

from Malauia, 28 km south to Kassala, the operation of this section had stopped since 1966. Estimated cost of reconstruction is about \$15 million.

6. Sudan-Uganda

It is significant to put into consideration that it is the unique entrance and the suggested way for the African south, starting from Wau across Juba, Nomoly to Ugandan Gulu. It is 625 km, while the cost for its reconstruction inside the Sudan borders is about \$207 million.

Conclusion

As we have mentioned, rail tracks have a great role, and benefits in social and economic areas, for the African continent. In addition to safety, economical cost, ability to confront the critical transport crisis, save the environment from pollution, noisy continuous movements, and less consumption of fuel, railways everywhere are more favorable than other modes of transport.

The subject requires the African governments to work jointly to overcome all obstacles and constraints that hinder their way, so as to reach the goals that are required for African unity in various fields.

Recommendations

In the short term:

1. Submit feasibility studies for inter-African rail links.
2. Activation of bilateral agreements in the way of linkage of countries with each other.
3. To enable the Railways Union to play an effective role in African interconnection, by which member railways should honor their obligation towards the Union.
4. UAR must play its role in coordination and harmonization between the African railways, to reach the goal of unifying the rail terms across the continent.

In the long term:

1. Union of African Railways effort must go ahead in their studies of having one type for railways' length and characteristics.
2. Encourage the existing rail industries in some African countries, until they are able to produce rail spare parts and equipment.
3. Financing of the extension of rail to link African countries, is the government's responsibility.

Kamal Ali Mohamed

Development of Nile Water Resources

Kamal Ali Mohamed is an engineer, and is Minister of Irrigation and Water Resources of Sudan. His speech was entitled, "Water Potential of the Nile: Achieving Peace Among the Nile Riparian Countries Through the Development of the Water Resources of the Nile."



Introduction

The River Nile, shared by ten riparian countries, Burundi, Democratic Republic of the Congo (D.R.C.), Egypt, Ethiopia, Eritrea, Kenya, Rwanda, Sudan, Tanzania, and Uganda, is one of the most important rivers in the world. The salient hydrological data are appended as annex 1. The area encompassed by the basin is 3 million square kilometers, which is about 10% of the land area of Africa (**Figure 1**). The total population of the basin today is 140 million people.

The basin has variety of climatic zones, ecosystems, and cultures. It was the home of famous civilizations in history. The Nile is a great asset with a lot of opportunities for cooperative socioeconomic sustainable development and integration.

Today, despite its vast natural resources, the people of the Nile Basin face the challenges of alleviating poverty, instability, imbalance between population growth and available food and water supplies, environmental degradation, and peace threats and foreign intervention (in the Horn of Africa, the Great Lakes, etc.).

Cooperation in the Nile Basin

Cooperation among the countries of the Nile Basin dates back to 1967 within the context of the Hydromet. Studies of the Equatorial Lakes Project have been steered by a basin-wide technical committee, composed of the heads of Water Resources Ministries of all the riparian countries, including Ethiopia as an observer. This has laid formidable ground for basin-wide cooperation. This cooperation continued until 1992, when the Ministers of Water Resources met in Uganda and agreed to further cooperate to formulate an action plan. Cooperation continued until 1996, and culminated in the Nile Basin Initiative, supported by the World Bank and other do-

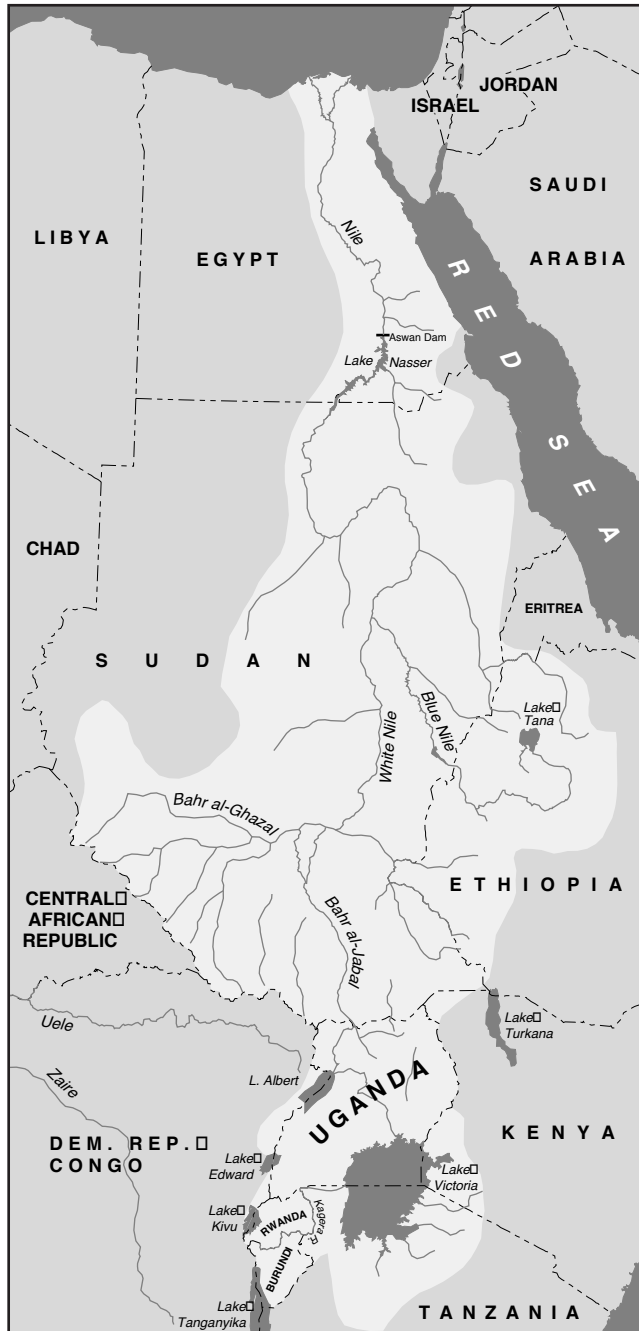
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FIGURE 10

The Nile River System



nors who constituted an International Consortium for Cooperation on the Nile.

The objectives of the Nile Basin Initiative:

To formulate a strategic action plan and program to utilize the potential of the Nile for benefit of all its peoples.

To move forward from studies to planning to action on the ground.

To achieve sustainable socioeconomic development

through the equitable utilization and benefit from the common Nile water resources with efficient water management and use, and without causing harm, and to realize economic and social prosperity, security, and peace for all its peoples.

To cooperate in joint action to achieve win-win benefits.

To eradicate poverty, environmental degradation, and instability.

The Strategic Action Plan and Program:

The Strategic Action Plan and Program is composed of two complementary sub-programs, the “Shared Vision” sub-program, and the “Subsidiary Action” sub-program.

The present institutional set-up for cooperators:

The Council of Ministers of the Water Resources Affairs of the Nile Basin (Nile-COM) is the policy and guidance body for the Nile Basin on ongoing cooperation.

The Nile-COM established a technical advisory committee (the Nile-TAC), which is a transitional technical body to coordinate the joint activities of the Nile Basin Initiative until the Institutional Legal Cooperative Framework is established.

The Nile-TAC forms working groups as required.

An Executive Secretariat, based in Uganda, has been appointed.

A panel of experts was established in 1997, composed of three law and water resources experts from each country, to look into the equitable use of the Nile Basin.

The Shared Vision Program

The Nile Basin Council of Ministers endorsed the Shared Vision Program, composed of five basin-wide pillars which are currently being prepared for implementation by working groups of experts from all the Nile Basin countries as follows:

1. Confidence-building multi-stakeholders involvement and participation in political engagement community awareness.

2. Socioeconomic environmental and sectoral analysis which comprise water resources planning and management for socioeconomic development and benefit, sharing Nile trans-boundary environmental action, including water quality monitoring, environmental impact assessment, bio-diversity conservation, macro-economic analysis, regional sectoral analysis (poverty alleviation, water, energy, regional power protection and trade, agriculture environment industry).

- Regional integration opportunities, noting that integrated development is the key factor for peace.

- Financing alternatives, including or emphasizing the role of the private sector.

- Opportunity cost analysis.

3. Development and investment planning, which comprises data management; modeling, including decision support systems; win-win scenarios; and regional integrated water resources planning, etc.

4. Applied training, which includes specific support to universities and applied research institutions in relevant water resources disciplines, building centers of excellence and targeted technology transfer, basin interchange of research re-

sults, training, and interaction among professionals.

5. Establishment of a legal, institutional framework to achieve sustainable socioeconomic development through the equitable utilization of, and benefit from, the common Nile water resources.

A panel of experts was established in 1997, composed of three law and water resources experts from each country, who prepare a report containing many general principles and institutional structure, but, to resolve all issues, the Council of Ministers agreed in the Khartoum Nile-COM session in August 2000 to extend dialogue on outstanding issues with UNDP [UN Development Program] support.

It is to be noted that the Nile Basin Initiative is a transitional arrangement until such a permanent legal institutional framework is established.

It is to be noted that the panel of experts has agreed on the will to cooperate, to adopt the principles of equitable use and no harm, to resolve water conflict through peaceful means, and to have an institutional body composed of a Technical Advisory Committee, a Council of Ministers, and a Council of Heads of States at the top of the proposed legal institute framework.

What Has Been Achieved with Respect to the Shared Vision Projects:

Establishment of working groups by the Nile Technical Advisory Committee (already established).

Preparation of TOR (done).

Detailed project preparation (under implementation).

This will be followed by submission to the Nile Council of Ministers session in Khartoum, hopefully by February 2001, and then mobilization of funding from the ICCON [International Consortium for Cooperation on the Nile] for implementation, hopefully in April 2001.

The Subsidiary Action Program

This comprises actual development projects at the sub-basin level within the basin-wide framework. Two experts groups of subsidiary action program have been formed. One is the Eastern Nile Subsidiary Action Program (ENSAP), including Egypt, Ethiopia, and Sudan, and Eritrea can join.

The other is the Nile Equatorial Lakes Region (NELSAP), including Burundi, the D.R.C., Kenya, Rwanda, Tanzania, and Uganda, as well as the two downstream riparian nations, Sudan and Egypt. The two experts groups are currently identi-

TABLE 1
NELSAP Program

NEL-COM Priority Areas	Project	Countries Benefiting
1. Irrigation and drainage	1.1 Enhanced agriculture productivity through rainwater harvesting and small scale irrigation project	BUR, DRC, KEN, RWA, TAN, UGA
2. Sustainable management and conservation of lakes and linked wetlands	2.1 Fisheries project for Lake Albert	DRC, UGA
3. Watershed management	3.1 Development of a framework for co-operative management of the water resources of the Mara River Basin	KEN, TAN
	3.2 The Kagera River Basin Integrated Water Resources Management Project	BUR, RWA, TAN, UGA
4. Water hyacinth and water weed control	4.1 Water Hyacinth Abatement in the Kagera River Basin Project	BUR, RWA, TAN, UGA
5. Hydro-power development and power trade Sub-program 1 Hydropower development Sub-program 2 Transmission interconnection	5.1 Rusumo Falls Hydro-Electric Power Development, HEP	BUR, RWA, TAN, UGA
	5.2 Ranking of HEPs in the NEL Region	BUR, DRC, KEN, RWA, TAN, UGA
	5.3 Feasibility studies of HEPs in NEL Region	BUR, DRC, KEN, RWA, TAN, UGA
	5.4 Interconnection between Kenya and Uganda	KEN, UGA
	5.5 Interconnection between Kenya and Tanzania	KEN, TAN
	5.6 Interconnection between Rwegura-Kigoma	BUR, RWA

fying cooperative projects for further project preparations, assessing upstream and downstream impacts, as the subsidiary action programs are to be built on the principle of equitable utilization, no significant harm, and to ensure benefits for all involved and to distribute benefits, costs, and risks equitably, such that the cumulative aggregate of impacts optimizes benefits for all parties involved.

Following is the list of potential Subsidiary Action Program projects.

Generic water resources management projects:

Water supply and sanitation; Irrigation and Drainage Development; Fisheries Development; Hydropower Development and Pooling; Watershed Management; Sustainable Management of Wetlands and Bio-diversity Conservation; Sustainable Management of Lakes and Linked Wetland Systems; River Regulation; Flood Management; Desertification Control; Water Hyacinth and Weeds Control; Pollution Control and Water Quality Management; Water Use Efficiency Improvements.

Other related joint development project possibilities are:

Infrastructure: Regional energy networks, including power intercommunication development; telecommunications development; regional transports, including railway and road networks, river, marine navigation, and aviation.

Trade and industry: Promotion of trade (including border trade); industrial development; regional tourism development; promotion of private investment and joint ventures; marketing and storage of agricultural products; and forest crop harvesting.

Health, environment, other: Malaria and other endemic diseases control; protection of wildlife; environmental management; disaster forecasting and management.

What has been achieved of the Subsidiary Action Program:

- a. Establishment of Experts Working Groups of both ENSAP and NELSAP (see **Table 1**). (Already done)
- b. Prioritization process and formulation of priority Subsidiary Action Program preliminary analysis (under implementation).
- c. Consultative Group Process, submission to Nile-COM through the Nile-TAC (hopefully in the Nile-COM meeting in Khartoum in February 2001).
- d. The Nile-COM will submit the ICCON for mobilization of funding for prefeasibility, feasibility, design, and then
- e. Funding for implementation.

An International Consortium for Cooperation on the Nile (ICCON) is being established to support the Nile Basin Initiative, organized by the World Bank as a partnership of the riparian states and the international community to seek funding for the shared vision and Subsidiary Action projects, to promote transparency among the countries and donors.

A financing mechanism is currently under formulation. It is proposed to have a Multi-Donor Trust Fund, or, alternatively, direct funding by the donors for specific activities of both programs.

ENSAP

The following is a list of proposed project profiles:

Egypt

1. Ethiopia Plateau Simulation Model
2. Hydropower and Flood Control
3. Baro-Akobo Conservation Plan
4. Power Pooling Study
5. Sediment Discharge Management along the Blue Nile and the Nile River

Ethiopia

Irrigation Projects

1. Tana-Beles Irrigation Project
2. Humera Irrigation Project
3. Didessa Irrigation Project
4. Angar-Nekemt Irrigation Project
5. Metema Irrigation Project
6. Nesh Irrigation Project
7. Baro Irrigation Project

8. Gilo Irrigation Project

Hydropower Projects

1. Karadobi
2. Mabil
3. Mendaia
4. Boarder
5. Chemoga-Yeda
6. Beles
7. Didessa
8. Baro 1&2
9. Geba 1&2
10. TAMS
11. Birbir A&R
12. Geba R

Watershed Management Projects

1. Integrated Conservation Based Development and Intensification of Rainfed Agriculture
 2. Participatory Soil Conservation
 3. Catchment Protection Forestry Development
 4. Integrated Gully Reclamation
 5. Development of Conservation Based Agronomic Practice
 6. Agroforestry Development
 7. Promotion of Forest Conservation and Tree Planting
 8. Establishment of Conservation Structures on Highly and Moderately Eroded Areas
 9. Establishment of Conservation Structure in 500 square kilometer catchment areas of dam sites
 10. Low-cost Surface Water Development
 11. Lake Tana Area Fogera Plains Nature Reserve
 12. Conservation and Utilization of Plant Genetic Resources
 13. Ecological Forestry
 14. Soil and Water Conservation Research
 15. Catchment Management and Training
 16. Training in Catchment Management
 17. Improved Forage Development and Seed Multiplication Centers
 18. Nursery Development and Establishment
 19. Support to Improved Stove Dissemination
 20. Dissemination of Kerosene Wick Stoves
 21. Demonstration of Biogas Technology
 22. Malaria Control
 23. Improving Agriculture Techniques
 24. Delivering Family Planning Units
 25. Detailed Study and Design of the Programs (4 projects)
- ### **Sudan**
1. Merowi Hydropower Project
 2. Atbara Watershed Management
 3. Hydrological Data Transmission and Flood Forecast
 4. Kajbar Hydropower Project
 5. Upper Atbara Development Project
 6. Great Kenana Irrigation Project