers of rapids which are an effective barrier to faunal interchange between the two lakes.

The water of the Victoria Nile is much less saline than that of Lake Albert. It has therefore been possible to demonstrate by conductivity measurements that even in times of floods the river water does not affect the lake beyond about 10 km from the north end. The Victoria Nile thus serves to maintain the level but has no other influence on the water of the lake except at its northern end though its rate

of flow is considerably greater than that of the Semliki. (ILCEC,)

Lake Albert is located on the border between Uganda and the Democratic Republic of Congo and is approx. 140 km long and 40 km wide. Lake Albert has a surface area of 5,300 km^2 at the normal water level of 617 m above sea level and a drainage basin of 17,000 km^2 (Nicol). March to May is the main stable rain season over most parts of the country, while October to December is the most variable rain season over most parts of the country (WWAP, 2005).

The 130 Km stretch of the Nile from Lake Victoria to Lake Kyoga is termed the Victoria Nile. Lake Kyoga is drained through the Kyoga Nile which, after a relatively flat reach downstream from the lake, enters a series of rapids and falls before it flows into Lake Albert at a level 410 m lower than Lake Kyoga. In Lake Albert, the Nile is joined by River Semliki which drains Lakes George & Edward found in the Rift Valley and high rainfall area of the Rwenzori mountains. Lakes George & Edward are connected through the Kazinga Channel. The Nile flows from Lake Albert with a gentle slope to the Sudanese border. This reach of the river is called the Albert Nile (WWAP, 2006). The main inflow to Lake Albert is the Semliki river which comes from Lake Edward but also has many tributaries from the Ruwenzori and Ituri Forest regions (Fish, 1955).

Annex (A) gives the main physical characteristics of the above lakes.

2.2.7 Main Physical Barriers

Floating vegetation and invasive weeds are regarded the most significant physical barriers to navigation in Lakes Victoria and Kyoga.

Much of the lake Victoria margin is swampy: islands of Cyperus papyrus, with its typical associates, detach from the fringing swamps (Hughes and Hughes, 1992). These can, from time to time, interfere with or block navigation routes within the lake. Lake Victoria is believed to have been invaded by water hyacinth in the late 1980s (Freilink, 1991), through the Kagera River (Twongo, 1996), and since then a constant stream of the plant have entered the lake to cover three hectares a day. On entering the lake it found a fertile environment for its

multiplication. The weed thrives in bays and inlets which are sheltered from strong offshore and along-shore winds; have flat or gently sloping, relatively shallow shores (rarely deeper than 6 m) and a muddy bottom rich in organic matter (Twongo, 1996).

From satellite imagery, it has been observed that nutrient-rich sediment plumes originating from agricultural runoff and the low-lying, deforested riparian zones and other areas surrounding Lake Victoria are feeding the water hyacinth (Wilson et al., 1999). For instance, in September 1998 the water hyacinth mat covered 400,000 hectares of the Kavirondo Gulf in Kenya. In the same year, four fifths of Uganda's shore line was covered by the hyacinth mat. Its spread has disrupted fishing activities, transportation, and has threatened the functioning of various lakeshore-based installations such as water purification and hydroelectric power plants (e.g. Twongo, 1996).

The economic costs for controlling the water hyacinth invasive weed (Twongo, 1996; Twongo et al., 1995) and for restoration of the modified ecosystems are high. Costs related to hyacinth clean-up are substantial, but they are in localised areas for example, the shipping harbours and water intake points (Odada et al., 2006). There was loss of earning opportunities when fishermen could not access fishing and fish landing sites, and through interference with fishing gear and clogging of pumps, as a result of water hyacinth infestation (Mailu, 2001).

In Lake Kyoga, rising water levels caused detachment of previously firmly anchored floating papyrus swamps(WWAP, 2006). The freed swamps drifted downstream and collected at the outlet of the Nile from the lake, causing a near total blockage. The blockage caused a further rise in lake levels and led to partial inundation of marginal homesteads and farmlands, the spread of water-borne diseases and disruption of economic activities around the lake shores (WWAP, 2006). As water levels above the blockage continued to rise, levels (in the Nile) below the blockage dropped significantly. The blockage was cleared in 2001 through dredging with equipment provided by Egypt, a Nile riparian. The government in 2000 set up a programme "The Mitigation of Lake Kyoga Floods" aimed at alleviating the economic hardships brought upon the local

communities in Kyoga basin by the floods and lake level rise (WWAP, 2006).

Water hyacinth (Eichhornia crassipes) appeared in Lake Kyoga in 1988. In 1994, water hyacinth covered 60% of the Kyoga shoreline to a width of 5-15 m (Twongo and Ochieng, 1998). This has subsequently been displaced, through ecological succession, with the native hippograss, and water hyacinth is no longer a significant issue in Lake Kyoga. Where water hyacinth has been introduced it can disrupt the natural hydrologic cycle by transpiring greater quantities of water, up to three times more, than native vegetation in the same habitat (de Groot 1993). Water tables and some surface water habitats are thus reduced and native species affected. The weed can impede navigation, even in motorised boats, and transportation costs may rise due to the necessity of taking alternative indirect routes or as a result of motoring through the mats which, if physically possible, increases fuel consumption (Akinyemiju, 1987; FAO, 2000).

To a lesser extent, Lake Edward has papyrus swamps including the endemic papyrus (Chloropeta Gracilirostis) (Nampindo and Plumptre, 2005).

In 1998 aquatic weeds flourished and spread all over the Great Lakes (Victoria, Albert, Kyoga) in Uganda due to the unusual heavy rains. This phenomena caused the moving of huge masses of floating islands of aquatic weeds, and blocked the outlets of both Lakes Kyoga and Albert upon which water levels were increased beyond the usual levels. Therefore water has threatened and flooded all villages and other major buildings round the Lakes shores with severe negative impact on health, and the social and economic life of people living around those Lakes.

Accordingly, the Government of Uganda called for help from all countries and iInternational agencies to assist in solving this complicated problem.

In this regards the Government of Egypt has immediately responded and offered the Government of Uganda a grant introduced in two stages. In the first stage (1999-2006) an amount of US$ 13.9 million was allocated while in the second stage (2007-2010) an amount of US$ 4.5 million was also allocated for the project extension with a total amount of US$ 18.4 million covering the two stages.

There are other physical barriers pertinent to specific lakes. For instance, barriers due to sediments, stream flow changes and water-related engineering structures do exist in Victoria, Kyoga and Tanganyika lakes. Extreme climate events such as floods and droughts sometimes hinder navigation in the afore-mentioned lakes in addition to Lake Kivu. Slackened winds have caused less intense mixing in Lake Victoria (Lehman, 1997), and may also affect boats that use sails.

2.3 Epilogue

After reviewing the navigational potential and physical barriers of both the River Nile and the equatorial lakes, several queries came up. Chief among these are the following:

- Do navigable sections cross the border between adjacent Nile Basin countries?
- Do navigable sections serve local trade only?
- Could navigable sections be connected with other modes serving CBT?
- Or, in another way, do we need intermodal transshipment to cross the borders?

In an attempt to reach reasonable answers to the above queries a simple analysis was carried out to draw up what could be referred to as the NB Countries Bordering Scheme. To this end an origin-destination matrix for the 9 Nile Basin countries was constructed as shown in the following figure and summarized in the next table.

Table 2: Bordering Scheme of the Nile Basin Countries

	Burundi	DRC	Egypt	Ethiopia	Kenya	Sudan	Rwanda	Tanzania	Uganda
Burundi		TL					LB	LB	
DRC	TL					LB	KL	TL	AL&EL
Egypt						WN			
Ethiopia					LB	BN,AT&SB			
Kenya				LB		LB		VL	VL
Sudan		LB	WN	BN,AT&SB	LB				AN
Rwanda	LB	KL						LB	LB
Tanzania	LB	TL			VL		LB		VL
Uganda		AL&EL			VL	AN	LB	VL	

In the above figure borders between each pair of Nile Basin countries are identified. Lake borders are differentiated from river borders. They are denoted by 2-letter symbol as follows:

Lake Borders:

VL = Victoria Lake

TL = Tanganyika Lake

AL = Albert Lake

KL = Kivo Lake

EL = Edward Lake

Land Border = LB

River Borders:

WN = White Nile

BN = Blue Nile

AN = Albert Nile

SB = Sobat River

AT = Atbara River

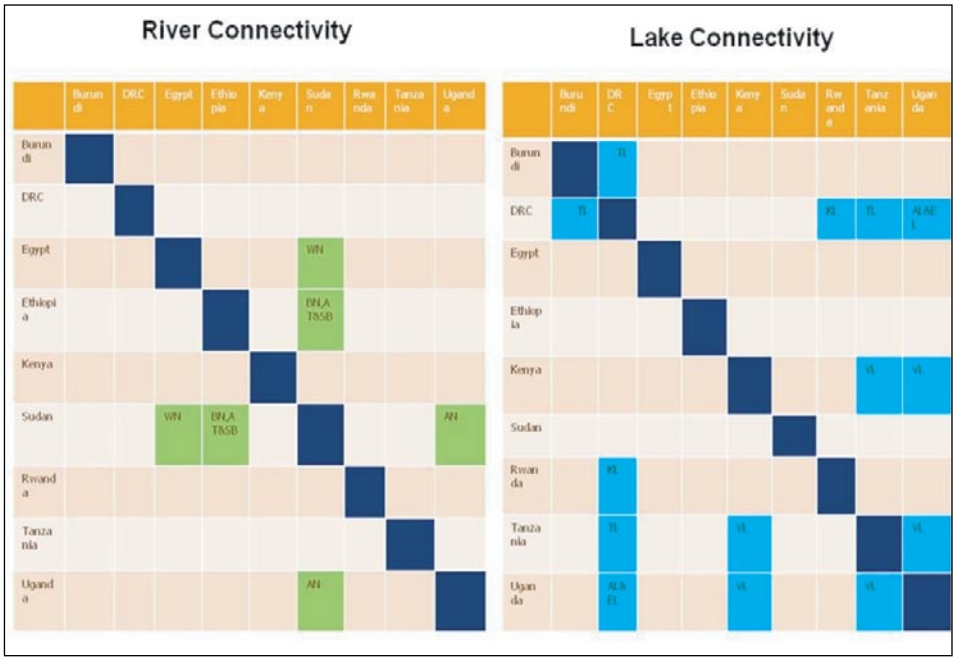
Table 3: Nile Basin Countries Bordering Scheme

	No of Borders	Border Crossing		
		Lake	River	Land
Burundi	3	1		2
DRC	5	5		
Egypt	1		1	
Ethiopia	4		3	1
Kenya	4	2		2
Sudan	7		5	2
Rwanda	4	1		3
Tanzania	5	3		2
Uganda	6	4	1	1

From the above table, it is clear that Sudan is central among NB countries bordering with 7 countries, followed by Uganda (6), Tanzania (5), DRC (5), Kenya (4), Ethiopia (4), Rwanda (4) and Burundi (3). Egypt is the country with least borders. It has one border only with Sudan.

As indicated earlier, border crossing could be through land, lake or river. The next figure compares river navigational connectivity and lake navigational connectivity.

Figure 9: Lake vs River Navigation Connectivity



From the above figure, the following preliminary findings could be outlined:

The navigational connectivity of the equatorial lakes could be more significant for NB CBT than the River Nile itself. They may be considered a fast track for promoting navigational CBT. This might deserve a separate study by itself. The Nile course per se connects Egypt, Sudan, Uganda and Ethiopia. CBT between two adjacent countries on the Nile might be possible. However, through navigation to a third country is almost impossible. Hence, the course of the Nile may be more significant for domestic trade inside the country. CBT through navigation in the Nile should only be considered within a multimodal scheme where intermodal ports on the Nile allow benefiting from the low cost river transport. This stresses the importance of a North-South multimodal corridor as well as an integrated transport system for the NB at large.

2.3.1 Conclusion

The above simple analysis reveals that the navigational connectivity of the NB countries through the equatorial lakes might yield quicker results as regards promoting their CBT compared to the River Nile per se. This fast track deserves a detailed analysis by itself. River Nile transport, though very cost-effective particularly for large shipments and low value cargo compared to other modes, is largely used for domestic trade inside the country rather than CB trade. CBT through navigation in the Nile would require intermodal ports to bypass physical barriers such as falls, cataracts and rapids. Hence it is believed that tapping the navigational potentials of the River Nile for CBT development could best be achieved through a North-South multimodal corridor within an integrated normative infrastructural network.

3

Non-physical and Non-tariff Barriers to Cross-border Trade and Navigation in the Equatorial Lakes Region

3.1 A Secondary Source Review

3.1.1 Introduction

This section will review non-tariff and non-physical barriers to cross-border trade among Nile Basin countries with special emphasis on navigation on the Nile and the equatorial lakes, based on a review of available secondary source information.

The Nile has two main sources. In equatorial Africa, the Nile springs from the Nyungwe Forest in Rwanda, and runs north through Lake Victoria into Sudan. The second source (the Blue Nile) comes from Lake Tana in the Ethiopian highlands. The White and Blue Niles join in Khartoum, the capital of Sudan, and continue through Egypt to the Mediterranean.

As noted in the First Draft of this report "Physical and non-physical barriers to cross-border trade in the navigation in the River Nile"[14] regarding the situation in Egypt: "The potential for increasing Nile transport is enormous, but so are the challenges".

The Report goes on to state/listseveral obstacles to achieving river linkages to road and rail networks: "One reason is that a standard legal framework for liability and insurance of intermodal carriers does not exist in Egypt. Liability terms are still negotiated on a case-by-case basis in contracts between various parties involved in the door-to-door trips. This lack of standardization results in different interpretations of contracts and creates legal problems associated with uncertainty.

14 Institute of National Planning Team, Cairo Egypt, 31 May 2008

Another wrinkle is an outdated customs regulation that requires that a separate letter of guarantee be issued if cargo is to change modes. This would lead to extra costs and extra loss of time. This situation overrides the principal aim of intermodal transport, which is to move goods to their destination on time, in good condition and at as low a price as possible. An intermodal system requires a high-quality fleet of trucks. Yet, Egypt's fleet is suffering from weak maintenance, overloading, old age, high prices and inefficient services. Furthermore, local fleets are not made for container transport. Instead, shippers use modified flatbed trucks, which (are) unsafe and inefficient."

This illustrates how trade and transport is hindered by outdated and restrictive legislation, one type of non-physical barriers to trade.

In regard to Sudan, the Report notes that: "the Nile River provides an important inland transportation route. More than 4,000 kilometers of navigable waterways centered on the Nile and its tributaries, but only about 1,700 kilometers are navigable year-round. Its overall usefulness, however, has been limited by natural features, including a number of cataracts in the main Nile between Khartoum and the Egyptian border, variations in seasonal flow, a series of dams, and the Sudd, the vast papyrus-choked swamp in the Upper Nile", all examples of physical barriers to trade and transport.

Because of the natural barriers, the river Nile by itself cannot be used for cross-border trade except as part of multimodal transport systems linking inland waterway traffic with rail and road networks.

3.1.2 Equatorial Lake Trade and Transport

The Equatorial lakes Albert (DCR-Uganda), Edward (DCR-Uganda), George (Uganda), Kivu (Rwanda), Kyoga (DCR-Uganda), Tanganyika (Burundi-DCR-Tanzania-Zambia) and Victoria (Kenya-Tanzania-Uganda), are all used to a varying extent for transportation of goods, both domestically and internationally. The most important ones are Lake Victoria, the second largest lake in the world by surface, and Lake Tanganyika, the second largest lake in the world by volume.

Since the early 1900s Lake Victoria ferries have been an important means of transport between Uganda, Tanzania and Kenya with ferry links between Port Bell in Uganda and Kisumu in Kenya which link Uganda, Rwanda, Burundi, and the Democratic Republic of Congo with the Mombasa seaport.

In Tanzania Lake Victoria has six main ports and various cluster ports. The port of Mwanza handles local and transit cargo to Kemondo Bay, Musoma, Port Bell in Uganda and Kisumu in Kenya. Kemondo Bay port is about 30 km south of Bukoba and the most developed port in the region. The port was built to serve Rwanda, Burundi and Uganda under an East Africa Community initiative in 1977[15].

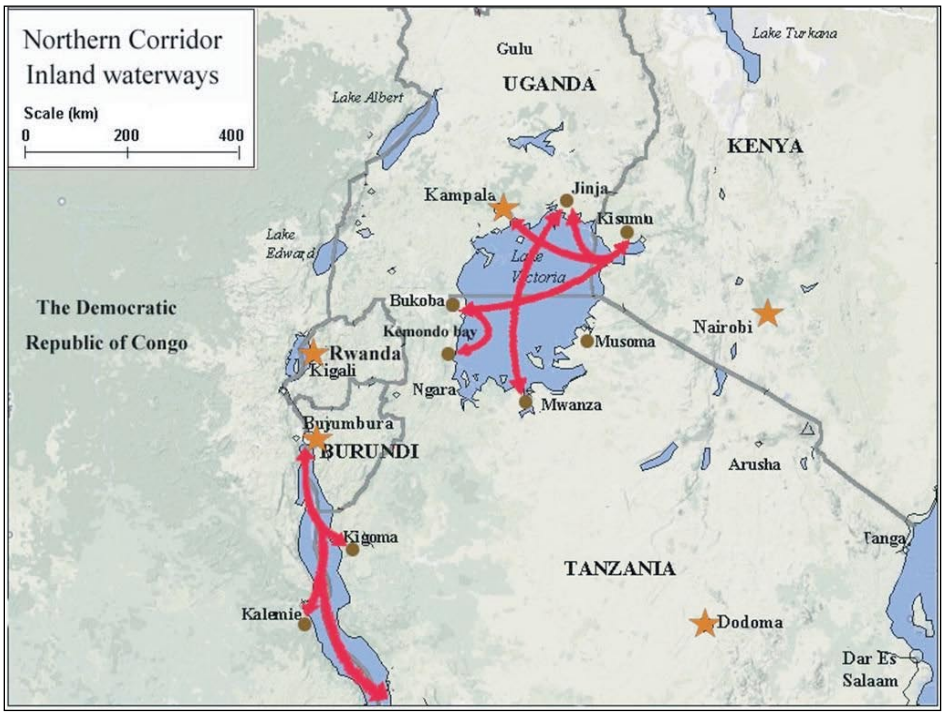
Lake Tanganyika has several ports serving Tanzania and the surrounding countries. The most important one is Kigoma in Tanzania which handles transit cargo for Congo and Burundi. Kigoma is connected to Dar es Salaam by rail and thus offers competition with Mombasa for export from Burundi, Rwanda and Congo (DCR). On the Congo side of the Lake, the port of Kalemie is the railhead for the Congolese (DCR) rail network.

The importance of Lake Tanganyika as a means of transportation is underlined by the fact that 75 to 80 per cent of Burundian trade travels on the Bujumbura-Dar-es-Salaam axis and most of it is transported to and from Bujumbura via Kigoma, combining lake and rail transport[16].

15 Corporate Tanzania website http://www.corporate-tanzania.net/ct/infrastructure-transport/Tanzania-Ports-Authority.html

16 WTO Trade Policy Review on Burundi, WT/TRP/S/113, 5 March 2003

Figure 10: Equatorial Lakes ferry routes



http://www.ttcanc.org/maps/waterways.html

Lake Kyoga and the Victoria Nile south of the lake constitute the second most important commercial waterway in Uganda[17]. There used to be a steamboat service between Namasagali, a railhead port on the Nile, going as far as Masindi Port on the other side of Lake Kyoga. However, Lake Kyoga's potential as a transportation link is severely limited by the fact that it is a shallow lake with a maximum depth of less than 6 meters and areas less than 3 meter deep are completely covered by water lilies.

Lake Kivu is by far the largest of Rwanda's lakes, forming the border with the DRC. There are occasional boat services between the ports of Cyangugu, Kibuye and Gisenyi but these do not run to a regular timetable and often have to be chartered. There are also boats used to ferry people to some of the islands in the lake, but these also do not run regularly[18]

17 http://en.wikipedia.org/wiki/Transport_in_Uganda
18 http://en.wikipedia.org/wiki/Transport_in_Rwanda

Other waterways such as Lake Albert, Lake George, Lake Edward, and the Albert Nile do not carry commercial traffic to any great extent[19].

3.1.3 The Equatorial Lakes Countries

The six equatorial lake countries, Burundi, Congo (DRC), Kenya, Rwanda, Tanzania and Uganda are among the poorest and least developed countries in the world. In addition, Burundi, Rwanda and Uganda are landlocked and depend on neighboring countries for transiting their import and exports.

Of the six equatorial lake countries only Kenya has a GNI that exceeds $1,000 while the worlds' average GNI is more than $9,000. As there is a strong correlation between international trade and development, it is also not surprising that the six equatorial lake countries in general rank low on the World Economic Forum's Enabling Trade Index and the World Banks Logistic Performance Index, which both in various ways measure the adequacy and efficiency of a country's trade and transportation infrastructure.

Some key indicators and rankings for equatorial lake countries are listed in the table below.

Isolation from regional and international markets has contributed significantly to poverty in many Sub-Saharan African countries and poor transport infrastructure and border restrictions are significant deterrents to trade expansion.

19 ibid

Table 4: Key indicators and index rankings – Equatorial Lake countries.

	Burundi	Democratic Republic of Congo	Kenya	Rwanda	Tanzania	Uganda	World
Population[1] (million)	8.2	60.6	36.6	9.5	39.5	29.9	6,538
GNI per person PPP2	$320	$270	$1,470	$730	$980	$880	$9,209
UNDP Human Development Index, ranking of 177 countries3	167	168	148	161	159	154	n/a
WEF Enabling Trade Index, of 118 countries4	117	n/a	86	n/a	102	79	n/a
WB Logistics Performance Index, of 150 countries5	113	n/a	76	148	137	83	n/a

World trade and investment flows have expanded over the last years, but the trade performance of Sub-Saharan African countries has been disappointing. Africa's share of world exports has dropped by nearly two thirds in three decades: from 2.9 percent in 1977 to 0.9 percent in 2007[20]. This implies that if Africa's share of world exports would have been kept at the same level as in the mid-seventies, its exports revenue should be approximately 10 times bigger than its current value. The high costs of trade, i.e. transporting goods and getting them across borders, are a major obstacle to African trade performance.

Emphasizing the importance of infrastructure, a recent World Bank study concluded that an upgrade of the African Trans-National Highway would expand

20 Portugal-Perez and John S. Wilson, "Lowering Trade Costs for Development in Africa: A Summary Overview", World Bank working draft June 2008

overland trade by about $250 billion over 15 years, with major direct and indirect benefits for the rural poor. Financing the programme would require about $20 billion for initial upgrading and $1 billion annually for maintenance[21].

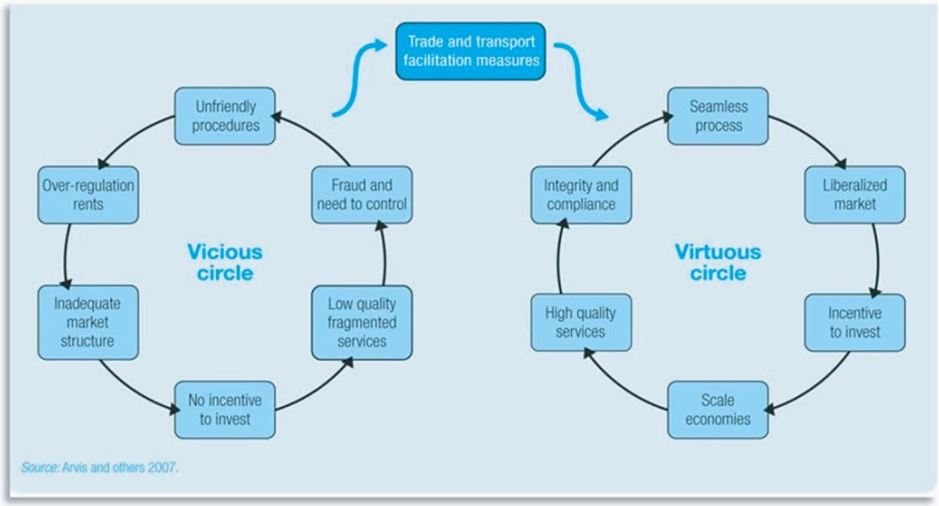
However, it is not just the poor state, or outright lack, of physical infrastructure that makes trade and transport expensive and difficult in Equatorial Lake countries. Complicated and non-transparent border-crossings rules and procedures, for example, often involving several un-coordinated government agencies with different working hours and locations, and which have to be repeated on both sides of a border, are often a bigger barrier to trade than Customs tariffs.

Border crossing issues are, however, only one aspect of the total logistics chain from the factory or warehouse of the seller to the receiving premises of the buyer, and include in addition to the physical movement of the goods the exchange of information required to initiate, conclude and support a trade transaction, and the related payment process.

Poor logistics environments are frequently characterized by rent-seeking, which creates powerful vested interests working to maintain the status quo. Countries become trapped in a vicious circle where rent-seeking leads to poor logistics services, often leading to fraud and giving rise to over-regulation and unfriendly procedures. This in turn discourages investment and the entry of more efficient service providers, completing a vicious circle of rent-seeking and poor performance, as shown in the figure below.

21 Buy's, Dickman and Wheeler, "Road Network Upgrading and Overland Trade Expansion in Sub-Saharan Africa" World Bank WPS 4097, Dec 2006

Figure 11: Vicious and virtuous logistics



Source: *World Bank (2007), "Connecting to Compete: Trade Logistics in the Global Economy",*

The Logistics Performance Index (LPI) established by the World Bank and published for the first time in 2007, uses a comprehensive approach to measure some of the critical factors of supply chain performance, including the quality of infrastructure and logistics services, the security of property from theft and looting, the transparency of government procedures, macroeconomic conditions, and the underlying strength of institutions.

More specifically, the LPI measures the following seven areas of performance:

- Efficiency of the clearance process by customs and other border agencies.
- Quality of transport and information technology infrastructure for logistics.
- Ease and affordability of arranging international shipments.
- Competence of the local logistics industry.
- Ability to track and trace international shipments.
- Domestic logistics costs.
- Timeliness of shipments in reaching destination.

Each of these areas of performance are rated individually and combined into the LPI on a scale from 1 to 5. In 2007 the country with the highest LPI was Singapore with an index of 4.19 while the average index for low-income

countries was 2.3. Of the six Equatorial lake countries, Kenya and Uganda were both above average for their group, low-income countries, with an LPI of 2.5 while Burundi, Tanzania and Rwanda were below average with LPI's of 2.3, 2.1 and 1.8 respectively.

The table below shows Sub-Saharan African countries' logistic performance as a group. The sad state of Sub-Saharan logistic performance is illustrated by the fact that compared to all other regions in the world it cost on average twice as much and takes twice as long to import a 40-foot container to these countries.

Table 5: Customs and border performance, by region

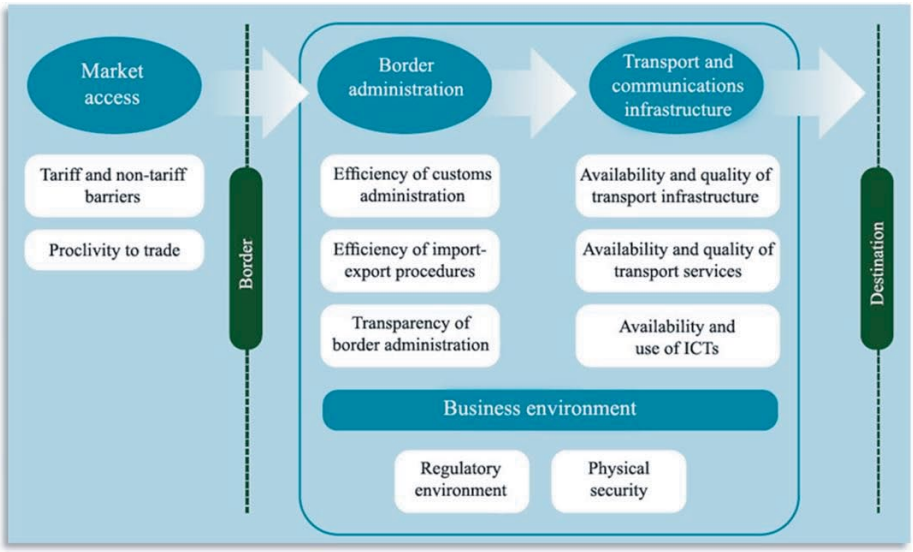
Percent	OECD high income	Non-OECD high income	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
Estimated percentage of physical inspections	3	22	22	14	25	45	36	48
Respondents agreeing that traders demonstrating high levels of compliance receive expedited customs clearance	54	25	41	51	42	42	57	17
Respondents able to use IT to submit customs declaration	70	42	28	46	58	53	50	55
Time (days) and cost (US$)								
Time between accepted customs declaration and customs clearance	1.0	1.7	2.1	1.7	2.7	1.9	2.4	4.2
Average time to export	2.4	2.9	3.9	2.8	3.9	3.7	3.6	8.1
Average time to import	3.2	3.6	4.4	3.5	4.8	6.0	6.5	12.3
Cost to import a 40-foot container or a semi-trailer (US$)	663	572	819	936	1,000	609	880	2,124

Looking at logistics and beyond, the World Economic Forum published for the first time in 2008 the Global Enabling Trade Report[22], which include an Enabling Trade Index (ETI). The ETI considers ten "pillars" which combine to make up the trading environment:

1. Tariffs and non-tariff barriers
2. Proclivity to trade
3. Efficiency of customs administration
4. Efficiency of import-export procedures
5. Transparency of border administration
6. Availability and quality of transport infrastructure
7. Availability and quality of transport services
8. Availability and use of Information and Communication Technologies (ICT)
9. Regulatory environment
10. Physical security

These pillars are combined into four sub-indexes: Market access; Border administration; Transport and communication infrastructure; and Business environment, as illustrated below:

Figure 12: Composition of the four sub-indexes of the ETI

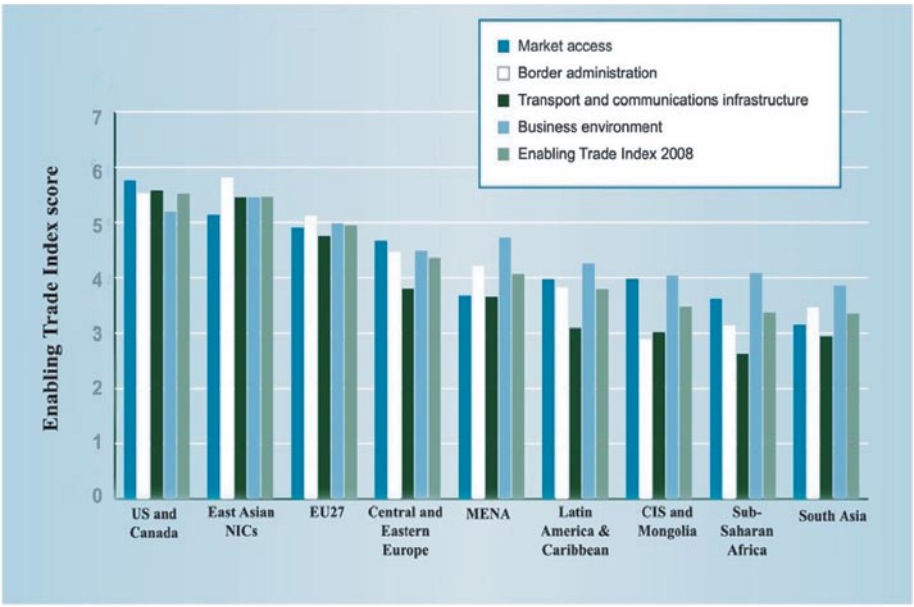


Source: *World Economic Forum: The Global Enabling Trade Report 2008*

22 See http://www.weforum.org/en/initiatives/gcp/GlobalEnablingTradeReport/index.htm

The regional ranking of the ETI and its sub-indexes are summarized in the graph below.

Figure 13: Regional Rankings of the ETI



Source: *World Economic Forum: The Global Enabling Trade Report 2008*

The Global Enabling Trade Report concludes that "Sub-Saharan Africa is among the regions that have been left behind in the globalization process over the past 50 years. (..) Africa's share in world trade fell continually throughout the second half of the 20th century. A look at the ETI results sheds some light on the reasons for this performance. Sub-Saharan Africa has the poorest transport infrastructure among all the regions assessed - on a scale of 1 to 7, the region scores only a low 2.6. Investing resources obtained from presently high-priced commodity exports in upgrading infrastructure would help enhance the region's benefits from globalization."

The purpose of this brief description of the LPI and ETI is to illustrate the complexity of the global trade and transport environment and the many factors and considerations that are involved in integrating with and benefiting from the global trading system.

3.1.4 Transport issues

The equatorial lake countries have undertaken a number of initiatives in order to improve the regional trade and transport systems. Most important among them is the "corridor" approach to integrated transport, which is under way in the region under the auspices of various regional economic communities with the support of important development partners such as the World Bank and the European Union.

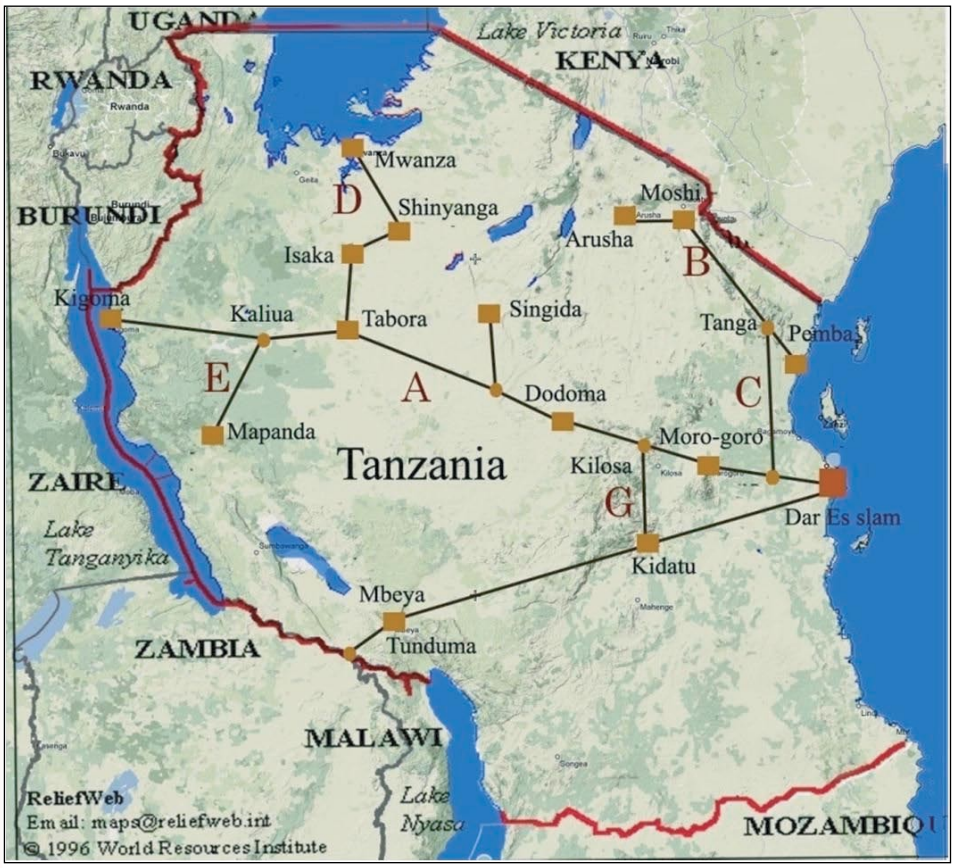
The equatorial lake countries are served by the following four corridors:

- Dar es Salaam – Kigoma – Bujumbura – Bukavu
- Dar es Salaam – Isaka – Kigali - Goma
- Dar es Salaam – Mwanza – Kampala
- Mombasa – Kampala – Kigali – Bujumbura

The rail network of the "Central corridor" through Tanzania is shown below, including the location of the Isaka inland dry terminal[23] for transit transport to Burundi and Rwanda, south of Mwanza.

23 See http://www.trctz.com/index3.htm and http://en.wikipedia.org/wiki/Isaka

Figure 14: Tanzania rail network

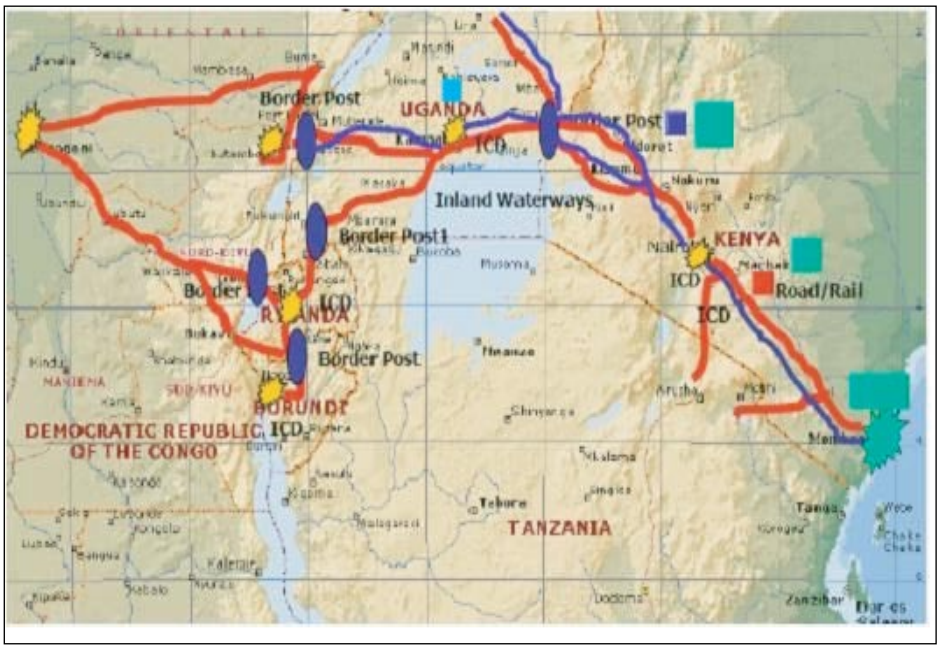


Source: *http://www.trctz.com/networkmain.htm*

Isaka is on a paved highway, running 610 km from the Rwandan capital, Kigali. The dry port functions as a sub-port of Dar es Salaam where road transport companies can collect or deliver containers coming from or going to overseas destinations, and clear customs.

The "Northern corridor" connects the Eastern part of Congo (DRC) and Uganda with the Kenyan seaport of Mombasa as shown below.

Figure 15: The Northern Corridor Transport Chain



Source: *Presentation by J. Kabangura, "Northern Corridor transport observatory", June 2006*

Of the four corridors, the Northern Corridor (Mombasa – Kampala – Kigali – Bujumbura) is best documented. The Northern Corridor Transit Agreement (NCTA) was concluded between Burundi, Kenya, Rwanda and Uganda in 1985 and is managed by the Transit Transport Coordination Authority (TTCA)[24].

Since its inception, TTCA has accomplished the following significant achievements[25]:

- Simplification of port clearance procedures. Release of landed cargo from the port of Mombasa can now be achieved within two days, down from an average of seven days, following a review of documentation and clearance procedures at the port.
- There has been a significant reduction in the number of national documents and copies to which transit transport along the corridor was hitherto subjected.

24 See http://www.ttcanc.org/index.asp
25 See TCCA website: http://www.ttcanc.org/about.asp?pageid=8

- Northern corridor countries are now using the COMESA Customs Declaration Document (CD-COM), a merger of the Road Transit Customs Declaration (RTCD) formulated by TTCA and the Single Goods Declaration (SGD) by COMESA. Work continues towards the withdrawal of the remaining national documents that are still used alongside the CD-COM.
- Transit time between Mombasa, Kenya, and Bujumbura, Burundi, has been reduced by half, from over 30 days to about 15 days, as a result of transit facilitation measures undertaken. Some unnecessary border formalities along the corridor have been removed.
- Reduction of transit charges and elimination of some non-tariff barriers.
- Mobilisation of funding for the rehabilitation of major highways along the corridor.
- Harmonisation of transit charges.
- Harmonisation of axle load limits
- Enhanced co-operation among its member states in matters concerning transit transport

A 2005 World Bank baseline survey of key non-physical barriers along the Northern Corridor recorded a total journey time from Mombasa to Kigali for a loaded fuel truck of 117.5 hours with a total delay time due to non-physical barriers is 26.4 hours – 22% of total journey time. The journey started in Kenya and thus didn't include time through the port, and delays normally incurred at the Mombasa Customs Long Room, in the port and didn't require escort. For a more typical truck load of imported goods, the total delay time would have been much in excess of 26 hours and delay time as a percentage of total journey time much more than 22%.[26]

A detailed review of the many barriers and delays along the Northern Corridor are readily available in the many reports on the corridor which give a vivid picture of the difficulties involved in moving goods to a landlocked country in Africa.

26 "Baseline survey of key non-physical barriers along the Northern Corridor", Prome Consultants, World Bank October 2005

In order to improve their customs administrations and logistics capabilities, all equatorial lake countries except Kenya have installed the UNCTAD automated customs system ASYCUDA[27]. Also, in order to improve their ability to track and trace goods and rolling stock, the Kenya, Tanzania and Uganda Railway Corporations have all installed UNCTAD's Railtracker[28].

However, the lack of ICT infrastructure at EAC Customs posts hampers efforts to make use of modern Customs risk analysis techniques[29]. Currently USAid supported initiatives include projects to harmonize and integrate Customs procedures and allow for electronic data interchange between the various custom posts along the Northern Corridor route plus a harmonized Customs Bond Guarantee Scheme, under the auspices of COMESA.

3.1.5 Regional Economic Communities

Most of the regional trade and transport integration initiatives among the Nile Basin countries are taking place within Regional Economic Communities (REC). In fact, the Equatorial Lake countries are served by three overlapping economic integration schemes namely the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), and the Southern African Development Community (SADC). The complexity of overlapping regional trade agreements is illustrated in the figure below.

EAC launched its customs union in January 2005, COMESA is working towards a customs union in 2008, and SADC has planned a Free Trade Area in 2008 and a customs union in 2010.

For the equatorial lakes countries, the most important REC is the East African Community (EAC) which is the regional intergovernmental organization of the Republics of Kenya, Uganda, Tanzania, Burundi and Rwanda. The EAC was originally founded in 1967, but collapsed in 1977. It was officially revived in July 2000 and Burundi and Rwanda became members in 2007. The first major

27 See http://www.asycuda.org/
28 See http://www.railtracker.com/
29 "Telecommunication survey of selected Customs border posts in Kenya, Tanzania, Uganda and Rwanda" USAid and Geekcorps, August 2005 - http://www.ecatradehub.com/home/index.asp

step towards closer integration was the customs union in East Africa which came into force on 1 January 2005. There are plans to introduce a monetary union with a common currency by 2009, and to establish a common market and a political union with a common president and a common parliament by 2010[30].

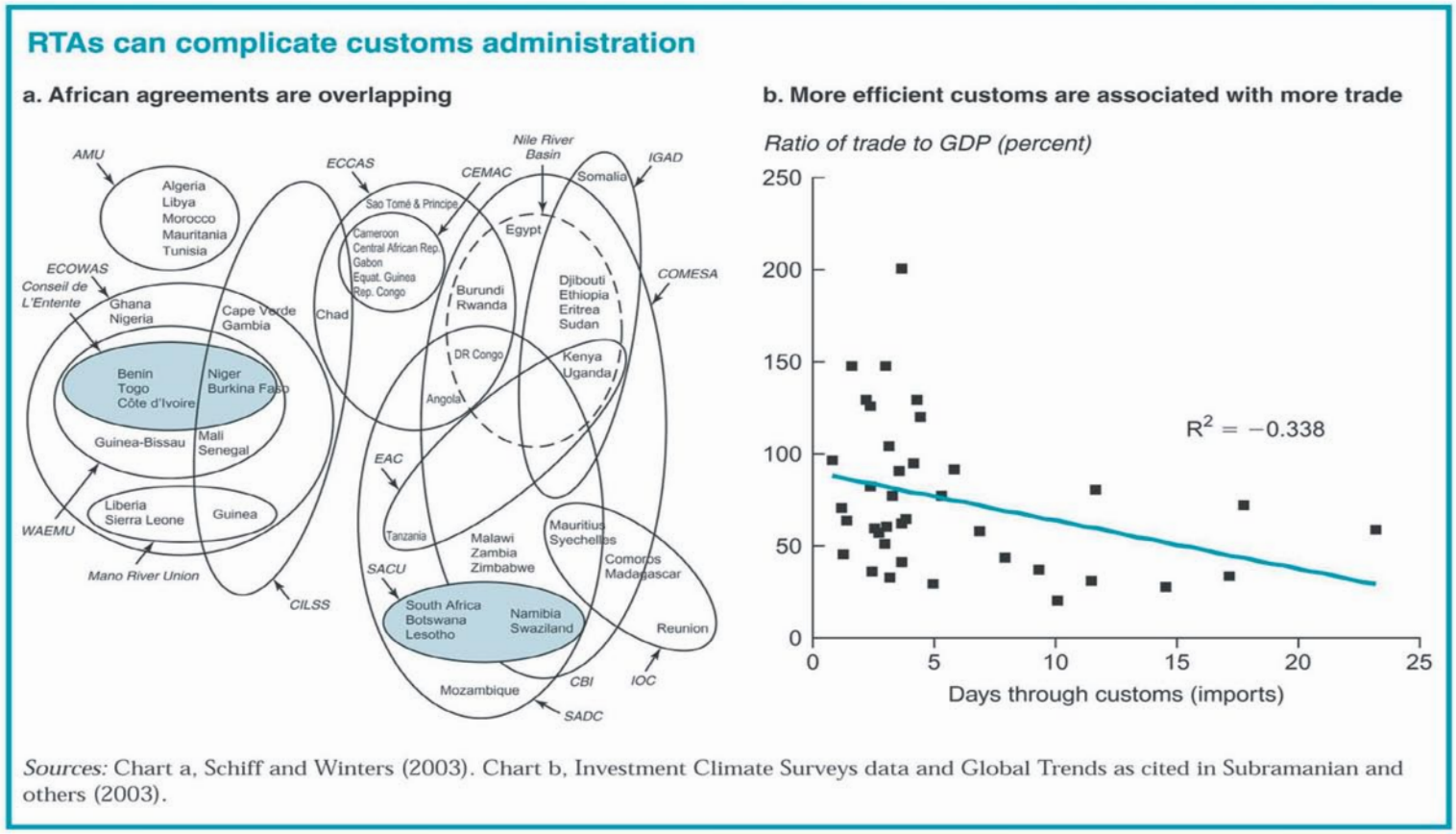
ECA is a sub-group within the larger community of the Common Market for Eastern and Southern Africa (COMESA), which is a preferential trading area with twenty member states stretching from Libya to Zimbabwe including the six equatorial lake countries, with the exception of Tanzania.

Comesa's vision is to achieve a fully integrated, internationally competitive and unified single economic space within which goods, services, capital and labour are able to move freely across national frontiers, and to contribute towards the establishment of the African Economic Treaty, which would encompass all of Africa[31].

Comesa is Africa's largest trading block and business among Comesa countries has doubled in the past two years to more than $7.8 billion in 2006[32]. Comesa is currently pursuing a crash programme to harmonize intra-regional policies before the December 2008 deadline of signing a joint Customs Union.

30 See http://en.wikipedia.org/wiki/East_African_Community
31 Comesa in brief , 2007 - http://www.comesa.int
32 The East African, Jan. 9 2007 - http://www.bilaterals.org/article.php3?id_article=6877

Figure 16: Regional Trade Agreements in Africa



Sources: Chart a, Schiff and Winters (2003). Chart b, Investment Climate Surveys data and Global Trends as cited in Subramanian and others (2003).

Tanzania is not a member of COMESA but has instead joined the Southern African Development Community (SADC) which aims to further socio-economic cooperation and integration as well as political and security cooperation among 15 southern African states.

Furthermore, the African Union seeks to establish the African Economic Community (AEC) through six stages culminating in an African Common Market using the Regional Economic Communities (RECs) as building blocks. The AEC Treaty has been in operation since 1994[33].

All these initiatives have the same positive goal of promoting regional economic integration. The problem is that the REC's sometimes have different political and economic priorities, and they make huge demands on the participating countries limited institutional capacities.

To complicate matters, the European Union is working towards bilateral free trade agreements with most African countries, including the equatorial lake countries. For the purpose of these negotiations the EU has divided African countries into four regional groupings where Burundi, Rwanda and Kenya are in the East and Southern Africa group, Tanzania in the Southern Africa group, and Congo (DCR) in the Central Africa group[34].

The United States has also started bilateral free trade negotiation with African countries and in July 2008, signed the first Trade, Investment and Development Cooperation Agreement with the Southern African Customs Union (SACU). None of the Equatorial Lake countries are part of SACU, but it will probably not be long before they too are approached by the US in regard to bilateral free trade agreements.

3.1.6 Rules of Origin

One particular problem stemming from regional or bilateral free trade agreements (FTA) relates to the issue of Rules of Origin (RoO). A free trade area is a designated group of countries that have agreed to eliminate tariffs,

33 See the African Union website - http://www.africa-union.org/
34 Se the EU website - http://ec.europa.eu/trade/issues/bilateral/regions/acp/plcg_en.htm

quotas and preferences on most, if not all, goods trade among them. However, in order to benefit from preferential treatment it becomes necessary to prove that the goods meet the criteria of originating from a participating country, i.e. that it meets the requirements as spelled out in the Rules of Origin that are part of the FTA.

EAC rules of origin currently apply only where an import originating from another EAC partner state is wholly produced in that country. Where such a product may have gone through a process of transformation, change of tariff heading or other value adding processes in the EAC originating country, the COMESA rules of origin are used, until the EAC reaches consensus on its rules of origin. However, the contention by Ugandan importers is that when the COMESA rules are used, Uganda customs has sometimes insisted that rule 3 and 4 should be used together, while both are supposed to be used independently. Rule 3 states that "local content of local raw materials should exceed 35% of the ex-factory cost of the finished product". Rule 4 states that "the product should be classified in a separate tariff heading other than those of the non-originating raw materials used in production". The two rules are supposed to be used independently of each other, meaning an importer can either use 3 or 4, whichever applies to the import product.

In addition to determine whether imported products qualify for preferential treatment, Rules of Origin are also used:

a) to implement measures and instruments of commercial policy such as anti-dumping duties and safeguard measures;
b) for the purpose of trade statistics;
c) for the application of labeling and marking requirements; and
d) for government procurement.

RoO are often very complex and differ from one agreement to another. For example, the European Union - Egypt Association Agreement, which came into force on June 1, 2004, is a 355-page document in which Protocol 4 "Protocol concerning the definition of the concept of originating products and methods of administrative cooperation" takes up no less than 195 pages! [35]

35 European Union website - http://trade-info.cec.eu.int/doclib/docs/2004/june/tradoc_117680.pdf

COMESA defines four alternative origin criteria: that goods are wholly produced in the region using no outside materials; the imported content of goods is no more than 60% of the c.i.f. value of the total cost of materials used in production; that goods contain no less than 35% ex-factory value added [36], reduced to 25% if the final product is considered to be of "particular importance" to the economic development of a member state[37]; or that there is a change of tariff classification heading following transformation.

The EAC RoO is quite similar, but not necessarily identical to those of Comesa, whereas the SADC rules are very different. (See Annex 3 for details regarding the texts of the Comesa, EAC and SADC rules of origin)

To add to the difficulties in benefiting from FTA's promise of preferential treatment, it is the practice of many customs administrations to automatically treat all imported goods claiming preferential treatment as "red lane" goods, i.e. goods requiring inspection, in order to ascertain the validity of the claim. This inspection and the complexity of proving that sufficient value has been added in the exporting country to meet the requirements of "proof of origin" cause delays and leave the door open to a multitude of bureaucratic red tape. In a European context, it has been estimated that the ad-valorem compliance costs of Rules of Origin rules are 4.7 to 8.2 percent[38], so one can only imagine what the cost is in Sub-Saharan countries.

An example of the importance of subtle differences in Rules of Origin rules is offered by the different trade preferences to the US and EU markets for the African textile sector. Although the extent of preferential access for apparel to the US market is similar to the one provided by EU's preferential regimes, these agreements differ in their RoO. While the EU require yarn to be woven into fabric and then made-up into apparel in the same country, or in a country

36 Value added is defined as the difference between the ex-factory cost of the finished product and the c.i.f. value of material inputs imported from outside the COMESA sub-region. The minimum level of value added was reduced from 45% to 35% in 2000. Egypt maintains the 45% ex-factory value-added level.

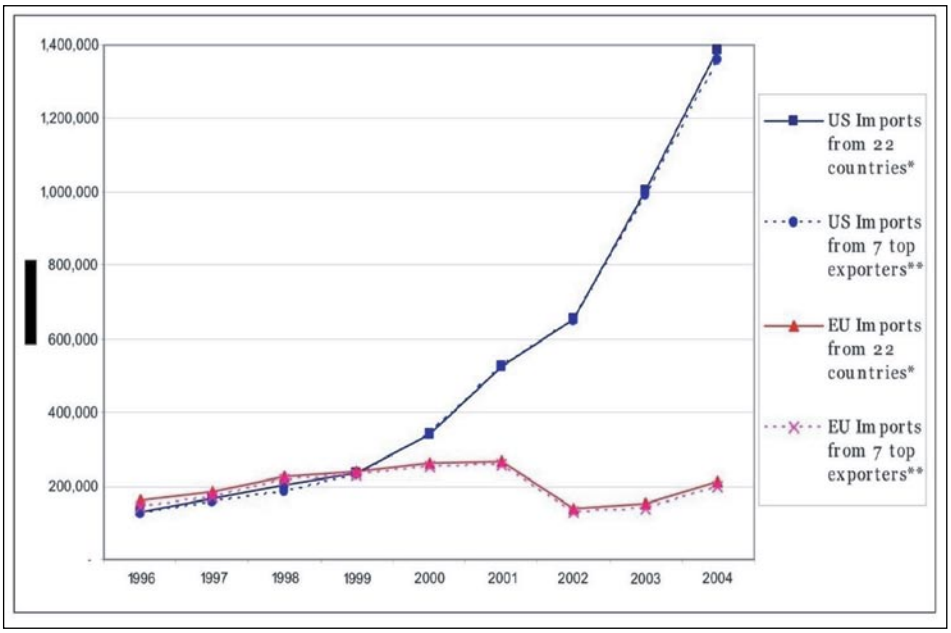
37 A long list of approved products is specified in the COMESA Treaty as being of particular importance to the economic development of the members.

38 Cadot et al (2007), quoted in "Lowering trade cost for development in Africa", presentation by Portugal-Perez and Wilson, World Bank workshop in Entebbe, Uganda 31 May 2008.

qualifying for cumulation, the US grants a "Special Rule" (SR)39 to "lesser developed countries" allowing them the use of fabric from any origin and still meet the criteria for preferences.

Following the entry into force of the US Special Rules in 2000, apparel exports to the US showed a substantial increase in value, as shown below, while the EU RoO do not appear to have offered a (preference) mix of tariff preferences and rules of origin conductive to export growth[40].

Figure 16: Apparel exports of 22 countries benefiting from US special rules by 2004



The result of the administrative complexity, transaction delays, and cost involved in attempting to benefit from preferential treatment is that many exporters do not bother even trying, unless they can establish long-lasting relationships with an importer.

39 US African Growth and Opportunity Act (AGOA) Special Regime (2001)

40 Portugal-Perez and Wilson, in "Lowering trade cost for development in Africa- A summary overview", World Bank working draft, June 2008

3.2 A Field Survey View

3.2.1 Introduction

Non- physical barriers are generally extensive, deep rooted and inherently difficult to come to grips with. They could be classified in different ways. Diagram 1 is an attempt on our part to classify trade barriers. These could be broadly classified into border-crossing barriers and barriers away from the borders. Each category could in turn be classified into physical and non-physical barriers. This section is concerned with the non-physical and non-tariff barriers to trade.

The East African states define Non-Physical Barriers (NPBs) as "quantitative restrictions and specific limitations that act as obstacles to trade", and which appear in the form of rules, regulations and laws that have a negative impact on trade. Most of the NTBs that businesses experience in the course of their EAC trade are currently categorized under eight clusters, namely (1) customs and administrative documentation procedures; (2) immigration procedures; (3) cumbersome inspection requirements; (4) police road blocks; (5) varying trade regulations among the three EAC countries; (6) varying, cumbersome and costly transiting procedures in the three EAC countries; (7) duplicated functions of agencies involved in verifying quality, quantity and dutiable value of imports and export cargo, and (8) business registration and licensing. In a recent survey of the Non-Tariff Barriers to cross-border trade in the East African Region, the six NTBs clusters identified were further broken down into eight categories during the consultations process. All NTBs under these clusters frustrate business people and translate into time loss and additional costs during their application.

A number of field surveys have been conducted to identify Non-Tariff Barriers (NTBs) to cross-border trade in the East African Region. Although these surveys were not specific to the operations of the six lakes, they are relevant because, with the exception of Lake Kyoga, all the other lakes are international borders as well. Thus a review of these NTBs is relevant to

understanding the nature of the barriers that adversely affect the flow of trade between the countries which share the border lakes. Twelve ports were included in the survey including Bujumbura, Kanyaru and Kigoma. The survey targeted cross-border traders, truck drivers and clearing agents as well as border government officials.

3.2.2 Equatorial Lakes Policies

For the purpose of our current study, a field survey plan was prepared to compile primary data and information on policies and practices on the ground. The field survey was conducted by a consultant from the region according to a specified TOR in the period from 10 August to 5 September41. Meanwhile more specific information was compiled to cover the relevant aspects of intended study.

The overall aim of this study was to establish the physical and non-physical barriers to trade in the equatorial lakes, namely, Lakes Victoria, Albert, Kyoga, Edward, Kivu and Tanganyika, and recommend appropriate measures and policies to increase the volume of trade on the lakes system.

The survey revealed that ports along the equatorial lakes are run in a traditional method and are mostly characterized by low productivity, inadequate investment and low standards of service. There is also no clear ownership of the facilities and sites, which limits the level of investment. As a result, inland waterway transport costs are high, which is one of the factors responsible for lack of competitiveness of the region's products in the international marketplace. It is essential to invest in port development and create the infrastructure necessary for increased productivity, investment and service levels at port locations within the equatorial region.

3.2.3 Poor State of Ports and Landing Beaches

The poor state of the ports along the lake shores and landing beaches appears to be the most highly ranked impediment to the expansion of trade across the borders and on the lakes. Shipping in the six lakes is mostly by traditional dug-out canoes and small vessels. Larger ships, ferries and barges cannot

41 Dr. Patrick Machyo, School of Economics, University of Nairobi, Kenya

be accommodated because of the poor state of ports and landing beaches. There is no infrastructure to accommodate larger vessels.

It is clear that increasing the volume of trade requires larger vessels to handle movement of steel, petroleum products, machinery and equipment and other larger volumes of merchandise. However, the more critical problem is that there is no policy in place to guide the development of ports and landing sites and increase the volume of transport on the equatorial lakes system. Although, there are efforts towards formulating seaports policy in Kenya and Tanzania, there is no region-wide lake ports policy framework and institutional capacity to guide lake ports development and investment, ownership, regulation, and operations of the ports as well as human resource development.

It is, therefore, recommended that a region-wide policy framework be formulated to guide the development of ports and landing sites in all the equatorial lakes region. Such a policy would lay down the regulatory framework, operational structure, management procedures and human resource development among other issues. Such a policy would also provide the framework for investment, ownership, and the type of partnerships required for increased port operations and trade, such as public/private partnerships in port operations. Rehabilitation and refurbishment of existing port equipment and acquisition of new ones will require substantial funding and an investment strategy should be developed for investment in equipment, technical capacity and training.

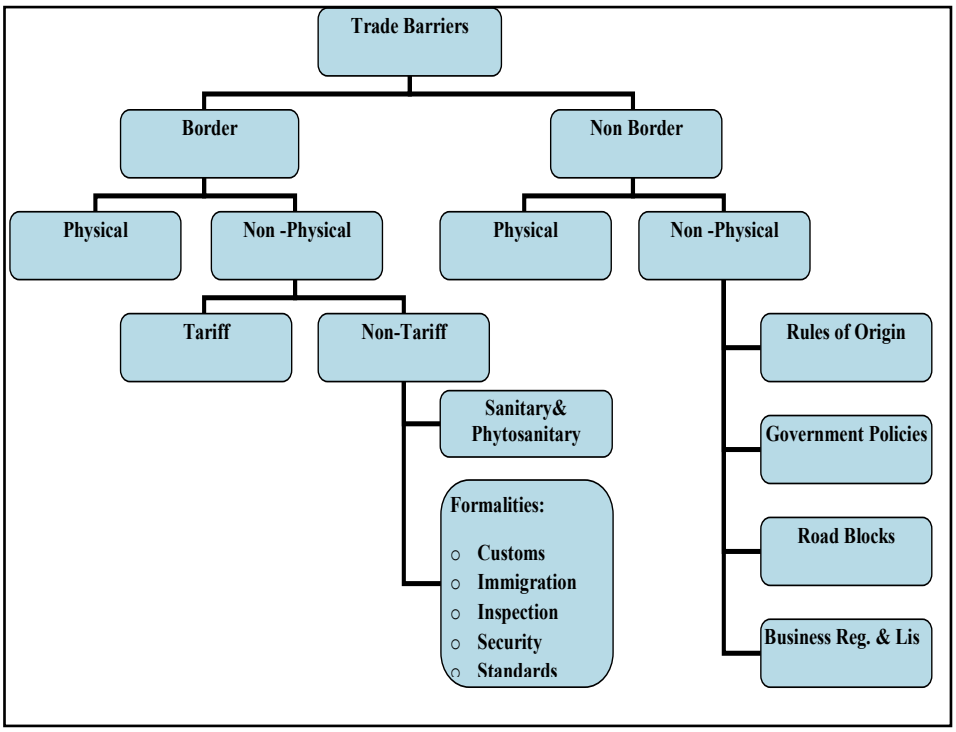
3.2.4. Sanitary and Phytosanitary (SPS) inspections and standards

A substantial amount of regional trade is in food and agricultural products. At the same time, agriculture accounts for the largest proportion of individual countries' gross domestic product. Thus trade in food will still constitute a large component of the trade across the borders. A major obstacle to increasing trade in food and other agricultural products is lack of SPS inspection facilities and harmonization of quality standards across the different countries. Partner states need to agree on the applicable import standards to enable increased

movement of food and agricultural goods within the region. At the moment, individual countries apply different standards, which are often not known by traders. Therefore, it is recommended that partner states:

- Establish sanitary and Phytosanitary inspections facilities at ports and landing beaches
- Establish and maintain capacity at ports and landing beaches for implementation of the standards to enhance intra-regional trade
- Bureaus of standards should explore possibility for greater collaboration through a one-stop standards office which could be manned by one country on behalf of the other.

Figure 18: Trade Barriers



4

Main Findings and Recommendations

4.1 Main Findings

1. The potential to expand trade by lowering trade and transport costs other than border tariff policy barriers is great. This may have a higher payoff to cooperative governmental efforts than reciprocal reductions in border tariff barriers. Normally transport infrastructure is a prerequisite for triggering trade potential. Trade per se, however, determines to a considerable degree the level of traffic between countries.
2. NB countries are deficient in transport infrastructure. These, although they are mandatory, are costly and time consuming. Inland waterways and lake transport is the cheapest way of transporting goods. NEPAD has identified waterways as potential source for high impact returns for relatively low finance. Thus it was logical to explore the implications of the navigational connectivity of the River Nile per se and the equatorial lakes on CBT among NB countries.
3. In a simple analysis of preliminary data, It was concluded that the navigational connectivity of the NB countries through the equatorial lakes stand to yield quicker results in promotion of their CBT compared to the River Nile per se. This fast track deserves a detailed analysis by itself. River Nile transport, though very cost effective particularly for large shipments and low value cargo compared to other modes, is largely used for domestic trade inside the country rather than CB trade. CBT through navigation in the Nile would require intermodal ports to bypass physical barriers such as falls, cataracts and rapids. Hence it is believed that tapping the navigational potentials of the River Nile for CBT development could best be achieved through a North-South multimodal corridor within an integrated normative infrastructural network.

4. The overall focus was therefore shifted to alleviating the physical and non-physical barriers to trade in the equatorial lakes, namely, Lakes Victoria, Albert, Kyoga, Edward, Kivu and Tanganyika, and recommend appropriate measures and policies to increase the volume of trade on the lakes system. Towards this end, a study was conducted by a consultant from the region through field visits and review of surveys and secondary literature. The study found the most highly ranked physical and non-physical barriers to trade across the lakes to be deficient ports and the lack of sanitary and phytosanitary inspection and standards facilities at border points and landing locations respectively.
5. The poor state of the ports along the lake shores and landing beaches appears to be a major impediment to the expansion of trade across the borders and on the lakes. Ports are run in a traditional method and are mostly characterized by low productivity, inadequate investment and low standards of service. There is also no clear ownership of the facilities and sites, which limits the level of investment. As a result, costs are high, which is one of the factors responsible for lack of competitiveness of the region's products. It is essential to invest in port development and create the infrastructure necessary for increased productivity, investment and service levels at port locations within the equatorial region.
6. Shipping in the six lakes is mostly by traditional dug-out canoes and small vessels. Larger ships, ferries and barges cannot be accommodated because of the poor state of ports and landing beaches. There is no port infrastructure to accommodate larger vessels.
7. It is clear that increasing the volume of trade also requires larger vessels to handle movement of steel, petroleum products, machinery and equipment and other larger volumes of merchandise. However, the more critical problem is that there is no policy in place to guide the development of ports and landing sites and increase the volume of transport on the equatorial lakes system. Although, there are efforts towards formulating a policy in Kenya and Tanzania, there is no region-wide policy framework and institutional capacity to guide port development and investment,

ownership, regulation, and operations of the ports as well as human resource development.

8. A substantial amount of regional trade is in food and agricultural products. At the same time, agriculture accounts for the largest proportion of individual countries' gross domestic product. Thus trade in food will still constitute a large component of the trade across the borders. A major obstacle to increasing trade in food and other agricultural products is the lack of SPS inspection facilities and harmonization of quality standards *across the different countries.* Partner states need to agree on the applicable import standards to enable increased movement of food and agricultural goods within the region. At the moment, individual countries apply different standards, which are often not known by traders.

4.2 Recommendations

Many studies exist which have reviewed trade and transport barriers in sub-Saharan Africa. A host of detailed relevant recommendations could be derived from these studies. These, however, could be reduced to few essential issues. Chief among these are:

4.2.1 Coordination & Cooperation

Many regional economic communities and other international organizations are involved in finding ways to eliminate or reduce Sub-Saharan trade and transport barriers. In order to ensure that these initiatives do not become counter-productive, it is essential to ensure close coordination among them.

4.2.2 Competition

One of the best ways to get better logistic service is through competition. Through competition shippers will have alternative ways/routes to ship their goods. With regard to transport on the equatorial lakes, it is therefore essential that the relevant legislative instruments in the countries bordering the equatorial lakes do not include barriers for investment in and the establishment of domestic or foreign transport companies and private/public partnerships for lake transportation.

4.2.3 Rules of Origin and other regional agreements/standards

Many studies have discussed the difficulties emanating from the many overlapping bilateral and regional preferential trade agreements, in particular in relation to Rules of Origin rules - although it should be kept in mind that regional agreements are probably the best, if not the only way, to make progress in trade and transport facilitation.

Considering the above, it is recommended that Rules of Origin rules and other standards related to trade and transport should wherever possible be not only similar but identical.

When, for whatever reason, it is not possible, or advantageous, to have identical rules, the differences should be spelt out in the introduction to the Rules, so that users do not have to spend hours or days studying the legal texts in order to find the subtle differences.

5

Towards Action

It is clear that the recommendations of the previous section are cutting across many stakeholders who are involved in the development of Nile Basin CBT namely:

- Importers and exporters, or traders, who buy and sell internationally;
- Banks providing letters of credit, which ensure that the exporter is paid when the importer receives the goods;
- Insurance companies that indemnify for loss or damage to the goods;
- Freight forwarders that organize and arrange transport and warehousing services;
- Transporters, or carriers, that move the goods through the different legs of the journey;
- Terminal operators and stevedoring companies that load and unload vessels and shift goods from one mode of transport to another;
- Sea and airport authorities that provide and manage essential transportation infrastructure;
- Inspection companies that verify that safety, quality, quantity and performance standards or contractual commitments are met;
- Customs brokers that assist importers in clearing goods through customs;
- Customs authorities that protect against the import or export of illegal goods and collect duties and taxes for governments; and
- Other government agencies responsible for providing safe navigation or that are involved in the inspection of goods entering or exiting a country.

Apart from the many stakeholders involved, non-physical barriers are extensive, deep rooted and inherently difficult to come to grips with. Non-physical barriers render the trading process far from smooth and efficient. Traders and transporters are faced with a bewildering and time-consuming array of red tape and arcane procedures involving a multitude of documents,

having to be filled out in many copies and requiring approvals and signatures at various offices located apart and often closed when their services are required, all aggravated by a lack of clear and predictable rules and a frequent need to pay unofficial fees to get the work done.

Local manufacturers and consumers end up carrying the cost of inefficient trading procedures. These costs discourage investment and make local products uncompetitive in foreign markets. Also, unpredictable delays at border crossings make it difficult, if not impossible, to apply modern supply chain management techniques.

Many regional economic communities and other international organizations are involved in finding ways to eliminate or reduce trade and transport barriers. Many studies exist which have reviewed trade and transport barriers in sub-Saharan Africa. The most relevant recommendations from these studies are centered on coordination and competition issues. In order to ensure that these initiatives do not become counter productive, it is essential to ensure close coordination among them.

Countries with less efficient trading systems have the possibility to leap-frog many years of developments by learning from the experiences of more advanced ones and implementing whatever reform measures are most appropriate to their specific situations.

To cope with the above complexity of the issue, UNCTAD and the World Bank have promoted the creation of trade and transport facilitation committees in various countries as part of their technical assistance programs. In part, the rationale is that facilitation is a cost-effective way of getting increased utilization from existing infrastructure. Another rationale is that effective reform requires that governments consult with users, and a committee is the best vehicle for such private-public partnership and government interaction.

Along these lines, it is believed that the creation of what could be called Nile Basin Cross Border Trade & Transport Facilitation Committees (NB-CBT&T FCs) could be a relevant step in the right direction.

NB-CBT&TNCs could be established through a NILE BASIN INITIATIVE to set up national committees in the respective NB countries according to a normative model together with an ASSOCIATION of national committees to ensure their harmonious operation.

Section B

POLICY BRIEF

Equatorial Lakes Ports Development and Implementation Strategy

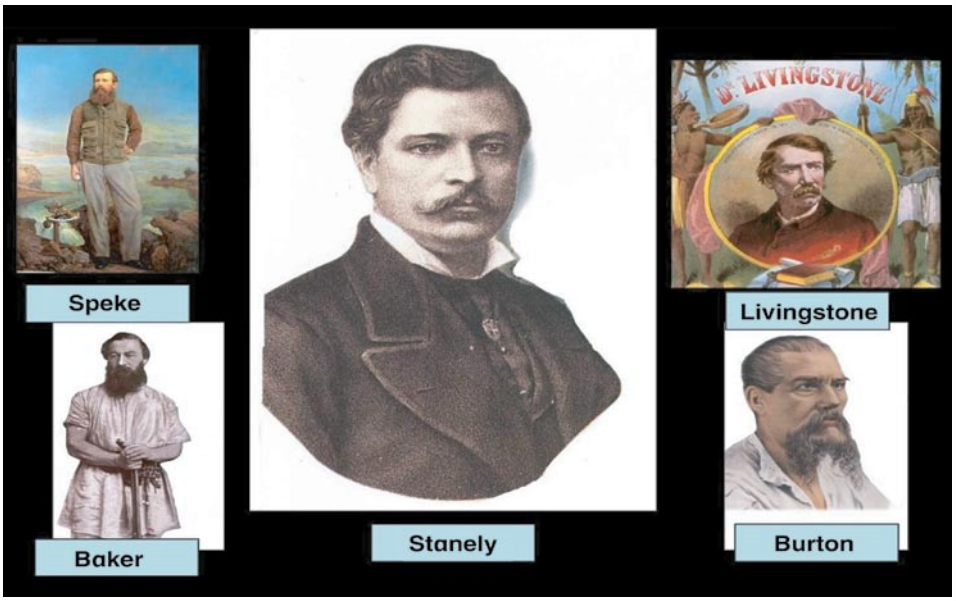


Figure 17: Some Discoverers of the Nile

Executive Summary

The study conducted by Institute of National Planning (INP), the Participating Institution of the SDBS project from Egypt on the physical and Non-physical barriers to Cross Border Trade (CBT) in the navigation in the Nile pointed to some evidence that the navigational connectivity of the NB countries through the equatorial lakes stands to yield quicker results in promotion of their CBT compared to the River Nile per se. Physical and non-physical aspects are involved. The study revealed also that chief among physical and non-physical barriers to trade across the lakes are the deficient ports as well as the lack of sanitary and phytosanitary inspection and standards facilities at border points and landing locations respectively. Many other studies exist which have reviewed trade and transport barriers in sub-Saharan Africa. A host of relevant recommendations are available. They are centered on coordination and cooperation issues and cut across many stakeholders.

To cope with the above complexity of the issue, UNCTAD and the World Bank have promoted the creation of Trade and Transport Facilitation Committees in various countries as a public- private partnership. Their role could be summarized in the simplification, harmonization, standardization and, whenever possible, automation of trade procedures. In part, the rationale is that facilitation is a cost-effective way of getting increased utilization from existing infrastructure. Another rationale is that effective reform requires that governments consult with users, and a committee is the best vehicle for such private-public partnership and government interaction.

In this Policy Brief the issue of developing the equatorial lakes' ports is addressed. A two stage implementation strategy is suggested, based on establishing national facilitation committees to take charge of the problem and the preparation of a sound investment proposal for ports development.

6

Introduction

6.1 Background

The potential to expand NB CBT by lowering trade and transport costs other than policy border barriers is great. This may have a higher payoff to cooperative governmental efforts than reciprocal reductions in border barriers. Transport infrastructure is normally a prerequisite for triggering trade potential. Trade per se, however, determines to a considerable degree the level of traffic between countries.

Inland waterways and lake transport are the cheapest mode of transporting goods. NEPAD has identified waterways as potential source of high impact returns for relatively low finance. A simple analysis revealed that the navigational connectivity of the NB countries through the equatorial lakes stands to yield quicker results in promotions of their CBT compared to the River Nile per se. This fast track deserved a detailed analysis.

The development of equatorial lakes ports is a key issue for the expansion of NB CBT and integration into international trade. Ports along the equatorial lakes are run in a traditional method and are mostly characterized by low productivity, inadequate investment and low standards of service. There is also no clear ownership of the facilities and sites, which limits the level of investment. As a result, transport costs are high, which is one of the factors responsible for lack of competitiveness of the region's products in the international marketplace. It is essential to invest in port development and create the infrastructure necessary for increased productivity, investment and service levels at port locations within the equatorial region

It is recommended, therefore, that a region-wide policy framework be formulated to guide the development of ports and landing sites in all the equatorial lake states. Such a policy would lay down the regulatory framework,

operational structure, management procedures and human resource development among other issues. Such a policy would also provide the framework for investment, ownership, and the type of partnerships required for increased port operations and trade, such as public/private partnerships in port operations. Rehabilitation and refurbishment of existing port equipment and acquisition of new ones will require substantial funding and an investment strategy should be developed to invest in equipment, technical capacity and training.

6.2 Methodology

The study started from secondary sources analyses. Based on the preliminary findings, the overall focus was shifted to the equatorial lakes, namely, Lakes Victoria, Albert, Kyoga, Edward, Kivu and Tanganyika, in an attempt to recommend appropriate measures and policies to increase the volume of trade in the lakes system. To this end, a study was conducted by a consultant from the region through field visits and review of surveys and secondary literature.

6.3 Findings

Field visits and surveys indicated clearly that the poor state of the ports along the lake shores and landing beaches appears to be the most highly ranked impediment to the expansion of trade across the borders and on the lakes. Shipping in the six lakes is mostly by traditional dug-out canoes and small vessels. Larger ships, ferries and barges cannot be accommodated because of the poor state of ports and landing beaches. There is no infrastructure to accommodate larger vessels.

It is clear that increasing the volume of trade also requires larger vessels to handle the movement of steel, petroleum products, machinery and equipment and other larger volumes of merchandise. However, the more critical problem is that there is no policy in place to guide the development of ports and landing sites and increase the volume of transport on the equatorial lakes' system.

Although, there are efforts towards formulating sea ports policy in Kenya and Tanzania, there is no region-wide policy framework and institutional capacity to guide lake ports development and investment, ownership, regulation, and operations as well as human resource development.

6.4 Policy Recommendation

It is recommended, therefore, that a region-wide policy framework be formulated to guide the development of ports and landing sites in all the Nile equatorial lake states. Such a policy would lay down the regulatory framework, operational structure, management procedures and human resource development, among other issues. Such a policy would also provide the framework for investment, ownership, and the type of partnerships required for increased port operations and trade, such as public/private partnerships in port operations. Rehabilitation and refurbishment of existing port equipment and acquisition of new ones will require substantial funding and an investment strategy should be developed to invest in equipment, technical capacity and training.

7

Implementation Strategy

A two stage implementation strategy is hereby suggested:

Stage I: Establishment of NB CBT&TFCs whose priority task in the early years of formation is the equatorial lakes ports development programme.

Stage II: Preparation of an investment proposal.

Upon approval of the proposal and securing finance, implementation starts by embarking on the detailed engineering design phase.

7.1 Establishing NB CBT&TFCs[42]

NB-CBT&TNCs could be established through a NILE BASIN INITIATIVE to set up national committees in the respective NB countries according to a normative model together with an ASSOCIATION of national committees to ensure their harmonious operation.

An NB CBT&TFC would be a formally constituted body where all interested parties in the nations' CBT and transport could present their respective problems and search, through consultation and consensus, mutually agreeable solutions. It would act as an inter-institutional forum to identify opportunities, promote facilitation, study trade and transport regulations, prepare recommendations, and create transparency on major trade and transport issues.

It would be a consultative organ; its outputs are recommended measures or actions to be voluntarily taken and implemented by the members of the committee concerned.

All key stakeholder partners to the nation's CBT, be they from the public sector or the private sector should become members of NB CBT&TFC. The following (non-exhaustive) list includes the main institutional structures, which

42 See "Creating an efficient environment for trade and transport - Guidelines to Recommendation No. 4: National Trade Facilitation Bodies" prepared by UNCTAD; ECE/TRADE/256, Geneva May 2000.

are competent or responsible for policy, and the monitoring and control of some activities related with the international transport of national trade:

a. Ministry of Works, Transport and Communications (including terminal operators);
b. Ministry of Finances (particularly Customs);
c. Ministry of Trade;
d. National associations of carriers (including freight forwarding association);
e. National associations of transport users (importers, exporters, shippers' councils, etc.);
f. National associations of banking institutions;
g. National associations of insurance companies; and
h Chambers of Commerce

The participation of these institutions in the NB CBT&TFC should be made through authorized representatives who will be in a position to express the views of their institutions.

The participation of both public and private sector representatives should enable an open dialogue on technical or policy issues and the reasoning behind certain decisions. Also it provides an opportunity for the Government's representatives to hear first hand what the implications of certain government policy decisions have on industry. Moreover, such a mixed representation will have better recognition with the relevant government institutions.

The following modality may be considered when establishing a National Trade and Transport Facilitation Committee:

a. Prepare the Terms of Reference of the Committee, Permanent Commission and Technical Secretary;
b. Elaborate a proposal for the formal establishment (e.g. a decree) of the NB CBT&TFC. The Committee will need to have a formal remit or terms of reference under which to operate, that needs to cover all aspects of work to be undertaken. The legal base, structure and administrative

framework of a NB CBT&TFC may differ considerably from one country to another. The constitution document should specify, inter alia, the legal basis and the broad structure of the organization, and the appointment of officers;

c. Elaborate a proposal for the funding of the NB CBT&TFC;
d. Identify possible key issues to be considered by the NB CBT&TFC; identify all potential key partners;
e. Call for a meeting of all identified key partners to launch the establishment of the NB CBT&TFC, to agree on suitable terms of reference of the Committee and its bodies, to determine how the Committee will be funded, and to elaborate a programme of work;
f. Set up (institutionalize) the Committee;
g. Schedule regular meetings (once a quarter, for example) of the Committee;
h. Allow the Committee to establish small working groups to deal with specific issues and let these groups work and report back to the full Committee for consideration, recommendations and action; and
i. Implement agreed recommendations and/or actions.

7.2 Preparation of an investment proposal

In this section the broad lines of a generic implementation strategy are given. It should be noted that such a strategy has to be customized and tailored to fit the objective circumstances of individual ports. Eighteen tasks could be distinguished namely[43]:

Detailed Traffic Forecast

Review national trade forecasts and traffic allocations by commodity group for the economic life of the investment proposal.

Survey of Cargo Handling Techniques

For each class of traffic that has been forecast, examine the alternative port-handling techniques and their impact on future productivity bearing in mind the expected form of presentation of cargo.

43 UNCTAD, "Port Development Handbook"

Rough Dimensions

Group together traffic classes with similar handling characteristics and, for each berth group, find the approximate level of additional facilities needed and make a rough estimate of their dimensions.

Alternative Locations

For the berth groups concerned, propose alternative water and land areas in locations that will not interfere with traffic in adjoining zones and that will provide safe berthing.

Engineering Surveys

For each location, carry out the engineering studies to quantify the main works required and adjust the locations where necessary to avoid excessive costs. Although engineering surveys should be carried out after task 4 and before task 6, in practice they may need to be continued, providing more accurate results as the survey proceeds.

Rough Costs

Estimate the cost of constructing and equipping each of the facilities under consideration.

Selection of Promising Options

Eliminate the less attractive alternative solutions; discuss conclusions with the decision authority and secure agreement on a short list of alternatives to be further studied.

Labour Requirements

Consider the labour questions and manning problems which may arise with respect to each alternative technology in parallel with task 7.

Preliminary Design

For each alternative retained, design the layout of all facilities in sufficient detail to discover access, operating or storage problems.

Operational Planning

Prepare plans showing the equipment and operation of the new facilities, and the productivity targets.

Capacity Calculations

Calculate the alternative levels of facilities needed to accommodate the range of capacities and services that are feasible.

Stakeholder Consultation

Initiate consultations with stakeholders on any issues that might be needed and new technologies that might be proposed.

Cost Estimates

Refine the cost estimates for all works, equipment and services to produce a basis for the economic and financial analysis.

Cost-Benefit Analysis

Analyze the economic feasibility for each of the alternative cases.

Financial Analysis

Analyse the financial viability of each option and review the available methods of achieving sound financing.

Draft Proposal

Consolidate all analyses and compare advantages and disadvantages of each option in a draft report.

National and Local Approval

Discuss draft report with local and national authorities and secure agreement on recommended solution.

Final Proposal

Formalize the agreed upon solutions in a report with supporting analyses.

Upon approving the proposal and securing finance, implementation starts.

Section C

Implications of Fuel Prices on the Feasibility of Ensap Hydropower Interconnection Projects

Figure 20: Round Table on Energy Prices

8

Introduction

8.1 Problem Postulation

ENSAP hydropower interconnection projects are mainly: (a) Ethiopia-Sudan Transmission Interconnection Project and, (b) Eastern Nile Regional Power Trade Investment Programme. The two projects will eventually be integrated in a more comprehensive "Eastern Nile Joint Multipurpose Programme".

The Final Main Study Report of the Eastern Nile Regional Power Investment Programme was concluded in June 2007. It fulfils the requirements of Phase I, Cooperative Regional Assessment of Power Trade. Phase II is on feasibility of an interconnection involving Ethiopia, Sudan and Egypt.

The study postulates that the profitability of the power exports from the Ethiopia - Sudan area to Egypt is determined by the competition between gas-fired CCGT in Egypt and hydro-power supplied to Egypt through the interconnection. The interconnection is economically founded if the average cost of the MWh supplied to Egypt through the interconnection is lower than the average cost of the MWh directly supplied by a gas-fired CCGT in Egypt. For this reason international fuel prices are considered a deciding factor in going ahead with the interconnection. Within this framework, INP was requested to prepare a study on the "Implications of International Fuel Prices on the Feasibility of ENSAP Hydropower Interconnection Project".

8.2 Study Objectives

It is clear that the Eastern Nile Power Trade Programme Study is a comprehensive one conducted by well reputed international consultants[44] assisted by leading local consultants in the three respective countries; Ethiopia, Sudan, and Egypt[45].

44 EDF- Generation and Engineering Division, France and Scott Wilson, England.
45 EPS (Egypt), Tropics (Ethiopia) and YAM (Sudan)

The study addresses a wide range of issues including the implications of the international fuel prices on the profitability of the programme under investigation from different perspectives. Preliminary indicators have been arrived at. It is believed that the consultant didn't dwell much on the fuel prices issue. His analysis was based on the quantitative forecasts of AEO2006. This might have fulfilled the requirements for this study as outlined in its TOR. In spite of the fact that these forecasts could be updated, still it is believed that the issue of international fuel prices and forecasts deserves a more elaborate analysis. Towards this end we arrived at the conclusion that the contribution this study might have is to help better understand the issue as well as the driving forces and deciding factors of the international fuel prices.

8.3 Suggested Methodology and Instruments of Analysis

The international energy market is highly volatile. It is increasingly sensitive to political developments and unrest brought about in several parts of the world. Moreover, it depends on several factors. Oil price for instance depends, inter alia, on the type of the market under consideration, commodity type and delivery point. The market of natural gas is even more difficult to forecast. European markets, for instance, are basically different from the American market. The highly expensive liquidation installations together with the specialized transportation vessels and costs have a clear bearing on the price agreed upon in the contracts concluded.

For these reasons, quantitative models of forecasting have to be augmented by qualitative factors. These could be achieved through integrating quantitative results with the opinions of a multidisciplinary and carefully chosen panel of experts. Quantitative scenarios are brought to the attention of the panel. Key questions covering the various aspects influencing the international market are then carefully formulated and posed to the panel in interactive manner and in several rounds until some sort of a consensus is reached.

Hence, the suggested methodology to be adopted could be summarized in the following steps:

1. Advice on an appropriate conceptual model to augment quantitative forecasts with qualitative ones.
2. Study on the Natural Gas market in Egypt.
3. Round table expert panel discussion according to prescribed rules to draw up a consensus as regards the key issue under investigation.

This methodology was discussed during the cluster meeting/workshop held in the period 26-27 June 2008 attended by ENTRO representatives.

8.4 Data Source and Requirements

No field data and information will be needed in this case. All relevant information and data are secured through the existing programme study. ENTRO secretariat has been approached for this purpose. The ENTRO Director has designated the PCU manager as a focal point for this purpose. Basic information has been furnished and made available to our study.

8.5 A Conceptual Framework for the Assessment of Oil Prices

In developing and using crude oil price projections, governments, oil companies, and financial institutions have been confronted by a fundamental dilemma. On the one hand, reliable price projections are crucially important to decision makers because of the level of capital required for energy economies of the world. On the other hand, the results of most "scientific" forecasts and projections have been strikingly off the mark in two key respects. First, crude oil price projections in the past fifteen years have consistently failed to provide a reliable warning of either pending price increases or price declines. Second, conventional methods have also consistently failed to judge accurately the extent and the severity of each successive period in the changing state of world oil markets. These failures have been so dramatic that the present conventional wisdom is that reliable crude oil price projections of more than one or two years in advance are impossible.

The Energy Department of the World Bank developed a conceptual framework guidance on technical issues for government officials, World Bank staff and consultants were involved in the various industrial and energy sectors and sub-sectors[46]. The main objective was to present a framework for projecting crude oil prices which provides greater reliability than those in general use since the escalation in world petroleum prices in 1973-74.

The perspective given in the report is that the petroleum industry is dominated by a long economic cycle rooted in the nature of the commodity and the market. This cycle is recurrent but it is not periodic, nor is the amplitude of the cycle constant. Timing and amplitude of the cycle are a function of market conditions, which vary with each cycle. Oil market analysis has become dominated by a crisis mentality that is aptly reflected in the terminology of the past fifteen years such as "energy crisis" and price "shocks."

The proposed method is based on analysis of oil market conditions over a period of more than one hundred years. The data base collected by the Petroleum Finance Company and used to develop leading and lagging indicators of the world petroleum cycle is readily available from public sources. Nevertheless, this data-base is somewhat unique in both the range of series included and the length of the time series. The forecasting approach proposed is based on the hypothesis that the characteristics of the oil market produce cyclical patterns in the industry's activity and oil prices. The long-run future of the world oil market can be projected as a continuation of the cycles of expansion and contraction.

The relative long-term stability and the cyclical nature of real crude oil prices are both expressed in an index of the real price of crude oil which is available for the period from 1870 through 1986.

46. World Bank Technical Paper No. 92, "World Petroleum Markets a framework for Reli able Projection", Industry and Energy Series, Oct.1999.

9

Current and future trends of Egyptian Gas markets

In the context of studying the implications of fuel prices on the feasibility of ENSAP Power Trade Interconnection Projects, several assumptions have been made including future world and domestic prices of oil and natural gas. The assumed oil prices in the current study are $35.4, $59.8 and $100.4 /bbl according to the low, reference and high scenarios respectively. The study concludes that the project implementation will be viable only for oil and natural gas prices greater than $100/bbl and $5.5/MMBTU respectively.

Due to the higher sensitivity of project implementation to oil and natural gas prices it was necessary therefore to assess the expected future world oil and natural gas price levels that the current paper deals with. This section focuses on analyzing the world and domestic natural gas prices.

9.1 Future of the World and Egyptian Natural Gas Prices[47]

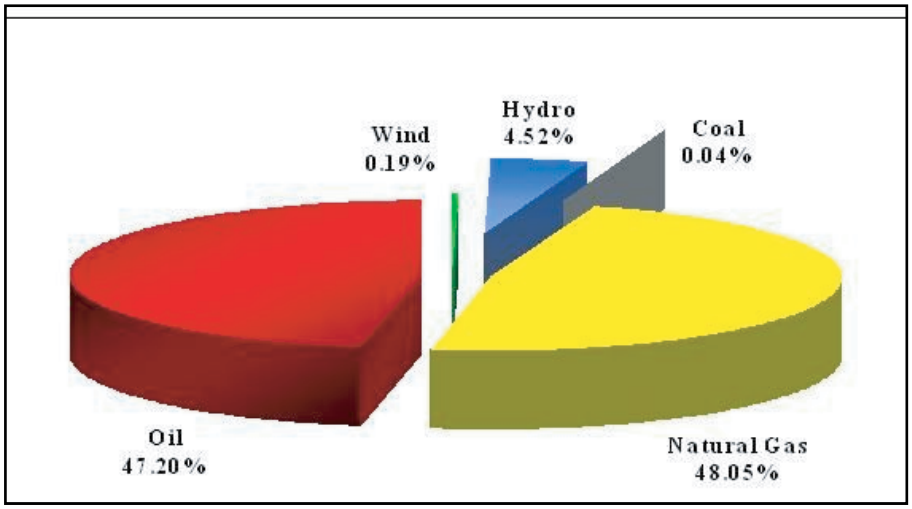
World natural gas prices are highly linked to oil prices. It increased from only $1.7/MMBTU in 1989 to reach a peak of $8.79/MMBTU in 2005 and to an average of about $6.95/MMBTU in 2007. According to EIA estimates, natural gas prices in 2006 real terms are expected to witness a continuing decline during the coming years to reach a level of about $5.8/MMBTU in 2021 after which it is expected to start increasing to reach a level of about $7.2/MMBTU in 2030.

Regarding the future pricing of Egyptian Natural Gas and Opportunity Cost Concept, natural gas is considered as one of the main energy resources in Egypt that contributes significantly in satisfying the energy needs of social

47 Dr. Hamed Korkor, 2008, Chairman Assistant for Integrated Studies & Research; "Egyptian Natural Gas Holding Company EGAS"; INP Round Table held in Sonesta Hotel, Cairo, Egypt, July 21st, 2008.

and economic development plans. According to 2006/2007 figures and as shown from the following figure its share of total primary energy consumption accounted for 48.1% compared to 47.25 for oil, 4.5% for hydro electricity and 0.2% for renewable energy and only 0.04% for coal. Meanwhile, it represented 56% of total hydrocarbon consumption in Egypt during the same year with oil representing the remainder 44%.

Figure 21: Egypt Primary Energy Consumption



9.2 Natural Gas Proven Reserves Development

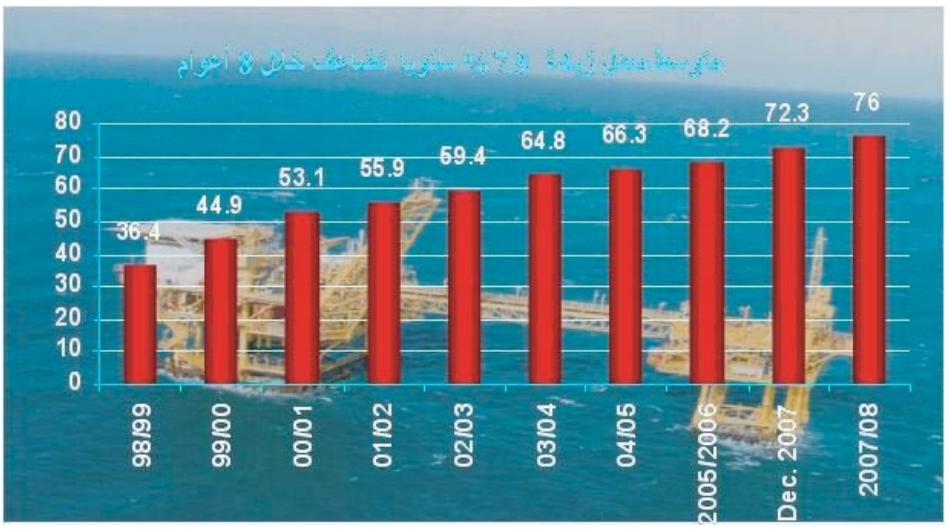
As shown in the next figure, Egypt natural gas proven reserves have been almost more than doubled during the last 9 years from about 36.4 Trillion Cubic Feet (TCF) in 1998/99 to about 76 TCF in last year 2007/2008 with an average annual increase of about 8.5% during that period. The Mediterranean region holds the largest portion of these reserves with a share that accounted for about 79% followed by the Western Desert 12%, Suez Gulf 7%, and the Delta region 2%.

It is worth mentioning that the achieved remarkable growth in Egypt's natural gas proven reserves is attributed to the following:

- Extensive exploration efforts particularly in virgin areas of ultra deep water areas of the Mediterranean.

- Attracting and encouraging major International Oil Companies IOC's to invest and participate in all oil and natural gas exploration activities. Currently there are 38 prevailing natural gas explorations concession agreements, of which 23 are fully owned and supervised by the Egyptian Natural Gas Holding Company EGAS while the remaining 15 concession agreements are fully owned by the Egyptian General Petroleum Corporation EGPC and supervised by EGAS.
- Implementing the most up-to-date drilling technologies and approaches for exploring natural gas in the ultra deep marine of the Mediterranean.
- Expanding the utilization of computer sciences and technologies for performing the 3D's seismic and reservoir studies in order to define the optimal approaches for field development and maximizing their gas reserves with the lowest possible investments.

Figure 22: Egyptian Natural Gas Proven Reserves Development (1998/1999-2006/2007)



9.3 Natural Gas Production

According to May 2008, natural gas production accounted for 5.9 buff/d compared to 5.5 buff/d as sales gas. As shown from the next figure, natural gas production has increased from about 8.2 million tonnes in 1992/1993 to about 41.3 million tonnes in 2006/2007, with an average annual growth

rate of about 14.6% during the last seven years (the period 1999/2000 – 2006/2007) compared to only about 8.5% during the previous years (the period 1992/1993-1999/2000). Also, and as can be easily noticed from the same figure, natural gas production has almost tripled during the last seven years and its level in 2006/2007 is almost 8 times its level in early 1990s (year 1992/1993).

More than 76% of total natural gas produced in 2007/2008 was from the Mediterranean region compared to about 18% for the Western Desert, 5% for the Delta region and only 1% for the Gulf of Suez.

Figure 23: Egypt Natural Gas Production Development (1998/1999-2006/2007)

9.4 Natural Gas Network

With the expansion of natural gas production activities to meet its demand according to appropriate specifications and quality and in order to maximize its value added through the extraction of its valuable derivatives, it was essential to establish several natural gas treatment, processing and liquifaction facilities. Meanwhile, it was also necessary to expand the natural gas national grid to

reach 16800 km in 2006/2007, of which 5800 km were as high pressure lines compared to only 570 km in 1980/1981.

In addition, a natural gas supply to Upper Egypt through pipelines of a total length of 762 km and total investment of about LE 4.5 billion is under development. It is expected that by the end of 2009 gas supply will reach Aswan.

9.5 Natural Gas Demand Development

The successful petroleum sector and the government fuel switching policies to expand natural gas utilization and monetize its resources has led to the rapid increase of natural gas demand to reach about 55 bcm in 2006/2007 compared to only 2.4 bcm in the early 1980s with an average annual growth rate of about 13% during that period as shown from the next figure. Meanwhile, natural gas exports have increased to reach 19 bcm in 2006/2007 representing about 35% of total gas demand during the same year.

As shown also from the same figure, natural gas consumption or local demand reached about 37.3 bcm in 2006/2007 with the electricity sector representing the major gas consuming sector with a share of about 56% of total natural gas consumption, followed by industry (including cement and fertilizer) of about 29%, petroleum 12%, residential & commercial 2% and finally transport 1% as shown in the next pie chart.

Figure 24: Natural Gas Consumption Development (1980/81-2006/07)

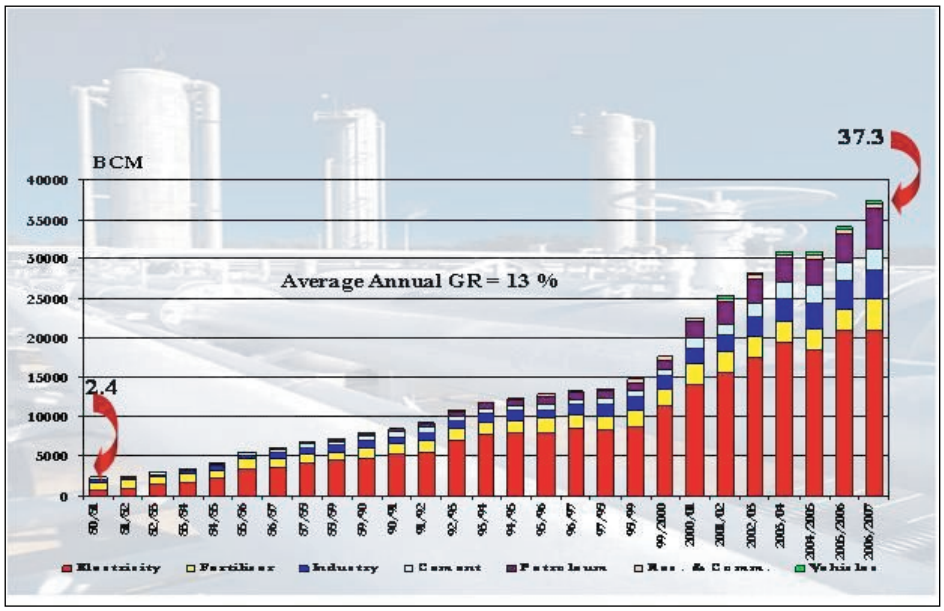
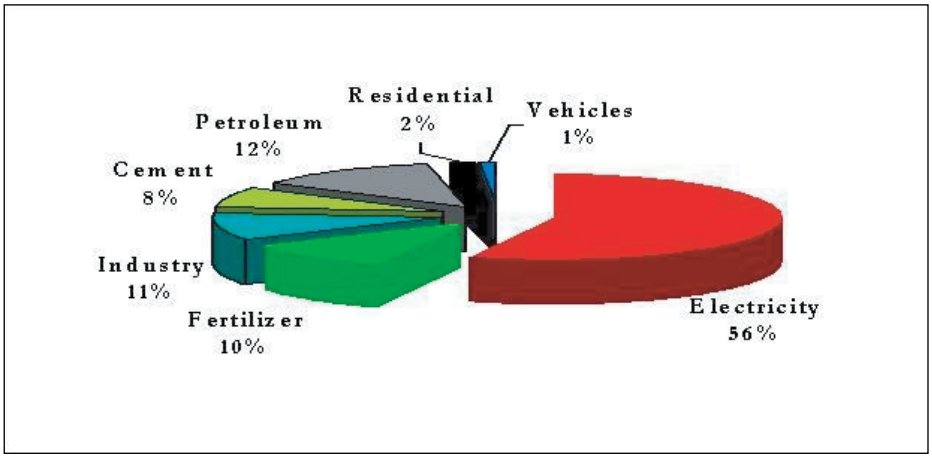


Figure 25: Natural Gas Consumption by Sector (2006/2007)



The total natural gas customers currently account for about 2.7 million, of which about 1 million were connected to natural gas from the early 1980's till the year 2000, compared to 1.7 million during the last 8 years (period 2000-2008) covering 18 governorates. An ambitious plan for connecting 6 million more residential units, 1000 commercial units in addition to 500 industrial plants started implementation and is expected to be completed by 2011 with a total investment of about LE 30 billion.

9.6 Natural Gas Export Projects

Within the context of attracting more Foreign Direct Investment (FDI) and attaining more revenues to cover the cost of foreign partners, it was decided to start exporting natural gas through pipelines and as LNG. The agreement of exporting natural gas through the Arab Gas Pipeline with a total capacity of 10 bcm was signed in January 2001, according to which the project is planned to be implemented through several phases. The first phase is a 36" – 294 km pipeline which extends from Al- Arish to Aqaba (Jordan) via Taba and started operation in July 2003 with a capacity of about 1.1-3 bcm annually and a total investment of about US$200 million.

The second phase of the project is a 36" – 395 km pipeline which extends from Aqaba to El- Rehab on the Jordanian- Syrian borders with a total investment of US$270-300 million. The third phase of the project is a 36" – 340 km pipeline which extends from Rehab (Jordan) to Homs (Syria), completed in February 2008 and will be extended in the future to Europe via Turkey with a total investment of about US$400-500 Million.

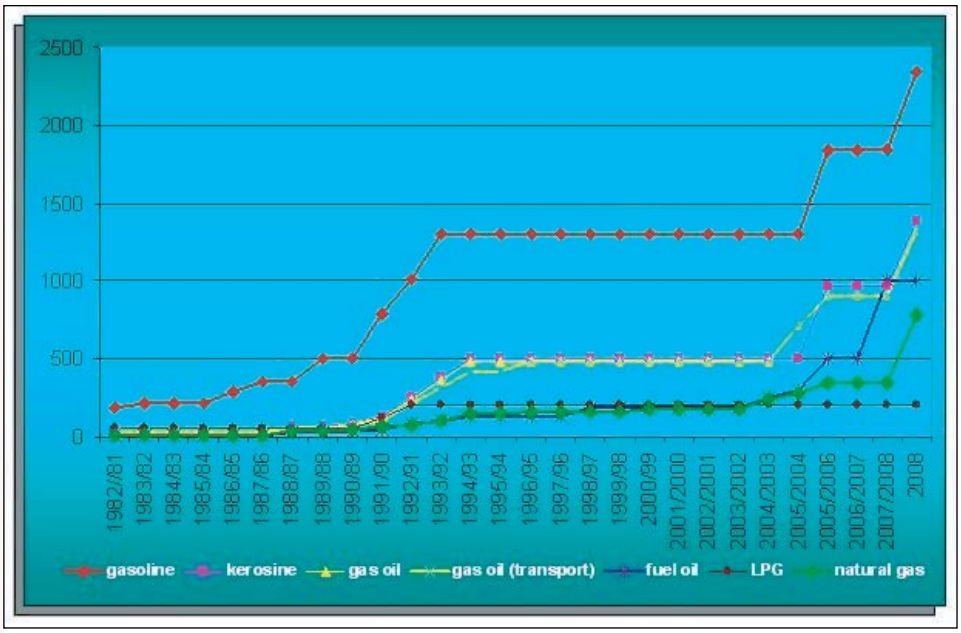
In addition to exporting natural gas through the Arab Gas Pipeline, two LNG projects have been constructed. The first project with the Spanish Company, Union Fenosa, at Damietta with a total capacity of 7.6 bcm annually and an investment of more than US$1.3 billion. The project started operation at the end of 2004 with the first LNG cargo shipment in January 2005.

The second project with BG, PETRONAS in addition to EGPC and EGAS at Idku with two LNG trains with a total capacity of 12 bcm annually and an investment of about US$1.9 billion. The project started operation by the middle of 2005 with the first LNG cargo shipment in May 2005. It is worth mentioning that while gas for export represented about 29% of the total natural gas demand in 2006/2007, its share of total natural gas revenues accounted for about 65% during the same year .

9.7 Oil Products and Natural Gas Pricing in Egypt

As shown in the next figure, oil products and natural gas prices remained relatively constant in Egypt for a long period of time, particularly from the 1990s till the early years of this century when it started since last May 2008, except that for LPG, to increase to reach the levels shown in table (8-1) for petroleum products and table (8-2) for natural gas.

Figure 26: Oil products and natural gas Prices development (1981/82-2008)



As a result of lower petroleum products and natural gas prices, subsidies increased from only about LE2 billion in 1995/1996 to reach about LE43.8 billion in 2006/2007, as shown below and more than about 70 LE billion by the end of 2007/2008.

Figure 27: Natural Gas and Petroleum Products Subsidy (2006/2007)

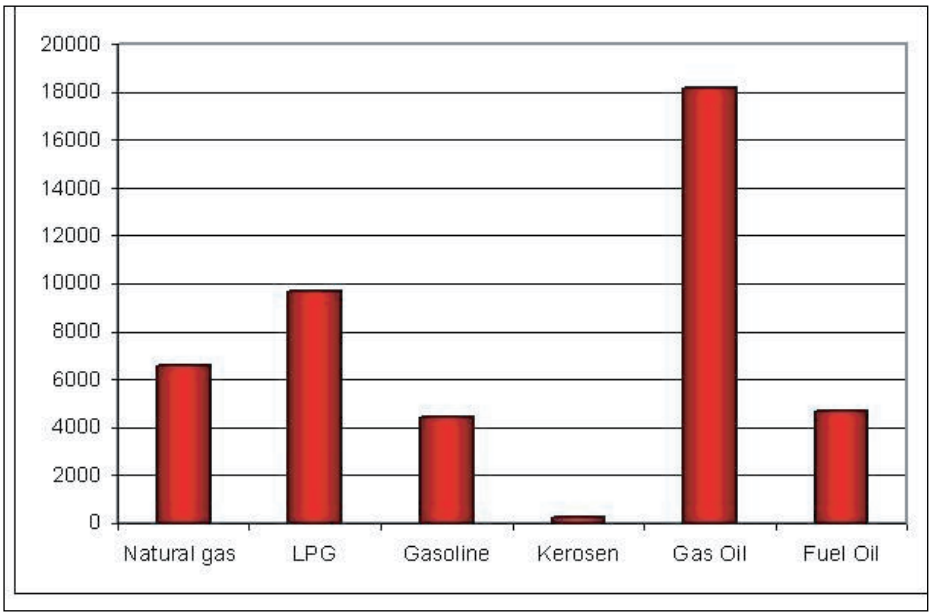


Figure 28: Petroleum Products Prices*

Petroleum Product	Price
Gasoline 90 Octane	1.75 / Litter (2345 LE / Ton)
Gasoline 92 Octane	1.85 / Litter (2479 LE / Ton)
Gasoline 95 Octane	2.75 / Litter (3548 LE / Ton)
Gas Oil	1.1 / Litter (1320 LE / Ton)
Kerosene	1.1 / Litter (1386 LE / Ton)

** Since May 2008*

Table 6: Natural Gas Prices*

Sector	Price
Intensive industries (cement, fertilizers, iron & steel, gas used as fuel in Petrochemicals)	3 $/ MMBTU
Other industries (food, textiles, engineering, pharmaceuticals, etc.)	1.25 $/ MMBTU **
Petrochemicals	According to a specific formula tied to the final products.
Electricity	1.25 $/ MMBTU
CNG	0.141 LE / M3 for CNG operating Companies 0.45 LE / M3 for CNG Vehicles
Residential & commercial: (up to 30 M3) (30 – 60 M3) (greater than 60 M3)	0.10 LE/ M3 0.20LE/ M3 0.30 LE/ M3

** Since May 2008*

*** To be increased to reach 2.65 $/ MMBTU within 3 stages (years).*

It should be mentioned that pricing of produced natural gas in Egypt has passed through several phases as follows:

- Before 1980: All discovered natural gas was considered the property of EGPC without any compensation for the expenses and costs of the foreign partner.
- Formation of national strategic reserve (1980-1986): The target of that phase was to build up national strategic reserves of natural gas of about 12 TCF. During that phase, 39 new concession agreements were signed in addition to the amendment of another 10 old agreements to include a clause for natural gas.
- Marketing and selling natural gas domestically with the equivalent price of fuel oil (1986-1993): That phase encourageed the foreign partner or the International Oil Companies IOC's to explore for natural gas through EGPC obligation to buy at least 75% of gas produced at the price of low sulphur fuel oil after making a discount of 15% to be assigned for the establishment of the national natural gas network. During that phase, 75 new agreements were signed.

- Linking gas price by oil price (1993-2000): during that phase pricing of gas based on low sulphur fuel oil was replaced by linking the price of gas to the price of Gulf of Suez crude oil. During that phase 64 new agreements were signed in addition to the amendment of 17 old ones.
- Gas pricing formula: This phase aimed at pricing natural gas in order to achieve the maximum benefit to the Egyptian economy. During that phase several agreements with foreign partners were modified. A price ceiling of natural gas was set at $2.65/MMBTU at Brent crude oil price of $ 20 or more, and a floor of gas price of $1.25/MMBTU at Brent crude oil price of $10. Setting such natural gas formulas prevented the Egyptian economy from international oil price volatility and saved more than about $18 billion from the implementation of that price formula in July 2000 to the end of June 2008.

9.8 Opportunity Cost of Natural Gas

In general the opportunity cost of any commodity including energy can be defined as:

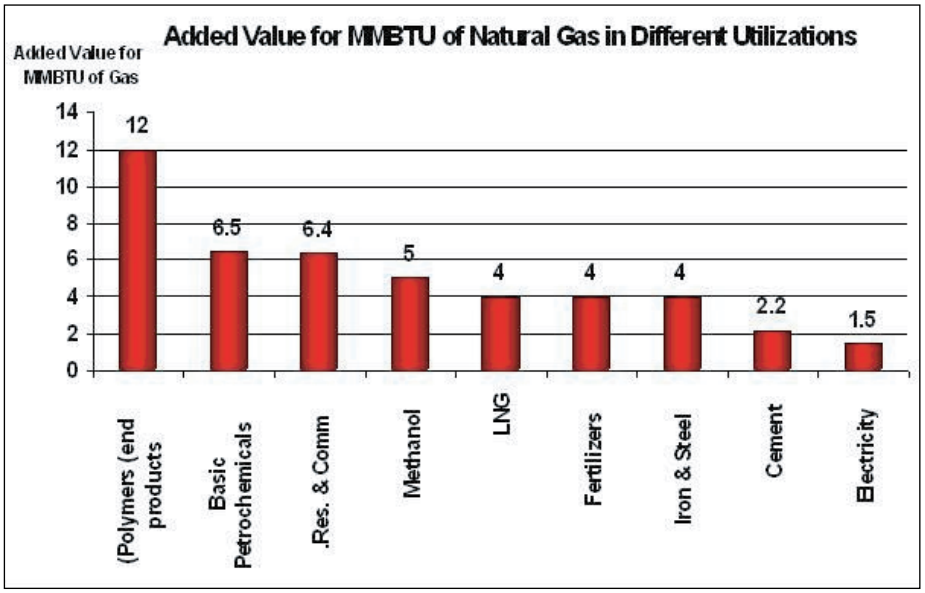
- The value of the product not produced because an input was used for another purpose.
- The income that would have been received if the input had been used in its most profitable alternative use. It denotes in general the real cost of using an input.

Therefore, the opportunity cost of natural gas could be defined simply as "the forgone income or benefit of not using natural gas at its most profitable alternative of use".

According to the main outputs and recommendations of one of the National Specialized Council's recent studies entitled "Optimal Utilization of Natural Gas", and, as shown in the next figure, the optimal utilizations of the Egyptian natural gas, based on the opportunity cost principle, were defined to have the following priority ranking:

Polymers (end products), basic petrochemicals, residential & commercial, methanol production, liquefaction of natural gas (LNG), fertilizers manufacturing, iron & steel industry, cement industry and electricity generation.

Figure 29: Added Value for 1 MMBTU of Natural Gas Utilization in Different Sectors



10

Round table on implications of international Fuel Prices on the Feasibility of ENSAP Hydropower Interconnection Projects

10.1 Introduction

The Round Table convened for a full working day on 21 July 2008 in Sonesta Hotel, Nasr City, Cairo upon invitation of the Institute of National Planning as part of its 2008 Work Plan. As explained earlier, the outcome of the Round Table is intended to help ENTRO better understand the driving forces and mechanisms, if any, that influence and fix the fuel prices both internationally and domestically in Egypt, and to provide expert views on the feasibility of the interconnection project under investigation.

A synthesis of the deliberations of the Round Table was prepared as reference material for the various points of view and the justifications behind them. It should be noted that it was not intended at any time to prepare a verbatim or detailed minutes of such deliberations. Yet, the synthesis is believed to give a fair presentation of the main view items which were expressed freely throughout the discussion.

10.2 Round Table Consensus

The Round Table discussions were moderated by Dr. Emad El Sharkawy, Chairman, Power Generation Engineering & Services Company (PGESCo) and former Chairman Egypt Electricity Authority. At the end of the deliberations, the Panel agreed on the following consensus:

The RT Panel unanimously stressed the importance of the Eastern Nile Power Trade projects to Egypt for strategic, economic and environmental reasons. The project under consideration should be viewed within this perspective. The methodology and conclusion of the consultant as regards the feasibility of the project and its pay-offs to Egypt were ascertained. The Study's fuel price projections compared with the actual prices for the years 2007-2008 reveals a significant underestimation. This effectively validates further the conclusions arrived at by the consultant. The panel believes that the upward trend of average prices would most likely continue in the future, though at slower rates. The cost of externalities and their effect on the benefits were not properly addressed in this phase. This would be another additional factor in support of the project viability.

Some remarks were raised regarding comprehensiveness of data and information used in the study. For instance, the interconnection with Saudi Arabia was not considered for reasons concerning the cut-off point decided upon by the consultant for data collection. These, in addition to price updates in view of recent developments and other remarks, have been compiled by EEHC and communicated to the consultant to be taken into consideration in the detailed feasibility study of Phase II. The panel emphasized that careful consideration should also be given in this phase to risk analysis as the interconnection line will pass through various geographical areas inhabited by endogenous communities with different perceptions of the consequences of the project to their respective communities. The African experiences of H.V.D.C. interconnections from Mozambique to South Africa should be considered as a guide in this respect.

Another point that was raised during the discussion is the expected time horizon for actual implementation of the project and whether results of the current study will be still valid by that time. The panel felt that a detailed update would be needed, at least five years before actual construction, to ascertain viability of the projects.

On the other hand, and most importantly, as stated earlier, these projects should be viewed in the context of a wider perspective of regional cooperation and integration among Egypt, Sudan and Ethiopia. Upon zooming out at this level other relevant projects would enter in the picture. The Joint Multipurpose Programme (JMP) is an attempt to address this issue. Within this perspective the implications of the dam projects in both Sudan and Ethiopia on the active storage capacity of the reservoir and the water level behind Aswan High Dam are deemed as a critically important governing factor. The MWRI and EEHC are of the opinion of conducting a dynamic optimization study to cascade the construction and filling of those dams in accordance with the "win-win" and "no regret" principles of the Nile Basin Initiative. It is clear that confirming the final decision regarding the projects under consideration would only be taken within this perspective. The consequential effects during the cascade fillings of the dam projects should not have significant adverse impact on the High Dam water flow down stream. The power generated from the High Dam could be marginally affected due to a potentially lower level in Lake Nasser. Hence, the energy generated from the dam Projects in Ethiopia and Sudan should necessarily cover such decrease. Power transmitted should not therefore be less than 3000 MW all year round.

Section D

CBT Cluster /workshop Report

Figure 30: CBT Cluster Workshop Le Meridian, Cairo, 26-27June 2008

11

Introduction

11.1 Background

A two-day workshop for the CBT cluster was held in Cairo on 26-27 June 2008. In addition to the visiting two cluster members Tanzania and Uganda, the workshop was attended by 43 participants from the PMU (3), ENTRO (5), Sudan PI (1), representatives of the National Office of the NBI and the MWRI in Egypt (9) as well as INP project team (25). Dr. Hussein Atfi, First Under-Secretary of the MWRI and Head of the Irrigation Department opened the workshop on behalf of H.E. Dr Mahmoud Abu Zeid, Minister of WRI, Egypt.

Deliberations of the workshop were centered around the First Draft Reports of the cluster members submitted on the 31st of May 2008. These dealt with three SDBS priority topics and three topics in support of the SAPs, namely:

SDBS Priority Topics

- Physical & non-physical barriers to CBT in the navigation of the River Nile [Egypt]
- The impact of regional power trade on poor communities along the interconnections in the Nile Basin [Tanzania]
- Gender mainstreaming in CBT in the Nile Basin Countries [Uganda]

SAPs Topics

- The implications of international fuel prices on the feasibility of EN-SAP Hydropower interconnection power trade [Egypt]
- Rationalizing use of discount rates for economic analysis of water resources and related projects in NEL-SAP [Tanzania]
- LEAF investment programme [Uganda]

The completion of the first draft reports marked the end of Phase I of the PIs 2008 Work Plans. This phase was to review background information of

the designated topics, compilation of relevant secondary data, specifying approaches and instruments to be used for analysis as well as plans for field mission to be conducted in Phase II.

11.2 Workshop Proceedings

The workshop was opened at 9:30 am with brief welcoming remarks by Dr. Ahmed Farahat on behalf of Dr. Ola El-Hakim, Director of INP who was on an official travel abroad. The floor was then given to Dr. Hellen Natu, SDBS acting project manager who made a short statement followed by statements of H.E. Dr. Mahmoud Abu Zeid, Minister of WRI and H.E. Dr. Osman M. Osman, Minister of Economic Development, Egypt. These latter statements were delivered on behalf of the ministers by Dr. Hussein El-Atfi, First Under-Secretary, MWRI and Dr. Ahmed Farahat respectively.

After the Coffee Break, a preliminary session was devoted to substantive introductions by representatives of SDBS PMU and SAPs. Dr. Hellen Natu gave an overview the socio- economic development and benefit sharing activities. She stressed the SDBS goals that comprise and include the necessity of achieving greater awareness, understanding and acceptance from policy-makers of the sustainable benefits that can be derived from cooperative management and development of the shared Nile Waters, as well as establishing and promoting a knowledge base on the principles and mechanisms for sharing potential social, economic and environmental benefits. Mr. Tamene Tiruneh, SDBS lead specialist, gave some preliminary observations on the first draft reports and some ideas on the next steps. Mr. Ahmed Khaled El-Daw, senior regional coordinator, ENTRO gave a presentation entitled "ENSAP Observations" in which he emphasized the "Joint Multipurpose Programme JMP" as an integrated approach within the framework of multi-country joint development and presented the key findings of the Regional Power Trade programme.

Afterwards, the workshop was structured into six working sessions. One session was devoted to each one of the three SDBS priority topics as well as the three SAPs supporting topics. Four topics were covered in day one. Since

topics five and six dealt with power trade interconnection issues they were combined and dealt with in the second day in two successive sessions.

In each one of the working sessions, the respective report was presented by the designated cluster member together with his/their views on the way ahead in Phase II followed by open discussion.

Three First Draft Reports on the SDBS priority and the SAP supporting topics were prepared and discussed in the workshop by Egypt, Tanzania and Uganda. Besides their First Draft Reports, cluster members provided power point presentations on the reports.

12

Key Issues Raised

12.1 Trade In Goods

12.1.1 General

Africa as a whole trades a very small portion of its production. Subsistence farming does not generate much trade. This is particularly true for trade across borders. Export and import are activities which for many countries are basically directed to overseas markets. Nile Basin CBT potentials are great. Transport infrastructure is normally a prerequisite for triggering trade potential. Trade per se, however, determines to a considerable degree the level of traffic between countries.

The development of inter-African trade has not shown particular advances. There is yet scant evidence of success of regional agreements promoting effective trade facilitation and development. Comesa might be an exception to this situation on a modest scale in East Africa where Comesa countries have become the most important export market for Kenya, overtaking EU.

One possible reason behind this general fact is the low political will because of the reliance on trade tax revenue, a very sensitive issue for poor countries especially. There might thus be strong resistance to facilitate trade with regional partners.

Regional trade agreements need to shift their focus from reciprocity and from a narrow vision of border enforcement to one of regional policy integration as a step towards integration into world markets.

12.2 Physical and Non-Physical Barriers

The alleviation of non-physical barriers incorporates border-crossing as well as inland facilitation measures. Port facilities should be aligned with customs rules and regulations, inland transport infrastructure and services. Road

blocks have to be minimized. Most of them are there simply to extort money mainly from trucks and buses. Other measures include the introduction of computerized tracking systems, extended opening hours for the border stations, setting up of observatories to report on actual conditions in terms of delays and illegal payments on the roads and close location of all offices involved in border crossing procedures. Concrete measures in connection with the latter are under way in some borders, on a pilot basis, namely, the construction of unified border control facilities in one common area so as to shorten the time for border crossing and controls.

In short, non-physical barriers are extensive, deep rooted and inherently difficult to come to grips with. They need to be prioritized in a rational way in the medium term. This could best be handled through better coordination between the different institutions within a country and between countries by providing what might be called "institutional homes" for joint initiatives, cooperation, coordination and facilitating dispute resolution.

The potential to expand trade by lowering trade costs other than policy border barriers is great. This may have a higher payoff to cooperative governmental efforts than reciprocal reductions in border barriers.

Overall, the Kenyan, Ugandan and Tanzanian inland waterways legislation is outdated and requires a major overhaul. A particular deficiency is that the current inland waterways legislation has a very weak safety focus. IMO assist with implementation of international conventions on maritime, safety and pollution control.

The Government of Burundi has made it a priority to improve the standard of the services offered by the port of Bujumbura, which is managed by the company holding the concession to operate the port, (EPB). Lake transport on Lake Tanganyika is mainly provided by private companies, the largest of which is North Lake Shipping (ARNOLAC).

In Uganda, water transport is governed by the Ferries Act, the Vessel Registration Act, and the Inland Water Transport Control Act. Inland water

transport is a major component of Uganda's transport system as 18% of its surface consists of lakes and rivers. It is usually also the cheapest mode of transport for passengers and cargo. The main navigable waterways include lakes (Victoria, Kyoga and Albert) and rivers (Nile, Katonga, Kafu, Aswa, Semliki, and Kagera). Uganda has five government-owned vessels, all based on Lake Victoria; none is currently operational but there are plans to put them back into service under private management. Foreign enterprises are allowed to provide cabotage services for cargo, but not for passengers.

Poor water landing site infrastructure, and weak enforcement of regulations constitute a major challenge to water transport in Uganda. Poor adjacent infrastructure of feeder roads and ferry connections also impede continued development of lake fisheries.

In Tanzania, inland water transport is undertaken on Lake Victoria, Lake Tanganyika, and Lake Nyasa. Lake transport services are provided by the Marine Services Company (MSC) and private operators. Inland water transport is under-developed. This constrains the smooth flow of traffic from landlocked countries.

The through flow of trade in the equatorial lakes region and benefitting from the low cost of inland waterways is closely related to connections with East African ports.

As a landlocked country, Burundi depends on its neighbours for access to seaports. The main route for exports is that linking Bujumbura with Dar-Es-Salaam, via Kigoma, which combines lake and rail transport. An alternative route, entirely by road, is Muyinga-Kobero-Dodoma-Dar es Salaam. The Bujumbura-Dar-Es-Salaam axis, generally known as the central corridor, is the route used for 75 to 80 per cent of Burundian trade. Another possibility is the Bujumbura-Kigali-Kampala-Nairobi-Mombasa route, generally known as the northern corridor, which is also entirely by road.. The northern Corridor Transit Transport Coordination Authority has introduced simplifications in the field of customs procedures and handling through computerized systems.

Tanzania has four major ports that can accommodate deep-sea and coastal transport: Dar es Salaam, Mtwara, Tanga, and Zanzibar. Mombasa is the main sea port in Kenya. Mombasa is connected to the hinterland with road and rail infrastructure. Inland container depots exist at Nairobi, Kisumu, and Eldoret. Kenya Railways Corporation (KRC) is the monopoly provider of rail transport services country-wide. Inland ports are currently owned and managed by the KRC. It serves as a trade artery for Burundi, the eastern portion of the Democratic Republic of Congo, Rwanda, Tanzania, Uganda, and southern Sudan. KRC operates a rail network of over 2,700 km that connects Mombasa to Busia on the Ugandan border, and through Kisumu using wagon ferries on Lake Victoria. The existing line has a capacity of 6 million tonnes per annum. The main problems facing KRC and the subsector in general include: poor management; inadequate maintenance of infrastructure due to lack of critical spare parts; shortage of locomotives and wagons; and inefficient operations due to use of old equipment. Uganda has an operational railway network of 1,228 kilometres. Railway transport remains underdeveloped.

12.3 Power Trade

12.3.1 Implications of International Fuel Prices

As a support to ENSAP Power Trade Programme, a study is now under way by INP to explain the driving forces behind the fluctuations in international fuel prices as well as the deciding factors for the Egyptian gas prices. In an attempt to find a straight answer to the question raised by ENTRO in this regard a Round Table of eminent persons from the stakeholder community was held in Cairo. The panel reached the consensus stated in section c of this report.

12.4 Main Findings To-date

INP-Egypt, in a simple analysis of Phase I data, concluded that the navigational connectivity of the NB countries through the equatorial lakes stand to yield quicker results in promotion of their CBT than the River Nile per se. This fast

track deserves a detailed analysis by itself. River Nile transport, though very cost effective particularly for large shipments and low value cargo compared to other modes, is largely used for domestic trade inside the country rather than CB trade. CBT through navigation in the Nile would require intermodal ports to bypass physical barriers such as falls, cataracts and rapids. Hence it is believed that tapping the navigational potential of the River Nile for CBT development could best be achieved through a North-South multimodal corridor within an integrated normative infrastructural network. Therefore, INP in their Phase II is to focus on strategies that will reduce physical and non-physical barriers to trade of NB countries through the equatorial lakes.

EPRC-Uganda had in their preliminary findings inequitable gender distribution along the marketing chain of agricultural products and its impact on food security. The male gender was more mainstreamed in the chain after value addition and less at production. The female gender was more mainstreamed in the chain at production and less at the after-value addition. The youth as gender were less mainstreamed in the chain at both production and after-value addition. Therefore, EPRC in their Phase II focused on strategies i) to enhance male gender mainstreaming at the production level; ii) to enhance female **gender** mainstreaming after value addition level and iii) to enhance youth as gender at both levels of production and after-value addition, of the agricultural marketing chain for food security.

By the end of Phase II, EPRC- Uganda Economic Policy Research Center generated three key outputs. A study report on gender mainstreaming in cross-border trade in the Nile Basin Countries, an integrated investment strategy to mainstream men, women and youth in cross-border trade in the Nile Basin Countries, and an investment strategy to enhance livelihoods among the people of the Lake Edward and Albert basins.

The main objective of the study was to understand any gender differentials in cross-border trade within the Nile Basin countries. The findings suggest that the youth are almost non-existent on the cross-border trade value chain; women are more involved in the production of agricultural commodities, less

in fishing, less in trade, less in export, and relatively more in imports. Men are less involved in production of agricultural commodities, more in fishing, more in trade, more in export, and relatively less in imports. To mainstream men, women and youth in cross border trade, EPRC proposes an integrated strategy involving the youth in generating information on prices, standards, demand and supply; appropriate agricultural production technology for men; and warehousing and credit for women.

ERB-Tanzania had in their preliminary findings the lack of focus that had been given to the benefit maximization of the power interconnections of the ENSAP vulnerable communities. Focus had been on the cost minimization and risk reduction. Therefore, ERB in its Phase II contributed to the benefit maximization strategy for vulnerable communities in the ENSAP countries.

12.5 Parallel Reports

According to the approved work plan, and as was clearly stated at the outset of this report, the current report has to be submitted by INP on 30 September 2008 along with the following reports:

- Final Draft Report on "Physical and Non-Physical Barriers to CBT in the Navigation of the River Nile"
- Policy Brief & Implementation Strategy on the above
- Final Draft Report on "Implications of International Fuel Prices on the Feasibility of ENSAP Hydropower Interconnection Projects"

Since according to the directives of the PMU the current report has to be a "Cluster Report" rather than a "Cluster Workshop Report" and as the above reports were assigned to the Cluster Leading Member, namely INP, this report tried to reflect the most recent and up-to-date findings of the above studies.

The other two sister cluster members are to submit their final draft reports on the same deadline. Due to communication lags, it was not possible to reflect their most up-to-date findings in this draft report. This could, however, be taken care of in the Final Draft Report scheduled for the 31st of October.

References

1. IRN (2006). African Dams Briefing & Map. International River Network's Africa Programme (IRN). http://internationalrivers.org/en/africa/african-dams-briefing-map
2. ILCEC ( ) Promoting Sustainable Management of the World's Lakes and Reservoirs. International Lake Environment Committee (ILCEC).http://www.ilec.or.jp/eg/index.html
3. TPA (2005) Major lake ports .Tanzania Ports Authority.http://www.tanzaniaports.com/mwz/port-profile.htm#LAKE
4. UN (2003). Maps and Geographic Information Resources. Department of Public Information. Cartographic Section. Unted Nations .http://www.un.org/Depts/Cartographic/map/profile/tanzania.pdf
5. CIA (2008) The World Fact Book. Central Intelligence Agency.https://www.cia.gov/library/publications/the-world-factbook/index.html
6. Web site: The Transit Transport Co-ordination Authority.http://www.ttcanc.org/about.asp?pageid=4
7. FAO. (2001) Information on fisheries management in the Democratic Republic of the Congo. The Food and Agriculture Organization of the United Nations. http://www.fao.org/fi/oldsite/FCP/en/COD/BODY.HTM
8. ILCEC ( ) Promoting Sustainable Management of the World's Lakes and Reservoirs. International Lake Environment Committee (ILCEC).http://www.ilec.or.jp/eg/index.html
9. CU (2001-07). The Columbia Encyclopedia, Sixth Edition. Columbia University Press. New York. http://www.bartleby.com/65/ki/KivuLak.htm
10. Web site: Lake Victoria Fisheries Organization (LVFO).http://www.lvfo.org/index.php?option=displaypage&Itemid=101&op=page
11. "Economic Report on Africa 2004: Unlocking Africa's Trade Potential", ECA (2004)
12. "Global Economic Prospects 2005: Trade Regionalism and Development" World Bank (2005),
13. "Regionalism and Trade Facilitation: A Primer", World Bank (2008)
14. "Review of the Implementation Status of the Trans African Highways and the Missing Links", AFDB (2000)
15. "Transport and Trade Facilitation: East and Southern Africa", World Bank (2003)

Annex A

Table 7: Summary Table of Physical Dimensions of Equatorial lakes

	Lake Victoria	Lake Kyoga	Lake Tanganiyka	Lake Kivu	Lake Edward	Albert
Coordinates	1° S 33° E	1°4'N 33°1'E	6°30'S 29°30'E	2°0'S 29°0'E	0°20'S 29°36'E	1°0'N 30°5'E
Lake Type			Rift Valley Lake	Rift Valley lakes, Meromictic		
Primary inflows		Victoria Nile; Mount Elgon	Ruzizi River; Malagarasi River; Kalambo River		Nyamugasani; Ishasha; Rutshuru; Rwindi	Victoria Nile
Primary outflows	White Nile River	Murchison Falls	Lukuga River	Ruzizi River	Semliki River Kazinga Channel	Albert Nile
Catchment area	184,000 km²; 238,900 km² basin	75,000 km²	231,000 km²	7,000 km² (2,700 sq mi)	12,096 km²	
Basin countries	Tanzania; Uganda; Kenya	Uganda	Burundi; The DRC; Tanzania; Zambia	Rwanda, Democratic Republic of Congo	Democratic Republic of Congo; Uganda	Democratic Republic of Congo, Uganda
Max. length	337 km	~200 km	673 km	89 km (55 mi)	77 km	160 km

Max. width	250 km		72 km	48 km (30 mi)	40 km	30 km
Surface area	68,800 km²	1,720 km²	32,900 km²	2,700 km² (1,040 sq mi)	2,325 km²	5,300 km²
Average depth	40 m	5.7 m	570 m	240 m (787 ft)	17m	25 m
Max. depth	83 m		1,470 m	480 m (1,575 ft)	112m	58 m
Water volume	2,750 km³		18,900 km³	500 km³ (120 cu mi)	39.5km³	132 km³
Shore length[1]	3,440 km		1,828 km			
Surface elevation	1,133 m	914 m	773 m	1,460 m (4,790 ft)	912 m	615 m
Islands	3,000 (Ssese Islands Uganda)			Idjwi		
Settlements	Bukoba, Tanzania; Mwanza, Tanzania Kisumu, Kenya Kampala, Uganda; Entebbe, Uganda	Soroti	Kigoma, Tanzania; Kalemie, DRC	Goma, Congo; Bukavu, Congo Kibuye, Rwanda; Cyangugu, Rwanda		Butiaba, Pakwach

Annex B

Table 8: Round Table Panel Composition

Dr. Emad El-Sharkawi	Chairman, Power Generation Engineering & Services Company(PGESCo) and Former Chairman Egypt Electricity Authority, Round Table Moderator
Dr. Hosni El-Kholy	Chairman, Engineering Power Systems (EPS)(in his personal capacity)
Eng. Fawzia Abdulah Abu Nehma	Director, The Egyptian Electricity Holding Company (EEHC), Member of the Project Steering Committee
Eng. Abdel Raheem Helmy	EEHC, Member of the Project Technical Committee
Dr. Hazem Hanafi	Power System Analyst, ENTRO
Dr. Hamed Korkor	Chairman Assistant for Integrated Studies & Research, Egypt Natural Gas Holding Company, EGAS
Dr. Mahmoud Saleh	Former Regional Adviser on Energy, United Nations
Eng. Ahmed Fahmy	Former Chairman, Nile Water Sector, MWRI
Dr. Taha Khalil	Strategy Expert, Faculty of Economics and Political Science, Cairo University
Eng. Abdel Monem Abu El Seoud	Former Chairman, Energy Planning Agency, Egypt
Dr. Ahmed Bahgat	Chairman, Benchmark Capital Corporation (private sector investment banking) and Former Vice President, African Development Bank
From INP	
Dr. Ola El Hakim	Director, INP
Dr. Ahmad Farahat	Professor, INP, Nile Basin Project Coordinator
Dr. Abdel Aziz Ibrahim	Professor, INP, Project Evaluation
Dr. Ali Nassar	Professor, INP, Modeling
Dr. Sayed Hussein	Professor, INP, Project Evaluation
Dr. Ahmed Barrania	Professor, INP,
Dr. Nevin Kamal	Associate Professor, INP, Energy Economy
Dr. Heba El Baz	Assistant Professor
Ms. Mariam Raouf	Research Assistant

Annex C

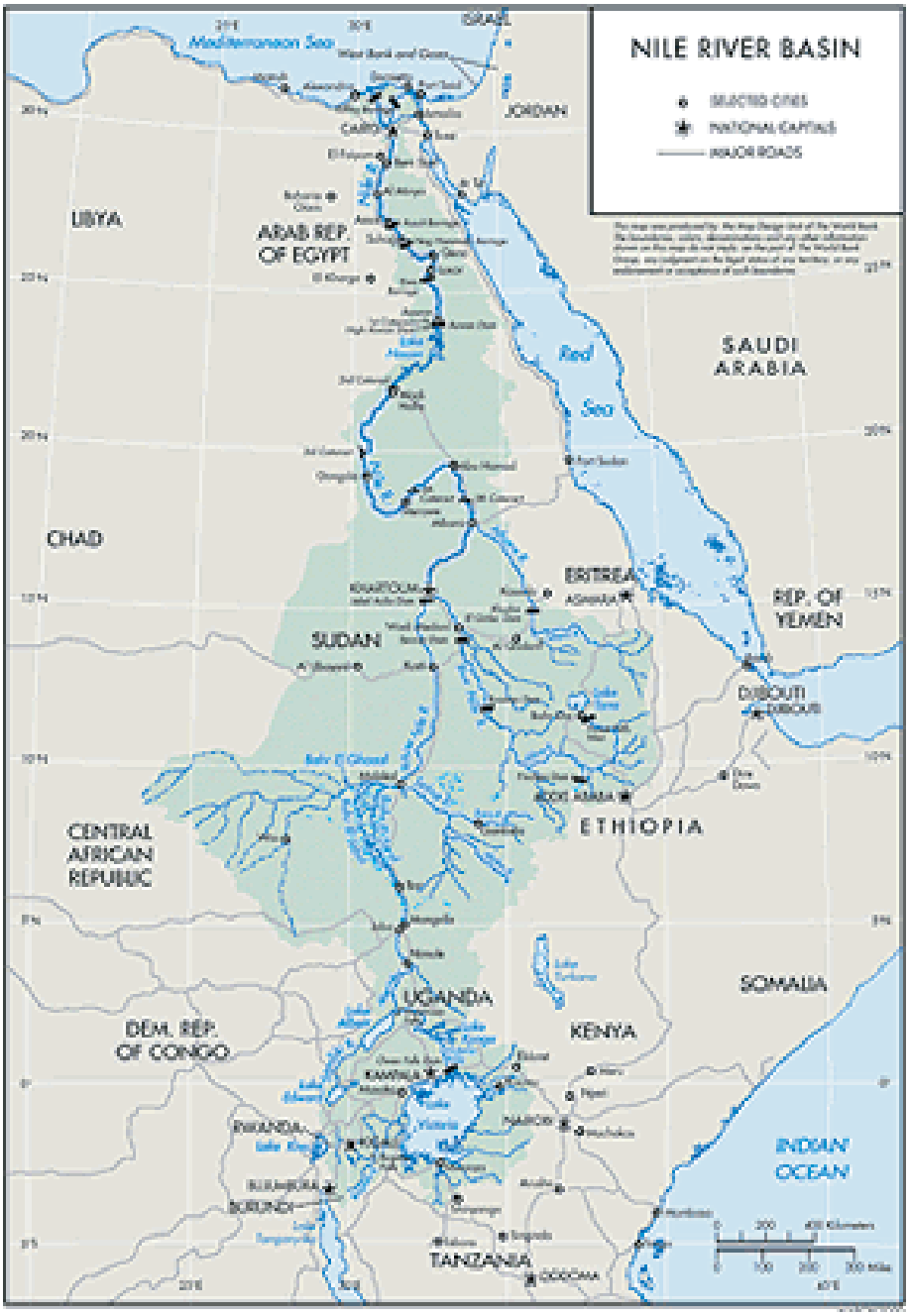
NILE BASIN INITIATIVE
Shared Vision Programme
SOCIO-ECONOMIC DEVELOPMENT & BENEFIT SHARING (SDBS) PROJECT

4241 B.C.

Cross-Border Trade Cluster Workshop

Le Meridien Heliopolis, 26-27 June 2008		
DAY ONE: Thursday 26 June, 2008		
8:30-9:30	Registeration	
9:30-10:30	OPENING	
	Dr Ola El Hakim, Director INP	
	Dr. Hellen Natu,SDBS Lead Specialist	
	H.E. Dr. Osman M. Osman, Minister of Econ. Develop.	
	H.E. Dr. Mahmoud Abu Zeid, Minister of Water Resources & Irrigation	
10:30-11:00	COFFEE BREAK	
11:00-11:30	SDBS/PMU	
	ENTRO	
	NELSAP-CU	
11:30-12:30	TOPIC 1:Physical and Non-physical barriers to Cross-border trade in the navigation of the River Nile	EGYPT
	Chairperson: Dr. Wael Khairy	
	First Draft Report	
	The way ahead	
	Discussion	
12:30-14:00	TOPIC 2:LEAF Investment Programme	UGANDA
	Chairperson: Eng. Ahmed Fahmy	
	First Draft Report	
	The way ahead	
	Discussion	
14:00-15:00	LUNCH BREAK	

15:00-16:30	TOPIC 3:Rationalizing use of discount rates for economic analysis of water resources and related projects in NELSAP	TANZANIA
	Chairperson:Mr. A. Sendama	
	First Draft Report	
	The way ahead	
	Discussion	
16:30-16:45	COFFEE BREAK	
16:45-18:00	TOPIC 4: Gender Mainstreaming in Nile Basin Countries	UGANDA
	Chairperson: Dr. Haji Semboja	
	First Draft Report	
	The way ahead	
	Discussion	
DAY TWO: Friday 27 June, 2008		
9:00-10:30	TOPIC 5:The impact of regional power trade on poor communities along the interconnections in the Nile Basin Countries.	TANZANIA
	Chairperson:Dr. Ahmed K. El-Daw	
	First Draft Report	
	The way ahead	
	Discussion	
10:30-10:45	COFFEE BREAK	
10:45-12:45	TOPIC 6:The implications of international fuel prices on the feasibility of EN-SAP hydropower inter-connection power trade projects.	EGYPT
	Chairperson:Dr. Hellen Natu	
	ENTRO	
	First Draft Report	
	The way ahead	
	Discussion	
12:45-15:00	LUNCH & FRIDAY PRAYER BREAK	
	General Discussion	
15:00-16:00	Chairperson: Dr. Ola El-Hakim	



NBI

To achieve sustainable socio - economic development through the equitable utilization of, and benefit from,

the common Nile Basin Water Resources

Annex D

NILE BASIN INITIATIVE

Shared Vision Programme

Cross-Border Trade Cluster Workshop

Le Meridien Heliopolis, 26-27 June2008

Table 9: List of Participants

Title	Category/Name	Occupation/Position	e-mail
	(a) PMU, Entebbe		
Dr.	Hellen Natu	SDBS Acting Regional Project Manager	hnatu@nilebasin.org
Mr.	Tamene Tiruneh	SDBS Lead Specialist	ttiruneh@nilebasin.org
Mr.	John Bosco Bampabwire	SDBS Research Analyst	jbbamps@yahoo.co.uk
	(b) CBT Cluster		
Mr.	Haji Semboja Hatibu	Economic Research Bureau, University of Dar-es-Salaam	haji@semboja.com
Ms	Madina Guloba	Economic Policy Research Centre	mguloba@yahoo.com
	(c) NB Pis		
Dr.	Ismail Elkhalifa Suleiman	Director of Development Studies and Research Institute	ismail.suleiman@gmail.com
	(d) ENTRO		
Dr.	Ahmed Khalid ElDaw	Senior Regional Project Coordinator	akhalid@nilebasin.org
Dr.	Fatma Moustafa	Manager of Power Coordination Unit ENTRO	fmoustafa@nilebasin.org
Dr.	Hazem Hanafi	Power System Specialist	hhanafi@nilebasin.org
Mr.	Jelal Shafie	Power System Specialist	jshafi@nilebasin.org
Dr.	Nadir M. Awad	Power Coordination Unit ENTRO	nawad@nilebasin.org

	(e) Ministry of Water Resources and Irrigation		
Dr.	Wael Mohamed Khairy	Director, National Office, NBI, MWRI	w.khairy@nws.gov.eg
Eng.	Ahmed Fahmy	Former Director, NWS, MWRI	ahmedfahmy95@hotmail.com
Dr.	Ahmed Mostafa	Ministry of Water Resources and Irrigation	ahmed@mwri.gov.eg
Dr.	Mamdouh Mohamed Hassan	Planning Sector, Ministry of Water Resources and Irrigation	mamdouhh@hotmail.com
Eng.	Amal Gasser	Electric engineer, Nile Water Sector	amalcasser@hotmail.com
Eng.	Enas Ahmed Abdel-Haleem	Civil engineer, Nile water sector	nasa766@yahoo.com
Eng.	Aref Gharib	Tech. Office, Nile water sector, MORWI	a.gharib@nws.gov.eg
Eng.	Wesam Sayed Metwally	National Office NBI, Nile Water Sector	bousysaeid@yahoo.com
Eng.	Marwa Khattab	Civil Eng., Nile Water Sector	
Eng.	Amgad Salah ElDin	NBI National Office, Nile Water Sector	a.radwan@nws.gov.eg
	(f) INP Participants		
Dr.	Ahmad Farahat	SDBS/PI Representative, Egypt	ahmad.farahat@gmail.com
Dr.	Ali Nassar	INP National Team	nassaral@hotmail.com
Dr.	Ahmad Barrania	INP National Team	ahmad-barrania@gmail.com
Dr.	Fadia Abdel Salam	INP National Team	fadiainp@yahoo.com
Dr.	Huda Elnemr	INP National Team	hodaalnemr@yahoo.com
Dr.	Moustafa A. Moustafa	INP National Team	moustafa63432000@yahoo.com
Dr.	Aziza Abdel Razek	INP National Team	aziza_abd_Razik@yahoo.com

Dr.	Samir Moustafa	INP National Team	samirmoustafa@hotmail.com
Dr.	Azza El Fandary	INP National Team	azzama21@yahoo.com
Dr.	Salwa Morsy	INP National Team	
Dr.	Ashraf El Araby	INP National Team	ashraf.araby@gmail.com
Dr.	Nevine Kamal	INP National Team	
Dr.	Mona El Dessouki	INP National Team	dr.mona.desoukey@gmail.com
Dr.	Heba Elbaz	INP National Team	h_elbaz@hotmail.com
Eng.	Islam Mahdi	INP National Team	engislammahdy@hotmail.com
Eng.	Mohamed Fathi	INP National Team	muhammadfathiafifi@hotmail.com
Mr.	Ahmed Suleiman	INP National Team	
Ms.	Sahar Abboud	INP National Team	sahar20042001@yahoo.com
Ms.	Mariam Raouf	INP National Team	mraouf23@yahoo.com
Mr.	Adel Mohammad	INP National Team	adel_plammer@hotmail.com
Ms.	Zeinab Nabil	INP National Team	
Mr.	Ahmed Ashour	INP National Team	
Ms.	Amal Zakaria	INP National Team	
Ms.	Walaa Hussein	INP National Team	walaa_660@hotmail.com
Ms.	Asmaa Melegy	INP National Team	
	(G) Admin Staff		
Mrs	Fawzia Ramadan	INP National Team	
Mr.	Ahmed Hassan	INP National Team	ahmed.zalal@gmail.com

Notes

1 World Bank- Key Development Data & Statistics 2006 - http://web.worldbank.org
2 ibid – Gross National Income per person, Purchase Power Parity
3 UNDP 2007/2008 Human Development Index ranking
4 World Economic Forum, the Global Enabling Trade Report 2008 - http://www.weforum.org/en/index.htm
5 World Bank, Logistics Perception Index - http://web.worldbank.org