DEVELOPMENT AND THE ENVIRONMENT IN KAGERA BASIN UNDER THE RUSUMO TREATY

By

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CORRECTION

Page	Paragraph	Line	Word	Correction
6	3	1	4	the not that
7	1	3	5	peak not peia
9	4	1	9	no not not
11	1	2	8	1968 not 1986
10	2	1	3	modern not modert
12	1	2	8	may not mya
14	3	insert "(e) Legal aspects of the funding of the organization and its projections; and...		
16	3	5	3	no not to
25	2	4	7	office not ofice
26	5	3	2	been not been
29	3	2	6	the not th
32	3	3	4	irrigation not irigation
35	3	2	5	sufficiency not fsufficiency
38	2	Remove "the Kagera river in Rwanda"		
91	4	2	4	remove "the"
97	1	1	2	most not nost
97	1	5	8	remove "the"
97	1	9	3	commer after "irrigated"
97	1	15	Insert "function" between "significant" and "requiring"	
103	1	2	2	hand not had
104	1	7	2	commitment not aom
106	3	4	8	possible not poisble
110	2	7	Insert "that" between "show" and "very"	
112	3	2	separate or/judicial	

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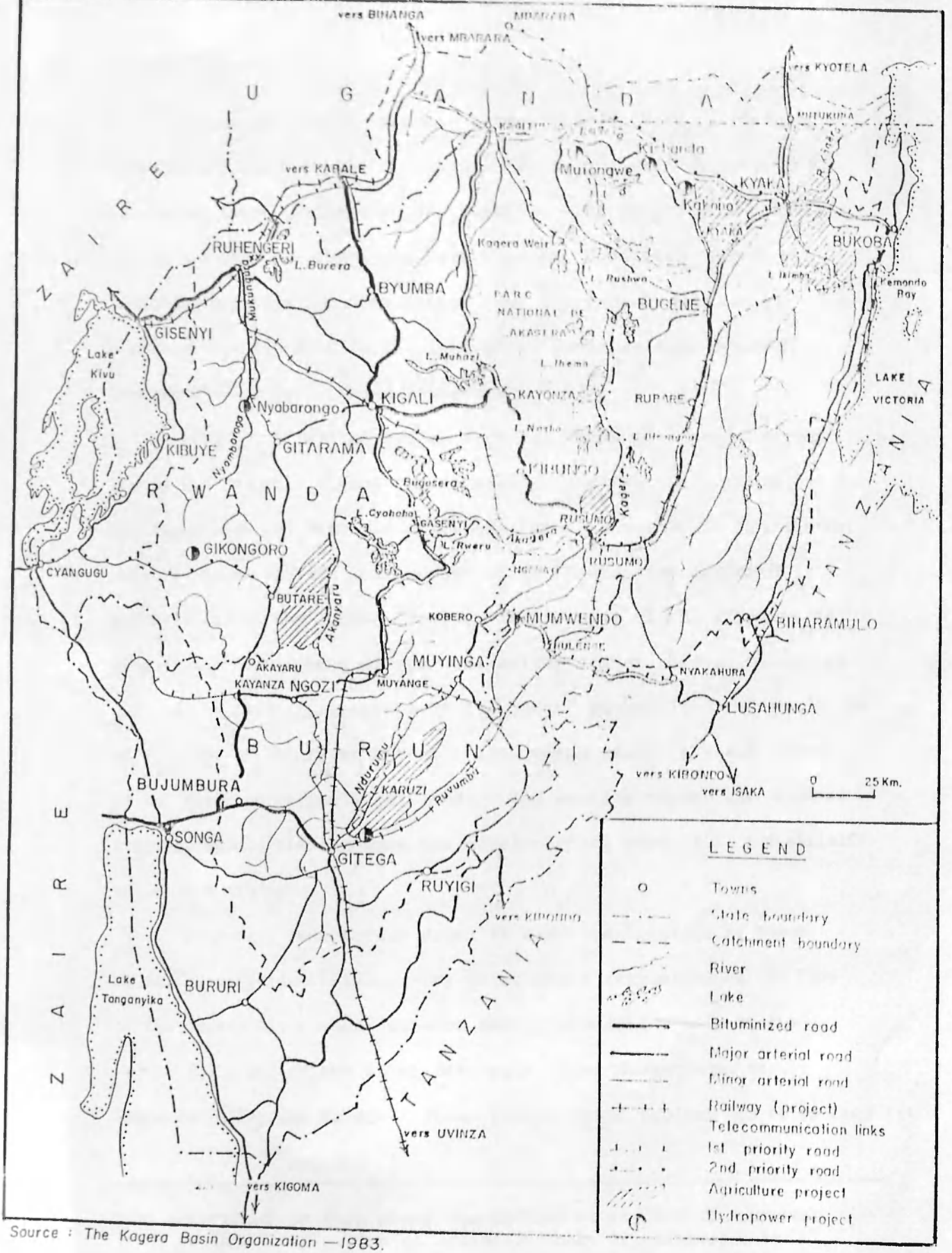
THE KAGERA BASIN



Source : The Kagera Basin Organization — 1983.

I INTRODUCTION *

Rusumo is a small Rwandese border town located on the Rwanda-Tanzania border, near the confluence of the two main tributaries of the Kagera River (Nyabarongo and Ruvubu). The location is only a little way from the three way border point of Burundi, Rwanda and Tanzania, upstream the Nyabarongo. But the name Rusumo has now assumed a special significance in the lexicon of international development cooperation for two primary reasons.

Firstly, it was at Rusumo that the Heads of State of Burundi, Rwanda and Tanzania signed the Agreement creating the Organization for the Management and Development of the Kagera River Basin (hereinafter referred to as KBO) on 24th August 1977. Hence, the agreement is properly called the Rusumo Treaty. The purpose of the agreement is to promote the development of the contracting states through the management of the natural resources of the basin, particularly by regulation of the flow of the river to facilitate energy production and transfer of the water to agricultural lands. The parties expect that such an activity should also enhance the developmental aspects of industrialization and mining.

Secondly, that border point is also the location of Rusumo Falls, already identified as the point where regulation of the flow of the Kagera River would enhance energy production both at the Rusumo Falls and at two other strategic sites downstream, namely Kishanda Valley and Kakono. Thus, Rusumo power project was to be the first

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*The information in this paper was collected as part of a broader study on "The Contribution of Drainage Basin Organizations to Development in Africa" covering, also Senegal, Niger and Limpopo. The research was done through direct interviews with the officials in the respective fields, supported by primary official documents of those organizations and other publications.

major joint project of the KBO giving it a central place. But this centrality raised other issues, particularly of the appropriate capacity of the dam, and therefore, the land area likely to be innundated by the backwater effect. Because of the scarcity of arable land in the area the question of the capacity of the Rusumo dam to be created was so controversial that it threatened to paralyse the prospects of the KBO programmes from the start. So salient was the controversy that from a distance, it seemed as if Kusumo dam and associated hydropower plan was the only development project planned by KBO.

Certainly, that was not the case. The development plans of KBO tended to reflect the diversity of the development problems of the basin states. Three out of the four basin states, Burundi, Rwanda and Uganda, are land-locked and non-oil producers. Therefore, while transport and communication,as "vehicles" of export and import trade, constitute a general bottleneck for their development, the situation is particularly exacerbated by the problem of hydro-carbon imports which have to be transported over long distances and across other territories. Such long transports would threaten the cost-effectiveness of such imported energy resources for industrial and domestic consumption. Moreover, the fluid political and security situation in most of Africa makes reliance on such imports rather trecherous. In fact, on both of the foregoing points, Tanzania's West Lake Region is in equally precarious position.

While northwestern Tanzania shares the foregoing adverse physical and economic conditions with Rwanda and Burundi, the latter two face different conditions for agricultural productivity and development from Tanzania. Rwanda and Burundi, it will be explained, are the most densely populated countries in Africa and where

agricultural productivity can be enhanced only by intensive practises while Tanzania's northwest is sparsely populated and with large reserves. But in both cases, various inputs, particularly fertilizers, will be an imperative.

The recognition of the common development problems in the region induced the three basin states to initiate consultations and studies which led to the conclusion of the agreement at Rusumo. The purpose was to establish a cooperative framework within which the states would jointly plan projects in the areas of energy production; agricultural development; industrialization, especially in the agro-based sectors; transport and communication; mineral exploration and exploitation; environmental management; and tourism.

The purpose of this paper is, partly, to outline the provision of the 1977 Agreement to establish the commitment of the contracting states and, partly, to assess the policy plans already developed for the realization of the objectives expressed in the agreement.

As a preface to that analysis, the next part of the paper will outline the physical setting of the Kagera basin and some of the salient economic implications of that setting. Part III will analyse the Rusumo agreement, in terms of the area of application, the subjects to which the treaty applies and the scope of commitment of the member states.

Part IV will give a synoptic profile of the development projects planned for the fulfillment of the agreement. These will be classified as: (1) water-related projects, including hydro-electric energy production, irrigated and rainfed agriculture, forestry, livestock and fishing, (2) transport and communication, (3) industries.

From that range of activities, it is obvious that the member states should be concerned about environmental protection in the basin. The foregoing range of planned development activities would necessarily generate or hasten adverse environmental changes which must be kept under control. In Part V the salient environmental implications of the development activities would be extrapolated. The section will then establish if those adverse consequences were anticipated in the constituent agreement and what additional protective provisions should have been included therein.

Part VI of the paper will outline some financial implications of the development programmes, especially the scope of the needs and management of financial resources.

II THE PHYSICAL SETTING OF KAGERA BASIN

Kagera River empties its load into Lake Victoria in Uganda territory, slightly to the north of the Tanzania-Uganda border, while Lake Victoria has the Nile as its only drainage outlet. Some observers have suggested that the Kagera and its tributaries actually constitute the most southerly end of the Nile drainage system. That hypothesis submits that hydro-geologically, it is possible to trace the ancient bed of the Kagera as it continues from the present mouth of the river into the Jinja point of the Nile by a clear depression in the bottom of Lake Victoria.

Be that as it might, the Kagera has its own character as a river with its main sources in the western highlands of Rwanda and

Burundi.[1] The two main tributaries are the Ruvubu, which drains an area approximately 12,3000 square kilometers in central and northern Burundi, and the Nyabarongo which drains approximately 16,000 square kilometers in west-central and eastern Rwanda. Of the two, the Nyabarongo is more hydrologically complex with several sub-tributaries contributing to its load. The Nyabarongo traverses about 300 kilometers from its sources in western Rwanda to its outlet in the Lake Rugwero in Southern Rwanda. Its principal tributary is the Akanyuru which flows from a direct southerly direction and joins Nyabarongo at a point about 50 kilometers to the south of Kigali. From Lake Rugwero to its confluence with the Ruuubu the Nyabarongo is better known as Akagera.

It is also important to note that for its entire stretch from Lake Rugwero to the confluence the Nyabarongo forms the border of Rwanda and Burundi in a 60 kilometers of ardous meanders through swamp-lands.

The Ruvubu originates from the southern part of the Congo-Nile Divide, in Burundi for a distance of 350 kilometers to its confluence with the Akagera (Nyabarongo) which is only two kilometers upstream from Rusumo Falls. Its main tributary is the Ruvironza, which joins the mainstream Ruvubu near Gitega, but there are several other sub-tributaries.

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1. Succinct information on the Kagera and KBO is supplied in the KBO publication, General Background Information on the Planning for the Development of the Kagera River Basin. Prepared by the Secretariat of the Kagera Basin Organization, Kigali, April 1979 (hereinafter KBO General Background, 1979) from which the following information is derived.

At Rusumo Falls the river forms a gorge with a drop approximately 30 meters over a distance less than one kilometer. This provides the potential site for the core Kagera Basin development commencing with hydro-electric power generation.

From Rusumo the Kagera takes a direct northerly direction, forming the Rwanda-Tanzania border, upto the three way Burundi-Tanzania-Uganda border, where it is joined by the Kagitumba, flowing from the west. In that stretch the river valley widens considerably, and is enclosed by heavy papyrus swamps. The broader basin is also dotted with several small lakes, beside the river, all of which add to the biological and hydro-geological diversity of the Kagera basin and the National Park. This total distance from Rusumo to the Kagitumba confluence is approximately 230 kilometers.

From Kagitumba confluence that Kagera changes to a directly eastern direction and flows for another 260 kilometers to enter Lake Victoria. For the first 60 kilometers of that distance, the Kagera forms the Tanzania-Uganda border. At the junction with Kishanda, a small tributary from southerly direction, the Kagera leaves the border and flows in Tanzanian territory through agriculturally active areas of Kakono and Kyaka, then a north-easterly direction, crossing the border and flowing its last 25 kilometers through Uganda, into Lake Victoria. The total length of the Kagera River is approximately 840 kilometers.

Throughout that distance the basin of the river covers four national territories distributed as follows:

Country	Total Area (Km^2)	Percentage of Basin
Tanzania	20,800	35
Rwanda	19,900	33
Burundi	13,300	22
Uganda	5,800	10
TOTAL	59,800	100

The climate varies drastically over the basin area, and so does the rainfall and run-off. The main rainfall period is March to May, with a secondary peia in October to November. The average annual rainfall along the western shores of Lake Victoria are approximately 1800 to 2,000 milimeters. But rainfall initially decreases sharply westwards with Kyaka receiving about 800 milimeters, then the rainfall trend increases westwards to approximately 1,800 at the Congo-Nile Divide.

In all, Kagera River contributes about 25 percent of the annual discharge into Lake Victoria, averaging approximately 184 million cubic meters per second at Kyaka. It is estimated that 85 percent of the discharge of the Kagera River is generated in the Nyabarongo and Akanyaru, that is western and southern Rwanda, and in the Ruvubu, upstream of Mumwendo ferry, again indicating southern and western and southern Burundi. These would suggest rainfall avaeraging moderate to low in central and eastern basin.

The proportion of arable land to the population in the region indicates high and increasing pressure on land within the basin. The background reports estimated the total population in the basin in 1973 as 5.6 million with an average annual increase of approximately 2.6 per cent.

It is also to be noted that Rwanda and Burundi are the most densely populated countries in Africa, with an average of 151 and 146 people per square kilometer, respectively. Rwanda's total area is 26,338 square kilometers while Burundi is 25,680 square kilometers. Out of that total 75 percent in Rwanda is within Kagera basin while for Burundi 52 percent of the land is in the Kagera basin. Tanzania's West Lake Region is endowed with 28,456 square kilometers of which 73 percent is in the Kagera basin, with a population density averaging 38 people per square kilometer.

Thus, for Rwanda and Burundi, the value of land is critically high, a factor which will explain the sensitivity of these states to the elevation of Rusumo dam.

The economy of the basin area is predominantly dependent on agricultural sector, with 95 percent of the population engaged in production of food crops, particularly bananas, beans, rice, maize, cassava and potatoes. The main cash crops are coffee and tea, but the basin states are by no means major producers. At subsistence level, the land is fully cultivated. Therefore, increased productivity is only possible with intensified inputs such as fertilizers, improved seed varieties, extension work and organized storage and market systems.

In terms of basic development indicators, the World Bank has given the following 1983 data for the basin states:[2] Rwanda GNP is 270 dollars; annual growth rate averages 2.3 percent and life ex-

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2. World Bank, World Development Report 1985 (Oxford University Press) p.210.

pectancy at birth is 47 years. Tanzania GNP is 240 dollars; annual growth rate is 0.9 percent and life expectancy at birth is 51 years. Uganda GNP is 220 dollars; annual growth rate of -4.4 percent and life expectancy at birth is 49 years. The fact is that there are no major economic activities attracting income into the region.

In ultimate terms foregoing economic conditions and the general physical setting are exacerbated by the transportation and communication problems of the land-locked states. The traffic links are long and therefore expensive since they largely move overland from Mombasa, through Eldoret and Uganda, or from Dar es Salaam through Kigoma into Burundi. By 1979 the KBO Background studies reported that the average cost of transport per ton was US$250 and was rising. At the same time they have had to deal with the political chaos in Uganda for the past fifteen years, with the more expensive and less direct alternatives through Tanzania.

With these problems in mind the basin states decided to create the permanent institutional and legal framework for the management and development in the entire Kagera basin.

III THE KUSUMO AGREEMENT - IN A NUTSHELL

1. Background

The Kusumo Agreement which established the KBO had not antecedent in the form of a legal and institutional framework for the management and development of the Kagera basin.[3] The agreement

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3. This is clear contradistinction to the Senegal Basin situation where the OMVS is simply the latest in a series of attempts which started in earnest in 1930's. For details see Okidi; "Development and Environment in the Senegal Basin Under the OMVS Treaty" (University of Nairobi, IDS, July 1986) in the series, especially pp. 8-15.

signed in August 1977 was the first attempt. Thus, whatever provides the background to the agreement are the series of studies initiated by the basin states with a view to articulating the specific development tasks which were later to justify the conclusion of such treaty. Therefore, what should interest this study is the beginning and identity of the studies.

The first modert-time development - oriented study of the region was the Hydrometeorological Survey of Lake Victoria, Kyoga, Albert (Mobutu Sese Seko) and George was declared operational from 17 August 1967. This stage was preceded by a two-year preparatory phase during which the East African Nile Waters Coordinating Committee negotiated the financial and logistical arrangements with the United Nations Development Programme (UNDP) and the World Meteorological Organization (WMO).[4] But this was to be a broadly based operation for the collection of data on the hydrometeorological regime of the drainage system, with the participation of Kenya, Egypt, Sudan, Tanzania and Uganda. Burundi and Rwanda joined the project in 1972. The end product were mathematical models for the quantitative and qualitative aspects of the water input into the drainage system.[5]

That project, though relevant, does not seem to have had any impetus on the creation of the KBO. In fact, the official

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4. For details of the background to what is often known as "Hydromet see Okidi, C.O. "Legal and Policy Regime of Lake Victoria and Nile Drainage Basins" in Indian Journal of International Law Vol.20 No.3 pp. 365, 432-433 (1980).

5. The progress beyond these models, if any, were to be determined at a joint meeting of the participating states. The meeting was scheduled to be held at Arusha on 4th and 5th August 1986..

position of KBO trace the origin of the treaty to the exchange of Presidential visits between Rwanda and Tanzania in 1986. According to D.K. Lwehabura,[6] the two presidents resolved during the visits, that the two countries would cooperate in the construction of a bridge across the Kagera River, at Kusumo, to facilitate the transport and trade between their countries. As a supplement to that agreement, the two states undertook to initiate technical studies towards harnessing the hydroelectric power at Rusumo Falls.

The eagerness with which these efforts were mounted is indicated by the fact that Burundi, Rwanda, Tanzania and Uganda sent a request to the UNDP, asking for assistance in planning and development with the Kagera basin waters. The UNDP response came in July 1969 when it sent a fact finding mission for consultation with the governments. The Mission's findings and recommendations were that the development possibilities existed in several sectors; that UNDP project should be set up to coordinate the regional planning in an orderly fashion; that a technical committee, composed of representatives of the four governments should supervise the project and planning efforts; and that such a project should be coordinated with the on-going UNDP projects in the region, particularly, the Hydromet, and mineral research projects in Burundi and Rwanda.

Accordingly, Burundi, Rwanda and Tanzania established a Technical Committee through which in July 1970, they submitted a joint request for the project. Uganda, it should be noted, agreed

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6. D.K. Lwehabura was the first Executive Secretary of the KBO from August 1977 to July 1982. For the comments see his "Cooperation in the Management and Development of the Kagera River Basin" (Kigali, Rwanda, May 1981) p.2.

with the concept of regional and basin-wide planning in principle, but chose to remain an observer until Mya, 1981.[7] Thus, only three basin states were active participants in the project which was approved by the UNDP Governing Council in January 1971.

The Kagera basin development studies was established, and officially started in June 1971 and its headquarters set up at Bukoba, Tanzania, in August, 1971. The field studies which actively commenced in September 1971 consisted of collection and analysis of existing data, identification of gaps in the data, recommendation of necessary additional studies and preparation of guidelines for the second phase.[8] These studies, constituting Phase I of the project, were completed in June 1973.[9]

One of the central observations of Phase I to be taken into account in the subsequent study was that preparation of a succinct and comprehensive development plan would require several years and funds far in excess of the project budget. Therefore Phase II was required to prepare an Indicative Basin Plan based on existing data and a minimum amount of additional information. In other words, the study was to provide the main development options available to the

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7. ibid p.3.

8. See ibid p.4 and KBO General Background 1979 op.cit. p.17.

9. Phase I report entitled "Planning the Development of Kagera River Basin" was prepared by a consortium of contractors from Italy and Czechoslovakia in Volumes I, II and III. See KBO General Background 1979 loc.cit.

three states, taking into account the existing national priorities which bear on the harmonious development of the basin.

Unlike Phase I the second one was done under eight different sub-contracts covering aerial photography; precise levelling; tourism; hydropower potentials; fisheries; and institutional arrangements. The main contractors, Norconsult/Electrowatt, submitted the final report of Phase II at the end of 1976.[10]

Another important development during the year was that in June 1976 the Technical Committee had unanimously accepted that the headquarters be transferred from Bukoba to Kigali. And that was effected during November 1976.

Three other measures were taken under the aegis of the Technical Committee, at the end of Phase II. The first action was a rigorous evaluation of the studies done under the contracts in the two phases*. The second measure was the commissioning of a specific study on the Kusumo Hydropower project. The study was to be conducted within the framework of a protocol signed by the Belgian Government at Kigali on 22 October 1976, in response to a joint request by Burundi, Rwanda and Tanzania. The Belgian Government, in turn, commissioned a consortium of Tractionel/Electrobel consultants on June 20, 1977 to conduct the hydropower study but also to show the implications of the Rusumo Dam hydropower development on inter alia agricultural land, settlement, environment, fisheries and tourism.

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10. ibid p.20.

* More on that will be outlined in the fourth part of this paper.

The report of Tractionel/Electrobel, issued in June 1979 contained "Optimization of the Dam Elevation" and "Power Market and Network". Since this report came after issue of Indicative Basin Plan, and therefore seperate from the latter, the reports were therefore to assist in determination of the final Action Plan issued in 1982.

The third measure taken was to establish the Organization for the Management and Development of the Kagera River Basin, when the Heads of State and Government of the three countries signed their Agreement at Rusumo on the 24th August 1977.[11] Evidently, it was the compilation of the Indicative Basin Plan produced at the end of the UNDP funded Phase II studies that justified for the states, the establishment of the legal and institutional framework.

2. The Agreement

This agreement may be analysed in the following specific sections: (a) Its establishment and area of application; (b) The subjects to which it applies; (c) Its principal organs and their functions; (d) Legal status of the organization and its projects; and (f) The general provisions.

(a) Establishment and Areas of Application of the Agreement

The Organization established under Article I of the Agreement has, as its territorial jurisdiction the catchment area of the Kagera River and its tributaries and sub-tributaries. That means,

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11. The legal and institutional framework in the Agreement was based on the recommendations by Dr. Guelerimo J. Cano of Argentina and Professor Robert D. Hayton of the United States as the U.N. Consultants engaged under Phase II study to examine Institutional Arrangements appropriate for the management of the Kagera Basin. Their study was done in 1974 and submitted as part of Phase II report in 1976.

essentially, the territories of Burundi, Rwanda, Tanzania and Uganda. This area of application is described in Article 3 whose second paragraph adds that the contracting states may, by mutual agreement extend application of the agreement beyond the catchment area, in order to facilitate the "full and proper study of, and comprehensive planning for the implementation of the projects, works, and programmes entailed in the harmonious development of the Basin, or where services are to be provided to or from the Basin."

Basically, the deference to the entirity of the catchment area of the river is a further expression of the principle recognized in the fourth paragraph of the preamble that the Kagera River Basin constitutes a geographical unit offering a valuable base for cooperation among the riparian states. On the other hand, the probability of extending the application of the treaty to areas beyond the catchment territories is a recognition of the past and existing commercial, service and social links between the basin states and their immediate neighbours. It is conceivable that the various activities and resources related to the commercial, service and social interests may be profitably managed by close involvement of non-basin states.[12] This seems to anticipate a rather rigorous integrated regional development, perhaps to underscore the desire to further "develop and reinforce the existing co-operation between the four countries"

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12. The possible sectors under these categories might become clear when discussions turn to the profile of development projects. It is anticipated that such sectors might include environmental management; major mining and industrial projects; hydropower production and marketing; and transport and communication.

as expressed in the second preambular paragraph of the agreement.[13]

Contrary to this expectation for wholeness, Uganda, occupying ten percent of the basin, did not sign the Agreement in 1977. However, its participation was anticipated by the founding states which reserved Article 19 of that original agreement exclusively to the provision that: "The present Agreement is open to accession by Uganda". One would have expected, in fact that Uganda, as the lowest riparian, should have had a special interest in the concerted consumptive use of the Kagera waters, especially for irrigation upstream. Of all the riparian states the lowest riparian is in the most precarious position as regards the security of water, should the upper riparians diminish the quantities through consuptive use, or should the latter alter the quality of the water to a deleterious extent.

For these reasons, the reluctance of Uganda to participate actively in the preparatory phases and in the KBO would seem somewhat puzzling unless it is explained in terms of the political and social chaos in the country which started in 1971. Truly, President Nyerere of Tanzania made to secret of the fact that he did not want to deal with the Government of Idi Amin.[14]

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13. Note that the original Agreement referred to "three countries". This was changed to "four" by the amendment adopted on 19th May 1981 as an annex to the instrument of accession by Uganda to the Agreement. For the details, read on.

14. In view of the changes and the chaos which followed the 1971 coup d' tat against Milton Obote it has not been possible to interview officials of the overthrown government to ascertain the reasons why Uganda remained an observer after the joint request sent to UNDP in 1968. The UNDP, it will be recalled, indicated its concurrence in July 1969 and in July 1970 Uganda did not join the other three states in the establishment of the Technical Committee.

Accession of Uganda to the agreement, under Article 19, was a special occasion for the KBO. The instrument of accession was in the form of an agreement between the three original contracting states and Uganda and signed by all the four parties at Bujumbura on the 19th May 1981. The agreement, in three articles, had an annex comprising the amendments to the material articles of the original agreement affected by Uganda's participation. Article 3 of the instrument of accession noted that the amendments to the 1977 KBO agreement were mutually accepted by the original parties and by Uganda.[15] Uganda's accession entered into force on 16 October 1981 after all ratification formalities were completed by the parties.

According to Article 2 of the instrument the agreement for the participation of Uganda was subject to ratification and it would enter into force on the 30th day after the last instrument of ratification was deposited with the Government of Rwanda, as the depositary. Thus, henceforth, the area of application of the Rusumo agreement covered the four state territories, with the provision for extension as provided in Article 3 discussed above.

(b) The Subjects to Which the Agreement Applies

The subjects to which the agreement applies are broadly analysed in the Indicative Basin Plan to be discussed in the next Part of this paper. However, for purposes of the basic treaty

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15. Apart from the first two preambular paragraphs of the original agreements, the other Articles affected by the amendments of 19th May 1981 were Articles: 5,6,7,9,10,13,15,16, 18 and 20. Article 19 which reserved the opportunity for accession to Uganda was deleted altogether. The last Article was, therefore 21, followed by the testimonium. They will be discussed below, under the relevant sub-sections.

obligations the twelve specific activities are listed in Article 2 of the agreement. Very simply, the Article indicates subjects of development in which the KBO is authorized by the agreement to carry out activities.

In fact, the language of the article in the chapter, suggest that the scope of application of the agreement might extend beyond the activities listed. It says: "The objectives of the Organization is to deal with all questions relative to the activities to be carried out in the Kagera River Basin, notably: (empnasis added).

And the "notable" activities are quoted here in extenso:

"(a) Water and hydropower resources development;

(b) The furnishing of water and water-related services for mining and industrial operations, portable water supplies for other needs;

(c) Agricultural and livestock development, forestry and land reclamation;

(d) Mineral exploration and exploitation;

(e) Diseases and pest control;

(f) Transport and communication;

(g) Trade;

(h) Tourism;

(i) Wildlife conservation and development;

(j) Fisheries and acquaculture development;

(k) Industrial development, including fertilizer production, exploration and exploitation of peat;

(l) Environment protection."

In effect, the agreement applies to any activities that may be characterized as developmental. And that is further expressed in

the sixth preambular paragraph where the contracting states "resolved to make use of the satisfactory work done by the Technical Committee..." where the broad gamut of development issues were analysed and summarized in the Indicative Basin Plan.

It may be presumed that this broad range of activities would include also support activities such as training and manpower development to facilitate the conduct of the development work. Another activity which is implied is the establishment and maintenance of information and documentation system, including libraries, which would enhance the managerial capability for development in and among contracting states.

(c) Principal Organs and their Functions

The organs of the KBO are provided for in Chapter II (Articles 4-11) of the agreement. As distinct from the practice in the Niger Basin Authority or the Organization for the Management of the Senegal Basin, the KBO agreement makes no provision for the assembly of heads of state and governments as the ultimate authority of the organization. It is known that the Heads of State and Government actually meet every year to deliberate on and direct matters concerning the KBO policies. But in the agreement, Article 4 provides for only two principal organs of the Organization, namely: The Commission for the Management and Development of the Kagera Basin (referred to as the Commission) and the Secretariat, headed by an Executive Secretary.

The Commission is composed of one representative from each of the contracting states. Thus, the only amendment to Article 5, adopted in May 1981, was to give effect to the participation of Uganda in the Commission. And the article requires that each

commissioner, as the national Representative, be accredited and given enough powers necessary for the fulfillment of the function of the Commission.

For the purposes of its functions the Commission is to meet three times per year in ordinary sessions. However, extraordinary sessions may be convened at any moment provided that the request is made by three Representatives. The venues for the meetings are to rotate among the capitals of the member states, but the procedure may be varied by the Commission for its own reasons. In any event, each session of the Commission is to be chaired by the Representative of the host country who is also to hold the chairmanship until the next ordinary session, while the Executive Secretary is to prepare materials and convene the sessions.

The general powers of the Commission, as outlined in Article 7, may be summarized as including. Determination of projects, their scope and priorities for implementation within the framework of the KBO; Authority to solicit and negotiate for funds, as well as technical assistance from bilateral and multilateral sources, either directly or efforts of the Executive Secretary; Budgetary control and management; and Authorization of assistance by Secretariat to governments for purposes of the implementation of projects which are entirely national. Obviously, since the Secretariat actually prepares the reports and services the Commission and its meeting it is the Secretariat which is, by implication, responsible for the above functions to which the Commission gives authority.

The Secretariat is the permanent bureau for the organization and is its executive organ.[16] It comprises the Executive Secretary,

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16. These general functions of the Secretariat are outlined in Article 8.

as the head of the organ, supported by four directors, in charge of their respective departments. The Commission appoints the Executive Secretary; it was agreed and entrenched in the agreement that the first one was to be a Tanzanian national. Each is to serve for four years, in rotation among the states.

It is not expressly provided that the Executive Secretary serves for one fixed term of four years. And even though it might be implied by the direct reference in Article 8 (b) that the tenure is "four years, in rotation amongst the member States", some members probably assumed that the tenure could be extended. This is suggested by the debate of the 13th Meeting of the Commission at Kigali in July 1982 where, under agenda item number 12 some of the members had expected that the term of D.K. Lwehabura would be extended.[17] But that proposal was dropped when some of the representatives reported that they had express instruction not to accept extension. In the end the Commission decided to entrust the executive functions to a "College of four Directors" until a new selection was made.

The specific functions or responsibilities are articulated in Articles 9 and 10, where the four departments (each headed by a Director) constituting the Secretariat are provided for as follows: (i) Department of Finance and Administration is responsible for Personnel Management, Finance, General Services, Purchasing and Property; (ii) Department of Research and Training is responsible

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17. Although 1982 was the end of his four year's term as the Executive Secretary, Mr. Lwehabura had been involved with the preparatory work of KBO since the inception of Planning and Development in the Technical Committee in July 1971.

for Research and data, Laboratories, Documentation and Publication, and Training; (iii) Department of Planning and Projects Preparation is responsible for Conception, Planning and Preparation of all projects and programmes including technical designs, Environmental and Ecological matters; (iv) Department of Projects Implementation and Management is responsible for execution of projects, Specification and Procurement, Operation and Maintenance.[18]

The Organization is required, under Article 13, to establish Regional Offices of the Secretariat in each member country. Through such offices the Secretariat is to maintain liaison functions with the contracting states and to hasten communication between the organization and the member states.

(d) Legal Status of the Organization and Its Projects

The legal status of the KBO is stipulated in Article 16 which enjoins the contracting states to accord the requiste legal status to the organization, sufficient for the exercise and fulfillment of its objectives. In point of detail the article urges that in the territory of the member states, the organization be accorded the legal personality enabling it to contract, acquire and dispose of movable and immovable property and to be a party to legal proceedings. In every case, the Executive Secretary is to be the legal representative of the organization.

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18. As at the middle of 1983 the Directors of the four Departments were held as follows:
(i) Finance and Administration - Mr. Hitayezu - Rwanda
(ii) Research and Training - Mr. Lwakabare - Tanzania
(iii) Planning and Project Preparation - Mr. Barigume - Burundi
(iv) Projects Implementation & Management - Mr. Besigiroha- Uganda

These provisions then, open the Organization and its Executive Secretary to the legal process, including suing and being sued, in the member countries. The range of development activities planned for the KBO, surely justifies this legal status in the contracting states.

Conversely, however, these provisions drastically affect the provision of Article 17 which states that "the Organization, members of the Commission and of the Secretariat will enjoy at the headquarters and in each of the member states, the required diplomatic privileges and immunities for the fulfillment of their activities" (emphasis added). It is upto the Commission to determine the categories of personnel of the Secretariat who should enjoy the privileges and immunities.

It seems, in fact, that through special arrangements such employees of the KBO would be subjected to the process of the host country under special circumstances, expressly permitted by that host state. Effectively, the so called immunities would be only subject of comity given the legal personality already extended under Article 16 with its implications for commercial and other forms of contracts.

The projects of the KBO have not been given the kind of legal status found under the Senegal Basin Organization OMVS, by the Convention adopted in December 1978.[19] Perhaps the KBO will have to

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19. After the OMVS member states decided in 1974 that they should clearly stipulate status of common works (Ouvrages Communs) they initiated studies which culminated in the adoption of the Convention relating to the Legal Status of the Common Works on December 12, 1978. In a nutshell, the Convention designated certain projects as common works, to be run as independent companies of the OMVS. The member states could be co-owners, joint owners or to own shares. For details see Okidi, "Development and the Environment in the Senegal Basin, under the OMVS Treaty" op.cit. pp.23-25.

face upto that question as its first regional project such as the Rusumo dam approaches actual construction. In these initial stages the KBO seems content with the characterization "inter-state" project, work or programme in the second section of Article 2. In that formulation an inter-state project is one which involves the territory of more than one state; with direct benefits to more than one state; or is likely to have beneficial or prejudicial effects in two or more states.

(e) Legal Aspects of Funding of the Organization and Its Projects

The two broad categories of budgets for which the KBO states need to make clear legal arrangements are: Administrative budget, required for the functioning of the Secretariat and other organs of the organization including regional offices; and the Programme or operational budget, required for the implementation of the objectives of the organization.

The provision in the Agreement for administrative budget is precise. The first paragraph of Article 15 states that:

> "The funds necessary for the functioning of the Secretariat, according to the annual budget as approved by the Commission, shall be contributed by the member States in equal proportion of 25% each."

Thus, the total is a hundred per cent for the four member States.[20] The second paragraph requires that the payments be made on half yearly, in advance, and in covertible currency. Except that all local expenses,

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20. Befor accession of Uganda to the agreement the three member States shared the administrative budget as follows: Burundi - 25%; Rwanda - 35%; and Tanzania - 40%. Presumably, this was according to some index of economic ability. This is one of the provisions amended on the 19th May 1981.

including those for sustenance of the regional offices, are to be reserved in local currencies.

Under Article 13, the Regional Offices are established as liaison offices for the Secretariat. It is required therein that the host government, depending on its capability, should provide facilities for the functioning of the ofice, until such time that the Organization will be in a position to provide them directly. But the host state is to credit such expenses to its share of annual contribution.

The provisions relating to programme or operation budget are rather scanty. They can be discovered in the powers of the Commission expressed in Article 7. Paragraph (b) empowers the Commission to submit requests to and sign agreements as well as to assume obligations, on behalf of KBO, for bilateral and/or multilateral technical assistance or financing. The following paragraph empowers the Commission to approve the budget and the work programme of the Secretariat. Presumably, this would relate to implementation of the projects. Reference is also made to assistance which may be requested by governments, from the Secretariat, for purposes of implementation of projects, and which the Secretariat is obliged to provide, after approval by the Commission.[21]

It would appear that project implementation of KBO is intended to rely on the technical assistance and finance solicited by the Commission, as shown above. No reference is made to possible loan arrangements and the system for their guarantee as is elaborately done by the OMVS States. The latter organization actually adopted a

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21. See Articles 7(g) and 11.

Convention Relating to Financial Arrangements for Common Works on May 12, 1982.[22] By that agreement the OMVS states provided the details for loan guarantee, cost sharing and a formula apportionment of benefits. Stop-gap measures for member-state funding before the externla resources are obtained is another factor covered by OMVS which the KBO States should consider.

As it is the financial arrangements and scope for funding of common works is not woefully insufficient to measure possible financiers.

(f) The General Provisions

The four items covered in Chapter VI, on General Provisions are: Settlement of disputes; Amendment to the convention; liquidation; and entry into force. The last one has been covered in the preceding pages.

The provision on settlement of disputes is rather laconic. It requires, first, that any disputes arising from application of the agreement shall be resolved by consultation among the member states. Should that procedure fail, resort should be had to the procedures provided in the Charter of the Organization of African Unity.

Considering the complex technical and management problems involved in the basin development and management the author of the agreement should have beemo more elaborate and substantive in the question of settlement of disputes. Very particularly, the questions of water apportionment and negative impacts of development require more contemporary and sensitive machineries, more specific than the OAU procedure which was

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22. See Okidi, supra note 19 pp. 25-27.

largely geared to the problems of political and security difference.[23]

On amendment to the Agreement Article 19 provides that an amendment proposed by any member state shall be adopted only if it is accepted unanimously by all the member states. And it enters into force on the thirtieth day after the date of deposit of the last instrument of ratification with the Secretariat. But in event of dissolution of the organization, Article 20 provides that a liquidator, agreed upon by the member states, shall assess the respective assets and liabilities. It is presumed that the assets and liabilities will include outstanding loans, if there are any, extended to the organization for implementation of its projects. But again such a dissolution might confront problems with projects of inter-state character such as the proposed hydroelectric power plant.

IV A PROFILE OF DEVELOPMENT PROJECTS

The purpose of this part of the paper is to outline sectoral projects and support services proposed for the objectives of KBO. It was pointed out earlier that the Indicative Basin Plan was considered the preferred outline of such projects, and was accordingly acknowledged in the preamble to the agreement. However, the Indicative Basin Plan was itself subjected to further appraisal and was later superceded by a more determinate report. What now constitutes the "blue print" of the development projects is contained in a six (actually blue covered) volumes report of a multi-disciplinary-multi-donor mission

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23. Settlement of Disputes is dealt with in Art. 18. The point will be dealt with further and recommendation made in the discussions on Environmental Implications of the Development Projects, infra.

organized by the UNDP in cooperation with KBO, and fielded in April 1980. Its final report to be referred to as Action Plan was submitted in February 1982.

The key sectors covered in the Action Plan, and which will be outlined hereunder are:[24] (1) Water related projects, including hydropower production, irrigated Agriculture, rainfed agriculture, forestry, livestick,,and fishing; (2) Transport and communication; (3) Industries; (4) Training and Manpower Development.

But before we get to these issues it is important, for the record, to give a synoptic background of the additional evaluational work after the Indicative Basin Plan, linking it to the multi-disciplinary-multi-donor Report. However, the profile itself will rely on that Final Report.

Background

The complexity of drainage basin planning is well underscored by the experience of the Kagera basin states within the decade of preparatory studies. It will be recalled that when the Indicative Basin Plan was submitted by the consultants, Norconsult AS in 1976 it was so clearly satisfactory to the states that they made it the basis of the Rusumo Agreement. In fact, in their letter of May 28, 1976, forwarding the Indicative Basin Plan, Norconsult submitted in the penultimate paragraph that in their view there was "no alternative to

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24. The Reports are slightly reorganized in this paper to suit our discussions. The actual Final Reports produced jointly by the UNDP and KBO are produced as follows: Volume 1 - Rainfed Agriculture. Volume 2 - Irrigated Agriculture. Volume 3 - Energy. Volume 4 - Transport. Volume 5 - Industries, Health and Environment. Volume 6 - Executive Summary.

Note that the crucial subject of environment is treated in its own separate part of the paper. On the other hand we have included a small section on training, which did not figure prominently in the Final Report.

the recommended development plan". And they added, "Moreover, it must be implemented promptly and effectively..." These words indicate the confidence they had in the report.

Before these conclusions the letter had summarized the salient points in their recommendations in the Plan. Firstly, they emphasized the need for promoting food self-sufficiency in the region, urging that the increase should be at a minimum rate of 2.5 to 3 per cent, to keep up with the population growth. Secondly, the Plan recommended intensification of subsistance agricultural sector in the region, taking into account that there was no visible surplus and that there was no land reserve to extend into. Accordingly, the only way to increase production is by substantially expanded agricultural inputs, particularly inorganic fertilizers to restore and maintain soil fertility.

Thirdly, the Indicative Basin Plan recommended mobilization of what the letter referred to as "th only known, important undeveloped asset in the region..." - hydropower. They observed that the main river power stations could produce 200 to 300 megawatts of firm power at an average on-site cost of less than 15 mills (US) per KWH. But they noted that the only potential economic use for that quantity of electric energy is the production of fertilizers at or near the power stations. Evidently, the implication was that the fertilizers would enhance agricultural productivity as recommended above.

Accordingly, they recommended the harnessing of the power resource which would only partly supply the demand centres in Kigali and Bujumbura. Interestingly enough, they did not mention West Lake Region of Tanzania which has particularly critical energy problems.

It is equally notable that irrigated agriculture took a low fourth place in the Plan recommendation. They submitted that this would be considered "in the longer term" and, presumably, for reasons of climate and topography. to be undertaken largely in the lower Kagera valley of Tanzania, where land is considerable and under-utilized. The Plan envisaged that with the combined power generated from Rusumo, Kishanda and Kakono they should produce 100,000 tonnes of ammoniac by the year 2000.[25] There would also be 325,000 tonnes of calcium nitrate, obtained by addition of limestone. Then 100,000 tonnes of phosphates and 15,000 tonnes of potash would be imported from Zaire or Uganda, for the production of 490,000 tonnes of fertilizers which should meet the requirements for the year 2000. And this was estimated to cost US $85 per tonne, as against imported fertilizer which costs US $160 per tonne.

On examination of the Indicative Basin Plan after the agreement was signed both UNDP and the participating governments resolved that the options presented "in the Indicative Basin Plan do not constitute an exclusive strategy for development acceptable to the member states and to the potential donors."[26]

The main grounds for the reservations seemed to revolve around what they thought was inexhaustive analysis of available options. For instance, they argued that other energy options, notably, peat and

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25. Additional data summarizing the Indicative Basin Plan are contained in KBO General Background, 1979, op.cit. pp. 29-31 from which these and the following data are derived.

26. ibid. p.23.

gas, were ruled out without much analysis. Besides, the sources of power available from outside the basin were not considered. Moreover, other possible substitutes to fuelwood, such as peat were sufficiently evaluated. And in all, the UNDP and the contracting states wanted to see an appraisal beyond the three hydropower potentials; such other projects like Mumwendo, Gitega and Murogwe should have been considered.

It was also considered inappropriate that the Plan should permit a plan where fertilizer production alone would utilize an overwhelming share of the available power resources. Besides they also wanted a study which would cover transport, storage and distribution of the fertilizer, factors not covered in the Plan.

Analysis of transportation routes and options were also considered insufficient. The ferry system across Lake Victoria, the route through Zaire and some of the mail options were not adequately covered in the Plan, thus raising the question of bias. And they wanted feasibility studies of Musoma-Arusha-Tanga rail link, to provide a new outlet to ocean for Rwanda and Burundi.

For these reasons the UNDP and the participating Governments rejected the confident assertions by Norconsult, about the Indicative Basin Plan. The UNDP then fielded two short-term missions to review the recommendations, on the projects and institutional issues and to prepare for a donor conference.

One mission was undertaken by Nobert Beyrard France was primarily to review the Phase II report which had been submitted by Norconsult/Electrowatt, and included the Indicative Basin Plan, hold further consultations and to prepare alternative development options. The mission was also required to design a multi-disciplinary-

multi-donor mission for a final Action Plan. The second mission,[27] was to be concerned with the institutional and organizational proposals for KBO.

Norbert Beyrard France had his own brief findings and recommendations. However, it will be recalled that the central purpose of that mission was to analyse the Phase II report of Norconsult/Electrowatt, particularly the Indicative Basin Plan, and to draw up guidelines for a thorough and hopefully, definitive multi-disciplinary-multi-donor mission. Perhaps for these reasons the N.B. France report came out largely in form of options, and further areas of research, particularly as regards the agricultural sector.[28]

In the agricultural sector the mission offered four options, ranging from the Phase two prescription which suggested a combination of 90,000 hectares irigation plus improvement in rainfed agriculture, to irrigation of 200,000 hectares of new land plus supplementary irrigation/rainfed operation on the small perimeters of privately farmed lands. Additional projections hypothesized in relation to the options is that the yield per hectare would be doubled from the 1970's rate, and an additional 500,000 hectares in the whole region would be freed for export crops. Agro-industrial processing would also be established and intensified to meet local needs and to provide employment opportunities. The population in the basin states is expected to reach 17 million.

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27. This mission apparently had an assortment of experts: D. Caponera from FAO, W. Emerson, and J. Frippiat of UNDP/OPE all under leadership of R. Berthelot of UNDP/RBA. See ibid pp. 23-24.

28. These comments are derived from KBO General Background, 1979, op.cit.

/are Transportation and communication links particularly/to alleviate the vagaries of land-locked status of the region. And that the studies of the alternative railway and road routes should endeavour to provide links through agricultural and potential mining areas. The external links proposed were all for access to the Indian Ocean. The three main railway options are the northern corridor through Kenya to Mombasa; the Musoma to Tanga link; and the Mwanza to Dar es Salaam link. Both of the latter links presuppose expansion of Kemondo Bay as the main port west of Lake Victoria for traffic from Gitega and Rusumo as well as from Kigali. Establishment and expansion of telecommunication links is also stressed for study.

The energy sector is to be studied for irrigation as well as for pumped irrigation. But special emphasis is placed on assessment of the continued exploitation of fuelwood on the environment. As a possible substitute for fuelwood peat is proposed but the mission stressed the necessity to study, among other things, the optimum exploitation conditions and impact on the environment.

Broadly-based environmental impact studies of irrigation, creation of reservoirs, transport infrastructure, tsetse fly eradication and human settlement were also stressed.

The broad outline of priority projects as well as subject areas requiring additional research were presented at the first KBO Donors Conference in Paris in October, 1979. The main features were endorsed but there was mutual and unanimous agreement that further detailed preinvestment studies were required to concretize and finalize the project sectors. Accordingly, a multi-donor multi-disciplinary mission was constituted and fielded by KBO and UNDP in April 1980. Their

report, Action Plan submitted in February 1982, is the basis of the outline of development projects which follows.[29]

1. Water Related Projects

Water is a central factor in basin development. Accrodingly, a large number of development projects anticipated within the programme fall under this category. They include (a) hydroelectric power generation; (b) irrigated agriculture; (c) rainfed agriculture; (d) others, including forestry, fishing, livestock and game cropping. The four categories will be taken in turn.

(a) Hydro-electric Power Generation

The Action Plan actually considered energy resources, other than hydropower, available within the Kagera basin.[30] Wood fuel, used almost exclusively for domestic cooking and heating, is already under pressure. And its continued use is likely to lead to serious ecological and environmental consequences. Although efforts at afforestation might alleviate the pressure other dependable sources of energy are urgently needed.

Methane gas exists in large quantities beneath Lake Kivu, and extensive studies have determined the reserves and ways of extracting it. However, the Action Plan submits that there are still serious political, technical and social problems hindering their exploitation.

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29. Outlined in note 24 supra.

30. It will be recalled that failure to appraise other energy options was one of the criticisms raised against the Indicative Basin Plan in particular, and Phase II studies in general.

For the following comments of appraisal, see Development Programme of the Kagera Basin: Final Report Volume 3. Energy (Hereinafter, "Volume 3 Energy") (Kigali, February 1982) pp. 53-54.

Peat deposits in Rwanda and Burundi are not yet fully studied to determine their qualities and quantities. The current estimates indicate limited quantities, possibly enough for a fifteen years' supply. Therefore it is not a promising substitute for other energy resources.

Geothermal energy sources have been located in north-western Rwanda, but the quantities are not fully determined. In general, geothermal power would not be expected to provide a dependable alternative.

Solar energy is another source for which some studies have been conducted, but neither is the technology advanced sufficiently nor do the climatological conditions appear conducive to large scale production.

These conclusions then leave the hydropower as the only resource for which there is sufficiently abundant potential in the region. The production of these energy resources are ideally to be targetted against the energy demand in the region. These are indicated by the total energy balance in the region upto the year 2000 as in Table 1 below.[31]

From the data in Table 1 below the Action Plan drew the conclusion that additional energy production of 599.3 Gwh/year would be required by the year 1990 to satisfy the regional energy network and 1322.8 Gwh by the year 2000. This would suffice to replace the thermal plants currently in use as well as to meet the future energy demands of the region. Further, it was emphasized that action for the development to meet the energy deficits should be commenced if production arises are to be avoided.

Fundamentally, the objectives underlying these demand and supply projections are tied to improving the well-being of the population in the basin. Other basic and associated objectives are to develop cheap

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31. See ibid Table 3 and 9 on pp.35 and 67.

TABLE 1 - ENERGY BALANCE IN THE REGION

	1980	1985	1990	1995	2000
	Gwh	Gwh	Gwh	Gwh	Gwh
BURUNDI					
Demand	49.7	95.8	147.4	226.8	249.0
Offer	24.9	62.1	107.8	133.6	233.6
Deficit/Surplus	-24.8	-33.7	- 39.6	- 93.2	-115.4
RWANDA					
Demand	68.7	117.4	164.7	231.0	324.0
Offer	69.4	97.5	194.1	194.1	194.1
Deficit/Surplus	+ 0.7	-19.9	+29.4	-36.9	-129.9
TANZANIA					
Demand	62.2	367.7	589.1	801.1	1077.5
Offer	--	--	--	--	--
Deficit/Surplus	-62.2	-367.7	-589.1	-801.1	-1077.5
Total deficit for inter-connected network in Burundi + Rwanda	-24.1	-53.6	-10.2	130.1	-245.3
Total deficit for network: Burundi + Rwanda + Tanzania	-86.3	-421.3	-599.3	-931.2	-1322.8

and renewable hydropower resources to reduce dependence on thermal plants using expensive imported fuels, to increase food production through pumped irrigation: to stimulate industries; and to develop mining in the region since lack of cheap energy resources has hampered mineral exploitation.

Hydropower potential of the Region.

The hydro-electric power potentials in the region under study are high and diverse, relative to the needs. Only one small-scale site has been studied and established at the Kelebe dam on the Ngona river, a tributary of the Kagera. Its installed capacity is 2.46 MW and an average annual production of 14.9 Gwh/year. The Action Plan has recommended a thorough survey of the two country's sector of the Kagera Basin.[32]

Burundi and Rwanda, because of their hilly terrain are much better endowed. The Action Plan has divided the potential sites into two broad categories: The main Hydro-power Projects and Other Projects.

There are three projects under the first category, probably so characterized because of their inter-state implications which could have easily qualified them as regional projects, if the countries developed such an idea. On the other hand, they may be so characterized because of their structural inter-dependence. They are the Rusumo, Kishanda and Kakono sites where the Rusumo project would determine the

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32. Hydropower potentials of the region are discussed in ibid pp. 70-105. For comments on Tanzania and Uganda, see p.101. This situation understandably explains the special keennes with which Tanzania wants the Rusumo project implemented.

downstream construction.[33] And the studies show their attributes as in Table II below:

TABLE II - MAIN HYDROPOWER POTENTIALS

Site	Installed Capacity (MW)	Guaranteed Energy (Gwh/year)	Cost* US$ x 10^6
Rusumo	80	270	130
Kishanda	207	500	181
Kakono	53	126	65

*Costs are updated to 1981 rates.

Additionally, there are several other possible sites located on the Kagera river in Rwanda
the Kagera river in Rwanda and Burundi. Of the two countries, Burundi has a total of 32 established sites with installed capacity of 304.9MW and annual production estimated at 1,630.8 Gwh/year. The details for each site are outlined in Table III below.[34]

The potential sites for Rwanda have also been studied, since 1967. In all there are 15 established sites with total capacity of 42.12 MW of installed power and guaranteed annual production estimated at 257.0 Gwh per year. Table IV below outlines the details for the Rwanda sites.[35]

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33. The structural inter-relation among the sites will be discussed later. For details, see the consultants' report prepared by Tractionel-Electrobel on Commission from Belgian Government, Hydropower Development of Rusumo Falls. Economic Summary and Conclusions, June 1979.

34. The data are from Volume 3 - Energy op.cit. Tables 5 on p. 39 and Table 12 on p.94

35. The data are from ibid Tables 6 on p.40 and 13 on p.95. Note that "Rusumu" site on this table is a smaller site, located on the Rusumu river, a tributary of the Kagera. Other details of the sites including heights, discharge rate and estimated costs are outlined on pp. 96-101.

TABLE III - HYDROPOWER POTENTIAL IN BURUNDI

RIVER	SITE	INSTALLED POWER MW	ANNUAL PRODUCTION Gwh/YR
Ruvubu	Gitega	25	117
	Mumwendo	30	157
	Murongwe	11	47.3
Kitenge	Rwegura	16	64
Kagunuzi	Masango	8	33
Kabulantwa	Rushiha	16	100
	Bitare	26.0	153.2
	Kagunuzi A	26.1	153.2
	Kagunuzi B	12.8	75.4
Mpanda	A	9.8	57.1
	B	1.7	12.3
	C	18	11.6
	D	3.9	23.0
	E	2.0	12.7
Musazi	Mubimbi	1.8	13.3
	Mumasumo	1.7	12.2
	Rushubi	2.3	16.9
	Muzinda	3.5	25.6
Ntahangwa	Ntahangwa	4.0	32.2
Kanyosha	A	2.9	17.5
	B	4.8	30.0
Mugere	Mugere	8.0	48.4
Karonge/	A	3.5	20.4
Kirasa	B	10.2	63.5
	C	6.1	38.4
	D	2.6	15.1
	E	12.6	73.5
Ruzibazi	A	1.8	10.3
	B	5.3	32.0
	C	6.1	39.1
	D	5.2	33.1
	E	14.2	92.8
TOTAL	32 Sites	304.9	1,630.8

TABLE IV - HYDROPOWER POTENTIAL IN RWANDA

Name of the River	Name of the Site	Installed Power MW	Annual Production Gwh/Yr
Rusumo	Rusumo	2.6	12.2
Nyabarongo	Nyabarongo	12.6	88.3
Sebeya	Gihira	1.0	8.1
Sebeya	Nyundo (Keya)	1.8	11.6
Mukungwa	Mukungwa II	2.9	14.6
Base	Base	3.4	19.7
Akanyaru	Akanyaru I	0.48	3.7
Akanyaru	Akanyaru II	2.0	16.1
Rukarara	Rukarara	6.4	23.5
Ruhwa	Ruhwa	6.0	35.0
Kamiranzovu	Kamiranzovu	0.7	5.3
Karundura	Karundura	1.3	11.4
Ndaba	Ndaba	0.24	2.1
Nkora	Nkora	0.15	0.6
Satinsyi	Satinsyi	0.55	4.8
TOTAL	15 Sites	42.12	257.0

All the fifty sites, in Tables II, III and IV, have been carefully evaluated for purposes of the Action Plan. The studies concluded that while it will be appropriate to develop small-scale hydropower sites to meet local needs and to serve the reserve capacity and to meet peak locations, it was not practical to rely on them to meet the forcasted power demands. The economics involved were considered highly unfavourable and the length of transmission were excessive.

Therefore, the Action Plan selected eight medium and large size sites for possible development to meet the demands upto the

year 2000. Table V outlines the eight sites showing the years by which, according to the plans in 1982, production was expected to begin.[36]

TABLE V - SITES PROPOSED FOR DEVELOPMENT TO YEAR 2000

Sites	Installed Power MW	Firm Energy Gwh/Yr	Cost[(1)] $x10^6	Start of Production
Rusumo Falls	80	270	130	1988
Kakono	53	126	65	1989
Gitega	25	117	54	1990
Kishanda	207	500	181	1992
Nyabarongo	12.6	88.3	24.3	1996
Mumwendo	30	157	83.5	1997
Rukarara	6.4	23.5	10	1998
Murongwe	11	47.3	24.4	1999
TOTAL	425	1329.1	572.2	

(1) Up-dated to 1981 prices.

The Action Plan clarifies that the scheduled year of production was feasible only if feasibility and preinvestment studies commenced immediately. It will be recalled that it was only for Rusumo that detailed preinvestment studies had actually been done. There were adequate background studies done on the others, particularly Kakono, Kishanda and Gitega, however, detailed economic and engineering studies were still required.

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36. The data are from ibid Tables 7 on p. 42 and 14 on p. 102.

The Rusumo Controversy

That it often takes a great deal of studies and reconsiderations before a well-identified hydropower potential is accepted for construction, is illustrated by the controversy which surrounded the Rusumo dam proposal. It has been explained here earlier that the Rusumo dam hydropower plan was so central to the consideration of the Rusumo agreement that the dam plan could have been easily assumed as the first justification of the agreement.

Those earlier surveys confirmed that Rusumo actually had an installed power capacity of 129MW, as distinct from 80MW in Tables II and V above. Accordingly the guaranteed output per year was also 535 Gwh as distinct from 270 Gwh shown above. Since, as has been pointed out above, the capacity of Rusumo would correspondingly affect Kishanda and Kakono schemes, their installed capacity were assessed at 214MW and 57MW respectively.

But the plan for Rusumo at the maximum level was expected to innundate considerable tracts of agricultural land, a fact which was totally unacceptable to the densely populated Rwanda and Burundi. The two countries objected strainuously. Rwanda's Foreign Minister Francois Ngarukiyitwali was reported to have told the press[37] that the 129 MW capacity was actually pressed for by Tanzania, he stressed that his tiny and overpopulated country would have had to displace 22,000 families and that they would lose 17,300 hectares of agricultural land.

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37. Reported in New Africa December 1981 p.68. More on this controversy will be discussed in the section on Environmental Implication of the Projects. For the detailed data in Table VI see Hydropower Development of Rusumo Falls (1979) op. cit p.6.

In the deliberations which followed, the three possible elevations for the dam, 1345, 1335 and 1325 meters were considered. The Tractionel-Electrobel study found that compared to Rusumo level at 1345 metres, the medium elevation of 1335m at Rusumo reduces the guaranteed power output at Kishanda by 20 percent and increases the cost of development by one per cent. For Kakono the respective figures are 20 per cent reduction and the cost of development increases by 2 percent. On the other hand at 1325 metres elevation at Rusumo the reduction in output at Kishanda is 51 percent and cost increases by 3 percent. The respective effects on Kakono are by 51 percent in output with development cost increased by 6 percent. Their respective power output as well as development costs are shown in Table VI.

TABLE VI - VARIANTS LINKED WITH THE WATER SURFACE ELEVATION OF THE RUSUMO DAM

	Installed power MW	Guaranteed output Gwh/Yr	Interannual output Gwh/Yr	Development costs 10^6 $
1. Rusumo 1345	129	535	597	115.9
Kishanda	214	1,026	1,125	251
Kakono	57	259	301	51
Total	400	1,820	2,023	417.9
2. Rusumo 1335	105	410	480	115.5
Kishanda	210	820	1,102	253.5
Kakono	54	207	286	52
Total	369	1,437	1,868	421.0
3. Rusumo 1325	80	270	374	107.5
Kishanda	207	500	1,082	258.5
Kakono	53	126	277	54
Total	340	896	1,733	420.0

Eventually the dam elevation of 1325 meters was accepted by the Heads of State of the KBO member countries despite the relatively low energy gains. The point was that at that level the dam would displace the smallest number of people and innundate the smallest area of agricultural land.

Clearly, then even in the instances where the power capacity have been established there is no guarantee that they will be finally installed at the same levels.

Power Transmission

At the time the Action Plan was completed specific main power transmission lines were proposed for Burundi, Rwanda and Tanzania. The proposals were based on the projected needs at the main supply centres within the region. Table VII presents the links and the estimated costs.[38]

TABLE VII - MAIN POWER TRANSMISSION LINKS

LINK	Size (Kv)	Length (Km)	Cost ($ x 10^6)
BURUNDI			
Rusumo-Gitega-Bujumbura	150	220	25.17
RWANDA			
Rusumo-Kibungo-Rwinkwavu-Kigali	110	108	5.06
TANZANIA			
Rusumo-Mwanza	220	300	44.57
Rusumo-Kyaka	132	150	15.07
Kyaka-Bukoba	33	50	3.37
Total		828	93.25

38. Uganda for its part is actually doing major rehabilitation of Owen Falls dam and increasing the capacity of the power station

T These links are expected to be further modified as new load centres, particularly irrigation projects, mining ventures and industries emerge. It may also be affected by the possible connections to Uganda. This may actually arise from energy production at Kishanda and Kakono which are close to Western Uganda where supplies might reduce Uganda's long distance transmission from Owen Falls. It seems that further studies will be done before implementation of the proposed links.

(b) Irrigated Agriculture

The trend in the studies for agricultural development in the basin will have suggested a bias towards intensified farming practices in the rainfed sector rather than in irrigation. However, it was also suggested, particularly in the critical study by Norbert Beyrard France, that there should be a clear balance between intensified rainfed agriculture and irrigation. This general hesitation to support large scale irrigation as the bias of KBO in its agricultural development also comes out clearly in the Action Plan finalized by the multi-disciplinary-multi-donor mission, on irrigation matters.

In their introductory pages the Action Plan on Irrigated Agriculture observed as follows:[39]

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38 continued:

from 135 MW to 172MW. Financing has been arranged through British Government, IBRD, CDC and Uganda Electricity Board to meet the required total amount of US $ 17.4 million. See Overseas Development. June 1985 p.2.

39. Development Programme of the Kagera Basin: Final Report Volume 2 - Irrigated Agriculture. (Kigali: Kagera Basin Organization, February 1982) (Hereinacter Action Plan Volume 2 Irrigated Agriculture). p.53.

> "Much of the Kagera River Basin agricultural land is not economically suited for irrigation, either because of poor soil, slope, distance and elevation differences to a dependable water supply. While not paramount, irrigation can play a real and effective role in increasing the land productivity and, thus, the basin food supply in the face of rapidly increasing production".

Thus, the irrigation programme of KBO is seen more as a supplement to intensified rainfed agriculture. And due to the adverse conditions mentioned above it should be borne in mind that even the selected areas, are not always the best circumstances for irrigated agriculture.

It is with such caution in mind that the KBO actually decided on the balance between rainfed and irrigated agriculture and, ultimately, the selection of the number of areas of planned implementation of irrigation in each of the three original members of the organization.

Initially seven project areas were studied by the multi-disciplinary-multi-donor mission. However, only three were retained in the Action Plan, for implementation. Table VIII below outlines both categories.[40]

Three, out of seven originally proposed project areas is rather small. But there are, presumably, four major and inter-related factors which determined the choice. First, it was already made clear that the KBO was more inclined towards intensification of rainfed rather than irrigated agriculture. Secondly, the Action Plan has made it clear that most of the Kagera Basin is not very suitable

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40. ibid pp. 6 and 8.

TABLE VIII - AREAS FOR IRRIGATION

Areas Proposed for Irrigation	Area Retained
1. Nyamswaga-Buyongwe (Burundi)	Bugesera (Rwanda)
2. Kanzigiri and Nyamaboni (Burundi)	Rusumo Covette (Burundi)
3. Bugesera Area (Nkanga-Rwanda)	Kyaka/Kakono (Tanzania)
4. Rusumo Covetter (Rwanda	
5. Borders of Rusumo dam (Rwanda)	
6. Kyaka/Kakono (Tanzania)	
7. Ikimba Area (Tanzania)	

for irrigation, at least not for reasonable economic returns. Therefore, the contracting states were likely to be cautions about the range of irrigation activities that they might take up from the outset. Thirdly, irrigated agriculture requires a great deal of education, experience and discipline. With the minor experience of Kagera Sugar Company in Tanzania's lower basin, there is no notable experience with irrigation in the basin. And in Africa generally, the success with irrigation in Egypt and Sudan has not been matched in Sub-Saharan Africa. In fact, the experience of SAED in Senegal and SONADER in Mauritania - both in the Senegal basin[41] show the same kind of dismal record as is, say The National Irrigation Board in Kenya. For these reasons, it seems pertinent that KBO should commence its work with a limited number and, thereafter, to establish its own success record before more projects are taken on. Irrigation is, by its very nature a very expensive enterprise. Fourthly, even with the three projects

41. See critical comments by Adrian Adams in "The Senegal River Valley: What Kind of change?" Review of African Political Economy No.10 Sept-December 1977 pp. 33-59 and OMVS, Social and Economic Study on the Senegal River Basin: General Report. Part C. Introduction of Irrigated Agriculture in the Senegal River Basin (Dakar, MVS High Commission April 1980.

retained for implementation the planned duration for implementation is quite long. In total, the three projects will cover approximately 24,200 hectares and it is anticipated that it will take at least 10 years to complete.[42]

For completness, let us outline brief the three areas selected for irrigation in the basin. The Bugesera Irrigation Project is located in Nkanga area, approximately 45 kilometers to the south of Kigali, but to the west of Lake Rugwero or Bugesera.[43] The soils in the area are rather poor and unproductive, suitable only for limited scale grazing. It is expected that with irrigation and additional inputs the crop yields would be increased.

The gross area is approximately 1,130 hectares. But the portion slated for irrigation is 1,000 hectares, constituting a 'model' along the shoreline of the existing Lake Bugesera. Sprinkler irrigation has been selected for the project with the investment and construction, all to be completed during the first year; production to commence during the second year at 60 per cent yields. The yields are expected to increase at the rate of 10 per cent per annum with full production to be realized by the sixth year. Already, laboratory type research has yielded some estimates for possible returns from irrigated, as against rainfed practices (Table IX).[44]

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42. See Action Plan Volume 2 Irrigated Agriculture.

43. Information on Bugesera project is in ibid pp. 57-58 and 68-94.

44. See ibid p. 71.

TABLE IX - COMPARATIVE MAXIMUM YIELDS FOR IRRIGATED AND RAINGROWN CROPS OBTAINED AT KARAMA RESEARCH STATION

CROP	Yield per Irrigated Ha. Kg	Yield per Raingrown Ha. Kg	Price per Kg Frw	Value Irrigated Frw	Value Raingrown Frw	Difference
Beans Wulma (Dry Grain)	2,189	1,050	20	43,780	21,000	+22,780
Soya Palmete (Dry Grain)	3,052	725	20	61,040	14,500	+46,540
GRNDS Fatui (Unshelled)	3,563	1,500	25	89,075	37,500	+51,575
Maize Bambou (Dry Grain	5,678	3,150	10	56,780	31,500	+25,280
Cotton (Seed CTN)	2,520	1,250	16	40,320	20,000	+20,320

The anticipated yields are contingent on certain agricultural inputs, and with considerable labour input, contributed by the farmers.

The system will be comprised of family farms, settled on seventeen, 60 hectare blocks, each with a 6 hectare infrastructure. But in most cases, they will all be trained in irrigation skills, and other inputs if the yields are to be realized.

The Rusumo Covette Irrigation Project originally identified by Tractionel in 1979, covered 10,400 hectares.[45] The purpose was to compensate for agricultural land innundated by the backwaters of the Rusumo dam, within Nyabarongo valley, particularly if the dam level was elevated to 1345 meters. The same area had been earmarked for development of Paysannot Settlement immediately after independence, to ease the pressure on the other crowded agricultural lands in Rwanda. However, due to persistently low rainfall that scheme failed and most of the original settlers abandoned the projects.

45. For information on Rusumo Covette, see ibid pp. 56-57 and 95-150.

Eventually, the KBO Action Plan adopted the project for 4,550 hectares of which 2,655 hectares would be intensely irrigated by sprinkler system using pumps driven by electricity from Rusumo dam, or diesel driven pumps.[46] The choice of areas for actual operation were to be limited by elevation, to moderate the cost of pumping. Areas over 1,400 meters elevation were eliminated as were also areas where the soil was particularly inferior. To further reduce the pumping heads and distance for water service, the project area was divided into three system areas, designated as A, B and C and with detailed coverage as in Table X.[47]

TABLE X - AREAS OF PROJECT

Area	Gross Area Under 1,400 m ha	Net Area ha	Irrigated ha	Non-Irrigated ha
A	1,320	1,190	770	420
B	1,800	1,620	1,055	565
C	1,430	1,290	840	450
	4,550	4,100	2,665	1,435

It is to be noted from table X that of the entire Rusumo Cuvette area, only 2,655 hectares would be intensively irrigated, with the rest only partially or on supplementary irrigation. The intensively irrigated area would be for the resettlement of 1,700 families, out of a total of 2,730 families which were expected to be displaced by innundation caused by the Rusumo dam.[48] At an average

46. ibid p. 56

47. ibid p. 98

48. ibid pp. 56, 97 and 105

1.5 hectares net cultivated area the total Cuvette should accommodate the 2730 families, with an additional five hectares as demonstration or seed multiplication units. Eventually, the resettled population would, be given the requisite agricultural inputs and irrigation education, contribute to the necessary food production schemes. But it is expected that the fertilizer quantities required would be substantial given the poor quality of the soil. The crops intended for the area are largely beans, sorghum, groundnuts, maize,cassava, sweet potatoes and bananas, with selected areas reserved for fodder crops.

Given the requisite inputs the yields are anticipated to be higher in the project area than without the project, as projected in Table XI below. The projected yield "without project" is with part irrigation to supplement low or erratic rainfall.

If there are no serious hitches the whole project should be completed in approximately seven years.

TABLE XI - PROJECTED CROP YIELD

Crop	With Project tons per ha.	Without Project tons per ha.
Beans	2.0	0.83
Sorghum	2.5	1.04
Groundnuts	1.5	0.84
Cassava	12.0	8.0
Sweet Potatoes	8.0	6.0
Bananas	10.0	9.0
Maize/Beans	3.1	1.05 maize 0.20 beans
Coffee	1.1	-
Fodder	65.0	-

The Kyaka/Kakono Irrigation Project is located in Tanzania's Kagera region in a general area comprising 50,000 hectares to the north and south of Kagera River, between Kyaka trading centre and Kakono dam site.[49] It was first given a detailed study by the Norconsult/ Electrowatt investigation in 1976 when an area of 21,440 hectares on the right bank of the Kagera River was earmarked for irrigation to grow maize, soya beans and rice. And it was envisaged, indeed to be irrigated by gravity canals after pumping water from Kagera River, at a location near Kakono, hopefully to utilize hydropower from Kakono dam.

Eventually, the project proposal was reviewed and revised, to take into account the topography, soil quality for irrigation, costs and other pertinent features. Additionally, the choice of location had to take into account the five agricultural projects existing in the area, namely: Mwisa and Misenyi Ranch complexes; Kitangule Ranch; Kitangule Prison Farm; Kagera Sugar Estate; and Agricultural Research Services.[50] Thus, the final area adopted in the Action Plan for irrigation is about 16,800 hectares, but the crops for the project remained the same. The conclusion of the multi-disciplinary-multi-donor mission was that "(t)he Kyaka Irrigation Project is by any standard of measure a bankable project."[51]

As distinct from the other project areas the Kyaka/Kakono irrigation project was to be situated in an area of existing experimental activities, including irrigation, from which it stood

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49. ibid p. 58 and 169-202.

50. For the existing projects, see pp. 175-77 and interviews with officials of the Sugar Development Corporation of Tanzania.

51. ibid p. 226.

to benefit. The five projects, listed above, are described briefly, as follows:[52]

The Mwisa and Misenyi Ranch complexes are immediately adjacent to the irrigation project area, to the southwest. Mwisa alone covers approximately 120,000 hectares and has a total of about 12,500 head of cattle. Misenyi ranch together with its areas of planned expansion is about 540,000 hectares but it was completely destocked during the Uganda-Tanzania border clashes in Amin's era.

Kitangule Ranch, established in 1964, is to the south of the river Kagera, and to the south of the Misenyi ranch. The original plan envisaged 47,460 hectares, for about 31,640 livestock on the whole ranch. Substantial parts of the ranch will now fall within the Irrigation Project area but significant portions will remain in the periphery for the continued ranching. This would possibly lead to intensive beef production as crop residues and irrigated forage is used in zero-grazing as a complement to conventional ranching.

The Kitangule Prison Farm occupies an area approximately 1,680 hectare, of which 890 hectare is within the area of the Irrigation Project. Upto now, the two crops grown in rotation in the farm are maize and beans, at the rate of one crop per year, but some 26 hectare have been under vegetable and root crop production.

The Kagera Sugar Estate is situated on the left bank of the Kagera river and is comprised of 5,000 hectares of cane with an additional 350 hectares with supplementary sprinkler irrigation. But the experience of Kagera Sugar Company has forcefully demonstrated some of the problems of irrigated agriculture in the region.

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52. ibid pp. 175-177.

The original plan conceived in 1972 was to farm a gross area of 14,000 hectares on rainfed basis, and to produce 56,000 tons of sugar per year with the capacity to expand to 80,000 tons per year. However, on closer examination the project was found to be risky: rains were unreliable; the soil was rather too sandy, meaning low water retention capacity; development on both sides of the bridge which was prohibitively costly; and a large part of the area was already in Kitangule ranch.

That is when the plan for irrigation was designed, scaled down to 6,500 hectares. And initially 4,500 hectares was planted with sugar cane. Although water was abundant in Kagera river, the pumping device became a problem. The plan was to derive the energy from burning bagasse to create steam for power. In fact, the power generated did not reach the seven megawatts capacity required for the total of 6,500 hectares. On the other hand, a thermal generator to use diesel which was recommended was found to be economically unfeasible. At the 1980 prices it was estimated that the entire irrigation infrastructure would cost approximately 400 million Tanzanian shillings of which 93 million shillings would go to construction of the power station alone.

Therefore, the irrigation plan had to be set aside. And this is where, the link between irrigation in the Kagera Region of Tanzania and the KBO hydropower, particularly 53 megawatts planned for Kakono dam, become apparent. Authorities at the Sugar Development Corporation, in Tanzania, estimate that Kagera Sugar Company alone would need approximately 10 megawatts.

For purposes of the KBO, projects could also use the facilities of the Kyakakera Pilot Farm, a research station established in 1971 to provide information on crop performance in Kyaka region, particularly

under irrigated conditions. Upto the time of the multi-disciplinary-multi-donor mission the centre had produced little information, but could conceivably be activated by a serious KBO.

The KBO irrigation project would evidently work out a proper delineation of boundaries with the Kagera Sugar Company, which is a private firm, before the implementation stage. For while the private company is primarily interested in Sugar production, KBO intends to concentrate on food crops, particularly maize, soya beans and rice, perhaps with some inter-cropping intended for maize and beans. At any rate the Action Plan anticipated that during the ninth year the production should reach 47,000 tons for maize, 14,100 tons for soya beans and 46,900 tons for rice, from net areas of 9,400 hectares, 9,400 hectares and 13,400 hectares, respectively.[53]

In final analysis it seems that the most extensive area for irrigated agriculture in the KBO programme will be in the Tanzanian section. The Rusumo Cuvette project will be largely imposed on KBO by the necessity to settle people displaced by inundation caused by Rusumo dam. But like the Bugesera project, it will be largely a supplementation of rainfed agricultural project.

In the Tanzanian section the Kyaka/Kakono projects highlights the agony of Tanzania both for want of increased food production, and for the need for alternative and renewable sources of energy, away

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53. ibid. p. 199. There seems to be an anomaly in the total acreage since the total project area was given as 16,800 hectare only. Even if maize and soya beans were inter-planted, which is not certain, the total area here would be beyond that for the project.

from imported hydrocarbons. Other than the regularly high cost of imported fuel oil, the distance over which it has to be transported magnifies the cost to prohibitive proportions. This problem applies to worse degrees in the case of Rwanda and Burundi. And therefore, all the irrigation projects planned by KBO are inextricably linked to the hydropower schemes, clearly, with the latter leading the way.

(c) Rainfed Agriculture

The primary occupation of 98 per cent of the population in the Kagera basin is agriculture. And, as has been clear from the foregoing section the agricultural practice has been entirely rainfed. For the most densely populated countries in Africa, this means that most of the land in the region would not be introducing a new culture, but instead intensifying the existing agricultural activities.[54]

Three specific areas, one in each of the three original KBO member countries, have been selected for the intensified rainfed agricultural projects:

In Burundi,[55] the area is the District of Karuzi, in Gitega Province, directly to the north of Gitega town. The area involved is about 20,000 hectares covering the communes of Buhiga and Bugenyuzi, where some 8,000 families of about 40,000 inhabitants live as farming communities. The average annual precipitation in the area is 1,200 mm with an average of 160 days of rain per year, distributed over most of the year. On the average there is good agricultural soil which is distributed among various crops farmed at small-holder level. The

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54. The projects in Rainfed Agriculture is discussed in Development of the Kagera Basin: Final Report. Volume I Rainfed Agriculture (Kigali: KBO, February 1982) (Hereinafter Final Report: Rainfed Agriculture).

55. ibid pp. 46, 203-269

crops include bananas, sweet potatoes, cassava, beans, peas, groundnuts, soya beans, maize, sorghum and millet. Some vegetables are also grown, but the main cash crops are coffee and tobacco.

The average farm size is 2.2 hectares,of which 1.7 hectares are on the slpes and 0.5 hectares are in the swampy areas. To support the crop yields, there is a seed multiplication centre located at Rusamaza in the area.

There is a limited 37,000 hectares for pastures in the region. And for the two communes there are approximately 10,000 head of cattle, 24,000 sheep and goats and 18,000 chickens. To boost or maintain the livestock part of the project will have to boost fodder production and increase veterinary services.

In Rwanda[56] the project area is the Prefecture of Butare to cover the communes of Kibayi and Muganza to the northeast of the prefectorate. The areas covered are 12,074 hectares for Kibayi and 10,559 hectares for Muganza.

The average annual rainfall for the area ranges between 1200 mm and 1400 mm distributed over two rainy seasons of each year. And the terrain is made up of ridges and hills whose average altitude is 1500 meters above the sea level.

The alluvial soil in the area varies in quality as well as water holding capacity, and the variation has been increasingly accentuated by the ongoing soil erosion, which reduces nutrients.

Although the French/Rwandan project started in the region in 1977 has encouraged farmers to grow peanuts and soya beans the

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56. ibid pp. 68-122

traditional subsistance farmers have habitually grown bananas, sorghum, sweet potatoes, cassava and maize, with coffee as the only cash crop for export. Definitely, the pressure on land and the need to enhance productivity of the land is accentuated by the high density of population, averaging 297 per square kilometres with an annual rate of increase at 3.0 per cent. More agronomic research is aimed at increasing productivity of the land, is done at Rubona Research Station located in the project area.

Livestock, which relies on the fallow land is lower in number than in the Karuzi project area. The present holding includes 9,000 bovine, 1,900 sheep, 10,000 goats, 1,800 pigs, 9,300 poultry and 1,200 rabbits. Perhaps more could be raised with better knowledge of the extent of the fallow area and veterinary services.

Tanzania's project [57] for rainfed agriculture is in Ikimba-Misenyi area of Kagera Region, neighbouring on the east with the Kyaka/Kakono irrigation project discussed above. It stretches from the southern end of Lake Ikimba to the border of Tanzania and Uganda, where the rainfall is generally low averaging 800 to 850 mm, except for the narrow belt along Lake Victoria where the rainfall reaches 2,000 mm.

This is an exceptionally sparsely populated part of the kKagera basin. The total population of Kagera Region of Tanzania is 1,009,291 which corresponds to approximately 35 pe ple per square kilometer. Most of them are engaged in small-holder agriculture, growing plaintains, sorghum, beans, maize, sweet potatoes and cassava, mainly for subsistence. But coffee and tea are the main cash crops. So far,

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57. ibid pp. 128-202

no detailed statistics for the cropped areas are available, even though rough estimates suggest that 2.2 hectares are the average cultivated area per family in the region. All these suggest that a great deal of development statistics should be gathered in this area to support intensified agricultural activities.

According to the Action Plan, the actual intensification of rainfed agriculture in the three areas will entail the following very specific actions:[58] (1) protection and reclamation of soils to ensure productive quality; (2) production and dissemination of selected seeds at the same time; (3) extension of agricultural methodologies; (4) intensification and development of subsistence crops; (5) intensification and development of commercial crops; (6) association of livestock and agriculture; (7) social and economic organization of the farmers; (8) adhering to the economics of production; (9) intensification of support actions of logistics and infrastructure.

It is understood here that a vital production item like fertilizers is actually implied under the rubric of reclamation of soils to ensure productive quality. In fact, given the recurrent observation about the generally poor quality of the soil in the basin, fertilizer input may be the most crucial factor in the enhancement of agricultural productivity. In the case of rainfed agriculture, it is projected that over the initial 5 to 7 project years productivity for the various crops should increase by 25 to 30 per cent, provided that well-trained and experienced personnel are deployed in the implementation.[59]

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58. Listed in ibid p. 45.

59. ibid pp. 43-44.

It is also observed that in both, the rainfed and irrigated projects special emphasis has been placed on production of food crops, with what seems as only casual mention of cash crops. At least in the case of Rwanda it is explicitly stated that price incentives were provided for oil seeds, particularly peanuts and that the French/ Rwandan project had actually started an oil factory in 1977.

Apart from the focus on manpower training and fertilizers the Action Plan lays special emphasis on agricultural credit system for financing of farmers, and marketing machinery to provide efficient outlets of the farm produce.[60] Storage and conservation are considered an essential component of marketing system.

(d) Other Project Sectors

Other project sectors discussed in the Action Plan are Livestock development, Forestry and Fisheries.

Several references have been made to livestock, almost as if it is a clear component part of irrigated or rainfed agriculture. That arises largely because the very agricultural activities are expected to produce most of the animal feeds. It is a critical question, of course, that livestock might not find much accommodation in the areas of exceptionally high density of human population as are Rwanda and Burundi. In general a number of factors have threatened the livestock population in the entire basin area. There have been inadequate nutrition; vector diseases especially from tsetse flies; heavy losses due to diseases and internal parasites; and inadequate veterinary care due to lack of funds, personnel and equipment.

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60. For Agricultural Credit in Burundi and Rwanda see ibid pp. 270-301 and for marketing in the two countries, see ibid pp. 302-338 where cooperatives are recommended as an important institutional machinery for organized marketing.

And these factors can drastically reduce the number of stocks. For instance during the 1978-79 about 15,000 out of 131,000 heads of cattle in Rwanda and Burundi were lost. Yet the member states recognize the value of the animals for nutrition as well as possible leather industry in the region. What the project intends to develop is a careful balance in the land holding capacity as well as for crop-production.

Afforestation is required within the basin for several reasons, particularly, soil and catchment conservation, poles and timber for building industry and for fuel-wood. The objective of the project is to plant 10,000 hectares of forests in each of the three countries to meet the above purposes.

Fisheries development within the basin is highly envisaged, partly because KBO members are conscious of their wealth in water bodies.[61] Apart from the Tanzanian part of the Lake Victoria which is approximately 50 per cent, Burundi and Rwanda, respectively have 26,460 and 15,465 hectares of lakes. The present fish catch potential in Rwanda is approximately 1270 tonnes per year and for Burundi, upto 1550 tonnes per year. In actual fact, Rwanda's annual catch is only 621 tonnes per year; for Burundi, it is 155 tonnes per year.

The value of fish as a source of nutrition for national population as well as its place in trade is well established. Within Kagera area it is estimated that the total animal protein available is approximately

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61. The following information on fisheries programme of KBO is derived from Development Programme of the Kagera Basin. Final Report Volume 5 Industries, Health and Environment. (Kigali: KBO February 1982) (Hereinafter Final Report - Volume 5 Industries, Health and Environment) pp. 36-46.

4,000 tons when the actual need in the region is about 38,000 tons.[62] It is obvious, therefore, that KBO could stimulate development in the fisheries sector to take advantage of the vast potential currently unexploited, as well as possibilities of aquaculture in ponds.

Table XII shows the status of fisheries sector in the whole basin.[63]

TABLE XII - STATUS OF FISHERY RESOURCES

Lakes	Area Ha.	Altitude m.	Potential productivity t/yr	Present productivity tons
Rwanda				
Bulera	2,610	1,962	50-60	93
Luhondo	5,280	1,764	50-60	31
Muhazi	3,410	±1,450	100-300	97
Mugesera	3,920	±1,340	350-400	65
Birila	540	±1,540	38	-
Sake	1,430	id	128	21
Gashanga	230	id	16	17
Muago	220	id	16	4
Rumira	280	id	20	19
Mirayi	230	id	16	4
Kilimbi	200	id	16	10
Gaharwa	230	id	16	30
Rweru	*2,230	1,324	165	16
Cyohoha N.	610	±1,345	43	27
Cyohoha S.	630	1,351	45	16
Rwampanga	950	±1,290	100	58
Rwehikana	2,160	±1,290	42	15
Nasho	1,300	±1,290	62	98
	26,460		1,273	621
Burundi				
Rugwero	*8,000	1,324	600-800	50 (1)
Cyohoha	*6,125	1,351	460-615	60
Kanzigiri	750	1,324	56-75	15
Katshamiranda	340	-	19-25	5
Rwihinda	250	-	34-42	25
	15,465		1,170-1,557	155
Tanzania				
Rwakajungwe	3,000	-	149	
Bisongo	2,500	-	124	
Burigi	7,500	-	373	
Ikimba	5,000	-	248	
Rushwa	4,500	-	224	
Victoria	3,370,000	-	73,375	
	3,392,500		74,493	

*partially in Rwanda and Burundi

62. ibid.

63. ibid p. 36,46

Apart from the resources in the natural lakes there are potentials for development of fisheries in the reservoirs created by the hydro-electric power dams. For instance, at the 1325 meters elevation a reservoir of approximately 20,200 hectares, will be created in the Nyabarongo valley. The Action Plan has called for detailed studies of the suitable species for the reservoir, and the organization of the communities for their exploitation. This should provide one of the ways for creating employment as well as boosting the livelihood for the people displaced by the dam - much like is intended for settlement in irrigated farms in Rusumo Cuvette.

2. Transport and Communication

The primacy of transport and communication in the development plans of the Kagera basin were briefly underscored in Chapter II above. The land-locked condition as well as the great distances from the oceans exacerbates the already bad economic condition of the region, as much for Burundi, Rwanda, Uganda, as for northwestern Tanzania.

The Final Report on Transportation[64] for KBO states that the straight line distance from the basin to the Indian Ocean is 1,000 kilometers and 1,900 kilometers from the Atlantic. And the port of Dar es Salaam is 1,430 kilometers by rail/lake links from Bujumbura, while Kigali is 1740 kilometers from Mombasa by road.

The KBO Background Reports in 1979 estimated that the cost of transportation is approximately US $250 per tonne. And the volume of the freight is expected to increase fourfold, from 260,000 tonnes in 1975 to

64. For the information on Transportation, see Development Programme of the Kagera Basin. Final Report. Volume 4 Transport (Kigali: KBO, February 1982) (Hereinafter Final Report Volume 4 Transport). For these distances see p.26.

one million tonnes by the year 2000. The cost might look rather ominous when are considered also in the context of the distances above.

Even under the best of circumstances that is an expensive way to run an economy. But internal transportation within the basin is by roads all of which are either earth or gravel surfaced and are all in poor conditions. There are no existing railways links within the basin. The countries of the basin cannot do much about their land-locked condition. They can only seek to diversify the alternative transport routes and to improve their quality for efficiency.

The trade and service transactions among neighbouring states, to the magnitude envisaged above, requires also formidable telecommunication links. As it is now the telecommunication links between Bujumbura or Kigali with Dar es Salaam, depend on the European circuits located 10,000 kilometers away.

For purposes of their external trade Rwanda depends largely on the Kigali-Kampala-Mombasa route, popularly known as the "Northern Corridor". Most of it is by road, even though it is the railway line from Kampala to Mombasa which is often used. Burundi also uses that route to a small extent. But their main route, as well as for eastern Zaire is Dar es Salaam to Kigoma on Lake Tanganyika, then by boat from Kigoma to Bujumbura.

Perhaps because of the terrain in the Congo-Nile divide as well as for reasons of distance, the governments of the basin states have put high priority on the links to the Indian Ocean, improving on the above, as well as providing additional optional routes. A particular attention is on maximizing links with the East African railway system.

The "Middle Corridor" is to link northern Burundi and central Rwanda to Kemondo Bay for a ferry terminal on Lake Victoria, then to

Mwanza to the Mwanza-Dar es Salaam line or to Musoma to link up with the proposed Musomal-Arusha-Tanga line.

The "Southern Line" would link southern Burundi from Gitega to Uvinza then to Kigoma-Dar es Salaam line. The proposition is that the area between Gitega and Rusumo, and westwards would partly be served by the "Middle" route, should the need arise. This proposition is further strengthened by the fact that over-crowiing and over-use of Dar es Salaam and Mombasa will probably continue, or get worse. And that may give increasing prominence to the Middle Corridor with the steady of expansion of Tanga Port especially if Tanzania decides to grant "free port" arrangements for the land-locked states.

At the end of the multi-disciplinary-multi-donor mission the KBO member states had agreed to the construction of a network for external links, consisting of the following:

— Uvinza-Musongati-Gitega-Buyongwe-Rusumo Falls

— Gisenyi-Ruhengeri-Kigali-Rusumo Falls-Kemondo Bay with a spur to Kyaka

— Ruhengeri-Kabale-Ntungamano-Kabwohe-Bihanga

— Musoma-Arusha

The total links would be approximately 2,011 kilometers of railway lines.[65]

In general these railway links will provide effective outlets to the Indian Ocean ports. But additionally they are designed to serve major development projects, particularly:[66] Mosso Sugar project at Giofi;

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65. See ibid pp. 29-30.

66. ibid pp. 28-29

Musongati nickel mines; Kabanga nickel and cobalt deposits; industries planned around Gisenyi on Lake Kivu; Lake Nosho agro-industrial complex; Mwisa and Misenyi ranching projects; Kyaka/Kakono irrigation project; Kyaka Sugar Estate; iron ore deposits at Kabale in south-western Uganda; Buyongwe peat deposits; the basin portion of Uganda; and other possible agro-based projects.

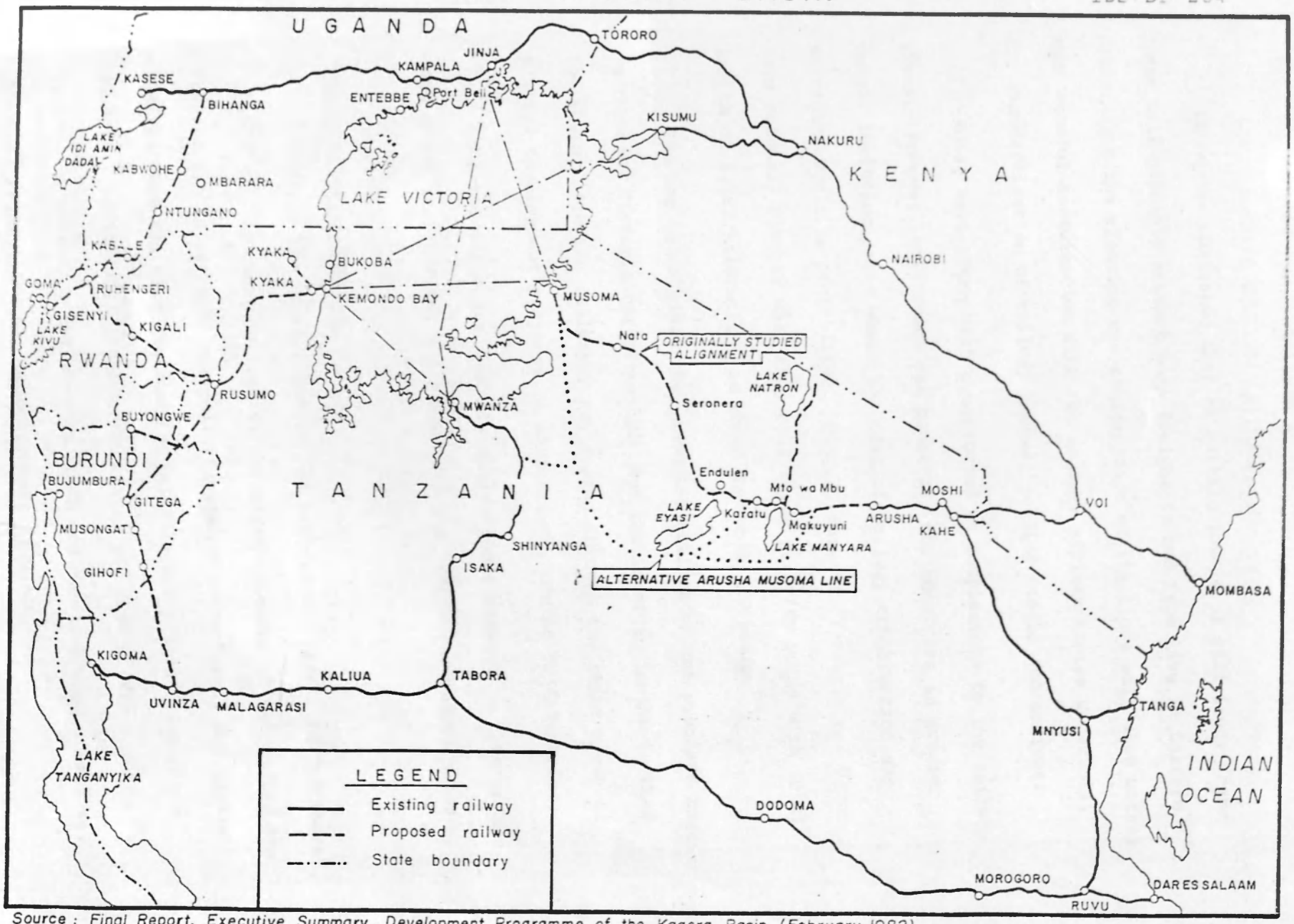
It is generally argued that basic infrastructure like railways should go where existing economic activities justify it. Conversely, it can be argued, conversely, that it is such infrastructure that could open up certain areas to development activities. Some of the locations listed above already have economic activities while others are still in plan. Nevertheless, it is possible to evaluate and project the volumes of freight anticipated forthese project areas, thus to further justify the planned construction, as shown in Table XIII.[67]

TABLE XIII - CONTINGENT VOLUME EVALUATE BY KBO FOR THE YEAR 2000

Project	Volume in Tons
Musongati Nickel	40,000
Giofi Sugar	20,000
Buyongwe Peat	900,000
Kabanga Nickel/Cobalt	30,000
Mwisa/Misenyi Ranches	10,000
Kyaka/Kakono Irrigation	100,000
Kyaka Sugar Estate	50,000
Gisenyi Area Industries	50,000
Lake Nasho Agricultural Complex	20,000
Other Projects	30,000
Southern Uganda Developments	100,000
Total Contingent Traffic	1,350,000

67. ibid p. 33.

THE KAGERA BASIN



Source : Final Report, Executive Summary, Development Programme of the Kagera Basin (February 1982).

It may be envisaged that at certain levels of efficiency these lines will probably attract more freight to and from Kivu in Eastern Zaire. But the planning and construction of the lines will also entail some careful coordination with the eastern African states especially for standardization of railway gauges, rolling stocks and engines.

Roads have often been constructed as complements to the railway lines. However, only roads can penetrate the countries in greater detail including areas where the cost of railway construction and servicing would be prohibitive. Rwanda, Burundi, Tanzania and Uganda, have actually planned what they call first priority roads with total length of 1,227 kilometers, as shown in Table XIV below.[68]

The map below gives the schematic outline of the proposed roads in the Lake Victoria circuit only. But the important point is that the roads, like the railways, are routed through the major areas of planned development projects in agriculture, mining or industries.

The KBO plans are that the entire roads network be constructed over a six year period, all phased out for different priority roads.

The Question of Transit

Whether the route taken by the land-locked states is "northern", "middle" or "southern" circuits, the basic concerns of the states are efficiency, in terms of cost-effectiveness; convenience; and alternatives when all else are found unfeasible for political or other reasons. Additionally, the basin states may also prefer a route for reasons of promoting inter-state trade and services and, therefore, regional integration of socio-economic transactions.

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68. ibid p. 123. For the schematic Map, see p. 127.

TABLE XIV - FIRST PRIORITY ROADS AS IDENTIFIED BY THE KBO

Country	Roads	Distance in Km.
BURUNDI	Gisenyi-Muyange Alt. A	73
	Alt. B	(50)
	Ngozi-Gitega	81
RWANDA	Kayonza-Kagitumba	126
	Kigali-Gisenyi	63
	Gitarama-Ruhengeri	108
	Ruhengeri-Cyanika	37
TANZANIA	Mtukula-Bukoba-Biharamulo	260
	Biharamulo-Lusahunga	31
	Kyaka-Bugene-Rusumo Falls	200
	Kobero-Rulenge-Nyakahura	85
UGANDA	Kyotera-Mutukula	41
	Kakitumba-Ntungano	35
	Cyanika-Kabale	66
	Gatuna-Kabale	21
TOTAL		1227

Tanzania may, for instance, meet for both Rwanda and Burundi only part of the basic concerns mentioned above. Yet, within the framework of the KBO, Tanzania may appeal to the land-locked states as the ideal route, that is through the middle and southern corridors, because they may want to strengthen the integrative functions enhanced by increased trade and services. And if that was the case, then Tanzania might, in fact encourage the use of the routes through its state.

Such an argument would also presuppose that there are economic benefits to be derived from being a transit state. Generally, the transit state would have the disadvantage of frequent repairs to roads over-worked by heavy commercial traffic. The requirements under the

1921 Barcelona Convention, and the York Convention on the Transit Trade of Land-Locked States Concluded at New York on July 8, 1965 affirm the "freedom of transit" for the land-locked state subject only to special regulations including charges levied to defray the expenses of supervision and administration of such transit.[69] Nevertheless such agreements are subject to accession or ratification of the respective states and thereafter adherence to the spirit of the agreement may be a different matter.

Tanzania as a coastal and transit state would be obliged to permit access for the land-locked KBO member states, regardless of the 1965 New York Convention, which it did not sign or ratify. Tanzania is presumed to be committed to further the transport goals within the framework of the KBO agreement. Perhaps the land-locked member states would be inclined towards the route if all else is equal. In this connection, the experience reported from Burundi in 1983 seems instructive.[70] The country had in 1979 imposed a tax on all freights transported from Dar es Salaam through the railway line, where the tax was to help defray the costs owed by Burundi to Tanzania, for the handling, including air-freighting from Dar es Salaam.

In the end, this caused a decline of goods traffic to Burundi, through Tanzania, to decline from 95 to 40 per cent over four years as the businessmen took alternative routes, largely through Mombasa.

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69. See Articles 2 and 3 of the New York Convention reprinted in United Nations, Treaty Series Vol. 597 (1967) pp. 42-62.

70. This was reported in Daily Nation, (Nairobi) 28 February 1983 p.16.

The effect is that Tanzania lost whatever revenues accrued from handling of goods at the port; at the same time Burundi was forced to take a longer and more costly route, That situation was changed in February 1983 when Mr. Remmy Nkengerute, the Burundi Minister for Transport and Communication announced the removal of the tax.

For Kenya the situation is only similar in that it is a transit state and that Mombasa becomes a congested port partly because of the freight it handles for the three land-locked KBO member states. Apart from not being a KBO member state like Tanzania, Kenya is also not a contracting party to the 1965 New York Convention. Therefore, it allows the transit partly as a matter of comity or partly in adherence to the general principles of international law recognized by civilized nations, within the meaning of Article 38(1) (b) of the Statute of the International Court of Justice.

The third and perhaps more pragmatic reasoniinducing Kenya to grant transit to the land-locked states is if Kenya derives revenues or trade opportunities from the transit through its territory. This matter has been the subject of several high level negotiations between Kenya and the land-locked states, with negligible substantive information published yet. In particular, the discussions became protracted after press reports that a Kenya Central Bank Circular of November 1983 had actually required all transit fees for the states to be paid in foreign currency and a February 1985 report that Kenya might, if fact, lose revenues which would accrue from handling of transit cargo bound for the hinterland states.[71]

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71. See "Transit fees to be paid in hard cash" in Sunday Nation (Nairobi) November 6, 1983 p. 24. and "Kenya May Lose Trade" in Daily Nation, February 14, 1985 p. 24

Indeed, the consultations with the states has been broadly based including also direct trade between them and Kenya with export opportunities which the latter might want to retain. Conceivably, therefore, Kenya might want to negotiate for transit terms attractive to the land-locked states, including "free zones" or inland container terminal, possibly at Eldoret where the requisite customs facilities, in any, could be operated. Th may also help alleviate the congestion at Mombasa port and hasten transit. It seems though, that the "free zones" would be more easily arranged for the expanded Tanga port than at Mombasa or Dar es Salaam.

Whatever is the transit option finally chosen and for any specific consignment, the KBO states are seeking alternative routes to reduce their vulnerability to political or economic hindrances to their external trade. The Government of Austria and Italy have actually undertaken to conduct the feasibility studies for the three alternative routes and their reports, possibly submitted to KBO in 1985.

The telecommunications links was examined by a special committee, six experts from the four KBO states, constituted on July 7, 1982 and reported their recommendations to the 13th Meeting of the KBO Commission the same week.

They examined two modalities: Temporary High Frequency Links and The Long Term Microwave Links. In the course of time, there was already a Standard B Earth Satellite station installed at Kigali for the improvement of telectommunications. It remained for the Commission to seek funds for installation of both modalities.

3. Industries

Industrial development projects envisaged by the KBO have been mentioned in several contexts in the preceding pages. In fact, such projects should figure prominently within the programme of KBO simply to get an effective link with the energy programmes and to make the hydropower projects viable. So far, the clearest consumer of the energy is irrigation where the hydroelectric power would be used for pumping purpose. It is clear, however, that most of the irrigation work will have long gestation period as the programme endeavours to train the farmers in the irrigation culture, to develop an effective extension service and to acquire the requisite agricultural inputs to make the farming profitable.

It seems, therefore, that for most of the formative years the irrigation programme would need subsidies. Consequently, its capacity to support the repayment of the loans for the construction, production and distribution of the power would be minimal, if not non-existent.

In the absence of industries as the consumers of electricity, the only consumer would be domestic and municipal entities whose financial contribution would evidently be inadequate for the effective repayment of the cost of the power.

For these reasons it seems imperative that the KBO programmes should ensure that bankable industrial projects are identified and developed to operational stage by the time the hydropower production commences.

The Final Report[72] of the multi-disciplinary-multi-donor mission was able to identify only six bankable projects, namely: manufacture

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72. This information is obtained from Final Report - Volume 5 Industries, Health and Environment. op.cit. pp. 26-35

of fuel peat products; use of bagasse for pulp and paper; molasses food product processing; malt and its uses; milling of corn and wheat; and Remie Fibre production.

Peat is found in minable quantities in both Burundi and Rwanda. Its importance is in its versatility as a source of energy, chemicals and fertilizer, as well as in the production of nickel. Thus, it is viewed by KBO as a possible cornerstone of industrialization in the region.

Further and detailed studies needed to be done on the precise location, quantity, quality as well as precise and ideal use patterns including possibility for substitution for other forms of energy. The KBO's final reports posited, for instance that peat could be substituted for fuel oils in cement plants.

In Bujumbura a USAID Project has experimented with small scale use of peat from inland sedge bogs for making briquettes for domestic use. Similarly at Kigali a UNDP Project has supported the extraction of papyrus peat from swamps. Both efforts could be nucli for a major collaborative industrial efforts in the basin.

Bagasse has been used as a source of fuel by the Kagera Sugar Company discussed above, and that possibility might continue on limited scale as hydropower production expands. Later, it is envisaged that the bagasse can be used in a paper and pulp industry leading to juxtaposition of sugar plants to paper and pulp mills. This is a project to keep in mind particularly in the existing sugar growing region in Kyaka Kakono area.

The processing of molasses food products is associated with the sugar industry where the initial stage would be desugarization of

molasses to recover sucrose in crystal form. Thereafter there are possibilities for production of animal feeds and alcohol.

Barley and raw malt as well as corn are needed to keep up the production of beer in the region. Existing and future breweries have been estimated to need a total of 4,000 tons of malt per year. Besides, there will be possibilities of export which can be exploited by local industries.

Industrial scale milling of corn and wheat has also been considered, specifically for breweries. It is estimated that the present needs are 1,000 tonnes per year, and an additional 2,660 tonnes per year with some future expansion. For these purposes cornhouses with production capacity of 4,00 to 5,000 tonnes per year is necessary. The reports say, though, that corn houses are profitable for a minimum production of 15,000 tonnes per year, which automatically urges the basin states to consider the higher brewery-capacities, so that the grits can be shared among the basin states.

Remie fibre, similar to cotton, has been considered for a project entailing an agricultural holding of 650 hectares. The fibre would be fed into a textile plant at Kigali to produce woven materials.

Two other possible industrial projects considered only preliminarily by KBO are Cement and Methane gas. The methane gas deposits whose deposits are under Lake Kivu, seem to have enjoyed more studies since 1930, but there still are no complete feasibility studies to determine large scale exploitation and utilization.

Fertilizer production possibilities was a rather prominent item in the background studies with the clear indications that it may

carry the key to any success in agricultural sector. Yet the Final Report did not list it among the possible projects under KBO's industrialization programme.

The Indicative Basin Plan was much clearer on this point than is the Final Plan of the multi-disciplinary-multi-donor mission. In the Indicative Basin Plan it was stated categorically that the hydro-energy projects of Rusumo, Kishanda and Kakono were to be significantly used for the production of fertilizers. Out of 206MW potential 130MW would go to fertilizer production.[73] That is a substantial portion of the power as envisaged and even though some variations would be expected from the final mission report it is rather curious that the difference could be so significant that fertilizer project is dropped altogether from the list of bankable industrial projects.

At least, it seems that the Indicative Basin Plan had given some statistical consideration to fertilizer production. It said:

> "350,00 metric tons of calcium nitrate will be obtained from limestone (deposits of which remain to be identified). 100,000 metric tons of phosphates, and 15,000 metric tons of potash would be imported from Zaire or Uganda for a total production of 490,000 metric tons of fertilizer which will meet the requirements for the year 2000".

The report added that the technology recommended for the production of amoniac is based on electrolysis of water for the production of hydrogen and this alone would consume 90 percent of the 130MW referred to above. They conclude that fertilizer so produced would cost

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73. For these summary data from the Indicative Basin Plan, see KBO General Background, 1979. op.cit. p. 29.

approximately US $85 per ton as against the imported fertilizer which would cost US $160 per ton.

It is important that both the agricultural projects and the hydro-power plans depended on the above combination. In fact, there was pressure that the Belgian Government should finance the Rusumo dam immediately with the above projects in mind.

Clearly, there is a weakness in the pace of planning for industrial projects under KBO and it desrves restatement that without industrial use of the power to pay for the cost of construction and production, the hydro-power plan might be in serious jeopardy as might also the agricultural sector.

4. Training and Manpower Development

Trained manpower is the human resource in the economic sense in that such people can contribute to the development work in their respective fields. In ultimate analysis trained manpower is a prerequisite as well as one of the indicators of development. Discussions with top officials of KBO characterized manpower shortage as one of the most critical bottlenecks to the development efforts in the basin states. Therefore, it was made one of the top priorities of the Commission.

In recognition of this serious weakness KBO initiated negotiations with possible financial support for training opportunities abroad, to meet their manpower needs. Concurrently, the prepared "Procedure for Selection of Candidates for Training and Conditions for the Award of KBO Scholarship", formally adopted by the Commission at its thirteenth session in July 1982.

According to these guidelines, the training opportunities of KBO would be worked out according to the organization's development work

and programme, and priority to be extended to those already in its service, and they must be citizens of the member states.

Whatever training opportunities are available notification is sent to the member states who are requested to nominate qualified candidates. But the ultimate decision for those receiving the opportunities is made by the Executive Secretary and the Directors.

All the recipients of the scholarships are bonded to serve the KBO for two years, or for a duration twice the training period, whichever is longer. For its part, KBO is to pay the benefits of the recipient, including the arrangement for travel expenses.

One set of scholarships had been obtained from USAID for four master's degree level studies in the United States. The agricultural economist's and the civil engineer (construction) positions went to Tanzanians while the industrial engineer was from Rwanda and a hydraulic engineer was from Burundi. Of these four the agricultural economist had completed studies by the end of 1982. A second set of scholarships from USAID was to include an electrical engineer, a civil engineer (structures) an electrical engineer and one in administration and management. And the Commission was busily exploring opportunities for more scholarships.

5. Uganda Projects

It will be recalled that the instrument accepting accession of Uganda to the KBO Agreement was adopted by the contracting states on 19 May 1981 and entered into force on 16 October 1981. Therefore, the possibility of Uganda projects did not evolve with those of the other KBO states. In fact, it was at its 12th Session in 1982 of the

Commission that Uganda actually requested that projects within its territory be considered for studies and evaluation. But only transportation in Uganda was considered at that session.

Thus, for the first time a formal list of possible Uganda projects was presented to the 13th Session of the Commission in July 1983, as agenda item number thirteen. They had not been evaluated by the time of this survey. Therefore, they are listed here only for indication of the range. The ten projects are: Nyabugongi Rice Scheme; tsetse fly and Trypanosomiasis eradication; small hydropower schemes in southwest Uganda; livestock improvement; afforestation in Ruhuma area; reclamation of Mulindi Swamp; mineral exploration in Kabale region; fisheries project in Lakes Mburo, Kakyora and Kijanibarora; saw milling in Muko planted forest and Kajiru forest; and improved rainfed agriculture in Rakai District. The Uganda Commissioner informed the session that Uganda experts had commenced formulation of four of the projects, namely, the Rice scheme, the Trapanosomiasis eradication project, afforestation, and rainfed agriculture.

V ENVIRONMENTAL IMPLICATIONS AND REMEDIES

River basin development programme, by its very nature, entails several environmental consequences most of which will have been suggested by the discussions of the development projects above. Some of the consequences are immediate, obvious and, at times sensational. These include inundation of land areas as well as displacement of population and wildlife by the reservoir created behind the dam. Othersare not so obvious, nor yet sensational; these include loss of lower fauna and flora, salinity of soil caused by irrigation, escalation

of the disease spread by water vectors, pollution caused by intensive use of fertilizers and pesticides, and adverse effect of the effluents from industries.

This section will briefly outline the major environmental impacts that have been identified by the KBO in its Action Plan. Indications will thereafter be made of some of the possible impacts not so clearly identified. Against these possible adverse effects we shall ascertain if the KBO programme of work had anticipated the impacts and what mitigating measures were included in the programme of work.

Secondly, we shall discuss the extent to which the founding states had provided in their constituent instrument for amelioration of the adverse environmental impacts. Finally, suggestions will be made for some possible additional legal and institutional machineries for the control of the adverse environmental impacts of river basin development programmes.

At least the Action Plan prepared by the multi-disciplinary-multi-donor mission took note of the concept of environmental problems arising from the development projects.[74] However, their concerns were confined to the effects of the Rusumo dam and Kagera weir the latter being behind Kishanda valley reservoir. So let us dispose of that discussion first before examining other possible problem areas which the KBO Action Plan seems to have ignored.

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74. Final Report - Volume 5 - Industries, Health and Environment, op.cit. pp. 95-109, is the full report on environment under the Action Plan.

The most dramatic and controversial environmental problem in the context of the KBO programmes was the impact of the reservoir of the Rusumo dam. As stated earlier, at various elevations it was to replace significant population from the adjoining Rwanda and Burundi in the Nyabarongo Valley. Recall that the original and highest elevation of the dam was 1345 meters. It was attractive because it would also result in the highest hydropower production at Rusumo itself as well as at Kishanda and Kakono sites. This is clearly expressed in Table IV above. The elevation was therefore, easily preferable.

On the other hand, the respective elevations of the dams were directly related to the land area which was submerged by the reservoir.[75]

TABLE XV - AREAS LIKELY TO BE SUBMERGED

Water level	Total Surface area submerged (2)			Usable surface area submerged		
	Rwanda	Burundi	Total (3)	Rwanda	Burundi	Total
1345	52,000 ha	11,000 ha	63,000 ha	17,240 ha	5,600 ha	22,840 ha
1335	33,000 ha	9,000 ha	42,000 ha	8,180 ha	3,120 ha	11,390 ha
1325	20,500 ha	6,000 ha	26,000 ha	2,510 ha	1,220 ha	3,370 ha

Corresponding to the areas of land to be submerged were the numbers of people who would be displaced by the reservoir and for whom alternative settlement would have to be sought. These numbers, for the three different levels of the dam are forcefully portrayed in Table XVI below.

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75. These figures came out clearly in the Tractionel-Electrobel Report done under contract with the Belgian Government for KBO States. See Hydropower Development of Rusumo Falls: G - Economic Summary and Conclusions June 1979 p.7.

TABLE XVI - INHABITANTS AFFECTED BY RUSUMO DAM AT VARIOUS LEVELS

Water level	Number of inhabitants affected		
	Rwanda	Burundi	Total
1345	22,975	2,975	25,950
1335	10,445	1,610	12,055
1325	2,220	535	2,755

The Tractionel-Electrobel study had estimated in 1979 that at the population growth rate of 2.5 per cent and on assumption that the new generation would settle within the confines of the area to be submerged then in 1990 there would be 3,600 people displaced at level 1325 meters and 34,000 people at level 1345. The intermediary elevation would affect 17,500 people.

With a negative environmental impact as anything that renders an area of land unihabitable or unusable the impact of the dam is obviously one. It was pointed out earlier that both Rwanda and Burundi are the most densely populated countries in Africa. Thus, simple loss of agricultural land, whaterver are the promises of gross national economic benefits, would generally be unacceptable. But when that is coupled with displacement of population for which new settlement are to be sought, then the matter might lead to a national crisis, depending on the degree as illustrated by the impact of the dam elevations. Rwanda and Burundi found it unacceptable to set the level of the dam at 1345 or 1335 meters. In fact, for these two countries, the highest elevation ff the dam was considered a "Tanzanian target" for the latter's own energy interest but, unacceptable for their "tiny

and overpopulated" countries.[76]

The resolution to this particular environmental problem of flooding was found in the adoption of the lowest elevation for the dam, 1325 meters. Determined over the necessity for the construction of Rusumo falls power project, the Head of State of KBO member countries decided as such at a meeting on 9th May 1981. Henceforth, they mutually agreed that the project should proceed.[77] The point they made is that the problem and finding its resolution was not a zero-sum game: compromise to them was to reflect the net benefit.

The reports also found that on the ichthyological perspective, the ecology downstream Rusumo Falls differed completely from the ecology upstream. Therefore, there would be no adverse consequences for the fish species. And other flow arrangements could be made for the replenishment of various planktons downstream. Ultimately, however, the reports suggested that further detailed studies of the impact were still necessary.

Downstream the Rusumo Falls, site of the dam upto Kagera weir, the site of the Kishanda project had its own possible ecological situation not least of which is the impact on the Kagera National Park. The area is dotted with several lakes surrounded by thick papyrus swamps, natural channels and channels created by fishermen. The ecologist for the Final Report were not able to predict any specific adverse effects on the ecology of the lakes and the papyrus swamps.[78] On the

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76. Comments by the Rwanda Foreign Minister were reported in New Africa December, 1981. p.67.

77. See the journalist's summary under "At Last: Kagera Go!" in ibid and in Final Report Volume 3 Energy op.cit. p. 57.

78. Final Report Volume 5 - Industries, Health and Environment, op.cit. p.106.

other hand, they add in the same pages that the impact on Kagera National Park would only slight, with the reservoir downstream the Rusumo dam, serving the purpose of seasonal water storage to be used during the dry season.

On the other hand, they agreed that the Kagera weir, causing the reservoir in Kishanda valley to facilitate the funnel diversion, would strongly affect the water levels of Kagera National Park. The plan here is that a weir would be constructed below the point of Lake Rushwa. It would cause a reservoir, rising in level and diverted to fill Lake Rushwa and to create the massive Kishanda reservoir. The water sould then be taken through Bugera Tunnel where it would have a sufficient head as it "falls" in the natural course of Kagera River. Here is the Kishanda hydropower project (before Kakono) discussed earlier. (See the Schematic diagram below.

It is predicted that the weir will operate at levels between 1282 and 1284 meters. Although the studies predict that the highest level will rarely be attained it is still apparent that the water level in the National Park will be high enough to warrant further impact studies, because there would be impacts on the wildlife as well as the papyrus swamps.

The final point to observe on the weir is that downstream "the river will be virtually dry for most of the dry season and the effect on the present narrow fringe of swamp vegetation will be drastic."[79] In any event, the drying up of the river will obviously destroy the habitat for various bird, animal and plant life.

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79. ibid p. 108.

In all these cases the Final Report makes no suggestion whatsoever for ways of ameliorating the adverse effects. It is simply submitted that the animals will probably migrate across the empty river to the Kishanda reservoir.

On the general questions of public health the only subject that seemed to concern the final report was tsetse and trypanosomiasis eradication for the protection of human beings and livestock.[80] This, of course, is an exercise to improve the environment and increase its habitability rather than eradicating a problem created by the basin development projects. It was to be handled as a regional problem only for reasons of effectiveness.

In general, however, the KBO had taken the position that even though irrigation would lead to several vectorborne diseases, the task of the control of the disease rested with the member states. 81 For its part KBO could play a role in the standardization and harmonization of health practices as well as exchange of information. It was hoped too that the donor agencies would take public health matters into account in the project fromulation so that the problems be dealt with generically.

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80. For the outline of the project, see ibid pp. 46-93.

81. Observation in the Report by Professor Takateru Ohse, MD. Environmental Health Consultant from UNECA. May 1980 to KBO, page 2.

Health and the general environmental problems which might be associated with industries do not seem to have received any attention. Clearly, the formulation of projects on industrialization seem to be unfortunately weak in that although a few bankable projects were preliminarily identified there are no solid formulation of industrial programmes. Concommitantly, those concerned with formulation of the environmental policies did not anticipate adverse consequences of any intensified industrialization in the basin in order to formulate general policies.

There are no policies regarding national or transnational effects of air pollution from industries. And there are no policies expressed on the disposal of wastes into the waterways particularly the river Kagera itself. Discharge of wastes into the waters could conceivably have deleterious consequences within the offending state or in the lower riparian, both in terms of contamination of drinking water or fishery resources.

Pollution of the Kagera river can have far reaching implications; the river finally empties its load into Lake Victoria which is drained by the Nile. Obviously it would take a great deal of pollution of the Kagera to defy autobiodegradation in the river itself and in Lake Victoria to reach the Nile, but that position is valid, in the long run, only if the discharge of wastes into the river is kept under control. In the long-run one has to recall that River Cuyahoga, a tributary of Mississippi caught fire due to its inflamable load of pollutants, or that Lake Erie turned into a cesspool due to pollutants reaching it within the same century. Probably, the latter situation would never have arisen if the pollution control standards called for by the International Joint Commission (between USA and Canada) in 1918 were heeded.

In the present case the absence of the policy suggestions on these environmental problems, in the Final Report seem to be a major defect. But it is also patently anomalous in an actual action plan of an organization whose list of functions include environmental protection. The problems will be immediate once the construction stage of the KBO is commenced.

Rather than these immediate problems, the KBO concerned itself with a long term goal of establishing an Environment Advisory Centre (EAC). The Centre was proposed by two consultants: Michel Maldague from University of Laval and Alan Rodgers of University of Dar es Salaam, funded by Swedish International Development Agency (SIDA) and executed by IUCN's Conservation for Development Centre. The consultants' report was submitted in August 1982.

The goal of the consultancy was described in general terms, as being "...to verify the feasibility of the creation within the Kagera Basin Organization of the Centre whose main objective would be to ensure that the natural resources of the Kagera River Basin would be used in an optimal way taking into account the needs of the population, the necessity for the countries to develop, and the obligation to safeguard the ecological Equilibrium" (emphasis added). One only needs to observe in passing that once the wide range of development activities was introduced, the goal should have been of sustainable utilization rather than ecological equilibrium.

There must be a place where the call for and the feasibility of the creation of the Centre was proposed, possibly within the KBO, in order to justify the verification of the feasibility. That could have been in a terms of reference, issued by the KBO, if there was. On the other hand, the obligations to be safeguarded, must have been assumed because as will be clear below, obligations of the member states on

ecological equilibrium had not been articulated in the Rusumo agreement, nor yet was there any special protocol providing the same.

The Centre was to have six broadly defined functions, summarized as follows: (a). coordination to avoid duplication of efforts in environmental matters, among disciplines, university research centres, and projects sponsored by international agencies; (b). data collection and organization for use by the KBO member states as well as KBO itself, and to provide data - base for existing environmental conditions; (c). monitoring - to get information concerning effects of disposal of new substances in the environment; to perform environmental impact assessment of pending projects; and to conduct aerial photography as part of data collection. (d). to conduct research into various ecological problems, liaise with scientists in the region and to advise policy makers; (e) to conduct training and to build manpower for implementation of environmental goals; (f) to provide general advisory services to KBO on environment and development.

The consultants outlined the staff needs, as indications of the institutional framework on the environmental question. At the top of the Centre, to be based at KBO headquarters are two Expatriates with two counterparts, consultants for 24 man-months over five years, and three professionals one at each of the regional offices in Burundi, Tanzania and Uganda.

Technical staff are to be recruited for aerial photo technician, reproduction, cartographer, data processors, agriculturalist, and computer assistant. The support staff are to be six in all.

For accommodation there would be three large and two small offices with six technical laboratory.

To assist in the technical direction of the Centre, there would be established an Advisory Panel.

The idea of the Environmental Advisory Centre may be a splendid move to strengthen institutional framework on environmental matters in KBO's development programmes. However, it seemed hardly an immediate issue for KBO. Projects were already planned and some of the impacts anticipated have been enumerated above. In most cases, the final report had called for yet further studies to determine the precise scope of adverse effects and the possible remedial measures. A properly balanced priority order within IUCN should have rushed to support the detailed studies rather than establishment of the Centre.

And even if the Centre was to be a priority matter the proposal sets for two expatriates perched at the top of it without a clear demonstration that there were no ecologists and engineers within the member states, who could be deployed to make the assessments. It is conceivable that for the technical functions, University staff could be deployed on secondment or part-time basis to assist the KBO's work. This approach might in fact work as a mode of establishment and building of local manpower and institutional capabilities. The provisions for foreign experts and consultants in the proposal seems suspiciously large. But then the consultants also suggested the creation of an Advisory Panel and recommended themselves by name, to become its members.

In the end the personal emoluments for the expatriates was to amount to US $840,000 as against only $550,000 for the local staff, over five year duration. And KBO member states would have to find the money alongside with the resources for development work and for the serious environmental impact assessment for the immediate development projects.

Thus viewed, the idea of Environmental Advisory Centre was difficult to view as a serious and immediate project for the KBO states.

What seems evident is that the environmental impact of the first generation of development projects of KBO were not given adequate and serious treatment by the member states and their consultants. The treatment in the multi-disciplinary-multi-donor mission reports were cursory and only pointed out the need for further and detailed studies. There are very scanty traces of explicit statement of remedial measures designed to mitigate any explicit negative impacts.

Environmental Issues and the Constituent Instrument:

The only explicit expression of concern with environmental matters in the Rusumo Agreement was the enlistment among the objectives of KBO that it would deal, inter alia, with "Environment protection". Obviously, this simple expression of the objective does not constitute an obligation on the part of the member states to prevent, control or mitigate any possible environmental injuries. Thus, there simply are no expressions of normative standards or procedures for regulation of posible direct or indirect negative environmental consequences of construction, industrial or agricultural work in the basin as discussed. It is not possible to establish that this discrepancy in the constituent instrument led to the laxity in the planners to endure serious and definitive mitigating measures to the adverse environmental impacts of the development programmes. But there is a curious coincidence between this and the lack of clear concern by the member states that the mitigating measures should be established before the development projects, such as the Rusumo dam, are commenced. There is no clear package of legal obligation to prevent environmental damage. Similarly, there is no expression of policy undertaking or activities designed to control or mitigate adverse environmental

injuries.

Expression of such policies may lead to action in the interest of the environment but the provision of legal obligation in the consituent agreement, properly ratified by the basin states requires the states to adhere to the general technical standards and the specific normative regulations adopted from time to time according to the perceived needs. For these reasons, one may suggest in summary form, the following additional principles which could have gone into the original agreement, or to be adopted in a special protocol on environmental protection.

(a) A provision should have been adopted stating explicitly that one of the purposes of the KBO is to ensure rational and integrated basin-wide development to imply sustained utilization of natural resources, prevention of environmental injuries, the protection of native fauna and flora, and the protection of public health.

(b) The constituent instrument should provide that in all common or individual state works the each developer is under obligation to ensure that the activities donot cause adverse environmental effects within the project area. Secondly, that effluents from such projects must not cause specific or general environmental injuries in any other area beyond the jurisdication of the member states.

(c) There should have been an obligation to the effect that in all projects conducted within the plans of the KBO, the organization and the individual states within whose state the project is done shall ensure the protection of health and well-being of individuals resident in the contracting states.

(d) There should be provision of administrative and judicial remedies in each basin state, for individuals or groups who are victims of environmental injuries arising from KBO projects.

A precusor convention with provisions along these lines is the Nordic Environmental Protection Convention, signed at Stockholm on 19th February 1974 by Denmark, Finland, Norway and Sweden. Article 3 is quoted here in extenso:[82]

> "Any person who is affected or may be affected by a nuisance caused by environmentally harmful activities in another Contracting State shall have the right to bring before the appropriate Court or Administrative Authority of that state the question of permissibility of such activities, including the question of measures to prevent damage, and to appeal against the decision of the Court or Administrative Authority to the same extent and on the same terms as a legal entity of the State in which the activities are being carried out.
>
> The provisions of the first paragraph of this Article shall be equally applicable in the case of proceedings concerning compensation for damage caused by environmentally harmful activities. The question of compensation shall not be judged by the rules that are less favourable to the injured party than the rules of compensation of the State in which the activities are being carried out."

The Nordic provision relates to trans-territorial environmental injuries and, implicitly it assumes that there will be legal provisions for redress of environmental injuries caused within each contracting state. Indeed, most countries in Africa, including the basin state may not have developed full legislation for redress of such injuries at national

82. The Convention is repreinted in 13 International Legal No.3 Materials pp. 591-596 (1974).

level. Then perhaps the increasing agricultural and industrial expansion within the basin should prompt such initiatives. Granted, the Nordic countries have long history of collaboration which explains their acceptance of the elaborate conditions. But there is no excuse for the African states under discussion failing to make bold attempts in the protection of their natural resources and public health. After all, development depends on these factors.

(e) The machinery for the settlement of disputes in Article 18 of the Agreement, which calls for consultations among the parties, failing which the parties should resort to the procedures set out in the Charter of the OAU is rather too general and imprecise for the complex issues of management of international water resources. It will be recalled that the Charter of the OAU was drawn up with a focus on the political and security problems of the 1950's and 1960s in mind. As such the emphasis was on mediation and conciliation by other member states. The management of natural resources under consideration in the KBO's work entail technical issues such as equitable sharing and utilization, regulation and control of pollution. Admittedly, the general OAU procedures might be applied mutatis mutandis with participation of technical "masters". On the other hand, it is more straight forward to sketch out procedure directly suited to the problems.

It is suggested here, for instance, that where preliminary consultations fail, the dispute should be referred to a selected panel of experts composed of persons with established experience in integrated management of drainage basins. The panel could then review the facts-in-issue then to give the parties a fixed duration during which an investigative mediation may be conducted towards a consensual resolution. There is no magic figure for the duration but it must not be too long: environ-

mental problems associated with drainage basin management are often such that if their resolution is delayed then some irreversible consequences might ensure. Moreover, the investiments and construction work which be might be involved, such as dam construction, are so expensive that once established they are not easily modified. Therefore, a maximum duration of two years is suggested here.

If a review by the expert panel after the two years does not yield a resolution then the dispute is to be referred to an arbitral or judicial machinery whose procedure entail a binding decision. The implicit suggestion is that the existance of a decisional procedure will actually induce the states involved to make the consensual procedure effective" states often prefer the latter to an arbitral or judicial procedure."

It is suggested here that these aspects of the machinery for settlement of dispute should have been set out the agreement for the management and development of the drainage basin. The basin states are, at that stage, able to review the machinery as part of the package with their anticipated socio-economic benefits and not as isolated intervention or interference with the development of programmes. As it is these suggestions could in some cases be adopted as amendments; they may also be adopted in a special protocol to the Agreement.

(f) An additional policy initiative for environmental monitoring and protection is available at regional level, covering the entire catchment area of Lake Victoria. The approach was recommended at the end of the "Workshop on the Quality of Water Input into Lake Victoria," which was held at Tom Mboya Labour College, Kisumu from July 25 to August 7, 1982 under the aegis of Kenya's Lake Basin Development Authority (LBDA). It was attended by senori experts from Kenya, Tanzania, Uganda and an Ecologist representing Kagera Basin Organization. At the end, the Workshop adopted

several procedural and substantive recommendations one of which requested the Managing Director of LBDA to assume the coordinating role and to convene subsequent regional meetings to work out strategies for the exchange of information, standardization of data and collaboration in the control of water quality particularly for the protection of public health and the conservation of living resources of the entire aquatic area. That line of action is particularly opportune, in view of the end of data collection phase of the Hydrometeorological Survey. It should be possible for the countries to work out a development oriented action plan, funded by UNDP as a follow up to the Hydrometeorological Survey. In fact, the LBDA has powers under Section 8(m) of its Act, to perform such functions.

VI FINANCIAL RESOURCE IMPLICATIONS OF KBO PROJECTS

This Chapter of the paper is concerned with three broad questions. First, how much money is required for the execution of the projects outlined above. Secondly, what are the sources organized for raising the funds. Thirdly, we shall outline a few logistical questions related to the financial resources and how they are to be obtained.

(a) The Financial Requirements.

On the sum of money required for the projects, the purpose here is only to bring out the precise magnitude, in global terms. Table XVII below gives a summary of the costs, from studies to the projects.[83]

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83. Obtained from Development Programme of the Kagera Basin: Final Report - Executive Summary (Kigali, Kagera Basin Organization February 1982) p. 73.

TABLE XVII - SUMMARY OF COSTS OF KBO PROGRAMMES

STUDIES	
Energy	$19,107, 00
Railway	8,585,000
Roads	
primary	28,525,200
seconda y	12,979,200
Industries	180,000
Total for studies	$69,377,400
PROJECTS	
Agriculture:	
rainfed	$21,200,000
IRRIgated	53,361,000
Energy:	
dams	$572,200,000
transmission lines	93,240,000
Railway:	
construction of network	$1,395,663,000
rolling stock	[illegible]
Roads:	
Primary	327,792,000
secondary	81,120,000
Afforestation:	17,207,700
Tse-tse fly.	2,511,735
Sub total for projects:	$3,120,999,435
GRAMD TOTAL COST OF THE PROGRAMME	$3,190,376,835

On the other hand, we are aware that the KBO has not adopted a formal framework for common projects/works as did the organization for the Management of the senegal Basin (OMVS) by the Convention on Legal Status of common Works, adopted on December 12,1978. Later, the OMVS member states adopted onCOaveembtionlOn the Financial Arrangements for the Common Works on may 12,1982. In the case of the KBO, the projects are essentially national, with the organization having done the overall basin-wide planning presumably, to ensure a basin-wide coherence as well as to take account of the unity of the basin as an ecosystem. Besides, the KBO as an organization, may coordinate the fund-raising operations to take care of the collectively agreed priority projects.

Otherwise most of the projects, particularly in agriculture, will be implemented as national projects, albeit, with the regional implications for food security. For these reasons the costs for the implementation of the agricultural sector projects should be isolated and identified individually. But unlike the agicultural sector, the all the three hydropower projects have regional implication, each with structures affecting more than one state. In fact, the respective member states may easily decide to go it alone on fund-raising for agricultural projects, rainfed or irrigated once the respective costs are identified, unless there is a specific and novel advantage in going together. For these reasons, Table XVIII, which is a disaggregation of Table XVII gives a picture of the costs of various projects of KBO.[84] Thus, while the total cost of the programmes is just over US$3 billion, if agricultural projects under the programme were handled by the individual and respective territorial states, then a significant requiring very high level of accountability, will have been taken up at its basic place, even if the financial relief, for KBO as an organization, is not overwhelming, Nevertheless, the amount of US $74,561,000 estimated for the agricultural sector is a significant amount.

The fact that the KBO's hydropower projects could be phased out over a long period of time is underscored by the fact that the estimated total amount for the energy sector extends beyond the three top priority projects, namely, Rusumo, Kishanda and Kakono. In fact, the estimate for energy covers some eight project sites, and includes studies, construction

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84 KBO, Final Report: Executive Summary op. cit. pp. 72-73

TABLE XVILL - DETAILED OUTLINE OF THE COST OF KBO PROGRRAMME

1.	AGRICULTURE		
	Rainfed:		
	Karusi	20,000ha	$7,000,000
	Butare	22,633	6,700,000
	Ikimba	10,000	7,500,000
	Sub total	52,633	$21,200,000
	Irrigated:		
	Rusumo	4,555	$34,600,000
	Bugesera (1000ha models)	1,000	3,400,000
	Kyaka	16,800	15,361,000
	Sub total	22,355	$53,361,000
	Grand total:	74,888	$74,561,000
	Cost.Ha:		
	Rainfed:		$402,79
	Irrigated:		$2,387,00
	Additional studies not required.		
2.	LIVESTOCK No specific programme recommended.		
3.	AFFORESTATION	30,000ha	$17,207,700
4.	ENERGY		
	Studies		19,107,000
	Construction of dams		$572,200,000
	Construction-transmission lines		93,240,000
	Total:		$684,547,000
5.	RAILWAY		
	Studies		8,586,000
	Construction of network		$1,395,663,000
	Rolling stock		556,704,000
	Total:		$1,960,953,000
6.	ROADS		
	Primary:	1,227 (1,204) km	
	Studies		28,525,200
	Construction		327,792,000
	Sub total		$356,317,000
	Secondary:	312	
	Studies		12,979,200
	Construction		81,120,000
	Sub total:		$94,099,200
	Grand total:	1,539 - km	$450,416,400
	Cost/km:		$ 292,668
7.	INDUSTRIES		
	Studies		180,000
8.	CONTROL OF TSE-TSE FLY		$ 2,511,735
	GRAND TOTAL COST OF PROGRAMME		$3,190,376,835

and the transmission lines. Therefore, to understand the estimated costs for the three top priority projects Table XIX offers an outline of the eight projects, the estimated costs and the scheduled time.[85]

TABLE XIX - SITES PROPOSED FOR DEVELOPMENT UP TO YEAR 2000 US$ to 1981

Site	Installed Power MW	Firm Energy Gwh/Yr	Cost $x10^6$	Start of Production
Rusumo Falls	80	270	130	1988
Kakono	53	126	65	1989
Gitega	25	117	54	1990
Kishanda	207	500	181	1992
Nyabarongo	12.6	88.3	24.3	1996
Mumwendo	30	157	83.5	1997
Rukarara	6.4	23.5	10	1998
Murongwe	11	47.3	24.4	1999
TOTAL	$25	29.1	572.2	

Note that the cost shown in Table XIX is only that of construction of the dams but excludes studies and the transmission lines, as shown on line 4 of Table XVIII. But what is also clear from the table is that some of the project sites offer an option for exclusively national funding, construction and distribution until some kind of regional grid is worked out. Examples under that category are Gitega in Burundi, Mumwendo in Tanzania and Nyabarongo in Rwanda. There is a general appearance that the Murongwe site may be physically related to the Kishanda and Kakono sites and therefore requiring a multi-state planning and construction. But the Bukarara-Gikongoro site like the Nyabarongo one, are Rwandese affairs.

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85. ibid p.49 It is to be noted that the years of "production" shown in the Tables would remain hypothetical if funds were not available to start site development.

Once more the implication here is that the KBO member states have the option to develop the resources and seek a modality for common financial responsibility for the projects, or to relegate some to all-out national efforts.

Precisely these options are already available in the railways and roads programme. Both of these infrastructure, it will be recalled, are package so as to disenclave the Kagera basin. Therefore, they are useful if the reticulation cover the region and retain the interstate character. At the same time, it is imperative that whoever is the funding source for the railways or roads sections of the road within each state have both, the national and international characters. It is therefore conceivable that a "puzzle approach" can be taken for the railways and roads where by the vital intra- and inter-state sections are done at a time as funds become available. Table XX outlines the various pieces of the "puzzle" and the financial implications.[86]

Table XX illustrates a segmentation which could be applied to railways as for roads. And while financial resources may be negotiated collectively, accountability for satisfactory completion could remain for the respective territorial state for each segment.

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86. ibid p. 59.

TABLE XX - SUMMARY OF COSTS OF STANDARD CONSTRUCTION, GRADING, DRAINAGE, STATIONS, SHEDS, LOOPS.

S E C T I O N	Km	Total Cost x 10^3 US$	Cost Per Km x 10^3 US $
Uninza-Bigina (Burundi Border)	122	51,782	424
Bigina-Musongati	60	30,515	508
Musongati-Gitega	42	25,897	617
Gitega-Buyongwe	85	90,779	1,068
(Buyongwe-Tanzania Border)	(108)	(126,329)	(1,170)
Gitega-Tanzania Border	74	71,816	970
Tanzania Border-Rusumo Falls	79	61,201	775
Kemondo Bay-Rusumo Falls	224	219,180	978
Kyaka Junction-Kyaka	50	18,700	374
Rusumo Falls-Kigali	228	295,661	1,297
Kigali-Ruhengeri	90	92,863	1,032
Ruhengeri-Gisenyi	66	87,629	1,328
Ruhengeri-Kabale	89	57,899	651
Kabale-Ntungamo	75	74,392	992
Ntungamo-Kabwohe	47	35,132	747
Kabwohe-Bihanga	102	74,538	731
TOTAL	1,433	1,287,984	899
( ) Alternative	(1467)	(1,324,497)	(903)

(b) The Modes of Fund-Raising

KBO has not established the elaborate arrangements for fundraising to finance common works as is in the case of OMVS. Instead they have adopted on formal and regular arrangement and one ad hoc arrangement.

The formal and regular arrangement is in Article 15 of the Rusumo Agreement. As discussed earlier, the original requirement was that Tanzania was to contribute the largest share of the budget, 40 per cent; while Rwanda and Burundi were to contribute 35 and 25 per cent respectively.

But this formula changed after accession of Uganda. Henceforth, the first paragraph of the article was amended to read that, "The funds necessary for the functioning of the Secretariat, according to the annual budget as approved by the Commission, shall be contributed by the member States in equal proportions of 25% each.

It is to be noted that the contribution here only went to the administrative and not project or operational budget. The Agreement is totally silent on the question of financing projects. This practice may have left open the question of optional modalities for raising funds for projects on ad hoc basis. But it may also be a benign arrangment which could encourage lack of seriousness on project funding. The danger is that if projects donot pick up quickly the very administrative may, in the face of tax-payers and member governments, lose justification for its existance. It is a dangerous policy which forces expenditure of tax-payers' funds to service an administrative machinery when the latter does not seem to be engaged on any productive projects. Contracting states should seem to have entered into formal obligations to raise in form of loans or grants for projects to engage the administrative machinery operationally. This is why it is important to ponder the contractual arrangements of the OMVS for financing common projects; a modified version of such an arrangement could be applied to the KBO situation where there are still no formally designated common works.

The second approach which has been taken by KBO is the use of Donor Conferences. The arrangement has history in the experience of Zimbabwe at the time of its independence and in Southern African Development Coordination Committee (SADCC). In both cases, some success in fund-raising have been made. But it is also important to remember that the Zimbabwean independence was an emotional and highly politicized and visible

affair, as a result of the events which led to it. And it took the acutely experienced had of Benard Chidzero, the Finance Minister who also had enormous contact and skill in mobilizing the existing sentiments to yield money. Somewhat similarly, the situation in SADCC relied on the sentiments towards South Africa in whose strangle-hold the SADCC countries were held. In fact, the foundations of SADCC seemed to lay in Brussels, the home of EEC, from which most of the support for SADCC came.

These situations are drastically diferent from those which obtained at KBO. Therefore, from the outset, KBO was opting for the concept from a "disadvantaged" position.

As pointed out earlier, KBO experienced with its first Donor Conference in Paris in October 1979. The assembled donors resolved politely that the main features of the priority subjects had been identified but that further preinvestment studies should be conducted before investment funding could be considered. In short, the preparation of the projects was inadequate.

The second Donor Conference for KBO was once more organized by the UNDP Regional Director for Africa, and held at Geneva on 20th and 21st May 1982. Before the Conference was presented the six volume Final Reports of the multi-disciplinary-multi-donor mission discussed in the projects chapter above, and in which, it will be recalled, the cost of various project sectors were given. But rather than concommitment to amounts, the delegates attending the Conference simply declared the general subject areas of their interest. The following list outlines the countries or organizations and the corresponding fields of their interest.

Country/Organization	Field of Interest
AUSTRIA	Railway transport, small hydropower schemes, afforestation, tse-tse fly control, malaria control, training
BELGIUM	Energy projects (Rusumo) Agriculture Training
CANADA	Energy projects, Rural works (Irrigation in Rwanda)
EGYPT	Institutional and Technical Assistance (supply of experts and technicians) in River Basin development
FEDERAL REPUBLIC OF GERMANY	Transportation and Energy development
FRANCE	Transport and Agriculture (Rwanda)
ITALY	Railway Transport, Hydropower, Agriculture, Training
FINLAND	Industrial projects (Paper manufacture from Baggasse, Industrial alcohol from Molasses, Malt, Afforestation, Panel manufacture
NETHERLANDS	Irrigation and Drainage Projects Agriculture, Rural Development (Tanzania)
SWEDEN	Irrigation and Drainage Projects Afforestation, Energy (Tanzania)
USAID	Resources and Environment Assesment, Energy, Agricultural Research & Irrigation (Rwanda) Training Fellowships
ADB	Agriculture, Transport

Ordinarily, it would have been expected that if seriously meant, the indications of interest would have been done in the respective amounts. As it is the indications were only general: In the discussions with the representatives of these donor agencies in Kigali, they were unanimous that the expressions of interests did not amount to commitment. They still expected that serious discussions would follow, on bilateral basis, for the precise commitments. And at Geneva, a number of countries already indicated which of the country sectors of the KRO programme they were actually inter-

ested in.

The KBO Commission itself was of the view that the Geneva Donor Conference was less than a success. At the 13th Commission Session at Kigali in July 1982, they assessed the Conference[87] and they summarized the weaknesses in some specific respects: (a) the preparation for the Conference was inadequate; (b) the Commission, the Secretariat and UNDP were not working as a coordinated team and this led to occaional embarassing misunderstandings; (c) members of KBO had not all agreed on the prioritization of projects; (d) while it had been assumed that the KBO Commission Chairman would preside over the Conference and UNDP to act as the animator at the meeting UNDP wanted to preside over the Conference, with awkward results; (e) the role of UNDP became confusing as they critized the prioritization of projects. This should have been sorted out before the Conference.

In the end, the Commission was convinced that the two concrete outcomes of the Conference were the commitment for the Rusumo dam project by Belgium and the railways Study by Austria and Italy.

Two of the decisions adopted by that Commission, of a consequence of the Geneva, were that they should have closes consultation with UNDP on the prioritization of the projects, and that KBO should, henceforth, commence rigorous direct and bilateral negotiations with interested donors. This means that the Third Conference which was still anticipated would be a formal presentation of positions already declared in the bilateral discussions.

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87. Agenda item No. 5.

The foregiong point to the fact that Donor Conferences, as such, did not promise a great deal of financial resources to KBO programmes. Three billion dollars is not small money; compare it to the one billion which is needed for the OMVS projects and most of which was secured in form of loan, secured by the contracting states.

(c) Observations on Logistics

The limitations on the existing financial arrangements of KBO will have been evident from the foregoing discussions. It will be suffiecient to directly suggest the following five possible approaches for raising the funds.

First, although the KBO should retain a strict coordination role for the Commission, it should also allow a formal operation of the "puzzle concept" so that within an agreed set of priorities the member states can proceed and bilaterally negotiate for funds from posible donors. It seems from the preferences of donors, that some donors prefer the approach, as they name Rwanda and Tanzania for some of the projects. The pieces of the puzzle which are taken up can then be ticked off on the drawing board.

Second, instead of presenting an amorphous list or volumes of projects as contained in the six volume presented at Geneva, the KBO Commission should agree on the priorities, then to prepare concise dossiers for each project. Very few of the people attending the Donor Conference have either time or temperament for reading the full studies. In the end the dossiers should be taken in a "shopping bag" to be presented to each prospective donor at a suitable forum, not the politicized setting of a donor conference. As is well known various donor institutions have their fields of interest in development which they will prefer and the dossiers should reflect an understanding of the various philosophies. These dossiers should also take into account the possible pieces of the puzzle.

Thirdly, with the shopping bag in hand, the KBO and member states should organize contact sessions to sell the various dossiers. On the side of KBO is the Commission and the member states; on the side of the donors are the individual states and multilateral agencies such as EEC, IBRD or African Development Bank. Some of the negotiations will be for grants and others for loans.

If there is to be any donor conference then it must come much later than these informal contacts held in appropriate non-politicized atmosphere. The donor conference coming later should be more of a "show-room" where ready-made commitments are announced and where the donors, if they wish, can exchange views on their intended strategies for implementation. Otherwise, donor conferences as such could be an unnecessary expense and a counter-productive exercise.

Fourth, if a conference is to take place it must be properly recognized as an affair of the KBO, and not of UNDP or other sponsoring institutions. It is the recipient organization which might decide, after proper consultation, to delegate the chairmanship to an independent person. But there should be no misunderstanding as to whose show it is.

Fifth, the arrangement for securing loans should be clearly adopted in an agreement or a protocol. As at the time of the Geneva Donor Conference the KBO States seemed set to look for grants. And some of the donors who were interested in the loan arrangements raised the question for which the answer was not ready.

The loan guarantee arrangement would be straight-forward with the agricultural projects because they are essentially national. It would also be adaptable to the pieces of the puzzle which are national as in the roads and railway lines. However, the formal arrangement is necessary for regional projects such as the Rusumo hydropower.

Finally, a formal legal status should be arranged for the essentially regional projects. Again there is a leaf to borrow from OMVS experience where Convention was adopted on the legal status of regional projects, adopted on December 12,1978.

Apart from the adoption of the concept of regional projects the projects should also be established as independent enterprises of the KBO so that their management are isolated for purposes of economic efficiency. They should be able to survive or sink alone, depending on the quality of their management.

VII CONCLUSION

The Kagera Basin Organization is one of the most recent efforts to plan and execute development in Africa through mobilization of resources determined by ecological unit of a basin. Very often development plans of that kind are influenced by the primacy of irrigated agriculture and the production of hydropower. In the case of KBO the primacy seems to be partly on hydropower production and one other development problem: transport and communication for the land locked basin states, namely Burundi, Rwanda and Uganda. But the same problems apply almost with equal vigour to northwestern Tanzania.

Only partly is the need for hydropower linked to the lack of hydrocarbon resources in these countries so that they have to import the same. It is equally significant that the importation entails over-land transportation through transit states. And this element of over-land transport increases the cost of the oil and other imports. Therefore, the land-locked condition of the basin states becomes a serious problem even for other development sectors including agriculture and industry. To some extent, then transport and communication infrastructure and alternatives become a central development goal for the basin states: both are a prerequisite to any future development

of the region and the KBO member states have treated it as such. Fortunately the construction of the roads and railways as well as the prospects for their profitable utilization are a rather straight forward matter.

But not so with hydroelectric power. Its production needs to be needs to be inextricably tied to major users at whose hands the power actually enhances revenue earning enterprises. Very primarily, these should have acore of industries.

At the centre of the hydropower production are eight sites: Rusumo,, Kakono, Gitega, Kishanda, Nyabarongo, Mumwendo, Rukarara and Murogwe which, together will vield approximately 425 MW and cost US$ 572,200,000. Assuming that this amount, which is only for construction, is received as loan. The consumers of the power should have enough income to help reply the loan. The other major consumer is irrigation. Domestic and municipal consumers are smaller capacities and with less ability to meet the loan repayment schedules.

The general review of the KBO studies indicate there is inadequate preparedness of bankable industrial projects. This is a fatal weakness especially for the viability of the hydropower schemes. Ordinarily, industries are vital in a regional development setting of this kind because it is an index in the structural deversification of the economy and offers opportunities for employment and for processing of the locally generated raw materials particularly the agricultural products. But in this case it is also important for the stable use and payment for the energy. Clearly, the identification and preparation of industrial projects is a critical weakness, and this might, in fact, create problems for the implementation of development undre the Rusumo Agreement.

Irrigated agriculture also seemed another leading contender for the consumption of the hydropower. In the first place the plans for irrigation are limited with the three sites selected at Rusumo Cuvette, Bugesera and Kyaka-Kakono regions. But even if it was accepted that their consumption level is significant the rate of returns might not be very high from the onset. To date there is very little, if any, experience with irrigated agriculture in the Kagera basin. What exists seem to be the experience in the Kagera Region of Tanzania. However, the actual success within the region has not been certain.

From the experience in the Senegal basin and in Kenya's National Irrigation Board it seems evident that irrigated agriculture has its own culture whose evolution is a tough road. The distinctly successful experience in Africa has been in Egypt, Sudan and Madagascar. Zimbabwe is evolving some interesting experience in its Save and Lundi basins. Otherwise the experience of Kenya's National Irrigation Board and of SAED in Senegal both show very careful arrangements should be made in the creation of irrigation institutions and the mobilization of farmers.

The point is that the Kagera basin states will have to fight resolutely to avoid such basis of folly in Senegal and Kenya as over-bureaucratization of the farming institution; over-centralization of that bureaucracy; over-politicization of the institution especially in the deployment as the basis of deployment; failure to consider established productivity as the basis for retention of jobs; and total insensitivity to the needs of the farmer.

It is suggested here that to prepare the selected areas for irrigated agriculture deliberate plans should be made to maximize farmer participation in the decision-making. Plans should also be organized to take the farmers co-operative leaders, and the extension workers on tours of selected

irrigated farms. That list should include cases such as Bura or Ahero and West Kano Irrigation scheme where the tour group could see exactly what a disaster in irrigation schemes look like. Tours of the Madagascar and Sudan may also give a different picture. But success in irrigated agriculture under KBO will require considerable innovation and education among farmers and institutional leaders.

Except for the plans to fight trypanosomiasis general environmental and health questions seem to have been given a rather cursory treatment in the preparatory studies. Vectorborne diseases such as malaria, bilharzia and river blindness are left for further studies. But the impact of dams on general ecosystem such as in Nyabarongo valley in Kagera National Park and downstream of Kagera Weir seem to have been glossed over rather cavalierly.

Similarly, various industries are anticipated in the study. Granted that their feasibilities have not been assessed in detail, but the volume on environment provides no arrangements for mitigating any negative effects. Development within this context must be seen to include protection of public health and provision of basic needs like clean drinking water. Therefore, efforts should be apparent to ensure that the industries do not pollute and render water unsuitable for human consumption. Of course water pollution might inherently mean contamination or killing of living resources such as fish which could provide protein. All these would be contrary to the development goals.

Ultimately, systematic monitoring, exchange of information and standardization of methods for all water flowing into Lake Victoria, as was proposed by senior regional officials at the Kisumu Workshop in 1982 seem a practical approach. The coordinating role was given to Kenya's Lake Basin Development Authority which could, in fact, take the initiative as part of the development oriented successor-task to the Hydromet Project which started

in 1967 but has since completed its primary task of data-collection. The product include, inter alia, computerized models for the quantitative and qualitative aspects of water input into Lake Victoria. Conservation, as part of rational management of natural resources, is not an intervention in the development process, it is part of that process.

The Kusumo Agreement was, in fact, very laconical on the question of environment. It should have spelled out the scope of obligation of states on environmental matters. And since the KBO programmes envisaged major industrial and agricultural development as well as major construction of infrastructure there should have been stated legal obligation to prevent environmental injuries within the member-states including to citizens, as well as beyond the jurisdiction of the basin-states. The remedies should have included adminstrative and judicial machineries accessible to the states and to the citizens.

The machinery for settlement of disputes should have been clearly and suitably articulated to include consensual as well as arbitral orjudicial remedies. The hypothesis here is that the consensual machinery to be guided by a panel of selected experts should find workable solution to disputes. Perhaps the existence of the decisional machineries will encourage states to make the consensual remedy effective so that the states might not use the arbitral or judicial mechanisms.

On the financing questions the KBO seems to have hoped too much for grants particularly through donor conferences. The only clearly articulated source is the equal contribution by the contracting states to meet administrative expenses of the organization. With the rising size of bureaucracy over the years, this source may be seriously strained, which infers that they may not do more than just keep the Secretariat alive.

It seems that the KBO States should also formulate financial arrangements for major common projects such as Rusumo dam project, Kemondo Bay, Kishanda dam, and a selection of other regional projects. This arrangements should include commitment to a system for guarantee of loans as is the practice of the OMVS.

But the financial responsibilities may be eased if the states agree that the KBO Commission will have a coordinating role while most of the projects will be funded and implemented through the initiatives of the territorial states. The reticulation of projects as agreed would then form "puzzle pieces" to be fitted and completed to completion within an agreed framework.

KBO has correctly identified manpower development as a crucial area in its programme. In fact there is no substitute to indigenous trained manpower and no African country should expect to be developed by use of foreign "experts". Such experts could only supplement the indigenous capabilities. In the end, however, KBO should be alert to the need to attract and retain the best qualified and dedicated staff for implementation of its projects.