

7718/210

6250915 (2)
PD-AAC-725-81

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT PAPER FACESHEET

1. TRANSACTION CODE
 A ADD
 B CHANGE
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 270p. PP

2. DOCUMENT CODE
3

3. COUNTRY ENTITY
SAHEL - REGIONAL ACTIVITIES

4. DOCUMENT REVISION NUMBER

5. BUREAU OFFICE
 A. SYMBOL **AFR**
 B. CODE **06**

6. PROJECT NUMBER (7 digits)
625-0915

7. PROJECT TITLE (Maximum 40 characters)
Niger River Development Planning

8. ESTIMATED FY OF PROJECT COMPLETION
FY **78**

9. ESTIMATED DATE OF OBLIGATION
 A. INITIAL FY **77**
 B. QUARTER **3**
 C. FINAL FY **77** (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$)

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	1,130	220	1,350	1,130	220	1,350
GRANT	1,130	220	1,350	1,130	220	1,350
LOAN						
OTHER U.S.						
HOST COUNTRY		354	354		354	354
OTHER DONOR(S)	3,156	230	3,386	3,156	230	3,386
TOTALS	4,286	804	5,090	4,286	804	5,090

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 77		H. 2ND FY		K. 3RD FY	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) SDP	7,715	710		1,350					
(2)									
(3)									
(4)									
TOTALS									

12. IN-DEPTH EVALUATION SCHEDULE

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT	
	Q. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN
(1)	-		-		-	
(2)						
(3)						
(4)						
TOTALS						

MM YY
03 78

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 = NO
2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: *David...*

TITLE: **Director, Office of Sahel and Francophone West Africa**

DATE SIGNED: **5/5/77**

15. DATE DOCUMENT RECEIVED IN AID/W. OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY

NIGER RIVER BASIN DEVELOPMENT PLANNING

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Part I. SUMMARY AND RECOMMENDATIONS

A. Recommendations

ADO/Niamey and AFR/SFWA/SDP recommend approval of the A.I.D. contribution to a multi-donor technical assistance project in support of the Niger River Basin Commission as proposed in this Project Paper. The A.I.D. contribution to this project, the first phase of a longer term multi-donor assistance project, would finance local and foreign exchange costs of U.S. consultant services, short and long term participant training in the U.S., short-term third country training, and limited commodity procurement and architectural design services. The project would be executed over a twelve month period, financed from FY 1977 grant funds.

The Grantee is the River Niger Commission.

Amount of Grant Assistance (\$000s) - FY 77

Project Funding (\$000s)

AID Grant FY 77

Foreign Exchange 1,130

Local Currency 220

Other Donor Contributions

Foreign Exchange 3,156

Local Currency 230

RNC Contributions

Local Currency 354

TOTAL **5,090**

B. Description of the Project

This project represents an interim "start-up" phase of a long-term multi-donor assistance effort, designed to support the institutional development of the River Niger Commission (RNC) and the preparation of a plan and investment program for the comprehensive development of the water, land and human resources of the Niger River Basin. The project is a multi-donor activity which, in this interim phase, involves the close coordination of donor contributions from the United States (AID), Canada (CIDA), France (FAC) and the United Nations (UNDP).

The River Niger Commission (RNC) is a regional organization of nine West African countries within whose boundaries the Niger River, its major tributaries and drainage basin are located. Its functions include, among others, the coordination of basin related development efforts among the member states to assure the most effective use of basin resources and the design and preparation of long-term development plans through the execution of general and project-specific studies.

Following a request to the international donor community by the RNC for assistance in the elaboration of a comprehensive "Indicative Plan" for basin development and the related development of the technical capabilities of the RNC Executive Secretariat, the United States, Canada, France and the United Nations responded by indicating their interest in participating in a 5-year program of data generation, study, and pilot project experimentation. The program would culminate with the preparation of a comprehensive basin development plan and investment program. A major effort would also be made to strengthen the institutional capability of the River Niger Commission to enable it to effectively mobilize resources and coordinate execution of the plan.

However, basic data are presently insufficient for the elaboration of the detailed terms of reference for such a long-term Action Program. The RNC and donors agreed that it would be desirable to initiate this long term project on a phased basis.

The first phase, or "start-up" project, as presented in this Project Paper, has been designed to produce the required information to precisely elaborate the long-term Action Program and associated costs as well as take the first steps in strengthening the institutional capability of the River Niger Commission's Executive Secretariat. The Project will thus:

(1) Gather and analyze available information on all aspects of the Niger River Basin through a comprehensive Diagnostic Study and on the basis of this analysis delineate the terms of reference and budgetary requirements for the second phase Action Program;

(2) Provide the initial expatriate technical advisory assistance required for the RNC Executive Secretariat to carry out the Action Program and provide advice, guidance and on-the-job training to the indigenous staff of the RNC;

(3) Initiate short and long-term academic training for member state nationals on the permanent staff of the RNC, and;

(4) Provide technical equipment, logistics support and architectural designs for the physical plant of the RNC required for efficient execution of the Action Program.

Although each donor will be responsible for the execution of its individual inputs the UNDP will assume responsibility for overall coordination and direction.

The Diagnostic Study will include surveys in the following areas:

Agriculture (AID, CIDA)
Water Resources (CIDA, FAC)
Engineering (CIDA, FAC)
Topography, Mapping and Remote Sensing (AID, FAC)
Education and Training (AID)
Environment/Health (AID, CIDA, UNDP)

Social Survey Research (AID)
Legal and Institutional (UNDP)
Integration of Study Components and Preparation
of Diagnostic Study, Atlas and Action Program
Reports (UNDP)

The expatriate advisory staff will include the following technicians assigned to the RNC on long-term contracts:

Senior Advisor Coordinator (UNDP)
Water Resources Planner (AID)
Regional Economist (CIDA)
Hydrologist (CIDA)
Civil Engineer (FAC)
Agriculturist (FAC)
Soils Scientist (AID)
Forecasting Hydrologist (UNDP)

The AID contribution will additionally fund (1) long-term, academic participant training (in conjunction with CIDA) for the initially identified technical staff requirements of the RNC Executive Secretariat, (2) short-term observational tours of river basin development projects in the U.S., (3) short-term, third country training for documentalists of the RNC's documentation center, (4) contract services with a local or third country architectural design firm for the preparation of plans for the physical plant requirements of the RNC Executive Secretariat, (5) consulting services to determine the feasibility of establishing in the RNC a social and economic survey research unit and (6) limited logistical support to the RNC.

The end result of this interim project would be the elaboration of a five year Action Program which would provide the detailed basis for long-term multinational support to the RNC, the existence of an expatriate staff capable of assisting the RNC in the implementation of the Action Program, and completion of initial efforts to strengthen the technical and managerial capability of the RNC to enable it to assume major responsibility for the execution of the Action Program.

Although approval of this Project Paper would only commit AID to the interim activities to be carried out in the first year, it is fully expected that AID will continue active participation with other donors in the implementation of the Action Program to be designed under this project. The extent and scope of this participation will be determined following a thorough review and analysis of the Action Program proposal and the experience gained through the implementation of this interim phase, including continuing evidence of commitment on the part of the RNC member states and the continued support and participation of other donors. Assuming positive indications on all of the above matters, it is projected that a Project Paper would be prepared in early 1978 which would outline a five year technical assistance and institutional support project for financing by AID.

C. Summary Findings

The ADO/Niamey and AFR/SFWA/SDP, with the advice and assistance of various technical experts, have determined that the project is technically, socially, and financially sound. Officials and technical consultants from several donor countries and organizations as well as the RNC participated fully in the collaborative development and design of this project and all participating parties are prepared to move ahead immediately with its implementation.

The project meets all applicable statutory criteria as evidenced by the statutory checklist attached as Annex K.

D. Project Issues

Issues previously raised by an AID/W Project Review Committee and transmitted to the ADO/Niamey (State 035136 dated 16 February 1977) for consideration and investigative action are as follows:

1. RNC Budget, Organization and Staff

The participating donors passed a joint resolution at the January 10, 1977 Paris meeting that the Member State of the RNC needed to provide the RNC Executive Secretariat

budget support at a sufficiently high level to ensure the successful execution of the greatly expanded institutional development and planning effort being envisioned. The Council of Ministers was further requested to approve a modified organizational structure for the RNC which would enable the RNC to adequately perform its planning and coordinating functions and to take steps to provide increased technical and administrative staff support to the RNC Secretariat.

The response to these issues are addressed in Part 2.B, (Background), Part 3.B, (Financial Analysis), and Part 4.D, (Conditions, Covenants and Negotiating Status). A copy of the approved 1977 budget for the RNC is attached as Annex E.

2. Institutional Issues

Questions on legal mandate of the RNC, and the scope of its institutional authorities and responsibilities, and the existence of established mechanisms for coordinating regional and national project planning were also raised as issues to be addressed during preparation of the Project Paper. These are addressed in Part 2.B. Copies of the regional agreements establishing and defining the role of the RNC as well as the member state obligations toward it are attached as Annexes C and D.

3. Other Donor Inputs

The AID/W Project Development Committee requested that a detailed statement of planned inputs by other donors be included within the Project Paper.

In response to this the entire Project Paper has been prepared as an integral program presenting the entire scope of other donor inputs as well as their interrelationship with those provided by AID. The draft Project Agreement, attached as Annex F contains the statement that similar agreements between the RNC and other participating donors must be executed and in force prior to any disbursements of AID funds under this project.

4. RNC Finances

A further condition would be included in the Grant Agreement which stipulates that no donor disbursements will be made until the approved 1977 budget for the RNC Executive Secretariat of 88,575,849 FCFA (\$355,000) is on deposit and available for dispersal by the RNC.

PART II - PROJECT BACKGROUND AND DETAILED DESCRIPTION

A. Background

1. Project Area, Population and Ethnic Countries

The Niger River Basin is shared by nine countries -- Guinea, Mali, Upper Volta, Ivory Coast, Niger, Chad, Cameroon, Benin, and Nigeria. A tenth country Algeria, shares a portion of the basin's watershed area, but all of the Algerian portion lies within the Sahara desert and is therefore not included for active consideration in the basin development program.

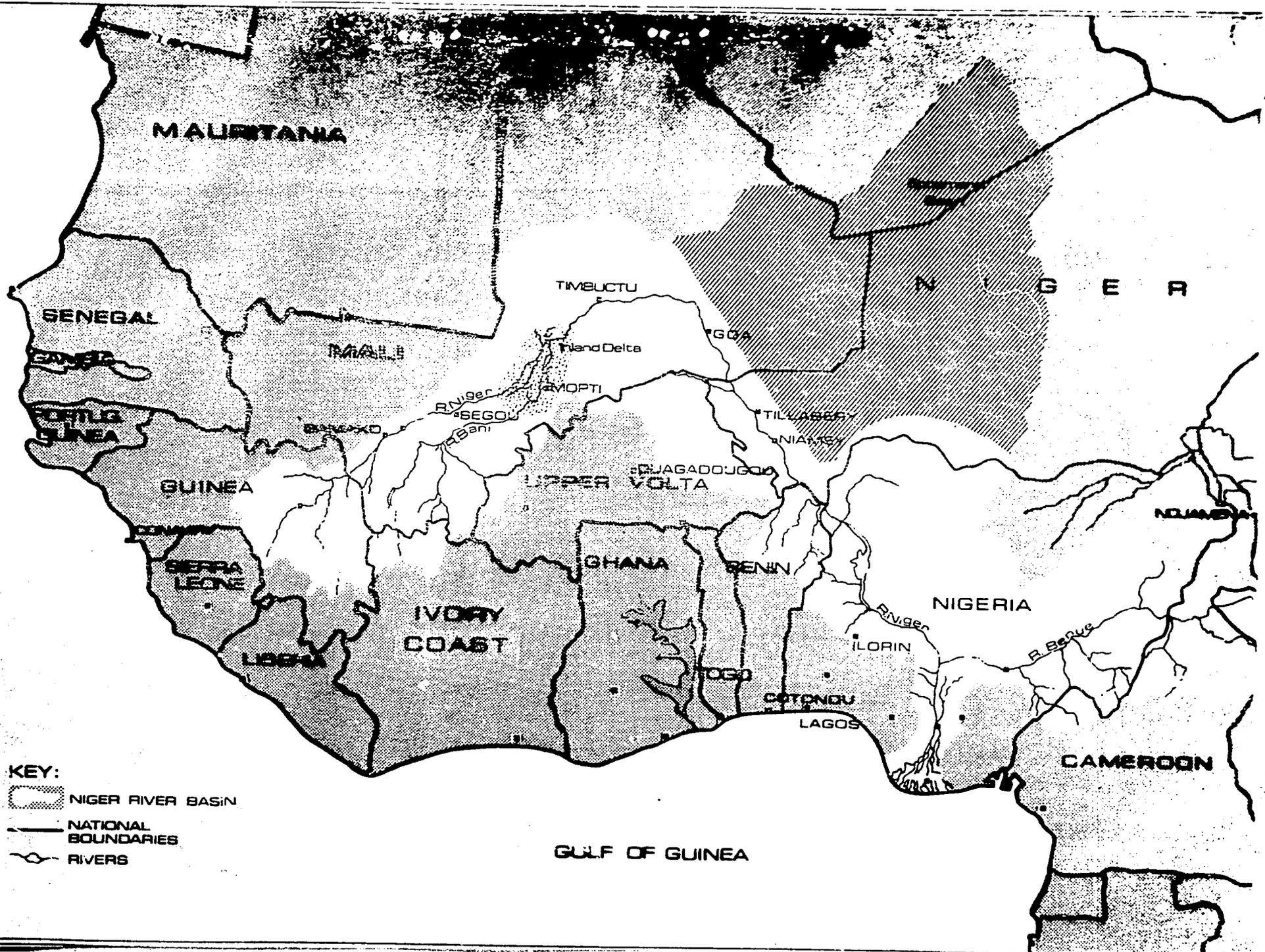
The physical basin has a total area of about 2,000,000 km², of which roughly 741,000 km² is an area of ephemeral drainages from which virtually no runoff occurs (see map). The ephemeral area comprises a large portion of the basin in Mali and Niger and all of the basin in Algeria. The mean annual rainfall in the ephemeral area is less than 5 inches. For agricultural development purposes, the ephemeral area has limited production potential. Given the absence of agricultural potential in the Algerian portion of the basin, Algeria chose not to join the Niger River Commission when it was organized in 1963.

The following is a tabulation of the watershed area (ephemeral area not included) by country and the percentage of each country located in the watershed. The figures are approximations and provided only for comparative purposes.

	<u>km²</u>	<u>Percent</u>
Guinea	103,600	42
Mali	336,700	28
Ivory Coast	23,300	7
Upper Volta	90,700	33
Niger	114,000	9
Benin	38,800	34
Nigeria	492,100	53
Cameroon	77,700	16
Chad	18,100	1
	<u>1,295,000</u>	

Guinea, Mali, Niger, Benin and Nigeria have major riparian interest in the mainstream, while the Ivory Coast, Upper Volta, Cameroon and Chad interests are solely limited to development of certain tributary areas. Four of the countries -- Chad, Mali, Niger, and Upper Volta -- are part of the land-locked Sahel-Sudano Region and, with the exception of Upper Volta, encompass both Sahara Desert as well as adjacent sub-Saharan and semi-desert savannas. The others extend to the coast and have more humid, tropical climates.

Agriculture is by far the most important economic activity within the River Niger Basin. Even in Nigeria, where oil production and other forms of industry are growing, agriculture is of prime importance. Agricultural production within the basin is of the subsistence type characterized by primitive methods, with only limited use of draft animals. Shifting agriculture is commonly used, a practice which allows crop land to return to its natural cover



- KEY:**
-  NIGER RIVER BASIN
 -  NATIONAL BOUNDARIES
 -  RIVERS

when the fertility of the soils has been depleted. Only a small fraction of production, primarily in the coastal countries, is oriented towards a market economy

In the Sahelian countries and some northern portions of the coastal countries, the chief crops are sorghum and millet generally produced under rainfed conditions. Rice and wheat are grown where irrigation is available. Peanuts, some cotton and cow-peas are produced for export. In the more tropical regions, production expands to include cocoa, oil palm, rubber, tobacco, and sugar cane. In the northern countries livestock is produced generally for export to the urban areas. Livestock production in the coastal countries is minimal because of the existence of the tsetse fly. There is substantial fishing in the Niger River in both Niger and Mali.

No figures are available on the population within the boundaries of the basin. The total 1976 population of the nine countries which share the basin, however, is estimated at more than 106 million, with more than half living in Nigeria. The estimated 1976 population by country is as follows:

(in millions)

Upper Volta	6.2	Ivory Coast	6.9
Mali	5.7	Benin	3.2
Niger	4.7	Nigeria	64.9
Chad	4.1	Guinea	4.5
Cameroon	6.5	TOTAL	<u>106.7</u>

Approximately ten percent of the people of the Niger Basin are transhumant herdsman. In the upper and middle basin another ten percent live in urban centers, although the proportion is higher in Nigeria which has a long history of urbanization that precedes the colonial era. In the Sahelian countries this urban population can be expected to double by the year 2000 while the proportion of nomads can be expected to fall to approximately six percent. The balance of the population, still over seventy percent, will continue to remain in the agricultural sector.

Though concentrated in nucleated settlements, farmers within the basin are also actively involved in seasonal and longer term migrations which take them primarily to the cities and farms in the coastal countries. During the dry season absentee rates among men aged fifteen to forty-four can range from approximately twenty percent to over fifty percent.

Though primarily circular through the mid 1970s, labor migration does lead to permanent emigration to urban centers, the growth rates of which are influenced more by migration than by natural increase of existing residents. Even fishermen are involved in migratory movements with the Sarkawa, for example, extending their operations from northeastern Nigeria as far upriver as the inland delta in Mali and downriver to the conventional delta. Hence migration is a major feature of life in the Niger River Basin and has been throughout history. Planning for basin development must be cognizant of this situation, which will obviously be a major complicating factor associated with any attempt at large scale development of sedentary farming based on irrigated agriculture.

Ethnically, the population of the Niger River Basin is very complex as partially suggested by Figure 1. Not indicated are the Peul (Fulani) herdsmen who move throughout the area with their cattle in search of pasture, water and markets. For example, the Mopti region of Mali which straddles the inland delta of the Niger, contains over a million cattle and two million small livestock. The herdsmen are 90% Peul and constitute over one-third of the area's population which also includes Bozo (who farm the inland delta), Dogon and other nucleated farming communities. Similarly Figure 1 does not indicate the large number of small groups which inhabit many areas. For example, in the Kainji Lake Basin are not just the Busa and the Kambari but also Peul, Hausa, Lopawa, Laru, Gungawa, Shangawa, Dakarawa, Dukawa, Nupe and Kebbawa.

2. River Basin Characteristics and Agricultural Practices

The Niger River Basin has an area of about 2,000,000 km² (see map). The mainstream is approximately 4,000 km long, but the width of the basin is only between 300 and 500 km. The source of the river is an area of very high rainfall (50 to 100 inches per year) in the Fouta Djallon Mountains of Guinea within about 300 miles of the Atlantic Coast. The river flows northeasterly deep into the heart of West Africa to the southern edge of the Sahara where it then makes a looping 90-degree turn and travels in a southeasterly direction until it empties into the Gulf of Guinea. The lower basin situated in the country of Nigeria is also a region of high rainfall.

One of the most distinctive characteristics of the Niger River is the large inland delta located in Mali immediately above the river's turn to the southeast. The delta is actually fed by two rivers, the Niger and the Bani, which pass through the delta via many small channels with a single outlet (the Niger) near Timbuctou. The delta is composed of many small lakes and swamp areas which are replenished by annual flood flows.

There is presently little development of water resources in the basin. Of an estimated 2.7 million ha. of irrigable land, only about 252,000 ha are under controlled irrigation, flood recession cropping and controlled flooding. The only large scale irrigation projects are in Mali. The largest of these is the Office du Niger. Initiated about 50 years ago by the French Colonial Government, the project covers approximately 45,000 ha. devoted to sugar cane and rice with the sugar cane residue supporting cattle. Smaller scale irrigation projects can be found in Mali, Niger, Upper Volta and Nigeria.

The land and water use systems of the people are not only complex, utilizing a wide range of strategies to exploit the full range of available resources, but they are also intricately interrelated. As elsewhere in the upper and middle portions of the Niger River Basin, the Peul are encouraged to graze the stubble left in the fields after the cereal harvest so that the farmers can benefit from whatever manure is deposited. When farmers build up their own herds, the Peul also serve as herdsmen. As the dry season progresses and the Niger flood recedes they drive their cattle into the swamps that border the river or cross the river channels to feed on the Echinocloa and other grasses that provide ample grazing during most years.

The Gungawa are irrigation farmers, although some Shangawa, Dukawa, Kamberi and Lopawa (see Figure 1) have taken more recently to irrigation, showing that local peoples are quite willing to experiment with new economic activities. Agricultural systems are complex with guinea corn, millet, legumes and a variety of other crops interplanted in upland gardens during the rains, and rice planted in wet spots closer to the river. Near the river itself two crops are planted annually with maize and early maturing millet planted at the start of the rains. After the harvest, onion seedlings are transplanted into these gardens with irrigation, using manual lift methods, begun after the rains stop and the flood waters arrive. Though onions are the main cash crop, other vegetables are grown. Subsidiary activities include fishing and a variety of other occupations including crafts.

Three distinct types of fishing activity are practiced along the Niger River. These include, (1) a low grade, primarily upland creek pattern; (2) a more advanced and intense Niger River marginal swamp pattern; and (3) a professional, river and swamp, pattern. Each of these has changed noticeably in the last twenty years with the advent of cheap and easily available nylon gillnets and machine made hooks, again showing the propensity for change when opportunity arises. The main professionals are the Sarkawa, and Kyedyawa who are a subgrouping of the Nupe. Respected as cooperative and productive fishermen, they present little competition to the farmers for land and minimal competition with the established patterns of fishing in upland creek and swamp areas.

The kind of land and water use systems found in the Kainji area (Nigeria) prior to dam construction are analogous to those carried out on a far greater scale in the inland delta of the Niger. Estimates of flood water farming upriver from Benin in a model year range from 15,000 ha. in Niger and 20,000 in Guinea to 130,000 in Mali of which by far the greatest amount is in the inland delta. In the Mopti area, the inland delta also supports over a million cattle and twice that number of small stock during the dry season when over a third of a million Peul utilize the area. As for fishing, up to 200,000 tons were estimated to have been caught along the Niger during 1970 with approximately half of that yield from Mali. The greatest proportion of the Mali catch comes from the inland delta which supports some 80,000 fishermen. Mainly Bozo and Somono, they form a well-structured social group with uncanny knowledge of their physical environment and a large range of traditional means to control their fish production. They have a large variety of gear, such as seines, catch nets, dragged mesh nets and barrages.

Flood water farming is most highly developed in the inland delta where two crops per year are produced by utilizing both the rising (crue) and falling (decrue) floodwaters. The African rice (Oryza glaberrima) was first domesticated in this region over three thousand years ago, the first cultigens being floating varieties which adapt to the rising waters by lengthening the stem. In the inland delta local farmers still sow "floating" varieties in their dry lower gardens just prior to initial flooding in September. Non-floating varieties are sown at a later date in the upper gardens where the depth of the floodwaters is less and are harvested after the floodwaters recede, unlike the floating varieties that may be collected from canoes while

the flood, though receding, is still high.

The flood recession cycle, which has a much wider distribution along the major rivers and their tributaries throughout the arid and semi-arid areas of Africa, begins once the floodwaters have peaked and begun to recede. The main crops are pearl millet and sorghum. The total acreage sown in each species varies from one year to another depending on the nature of the flood. Pearl millet, being the most drought resistant, is sown first, especially in the sandier soils which tend to predominate on the upper garden slopes.

The Niger has begun to be used for power generation. Plants exist at Sotuba (near Bamako); Markala near Segou; and Kainji, Nigeria. In advanced planning stages are the Selingue Dam on the Sahkarani in Mali (45 MW), the Kandadji about 100 km upstream of Niamey in Niger, a run-of-river project of 24 MW at the Park W in Niger, a dam on the Mekrou in Benin, and two additional large projects in Nigeria (Jebba 300 MW and Shiroro 80 MW).

Much of the interest to date in using Niger River water has been for inland water transport in various reaches of the mainstream from Kouroussa to Bamako, from Koulikoro to Bamako, from Koulikoro to Amsongo through the inland delta, and from Tillabery, Niger, to Yelwa, Nigeria. The other reaches are not open to navigation because of rapids and the Niamey to Yelwa reach is obstructed by the Malanville-Gaya bridge which only has a 0.6 m clearance at normal high water.

3. Potential for Future Development

There is an urgent requirement for expansion of agricultural development in the River Niger Basin to meet the needs of the rapidly increasing population, reduce reliance on agricultural imports, and increase exports. The recent drought in the Sahel, only the latest in the regularly recurring cycle of droughts, emphasized the precariousness of the food situation. Despite millions of dollars of relief efforts, thousands starved, livestock herds were decimated, and life cycles of much vegetation permanently destroyed. Although more dramatic in the Sahelian countries, the vagaries of rain also cause droughts in the coastal countries of the basin and often reduce crop production drastically below normal. Even in normal rainfall years, locally produced feed supplies barely meet local subsistence requirements and diets are deficient, particularly in proteins, vitamins, calcium and iron.

The World Bank, FAO and most other donor evaluations recognize that in the higher rainfall areas, rainfed agricultural production must be expanded to assist in meeting the food requirements of growing populations. Also substantial areas of irrigation will be needed over the long range of time to produce both additional food crops to stabilize overall production and irrigated crop residues for supplemental livestock feed. With high evapotranspiration rates and severe variability of rainfall, very low yields of under 400 kg/ha. of cereals such as millet are presently obtained on rainfed lands. While some improvement of these yields is feasible through better practices and the use of modern inputs, the ultimate potential from rainfed production remains probably no more than the 1000 kg/ha. now realized in the higher rainfall areas of the region. By comparison yields with irrigation could be expected to reach at least 2,500kg/ha. for rice.

Numerous obstacles remain in the way of irrigation development. Primary deterrents are the deficiencies of soils for agricultural production and the prevalence of vector-borne and macroparasitic diseases (malaria, trypanosomiasis, schistosomiasis, and onchocerciasis) which often occur where water is abundant in the basin. Added to these is the lack of **an extensive** level and agricultural tradition among local farmers and a lack of capital to finance improved practices. A further complication is the fact that since all of the riparian states have been independent for less than two decades close coordination among the riparian states has been difficult as the newly independent governments have correctly focused on building national institutions and have not fully developed the institutional capability required for effective regional cooperation.

In addition to agriculture, many uses, some of which are mutually exclusive, are competing for the available water supply. These include production of hydroelectric power, maintenance and improvement of fisheries, navigation and flood control. These potentialities are faced with much the same obstacles as agriculture.

Before final decisions are made on priority assignments for water utilization, a number of basic studies and policy decisions are necessary. Among these are: the quantity and quality of groundwater and its relationship to the river and its tributaries; a full understanding of the existing riverine regime, including likely maximum and minimum flows; knowledge about the life cycles of commercially important fish and the effects upon them of changes in the river regime; full awareness of mineral deposits - location, availability, and quantity - to both avoid flooding them and to establish hydro-power priorities vis-a-vis other water uses; the role of water transportation, both in light of other complementary and competing modes and of competing water uses; and the likely effects on disease vectors and other environmental impacts on both changes in the river regime and the introduction of large-scale year-round irrigation. Above all, a great deal of research, supported by pilot project experimentation, needs to be undertaken to insure development of methods to introduce improved irrigation practices to the local population with as little disruption as possible.

River Basin Studies

1. Niger River Commission

In an effort to harness the resources of the Niger River and to assure the necessary regional coordination and cooperation required for the effective planning and implementation of development activities, the nine African countries of the Niger River Basin formed the Niger River Commission (NRC) in 1963. The stated purpose of this organization is to promote and coordinate studies and programs for exploitation of the Niger River Basin resources. The NRC was officially brought into existence by the "Act of Nancy" (1963). Its composition, mandate and legal functions were more specially delineated in the agreement concerning the Niger River Commission and the navigation and transport on the Niger River (1964 as amended 1966, 1973). These documents are attached as Annexes C and D.

The UO is governed by a Council of Ministers, composed of representatives from each member country, whose policies are implemented by an Executive Secretary with an office and staff in Niamey. The Council is, in turn, advised by a Committee of Experts which is composed of member country representatives.

The Executive Secretary has an office and a small administrative staff (Secretariat) in Niamey. He is presently assisted by a technical adviser provided by USAID. However, the present staffing pattern of the Secretariat is insufficient, lacking in both technical and managerial expertise, to allow it to perform its mandated functions. Exclusive of the Documentation Center, the available permanent staff consists only of an accountant, translators, secretaries, typists, messengers, etc.

The Documentation Center of the UO was established in January 1971 with assistance from USAID and counterpart contributions from the member states. This center is an integral and important element in the structure of the UO. Its function is to collect all documents and information concerning the exploitation and development of the resources of the basin and to **classify** and disseminate these documents and information to member states. It is presently staffed with a Director, three documentalists, two archivists, one analyst and one assistant librarian.

Since its formation in 1963, the **Commission** has sponsored the following studies:

a. "Niger River Commission Study" by Holmes and Narver, Inc. - a general study of the river, its hydrology and development potential, 1966, financed by USAID;

b. A report on the Integrated Development of the Niger River Basin by ILO/INR Interdisciplinary Mission of 1967 - a study of the prospects of and constraints on the development of the basin.

c. Navigation Study of the Niger River between Tossaye (Mali) and Gagnoa (Guinea) (part of the Gagnoa reservoir) - carried out by ILO/INR 1971

d. The setting up of the Documentation and Analysis Centre at Niamey in 1971 with the assistance of USAID/INR.

e. A Study Programme to determine the Causes of the Anomalies in the Flood Regime of the Niger by UNESCO of Paris. This study, now underway, will provide an analysis of the flood regime in the inland delta of Mali.

At a meeting in February 1974, the Council of Ministers approved a number of additional projects:

- Adoption of the principle of an Indicative Plan for the Water Resources Development of the Basin; it entrusted the Executive Secretary to seek financial support from international agencies for its preparation.

- A Stream Flow Simulation Model for which assistance has been requested from CIDA;
- The extension of the UNDP/WMO Flood Forecasting and Warning System to the downstream sector of the river;
- Adopted the General Regulations on Navigation, drafted with the assistance of the Economic Commission for Africa.

Despite the start that has been made in setting up the basic institutional framework for regional planning and coordination, the expansion of irrigation and intensification of land and water use has been slow in the Niger Basin.

As the above studies suggest, planning over the years since the Commission's inception has been piecemeal and ad hoc in nature. What planning has taken place has been the result of specific and uncoordinated interventions by various bilateral donors. While this uncoordinated donor support was well intentioned, the usefulness of the various studies is of limited value since they have been carried without benefit of an overall, goal oriented planning framework and systematic process of study.

2. Organization of a Multi-Donor Assistance Program for the Niger River Commission

The RNC Council of Ministers recognized in 1974 the inadequacy of the Commission's previous planning efforts and accordingly charged the Executive Secretary with responsibility for securing the necessary donor assistance required to prepare an indicative plan for the development of the water, land and human resources of the basin.

In response to subsequent RNC requests for assistance the Canadian International Development Agency (CIDA) sent a technical mission to Niamey to determine the long-term planning requirements for the basin and make recommendations for their provision.^{1/} A similar study mission, although less exhaustive, was carried out at RNC request by the World Bank.^{2/} Almost simultaneously, AID was in the process of preparing its "Proposal for a Long-Term Comprehensive Development Program for the Sahel"^{3/} and included an analysis of the requirements for a long-term plan of action in support of the RNC and Niger River Basin development planning.

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- 1/ "Assistance Needs for Developing the Niger River Basin", Canadian International Development Agency, Francophone Africa Division, May 14, 1976.
 - 2/ "Development of the Niger River Basin", International Bank for Reconstruction and Development, June 5, 1975.
 - 3/ "Proposal for a Long-Term Comprehensive Development Program for the Sahel," Report to the U. S. Congress; Agency for International Development, July, 1976.

At the June 1976 meeting of the RNC Council of Ministers these reports were examined. The Council of Ministers adopted the CIDA report as the basic working document and advanced and approved the idea of a multi-donor conference to prepare a common approach and multi-donor assistance project for the preparation of the Indicative Plan.

Through a series of meetings (September 1976 at UNESCO Headquarters in Paris, October 1976 in Niamey, and January 1977 at Paris) with the RNC and various interested donor countries and institutions, a broad general plan of study and institutional support has been developed for the Niger River Basin and is estimated to cost in the range of \$27-30 million dollars over a five year period. The goal of this Action Program is to produce an indicative plan and investment program for the development of the water, land and human resources potential of the Basin simultaneous with a concerted effort to strengthen the RNC's technical and managerial capacity to enable the RNC to effectively plan and coordinate the development of the basin overtime in conjunction with member states.

While it was possible to lay out the broad outline and order of magnitude costs associated with a five year Action Program, both the RNC and the donors, early on in the negotiations, recognized that insufficient information existed on which to formulate and precisely cost out a definitive five year Action Program. Accordingly, it was determined that a "start-up" assistance project covering a twelve-month period was necessary to precisely define, cost and prioritize the study requirements of the five year Action Program. As agreed with the RNC and the initial contributing donors (France (FAC), Canada (CIDA) the United States (AID) and the UNDP), the "start-up" project would include a diagnostic multi-sector study of the basin including the preparation of a five year Action Program, the recruitment of a full-time expatriate "core" staff of technical specialists for the RNC Secretariat, the initiation of a short and long term training program for future African staff members of the RNC, the provision of necessary technical and logistics equipment, and the design of physical plant facilities to accommodate the expanded requirements of the RNC Secretariat headquarters. This Project Paper covers the planned A.I.D. support for the "start-up" project and outlines the balanced contributions to be made by the three other participating donors, UNDP, France and Canada, which are necessary to insure successful completion of the first phase assistance project. Assuming successful completion of the first phase A.I.D. intends to prepare an expanded project to cover a reasonable portion of the technical and financial requirements of the five year Action Program. In addition to the clear articulation of a five year Action Program, two principal conditions will govern A.I.D. participation in the execution of the Action Program. These conditions are: (1) that future assistance requirements be drawn in a coordinated manner from as wide a range of donors as possible and (2) that the RNC member states fully support the RNC Secretariat. Evidence of this support will be the degree to which member states meet the budgetary and staff requirements necessary for proper and efficient execution of the Action Program.

C. Detailed Project Description

1. Project Goal

The goal of this multi-donor project is to assist the River Niger Commission design and undertake a coordinated program for the development of the land, water and human resources of the Niger Basin for the benefit of the basin population. Attainment of this goal is dependent on realization for two project sub-goals:

- formulation of an internationally recognized Indicative Basin Plan and Investment Program which will insure the rational development and utilization of basin resources for the benefit of the resident population;
- establishment of an institutional structure with sufficient technical and managerial capability to mobilize necessary resources and assist member states in the future implementation of the basin plan and supporting investment program.

2. Project Purpose

The purpose of this "start-up" assistance project is to:

- establish the analytical base (Diagnostic Study) and planning framework (Action Program) required for the preparation of the indicative basin plan and investment program.
- commence the process of strengthening the institutional capability of the RNC to carry-out an effective program of planning and development for the Niger River Basin overtime.

3. Project Outputs

The output of this multi-donor "start-up" project will consist of the following two main elements:

(1) Diagnostic Study and Action Program

The purpose of the Diagnostic Study is to collect and evaluate all existing data and to prepare a detailed 5-year Action Program leading to an Indicative Plan and Investment Program for the basin through beneficial use of the basin's land, water and human resources. The Diagnostic Study will conclude with the publication of three separate, but related documents. The first document will consist of a multi-volume compilation and analysis of all relevant existing information on the land, water and human resources of the River Basin. This document will facilitate the preparation of the five-year Action Program discussed below. The second document, which will synthesize relevant information from the basic study discussed above, will be an Atlas of the Land, Water and Human Resources of the Niger River Basin. This Atlas will be modeled after the "Atlas of Physical, Economic and Social Resources of the Lower Mekong Basin," financed by A.I.D. and prepared under UNDP auspices by the Tennessee Valley Authority and the U.S. Army Corps of Engineers. The final report to be produced under the Diagnostic Study will be the detailed five year RNC Action Program which will set the stage and delineate the study

priorities for the second phase of the multi-donor assistance project.

The diagnostic study will include eight components which are summarized below. Complete terms of reference for these component studies are attached as Annex B. 1. All of the study components will involve desk reviews of existing data dispersed in several countries as well as visits to the field. In addition to the inventory and analysis to be undertaken in each sector assessment, the consultant will prepare a recommended five year Action Program for the sector. The UNDP management consultant who will be responsible for overall study management and coordination, will draw on these sector Action Programs in presenting the overall five year Action Program for consideration by the RNC Council of Ministers.

- Agriculture

This component will include an assessment of land and water suitability for crop, livestock, fishery production and forestry, including a descriptive analysis of major existing farming systems; demand and supply analysis for food and fiber; an assessment of agricultural service institutions covering such factors as marketing, credit and storage. It also will include studies of potential costs and returns to various agriculture farming systems, with and without irrigation and an analysis of member state marketing and price policies. This component will be undertaken by AID and CIDA.

- Water Resources

This component will cover studies of meteorology and climatology, surface water hydrology, hydrogeology and groundwater, and water supply demands. It will be undertaken cooperatively by CIDA and FAC. CIDA will be responsible for the meteorology/climatology aspects and report preparation. Responsibility for the other aspects will be shared and the report issued jointly.

- Engineering

This component will include identification, location, and evaluation of existing hydraulic structures on the river system and potential storage sites, with emphasis on water supply, construction materials, and access. CIDA and FAC will share responsibility. FAC will participate primarily in dam site studies in the Franco-phone portion of the basin and provide participation of EDF and OSTROM as sources of information. CIDA will take responsibility for dam sites in the Nigerian portion of the basin, studies of construction materials and access, overall coordination of work, and preparation of the final report.

- Topography, Mapping, and Remote Sensing

This component will include inventory and evaluation of existing topographic maps, imagery control, and special purpose thematic

maps as well as preparation of contract specifications for issuance to obtain needed geodetic control and topographic mapping data. The most useful maps along with tabular data will be compiled into a thematic atlas. Responsibility for this component will be assumed jointly by AID and FAC.

- Education and Training

This component will include estimates of RNC requirements for professional staff over the short, medium and long term and an analysis of RNC member states' capability to supply required training, including recommendations for training to be carried out by RNC member countries. The study will outline programs of professional training to be carried out in donor countries as well as training programs to be jointly conducted by professional institutions in Africa and selected institutions from various donor countries. USAID will carry responsibility for this component.

- Health and Environment

This component will include a comprehensive survey of existing environmental and health conditions in the Niger River Basin. It will determine major areas of potential environmental impact resulting from implementation of the types of activities which would be identified under the five year Action Program. The consultant, working in conjunction with other sectoral teams, would prepare guidelines and terms of reference for environmental/health studies which would be carried out during future project specific investigations. The UNDP will assume responsibility for this component. A.I.D. and C.I.D.A. will provide partial financing by individual contributions of one-third of the total cost to a Funds in Trust account of the UNDP which will match an equivalent in-kind or cash contribution by the UNDP.

- Legal and Institutional

This component will include an analysis of the existing RNC management system and the overall organization structure required to execute the Action Program, including division of planning and implementation responsibilities between the RNC and member states. Also a legal analysis of property rights relating to land and water use for the basin will be undertaken, with specific reference to the externalities which are likely to occur in international basin development, particularly with regard to water rights allocation.

- Integration of Study Components and Preparation of Diagnostic Study, Atlas and Action Program Reports

The UNDP management consultant will be responsible for the overall leadership and coordination of the various sectoral teams and for preparation of three reports which will conclude the diagnostic

phase of the project (i.e. the descriptive Diagnostic Study and Atlas and the prescriptive Action Program for the RNC). In addition to integrating the various findings of the sectoral teams and publishing the results, the UNDP consultant will be responsible for conducting a number of analyses not covered by the various teams. Specifically the UNDP consultant will analyze existing national plans and conduct demographic analyses of the basin population. This information will be provided to the various teams for their use.

(2) Institutional Development

a. Expatriate Advisory Team

After extensive discussion with the RNC Committee of Experts and interested donors, complete agreement has been reached on the assignment of an interdisciplinary team of technicians to support and facilitate the work of the RNC during the "start-up" phase. The role of this expatriate assistance team will be to:

- provide necessary technical support and on-the-job training to the RNC technical staff;
- facilitate liaison between the RNC technical staff and the diagnostic study teams; and
- provide ongoing planning continuity between the Diagnostic Study and the resulting five year Action Program.

To insure continuity between the Diagnostic Study and the Action Program, the interdisciplinary technical assistance team will be retained for a 24 month period, with an option to extend for a second 24 month period subject to performance and subsequent donor/RNC agreement on the extension. The expatriate advisory team as well as the RNC technical staff will function as special members of the various Diagnostic Study teams during the initial 12 months of the project. Recruitment of the technicians to be provided by A.I.D. will commence upon project approval. Complete job descriptions are attached as Annex B. 2.

The specialists and the donors who have assumed responsibility for providing them are listed below:

1. Senior Advisor and Coordinator (UNDP)
2. Hydrologist for Flood Forecasting (UNDP)
3. Water Resources Planner (AID)
4. Soils Scientist (AID)
5. Regional Economist (CIDA)
6. Hydrologist (CIDA)
7. Civil Engineer (FAC)
8. Agronomist (FAC)

The expatriate staff positions are considered to be minimal requirements at the present time. At the end of the "start-up" phase and following a

thorough review of the completed Diagnostic Study, additional staff requirements may be identified for the second phase.

b. Training Program for Member State Nationals Long-Term

In pursuit of the long-term objective of establishing the technical capability of the RNC to perform its mandated functions with an indigenous staff, a program of long-term academic training at the graduate level (Masters Degree) in U.S. and Canadian Universities will be initiated as a component element of this multi-donor assistance project. In June 1976 A.I.D. executed a Grant Agreement with the RNC which provided funding for six long term participants. Under the "start-up" assistance project A.I.D. and C.I.D.A. will provide funding for an additional fourteen participants (6 A.I.D.; 8 C.I.D.A.). Upon initiation of the multi-donor assistance project final arrangements between A.I.D., C.I.D.A. and the RNC will be negotiated to insure formulation of a training program that will produce a core interdisciplinary staff for the RNC appropriately balanced to cover the engineering, economic, behavioral science and agricultural disciplines that will be necessary if the RNC is to plan and carry-out a comprehensive river basin development program.

In addition to the participant training outlined above, which is intended to meet the immediate staffing requirements of the RNC, a comprehensive manpower development study will be undertaken by A.I.D. as a component element of the Diagnostic Study. The study will outline RNC training needs over both the short and long term. The study will also design a training project for subsequent implementation which will emphasize close collaboration between donor training institutions and selected African training centers in meeting the manpower requirements of the RNC and member governments.

Short-Term

The Documentation Center of the RNC serves as the repository of all information, data and studies relevant to river basin development. As such it is an indispensable element to the successful and efficient performance of work tasks required by the Executive Secretariat of the RNC. One of the results of the Diagnostic Study will be the identification and collection of all information related to the Niger River Basin and its ultimate transfer to the Documentation Center for classification and future use. The following five year Action Program is expected, in turn, to generate additional documents and studies and require expanded search efforts for information and studies not available to the Center.

For the Documentation Center to effectively carry-out the anticipated expanded work load, additional short term training for the Center's documentalists would be desirable. As part of its contribution to the multi-donor assistance effort A.I.D. proposes to provide six-months of on-the-job training and orientation tours for the three documentalists presently assigned to the Documentation Center. This training will take place at established documentation centers at St. Louis, Senegal; FAO in Rome; CIEH, Ouagadougou and the Sahel Documentation Center at Michigan State University. The training will commence as soon as possible following project approval in order to assure completion in sufficient time to receive and catalog incoming documentation.

generated and forwarded as a result of the Diagnostic Study.

Study-Tours

In an effort to improve understanding of river-basin development possibilities among officials from member state technical services as well as to improve the working relationships between the Executive Secretariat and the member states a study tour of river basin development projects in the United States is proposed for financing by A.I.D. through this project. One member from each member state will participate in a 4-week study tour during the summer of 1977 under the direction and coordination of the U.S. Bureau of Reclamation.

c. Technical Equipment, Logistics and RNC Headquarters Design Support

At present the Executive Secretariat of the RNC occupies four rooms within the Niamey headquarters complex of the United Nations. Space is inadequate at present and is entirely inadequate for the large planning program which will be initiated with this project. The RNC has virtually none of the standard office, technical and logistics equipment required to support a serious planning effort. To address this situation both A.I.D. and C.I.D.A. will provide complementary technical and logistics equipment sufficient to meet the immediate needs of the RNC during the early phase of the Action Program. Additionally, A.I.D. will complete A&E designs for a modest headquarters complex.

This design work will be completed concurrently with the Diagnostic Study such that construction budget requirements can be reviewed by donors for specific contributions during the second phase. The architectural design will be commissioned to a firm established within the West Africa region so that follow-up services by the design firm will be readily available during the construction phase.

4. Project Inputs

a. Five Year Action Program

In September 1976 the donor community and the RNC met in Paris to lay out the broad outline and order of magnitude cost estimates for a five-year Action Program. A program aggregating \$27.5 million was advanced at that conference (see Annex L). Against this financial target the following expressions of intent were made:

(\$ in millions)

<u>Donors</u>	<u>Low</u>	<u>High</u>
C.I.D.A.	6.5	6.5
UNDP	2.0	2.0
A.I.D.	<u>5.0</u>	<u>8.0</u>
Total	13.5	16.5

Since this initial donor meeting where the United States, UNDP and Canada expressed their intent to finance a substantial portion of the five-year Action Program requirements, France has indicated its intent to participate at a level roughly commensurate with A.I.D. and C.I.D.A. All participating donors indicated, however, that before binding commitments could be made, a substantially greater degree of precision would be necessary in defining and costing the Action Program. Accordingly, it was agreed that a "start-up" multi-donor assistance project would be necessary to collect, organize and analyze existing data and to precisely define the study and cost elements of the five-year Action Program. To this end (as outlined in II C.3) a multi-donor "start-up" assistance package has been designed and negotiated.

b. RNC "Start-Up" Assistance Project

Table 1 outlines the technical assistance to be provided by category, either separately or jointly, by the initial group of donors to the RNC. Part III B. (Financial Analysis and Plan) outlines the estimated financial cost to be borne by the four donors who have agreed to finance the initial assistance requirements of the RNC. The Logical Framework (Annex I) combines the specific component inputs with the financial requirements for their provision.

Table 1
Multi-Donor Technical Assistance to the RNC

<u>Technical Assistance Inputs</u>	<u>C.I.D.A.</u>	<u>A.I.D.</u>	<u>FAC</u>	<u>UNDP</u>
1. <u>Diagnostic Study</u>				
a. Agriculture Sector Survey	X	X		
b. Water Resource Survey	X		X	
c. Engineering Survey	X		X	
d. Health/Environment	X	X		X
e. Education & Training		X		
f. Cartography & Mapping Survey		X	X	
g. Legal & Institutional				X
h. Study Management & Integration				X
i. Survey Research Project Design		X		
2. <u>Expatriate Advisory Assistance</u>				
a. Coordinator				X
b. Hydrologist (Forecasting)				X
c. Water Resources Planner		X		
d. Soil Scientist		X		
e. Regional Economist	X			
f. Hydrologist	X			
g. Civil Engineer			X	
h. Agronomist			X	
3. <u>Training Program</u>				
a. Long Term	X	X		
b. Short Term				
(1) Documentalist		X		
(2) Observational Tour		X		
4. <u>Equipment, Logistics & RNC Headquarters Design</u>				
a. Tech equipment & logistic support	X	X		
b. RNC Headquarters Design		X		

PART III. PROJECT ANALYSES

A. Technical and Environmental Analysis

1. Technical Analysis

a. Zones.

The Niger Basin geographically and hydrologically lends itself to division into zones. For the purposes of this discussion, the basin, excluding the ephemeral area, will be divided as follows:

Upper Zone — All the area above the delta

Inland Delta — Located in Mali

Middle Zone — The area from the delta outlet to Niamey

Lower Zone — All the area below Niamey

For more detailed analytical study, the Upper and Lower Zones may be subdivided into tributary basins, but the Inland Delta and the Middle Zone are unique and should be studied in their entirety.

- (1) Upper Zone—The area of the Upper Zone is about 260,000 km² and produces an average annual inflow to the Inland Delta of about 70 billion cubic meters. The monthly mean discharge of the Niger ranges from a maximum of around 5,500 cubic meters per second (cms) during September to a minimum of around 300 cms for April and the Bani discharges 2550 cms in September and October and 50 cms in March.

The Upper Zone is located in parts of Guinea, Ivory Coast, Mali and a small part of Upper Volta with annual rainfall over the area varying from 30 inches (750 mm) in the north to 100 inches (2,500 mm) in the south. The rains occur between May and September, followed by seven dry months.

At least 10 potential storage sites have been identified in the Upper Zone, but the only site which has been investigated in detail is the dam at Selengue in Mali on the Samkarani tributary. Part of the Selengue reservoir would be in Guinea. The dam would store 1.5 billion cubic meters of water and is being designed for hydroelectric generation, flood control, navigation, and water supply for development of about 2,000 hectares

of irrigation along the Sankarami and expansion of the Markala Diversion project (Office du Niger) by approximately 50,000 hectares, as discussed below. A ready market for the power is available in the Bamako area which is less than 100 miles from the dam.

The Selengue Dam has been proposed as the first storage facility upstream of the delta. There are only two existing structures on the Niger above the delta—the Sotuba Dam and 5 MW powerplant above Bamako and the Markala Dam below Degou. The only diversion from the river above the delta is for a supplemental water supply for irrigation of approximately 40,000 hectares at Markala to supply the water requirements of the Office du Niger. This project was originally designed for irrigation of about 200,000 hectares and the main distribution and drainage system was built to serve the total area. Because of an inadequate water supply, poor drainage, poor management, and many other factors, particularly factors associated with farmer support and participation in the Office's agricultural development program, the project was never completely developed and much of the system now requires major rehabilitation. Regulated flows from the Selengue reservoir would provide a water supply which would permit the expansion of the irrigated area by about 50,000 hectares. However, for this expansion of the Office du Niger to be economically feasible, a major policy change will be required. At present, participating farmers are allocated up to 9 hectares of irrigated lands, which, with present labor intensive technology, results in application of extensive agriculture practices which, in turn, produce low per hectare yields.

Clearly, justification of the investment in capital intensive distribution systems, as would be required to irrigate the expanded area, would require a major transformation from the extensive production practices currently encouraged by the Office du Niger to a more intensive agriculture production system. This could be accomplished by decreasing the size of the average farm holding allocated to participating farmers.

If major regulation of the flows into the delta is found to be desirable, it is reasonable to assume that adequate storage sites could be developed; however, nearly half of the Upper Zone is in Guinea and any development in that region would have to produce substantial benefits to Guinea for it to be receptive to the development.

There are, undoubtedly, lands in the Upper Zone that are arable and some of these lands might be situated so that they could be readily served by direct diversion from the storage reservoirs or by downstream diversion or pumping. Even though these lands are in an area of relatively high rainfall, regulation would be beneficial since all the precipitation occurs in a 5-month period followed by 7 dry months.

- (2) Inland Delta—The area of this zone is roughly 20,000 square miles. Its swamps, multiple channels and lakes provide a huge natural retention reservoir for storage of flood flows. This natural regulation provides a more constant downstream discharge, but the loss of water is tremendous. Anywhere from 50 to 65 percent of the flow entering the delta is lost principally through evaporation.

As mentioned previously, flows from the Niger are presently being diverted at Markala for irrigation of about 40,000 hectares. Also, some diking has been constructed in the delta for irrigation of rice with low-lift pumps. The combination of these activities may already have had some effect on the delta. ORSTOM has found that the peak flow below the delta has been increasing during the last ten years and the peak is occurring about 10 days earlier than normal. At present, ORSTOM is conducting an investigation of this anomaly to determine if this change in the flow pattern is a result of climatological changes or man-made interventions, or a combination of both.

Construction of the Selengue Dam and the expansion of the irrigation project at Markala are sure to have a noticeable effect on the delta. Large scale conventional irrigation development upstream, such as the expansion proposed for the Office du Niger, will decrease the total volume of water entering the delta and the regulation at Selengue will affect the flow pattern.

The Inland Delta is a major food source for the region through crop production, livestock, and fishing. The delta is also a nesting and breeding ground for many varieties of migrant birds. Major upstream regulation could have a significant impact on the existing agricultural production systems and on the environment of the delta. The impact of these upstream developments should be clearly understood before proceeding with the proposed

regulatory structures. The RNC is presently not adequately staffed to effectively comment on, or influence, the various development projects being considered by the member governments; however, as a result of the proposed multi-donor assistance project, the RNC should be in a strong position to guide and control the development of the basin's resources in the future.

In order to insure that adequate water is available during the dry years, sufficient carryover storage will have to be developed. The question then is not, should upstream regulation be provided; but rather, how should this regulation be planned, designed, and operated to insure sufficient annual food production for the region without adversely affecting the existing delta environment and existing and planned developments downstream from the delta. Obviously, this determination will require lengthy and detailed investigations which must be conducted in a basin-wide context and must consider all aspects, both physical and non-physical, related to the integrated development of the basin.

At this point, it is difficult to visualize all the affects which could result from major upstream regulation, but a few appear probable.

- (a) By diminishing the larger annual floods, the overall flooded area in the delta will be decreased; however, because of the rather flat topography, this reduction may not be significant. The only extreme change will probably be a decrease in depth of flooding which should not adversely effect crop production. This, of course, is dependent on the amount of regulation provided.
- (b) A change will occur in the flow pattern downstream from the delta. The extent of the change will be dependent on the amount of upstream regulation and the operating criteria for the storage reservoirs. For example: if the reservoirs capture peak flood flows and release the waters at a somewhat constant rate during the dry season the discharge from the delta will very likely become more constant. On the other hand, if the storage is utilized to diminish the major annual floods so as to augment the floods during drought years, the downstream flow pattern will probably not change significantly, but the total annual volume of discharge will become more constant. Under either of the above conditions, the downstream changes in flow would probably be beneficial.

- (c) The regulatory reservoirs will inundate lands in the upper reaches of the basin. This area of the basin is in the steeper, higher rainfall areas and is covered with a classic dense savannah. Little of this area is now under cultivation. Because of their location, the reservoirs will probably not decrease measurably the sediments carried into the delta.
- (d) The reservoirs are located in an area with evaporation rates of less than the rates in the delta, but the total annual volume of water entering the delta will decrease because of the evaporation from the reservoirs. This will probably not be a significant amount.
- (e) Under either of the operations suggested in (b) above, the large losses in the delta would probably be diminished, but it is impossible to speculate to what extent.
- (f) The impact of regulation on existing farming systems (both crop and livestock), fish, wildlife, waterfowl, etc., will have to be studied carefully. Provided an adequate supply of water is maintained in the channels, the swamps are not drained, and the lakes are kept supplied, it would seem that the overall ecological picture would improve.

The planning of any regulatory storage must be done with multiobjective purposes, and the purposes must be ranked according to priority and the projects operated in strict accord with these priorities, otherwise, disastrous results could ensue. In the operation stage, the RNC should be the body that will shoulder the responsibility for enforcement of operating criteria, or alternatively the RNC could assume the operating functions of the storage projects. In fact, it is difficult to foresee the rational development of the basin without a planning and regulatory body such as the RNC.

- (3) Middle Zone—This zone extends from the Interior Delta to Niamey, approximately 900 km (560 miles). The zone borders on the ephemeral area of the basin and the tributary inflows virtually balance evaporation losses with the annual Niger flows being relatively uniform. The peak discharge from the delta occurs in December and requires about 1 month to travel to Niamey. Channel storage effects further regulate the flow; therefore, the maximum monthly discharge is reduced to about 2,700 cubic meters per second and the minimum is about

125 cms. The average annual rainfall in the Middle Zone is very low, ranging from 100 to 250 mm.

Several potential damsites have been studied in this reach of the Niger River. The site which is presently under detailed investigation is the Kandadji Dam located about 160 km (100 miles) upstream from Niamey. The dam would provide a reservoir of about 13.6 billion cubic meters designed for hydroelectric generation, flood control, irrigation, and navigation.

There are an estimated 50,000 to 100,000 hectares of arable land between the Kandadji Damsite and the Nigerian border. Most of these lands, assuming construction of the Kandadji Dam, would have to be served by pumping from the river. Power for pumping could be furnished by the Kandadji powerplant as well as for the establishment of a rural electric cooperative network. Conventional irrigation development in the area below Kandadji Dam may be a necessity, particularly if the existing flood recession agriculture is drastically reduced due to decreased flooding. To minimize the negative impact of dam construction on the downstream population, schemes should be operable by the time the dam is completed. To insure success of the irrigation projects, the NRC should immediately develop small pilot projects throughout the area to train operating staff and to train the farmers in irrigation practices.

- (4) Lower Zone—This area is the largest of the four zones and is an area of high rainfall ranging from 250 mm in the north to 4,000 mm in the south.

Below Niamey, the tributaries of the Niger receive sufficient rainfall to produce a peak flow exceeding the upstream peak. The upstream peak arrives in February and the local peak in September—October.

The existing Kainji dam and reservoir store the peak flows during February and use the storage to generate energy during the succeeding seven months. At the end of August, the reservoir is drawn down and is ready to store the September—October peak which can be used for generation until the following February. A very efficient operation, but not without costs, since reduced flooding decreased the downstream recessional agriculture and the altered flow caused a drop in fish production. Through proper reservoir operation with reduced power

benefits some of these adverse affects could have been avoided or at least minimized. Construction of the Kandadji Dam with its' large reservoir will have a substantial affect on the operation of the Kainji since it will probably store part of the February peak and release the water during the low flow period. The operation of the two reservoirs will have to be closely coordinated.

Potential development downstream of Kainji on the Niger and its tributaries is, for the most part, a national program for Nigeria. The exception would be developments in the upper reaches of the Benue tributary which originates in Cameroun and Chad.

b. General Observations.

Because of the unique characteristics of the Niger Basin, particularly the Inland Delta, a standard approach to the development of the river may not be acceptable. Success of large conventional irrigation development also may not prove to be attainable if the Markala Project is a true indicator. What then are the alternatives? If the primary object is only to assure an adequate food supply for the area (no starvation) and we assume the present agricultural systems in the delta can provide that food supply with an adequate annual water supply, the obvious alternative would appear to be to provide that food supply with an adequate annual water supply, the obvious alternative would appear to be to provide an assured water supply through upstream regulatory storage.

As everyone knows, large dams and storage reservoirs are very expensive and often difficult to justify economically even when designed as multipurpose projects. The prospects for economic justification of reservoirs which would serve only for multiannual carryover storage from the wet years to the drought years, is not encouraging. Hydroelectric generation, the cash register for large dams, would be possible only on a limited basis. Some flood control benefits would be realized, but these probably would not be significant. Agricultural benefits would, of course, also be forthcoming, but not nearly to the magnitude of year around conventional irrigation. Some regulation of downstream flows might result which would provide additional benefits from hydropowerplants such as Kandadji and Kainji, but again, these would probably not be significant.

The major economic justification for funding large regulation projects would be the assurance that future huge relief expenditures, such as were made during the recent drought, would never again be needed. The relief expenditures for the Sahel were in excess of a billion dollars and even then, the losses in human and animal life were staggering.

In summary: storage projects in the Upper Zone, such as Selangua Dam, would have a marked affect on the Inland Delta and downstream flow; irrigation development above and within the Inland Delta, such as the Markala Diversion Project, would affect downstream flows; regulation in the Middle Zone, such as Kandadji Dam, would affect downstream projects such as Kainji Dam. Granted that this analysis is based on very limited knowledge of the Niger Basin, it is still obvious that very serious consequences could result if the ad hoc developments presently being planned are allowed to continue. From a technical point of view, it is imperative that any water resource development project be thoroughly investigated and be planned, designed, and operated in the context of the overall basin with investment decisions made only after analysis has determined that construction of any given project will have major benefits and minimal disruptive impact on the basin environment. The only way to insure this is done, is through the support and expansion of the Niger River Commission into a body with the authority and capability of planning and managing a basinwide development program.

2. Environmental Analysis

As a study and institutional development project, this project will have no environmental impact of either a positive or adverse nature. In the same vein, the expected long-term program of continued support to the RNC in the elaboration of a Comprehensive Indicative Plan and Investment Program for the coordinated development of the basin's resources will, in and of itself, have no environmental impact.

From a broader perspective, it has been determined by the participating donor community and the RNC that environmental concerns must be woven into the framework of the study effort from the very beginning in order to emphasize the possible effects of concrete, physical actions, and the necessity to pursue in-depth investigations of the consequences which could arise from their implementation.

To lay the basis for future project specific environmental studies, a comprehensive overview of the existing environmental and social conditions will be carried out as a component element of the Diagnostic Study. Additionally, the Diagnostic Study will identify those areas where information gaps appear to exist and make recommendation for further studies to be carried out under the subsequent five-year Action Program. This strategy will ensure that the resulting Indicative Plan is a balanced analysis, not only of the physical activities proposed for subsequent implementation, but also of the existing ecological balance and the measures which should be observed in preventing or minimizing adverse impacts from project implementation.

The diagnostic team will work in close coordination with the other component teams in identifying the major types of activities

likely to be planned under the auspices of the RNC and prepare general terms of reference and guidelines for the environmental impact studies which would be conducted simultaneously with the preparation of specific project activities.

B. Financial Analysis and Plan

1. Recurrent Budget Analysis

The nature of the "start-up" project is to provide the information and data necessary for both the elaboration of a program of long-term assistance to the RNC and an analysis of the financial implications which must be thoroughly reviewed by the international donor community prior to committing themselves to such a program.

This "start-up" project will place limited recurrent cost requirements on the RNC. As a result of the conditions placed upon the RNC by the donor community, it has agreed to provide an operating budget to the Executive Secretariat in the first year of the project which represents an increase of 33% over the previous year (1976).

The 1977 approved budget for the RNC totals 88,575,849 FCFA (\$355,000). Member State contributions to the RNC are presently apportioned on the basis of equal shares thus representing an annual requirement of approximately \$40,000 from each of the nine member states. While this sum does not represent an onerous burden on any of the members the larger question of future requirements resulting from a greatly expanded Executive Secretariat remains an outstanding issue which cannot be properly addressed at the present time. One objective of this interim phase activity will be the compilation of sufficient information on which to more adequately forecast the recurrent costs which must be borne by the RNC in support of its own institutional functions.

It is recognized that a future issue will conceivably arise over the proportional shares of member state contributions to the RNC operating budget. While at present, each state contributes an equal share, this formula will undoubtedly be called into question as the requirements rise and the benefits accrue unequally. As it is obvious that three member states, Mali, Niger, and Nigeria, will reap the preponderant share of project benefits, it is probable that member states, such as the Camerouns, Chad, and the Ivory Coast, will ultimately ask for a reassessment of the equal cost-sharing formula as the requirements increase.

As an example, Chad may present a special case which will have to be given serious consideration by both the RNC and the donor community. In addition to being the poorest of the nine member states comprising the RNC, Chad is also a member of two other regional commissions: the Lake Chad Basin Commission (LCBC) and the Joint Chad/Cameroon Commission for Logone Basin Development.

While being a primary beneficiary and locus of activity for the latter two organizations, Chad remains only a peripheral partner within the RNC in terms of ultimate benefits.

Given Chad's pre-eminent position within the LCBC and the Logone Commission, it would appear to be within the interests of both donors and the regional organizations themselves to allow Chad to concentrate its efforts and monetary support on those organizations with which it has primary concern, and not insist upon full and equal participation in an organization for which it has only tangential interests. The ability of Chad to fulfill its obligations to all such groupings is obviously limited and insistence on the fact could prove to be both onerous to the country and detrimental to its successful participation within its area of prime concern.

Historically, the record of member state contributions to the RNC operational budget has been less than admirable. A summary of member states payments to the RNC in 1976 and outstanding arrears as of December 31, 1976 is as follows in FCFA:

<u>COUNTRY</u>	<u>1976 PAYMENTS</u>	<u>ARREARS (ALL YEARS)</u>
Benin	4,474,000	7,416,622
Cameroon	8,998,600	2,892,622
Chad	—	29,610,847
Guinea	—	11,891,222
Ivory Coast	4,474,000	7,416,622
Mali	—	11,891,222
Niger	7,416,622	—
Nigeria	7,361,365	55,257
Upper Volta	4,474,000	8,436,847
	<u>37,199,787</u>	<u>79,611,261</u>

In actual performance, the RNC completed its 1976 Budget year with a 2,638,806 FCFA deficit (\$10,555). This suggests that the RNC Executive Secretariat has been able to adjust expenses to actual fund availabilities and that payment of arrears would not be required simply for the purpose of solvency. More importantly, however, it also suggests an historical lack of commitment on the part of the member states to the functioning of the RNC.

Historical performance, however, although cause for the application of prudent caution, is less important than evidence of present and future commitment in consonance with donor support. As a Condition Precedent to the disbursement of AID and other donor funds, it will therefore be stipulated in the AID Grant Agreement and other donor grant agreements that sufficient arrears and dues for 1977 will have been made available by member states to fund the approved 1977 budget level of 88.5 million FCFA.

TABLE 2

Summary Cost Estimate and Financial Plan
(U.S. \$ 000)

SOURCE USE	AID		RNC		CIDA		FAC		UNDP		TOTAL
	FX	LC	FX	LC	FX	LC	FX	LC	FX	LC	
<u>Technical Assistance</u>											
Long Term	300	60			300	60	300	60	300	60	1,440
Short Term Contract Studies	705				1,015		806		335		2,861
<u>Training</u>											
Long Term Academic	75				100						175
Short Term	50	30									80
<u>Other Costs</u>											
Architectural Design		80									80
Logistical Support		50		177		50					277
RNC Personnel				177							177
TOTAL	1,130	220		354	1,415	110	1,106	60	635	60	5,090

TABLE 3

Costing of Project Outputs/Inputs
(U.S. \$ 000)

PROJECT INPUTS	PROJECT OUTPUTS		TOTAL
	Diagnostic Study	Institutional Development	
AID Appropriated			
● Technical Assistance Long Term (48 p/m)		360	360
● Contract Studies	705		705
● Training			
Long term academic (72 p/m)		75	75
Short term (18 p/m)		30	30
Study tours (9 p/m)		50	50
● Architectural Design		80	80
● Logistical Support		50	50
Other Donors:			
CIDA			
● Technical Assistance Long term (48 p/m)		360	360
● Contract Studies	1,015		1,015
● Training			
Long term academic (96 p/m)		100	100
● Logistical Support		50	50
FAC			
● Technical Assistance Long term (48 p/m)		360	360
● Contract Studies	806		806
UNDP			
● Technical Assistance Long term (48 p/m)		360	360
● Contract Studies	335		335
BIC			
● Personnel		177	177
● Logistics Support		177	177
TOTAL	2,861	2,229	5,090

C. Social Soundness Analysis

1. AID's Participation

The attractiveness of the RNC Diagnostic Study and of AID's participation in it, as elaborated in this Project Paper, is that social soundness analysis is being built into the initial studies to be carried out under the auspices of a revitalized Niger River Commission. Hence, the possibility exists of providing information that will increase the chances of success of subsequent development strategies, and of specific programs and projects, more directly involving local populations. On the other hand, AID will need to follow the situation very closely as it develops since subsequent policy decisions may not be in the interests of local populations. A case in point is the development strategy currently followed in Upper Volta for settling sparsely occupied or unoccupied river valleys in the onchocerciasis control program area. Though the advice of sociologists involved in the initial UN feasibility studies in 1971 and 1972 was to concentrate on a relatively low cost approach to settlement which would pinpoint areas for the provision of wells and feeder roads along with a unified extension service, and hence reach large numbers of spontaneous migrants (while directing their flow), the actual strategy chosen emphasized the settlement of small numbers of people in capital-intensive, and closely controlled, agricultural settlement schemes in which the settlers are relatively passive recipients of government expertise.

Obviously, the involvement of social soundness analysis in the initial stages of planning in no way guarantees that subsequent plans will in fact be socially sound. While AID's present involvement in the Diagnostic Study is socially sound, this conclusion must not be extrapolated to subsequent AID projects within the Niger River Basin, each of which must be separately appraised.

2. The Niger River Commission and the Diagnostic Study

The Diagnostic Study comes at a critical time in the history of the Niger River Basin. To date, development of the basin has emphasized the generation of hydroelectric power for urban and industrial development, hence, subsidizing urban populations at the expense of rural residents. The early history of the heretofore inactive Niger River Commission was also primarily preoccupied with water resource development. The Commission was established primarily as a result of the initiative of Niger whose President saw it as a mechanism for improving Niger River transportation. This emphasis was still apparent in 1976 when the Commission sought international assistance for institution building, including an active training program and a greatly enhanced capacity to carry out studies. For example, the initial list of disciplines (subsequently under revision) for the first twelve trainees, who would form the core staff of the Commission, omitted disciplines which are necessary for the study and evaluation of socio-economic data relating to the rural inhabitants and their systems of production. On the contrary,

the large majority were exclusively concerned with water resource evaluation or with structures to manage water flows.

In recent months, however, the Niger River Commission appears to have broadened its focus to include the human resources of the Niger River Basin. On the one hand at least, one member of the Council of Ministers has emphasized the need for the Commission to play a major role in the integrated rural development of the basin while the Commission's Committee of Experts has recommended and secured Ministerial approval, for an organizational structure under the Executive Secretary which will include a Division of Agriculture, Fisheries, and Livestock. The Executive Secretary himself has also expressed a desire for a wider mix of staff, has requested advice on how to enhance the Commission's role as a rural development agency, and has asked AID to draw up the terms of reference for a rural sociologist to be recruited among the first twelve trainees. Since AID and CIDA will be financing this training program, there is every reason to believe that the opportunity exists to add additional fellowships for trainees in agricultural economics, fisheries, livestock development, the behavioral sciences, and other fields relevant to rural development.

As a twelve-month study, the Diagnostic Study should play a major role in focusing attention on the human resources of the Niger River Basin, and on influencing future development strategies as they relate to these resources. Since AID and CIDA are responsible for the survey components dealing with Agriculture and Water Resources, respectively, and will be jointly financing with UNDP, the Environmental/Health Sector Survey, there is every reason to believe that the human element will be properly addressed. Since Agriculture is defined to include fisheries and farm enterprises, including livestock, AID has the opportunity to survey the current land and water-use systems of the local populations and on the basis of those surveys to make recommendations for further research which will provide information for involving the local people more actively in the development process.

3. Consideration of Existing Lifestyles

Development in the Niger River Basin should include strategies which take existing lifestyles, with their attendant production systems, as a starting point, and then proceed to enhance them. To date, the design of mainstream and tributary dams for the Niger River has yet to be used as a mechanism to involve local populations in the development process. Even worse, potential impacts of dams on downstream users have been largely ignored. This point is emphasized by Adeniyi (1973) in his review of the "Downstream Impact of the Kainji Dam." Concentrating on three villages, with a total population of somewhat over 12,000 people, and located 70, 114, and 186 miles below the dam, he noted declines in floodwater cultivation (fadama) during the dry season of 70, 44, and 53 percent, respectively. Since over

2000 acres were lost to cultivation in these three villages alone, the total loss below the dam must amount to tens of thousands of acres. These cannot be cultivated by customary means simply because they are no longer flooded during the dry season because of flood retention in the Kainji reservoir. Furthermore, "In addition to loss of fadama as a result of decreased flooding, yields of swamp rice at Rabba went down from an average of 1,650 pounds paddy rice per acre to an average of 1,300 pounds, a decrease in yield of eighteen percent as a result of moisture shortage and loss of fertile alluvial sediments usually brought down by the Niger while in flood every year." Reduced flooding also adversely affected the downriver fisheries. According to Adeniyi's research, the income of fishermen in the above three villages decreased 73, 60, and 47 percent following dam construction, while actual catches monitored by the FAO-Nigerian Government Kainji Lake Research Project at one landing point dropped over fifty percent.

Because approximately sixty-five percent of the flood waters of the Niger are "lost" in the interior delta, some planners obviously will attempt to "capture" some of this for other uses through the construction of regulatory dams like Kainji, and channelization and other mechanisms in the interior delta itself. Unless the needs of existing populations who use the delta are taken into consideration, the results could be far more catastrophic than in the Kainji case, not just because a far greater number of people and livestock are involved, but also because alternate resources are less available. Though governments obviously will build into their plans gravity-fed and pump-fed irrigation projects, these, as in the Kainji case, cannot be expected to come on-line until years after the initial regulatory structures in the form of dams and barrages are built. In the meanwhile, what are the local people to do who lose their livelihood as soon as the annual flood is reduced through regulation? Because of the cost of irrigation (estimated by the World Bank at about \$7,000 per hectare in 1975 for pump schemes in Niger) alone, which reduces drastically the total number of people who can be involved, and because of the difficult physical and economic problems associated with existing projects (like the Office du Niger), a careful study of current uses of the natural flood for floodwater farming, grazing, and fishing must be completed before development strategies are designed. Quite possibly, as the 1975 IBRD Mission to Niger believes, perennial and flood water irrigation in the inland delta of the Niger are not "mutually competitive." In terms of socio-cultural feasibility, spread effects and beneficial impacts, the initial enhancement of the latter makes the most sense since it will reach a larger number of people in a shorter period of time.

4. Constraints to Development as They Relate to Local Populations

The capacity of the local population to participate in future Niger River Basin development will obviously depend on the nature of the development strategies followed and on the type of programs and projects

implemented. The local farmers, herdsmen, and fisherman are the most important development resource in the basin, and they are members of relatively dynamic, relatively open-ended systems. They are susceptible to change, indeed have frequently changed in the past as new opportunities have appeared. While specific socio-cultural constraints to development can be expected to arise in specific cases, which will require identification and careful handling, there is no evidence to suggest that local populations are unresponsive to new ideas and technologies as such. The principal constraints to development presently known can be summarized as follows:

a. The development from above syndrome, the very nature of which makes it difficult to involve local populations in the planning, implementation, and evaluation of development, and to use their existing socio-cultural systems (and especially their highly adaptive land and water use systems) as a basis for development. Obviously, it is not possible to facilitate local initiatives and enhance existing systems of production, if planners are ignorant of both these initiatives and these systems. The solution to the problem is to improve our understanding of the nature of these initiatives and systems through research and then to design appropriate development strategies to incorporate them. The surveys to be conducted under this "start-up" assistance project, particularly the agricultural, water resources, and environmental, health surveys, will add substantially to our knowledge of existing farming systems and will also begin to layout alternative development strategies for consideration which build on the existing agricultural systems.

b. The general inability of hierarchial and highly centralized governmental structures to reach the rural producer through such mechanisms as an active unified extension service, and suitable feeder roads and waterways for marketing purposes, and to actively incorporate rural populations into influential decisionmaking bodies at the local level.

c. The existing price structure, which continues to favor the urban consumer, representing less than 10 percent of the total population (except in Nigeria), at the expense of the rural producer, whether farmer, herdsman or fisherman. Niger River Basin development, to date, has continued this bias through an overemphasis on hydropower generation. As a result, rural residents follow the transmission lines to their urban and industrial destinations, a logical response to national development strategies which do not favor rural areas.

d. High labor migration rates, which themselves are a reflection of the existing price and opportunity structure, and hence cannot be legitimately viewed as just a local constraint. Indeed, the impact of labor migration must be carefully evaluated in each case since there are

always important tradeoffs involved. Provided opportunities exist, labor migrants may be a major source of capital for rural development as has been demonstrated in East and Central Africa.

5. Social Soundness

Guidelines for A.I.D. Support to the RNC

a. Through its involvement in the Diagnostic Study, AID will continue to emphasize its previously stated conviction that the local farmers, herdsman, and fishermen are not only the primary resource for development, but also should be actively involved in the development process.

b. Following from (a) and the Congressional Mandate, AID will use the Diagnostic Study as a mechanism to study the existing land and water-use systems of the local people through the Niger River Basin. These systems will be mapped and assessed in sufficient detail to provide information for the design of subsequent research and action programs

c. The Agency should anticipate the need for more detailed studies of selected land and water-use systems following the completion of the Diagnostic Study. To provide the information for generating specific development interventions, these studies should combine two research strategies. One would emphasize short-term studies to provide highly specific information which can be gathered at particular seasons. The other would emphasize long-term studies (fifteen months) which cover a complete annual cycle with six weeks at either end to establish and terminate field operations. Several such studies might emphasize flood-water farming in different ecological zones, although attention must be paid to the entire range of strategies used by the different ethnic groups in the area. These include rain-fed agriculture, livestock management, fishing, local crafts, trade and wage labor, both within and without the area, and the relative importance of each shifting from year to year, and from household to household owing to variations in ecological and economic conditions, and factors relating to local preferences. Without detailed information on labor profiles for different activities and on how and why heads of households and other production units allocate labor for economic purposes, it will not be possible to design realistic development programs for increasing production and the standard of living of the local people.

During each fifteen-month study, information should be systematically gathered on the following topics:

- (1) The social organization of production units, including their actual composition, and their relationship to absentee members (especially labor migrants), other

kin and neighbors in terms of capital inputs (remittances especially), and labor.

- (2) The systems of land tenure, including detailed maps of all gardens controlled (whether in use or not) by members of the study community, assessment of water rights, and of the implications of population trends, and of systems of inheritance as they relate to resource availability.
- (3) The systems of land and water usage, including agriculture, livestock management, and fishing.
- (4) Labor profiles (including the division of labor between male and female members of production units) and labor availability, information to be gathered on a weekly basis at least.
- (5) The economics of production, information to be obtained through the weekly recording of income and expenditures from a carefully selected stratified sample of production units. As with social organization, a special effort should be made to include resources, such as remittances, brought into the community from the outside. Study of income and expenditures should be combined with a study of food consumption within the production unit. While such consumption surveys provide useful information on nutrition, their main purpose is to provide a reliable mechanism for identifying the range of foodstuffs available and for tracking the use and distribution of locally produced commodities within community. Special attention should also be paid to the extent to which women benefit, or do not benefit, from the increased demand on their labor that the introduction and development of cash cropping often involves.
- (6) The storage and processing of local produce.
- (7) The price structure in reference to potential and actual cash crops, including the relationship of this structure to other options (such as labor migration out of the country or to urban centers).
- (8) The marketing system within the community, the Niger River Basin, and adjacent areas as it relates to local produce.
- (9) The comparative advantages and disadvantages of local systems of production to relevant government irrigation projects.

d. In planning future support to RNC, AID should consider the possibility of utilizing one, or possibly two, of the fifteen-month studies mentioned under (c) as a "baseline" for a longitudinal research program, which, in effect, monitors how the people respond to subsequent development interventions, and their decisionmaking and coping mechanism in general. Though they have very important implications for evaluating specific development programs and for formulating a broader range of development strategies, few such studies exist.

e. In working closely with the Niger River Commission during the years ahead, the AID should endeavor to ensure (1) that the proper type of studies are carried out as they relate to a program of integrated rural development, and (2) that the results of such studies are built into specific development programs and projects. In this regard, AID intends to work closely with the Commission to expand the scope of its professional staff to include key staff members trained in such disciplines as rural sociology, social anthropology, social psychology, cultural geography, agricultural economics, livestock management, and fisheries development. The training of such staff, however, also requires that the RNC have the organizational capacity to use them effectively. One mechanism which deserves serious consideration is the creation of a social and economic study and evaluation unit within the Commission which is responsible for providing whatever information is necessary for involving local populations more actively in the river basin development. Since it relates to the capacity of the RNC to use and build upon whatever results are produced, the feasibility of establishing such a unit will be undertaken by AID as part of the Diagnostic Study.¹

D. Economic Analysis

One of the purposes of this "start-up" project is to provide the necessary data and information which will allow the member states of the RNC and the international donor community to thoroughly analyze future requirements for the comprehensive planning of the Niger River Basin development program and determine the level of investment which can be rationally justified on the basis of expected benefits resulting from the execution of planned development activities.

¹A.I.D. has successfully sponsored a similar unit (The Social Survey Research Unit of the Bicol River Basin Development Program); see Bicol River Basin Development Program; Department of Public Works, Transportation and Communication, Republic of the Philippines, February, 1973, p. 121, and Bicol River Basin Prop; Annex #1; USAID/Philippines, May, 1973.

In the absence of the detailed information required for full analysis, which this project phase will produce, it is felt that the section on water resources prepared for the Sahel Development Program's "Report to the United States Congress" presents the best economic justification for Sahelian river basin development including the Niger River Basin, that can be made at this time. Pertinent sections of this report (part II.E.3.a., pp. 173-178) are reproduced below:

The Potential Role of the Major River Systems in Sahel Agriculture

"There is a need for rapid increase in the food crop production which has not kept pace with population growth in the Sahelian countries, even prior to the recent drought. While there is considerable scope for expansion and improvement in rainfed crop production in the higher rainfall zones of the Sahelian countries, because of the arid conditions in most of the region, there are large areas, particularly along the Senegal river in Senegal and in Mauritania, along the Niger River in Central Mali and in Niger from Tillabery to Gaya, and in the Lake Chad Basin, where rainfall amounts are insufficient to grow food crops on a reliable basis, and irrigation is the only viable alternative. Experience in the "groundnut basin" of Senegal is a demonstration that productivity improvement from investment in rainfed production has barely - if at all - kept pace with population growth and that income increases have been insufficient for significant improvement in the quality of life of the people living in the area. Certainly there remains settlement of new lands freed from disease vectors or otherwise made available for cultivation through technology, but this is a limited possible solution because poorer soils and lower rainfalls are constraints and moderately large farms are necessary to produce the income levels needed as an inducement for resettlement. Thus, such settlement requires just as high an investment per family as is needed to obtain the same income level from irrigated holdings.

"Based on the World Bank, FAO, AID, and UNDP studies to date, it is clear that, although the extent of irrigable land in the principal Sahelian states' river basins is not yet known, considerable advanced planning has been undertaken in the three principal basins - Senegal, Niger and Lake Chad. In the absence of definitive land capacity and irrigability studies, most of the planning is based on estimates of 430,000 ha. in the Senegal basin (OMVS program) with IBRD current costs for development running at an average of over \$5000/ha; 2,700,000 ha. in the Niger basin (IBRD rough preliminary estimate); and 680,000 ha. in Lake Chad basin (FAO 1974 survey of prospects).

The Bank, FAO, and most other donor evaluations for a development strategy in the agriculture sector recognize that in the higher rainfall areas of the Sahelian countries, rainfed agricultural production must be expanded to assist in meeting the food requirements of growing populations. There are, though, large areas where rainfall even in normal years is insufficient to grow food crops without irrigation. In addition, the recent drought years resulting in huge imports of food grains on an emergency relief basis has demonstrated that traditional rainfed production alone can not sustain the human and livestock population of the affected countries. Development of substantial areas of irrigation will be needed over the long range of time to produce additional food crops to stabilize overall production and, additionally, irrigated crop residues for livestock feed to help to maintain the cattle herds which were decimated by the recent drought.

Average annual rainfall throughout the lower Senegal basin in Senegal and Mauritania, the Niger inland delta in Mali, the Niger course in eastern Mali and part of Niger, and the Lake Chad basin north of N'Djamena in Niger, Nigeria, Cameroon and Chad is below 500 mm, and in a major percentage of these areas there is quasi-desert. With high evapotranspiration rates and severe variability of rainfall, very low yields of under 400 kg/ha. of drought-resistant cereals such as millet are obtained now. While some improvement of these yields is feasible through better practices and the use of modern inputs the ultimate potential remains very low, probably less than the 1000 kg/ha. now realized from rainfed production in the higher rainfall areas of the region. This is the reason that wherever in these parts of the Sahel there is no irrigation, rainfed farming is restricted to very low level subsistence type operations or flood recession cropping that is very high risk and limited in time and growing season. If the Governments, assisted by a wide range of donors, pursue the rainfed alternative in the Savannah or Sudanian portions of the region, irrigation development will not detract from worthwhile investment in rainfed production.

Irrigation, of course, is possible from wells to tap groundwater, from ponds to trap and hold surface water, and from diversion of unregulated river flows, as well as from storage reservoirs on the rivers. All of these types of irrigation, both for rainy seasons supplemental water and for dry season additional crops, deserves study and pilot utilization when it proves feasible. It may well be that for long-range solution to the problem of food deficit in the Sahelian states, upstream regulation for dry season pumping and gravity flow irrigation must be employed, but this is the most costly solution and the one requiring the most thorough understanding of physical and socio-economic data before it is undertaken.

It must be kept in mind in planning the program of studies and projects for long term utilization of water resources in the region, that in such an area of water shortage that there are multiple uses for the available water: many of them mutually exclusive and competing. Before final decisions are made on priority assignments for water utilization, particularly of the water in the major rivers, a number of basic studies and policy decisions are necessary ...

If studies of the river and lake basins proceed and the full potential becomes clearer, while at the same time efforts are intensified to obtain maximum production from rainfed and flood recession agriculture, livestock and fisheries through improved husbandry and increased modern technology, it is conceivable that one would find that sufficient water is available from surface and ground sources to have some water resources projects in which priority is reserved for other uses than irrigation. If this proves to be true, then large blocks of firm hydro-power for agro-industry, mining exploitation and refining, and urban activities can be planned; extensive water storage and releases for maintenance of through navigation can be contemplated; and consumptive use of water by industry can even be considered. However, until the basic data-gathering studies are completed and a number of years of experience with large-scale modernization of rainfed agriculture, including through a drought cycle, is evaluated, it is clear that planning consideration must assume over-riding priority of surface water for irrigated agriculture and fisheries for food production, with secondary priority for domestic water supply and livestock.

In all of the basins examined - Senegal River, Niger River, Lake Chad - there are fundamental data-gathering studies and surveys that have not yet been made on a satisfactory reliable basis, and which are essential to any planning of rational use of the water in the river system. Without such reliable basic data, almost any isolated or ad hoc project development will lead to uneconomic under-building or over-building of project sites and will virtually insure a fiasco of misutilization of the scarce and invaluable resource of surface water ...

It is evident that in order to fund and staff the studies and surveys needed to provide reliable answers to these fundamental questions that must be answered if indicative plans are to be formulated for utilizing the potential of the basins, a massive effort must be organized. For such an effort to succeed, it must have the support of the governments of the basin countries and must be backed by the funds and the technical inputs of a major proportion of the donor community, both bilateral and international."

The multi-donor assistance project outlined in this project paper will directly translate this strategy statement, made by the Agency to Congress, into an operational program. As the first coordinated, multi-donor assistance project to be designed in support of a Sahelian river basin, the experience gained in this collaborative undertaking will be valuable in planning similar multi-donor assistance projects for other Sahelian river basins. As a result of the encouraging progress of donor/RNC collaboration, two other multi-donor river basin assistance projects (the Gambia River and Lake Chad Basin) have been initiated under UNDP auspices. As with the Niger River Basin, A.I.D. intends to participate, in close cooperation with other donors, in the design and execution of these river basin planning and institution development assistance projects.

Part IV. IMPLEMENTATION PLANNING

A. Administrative Arrangements

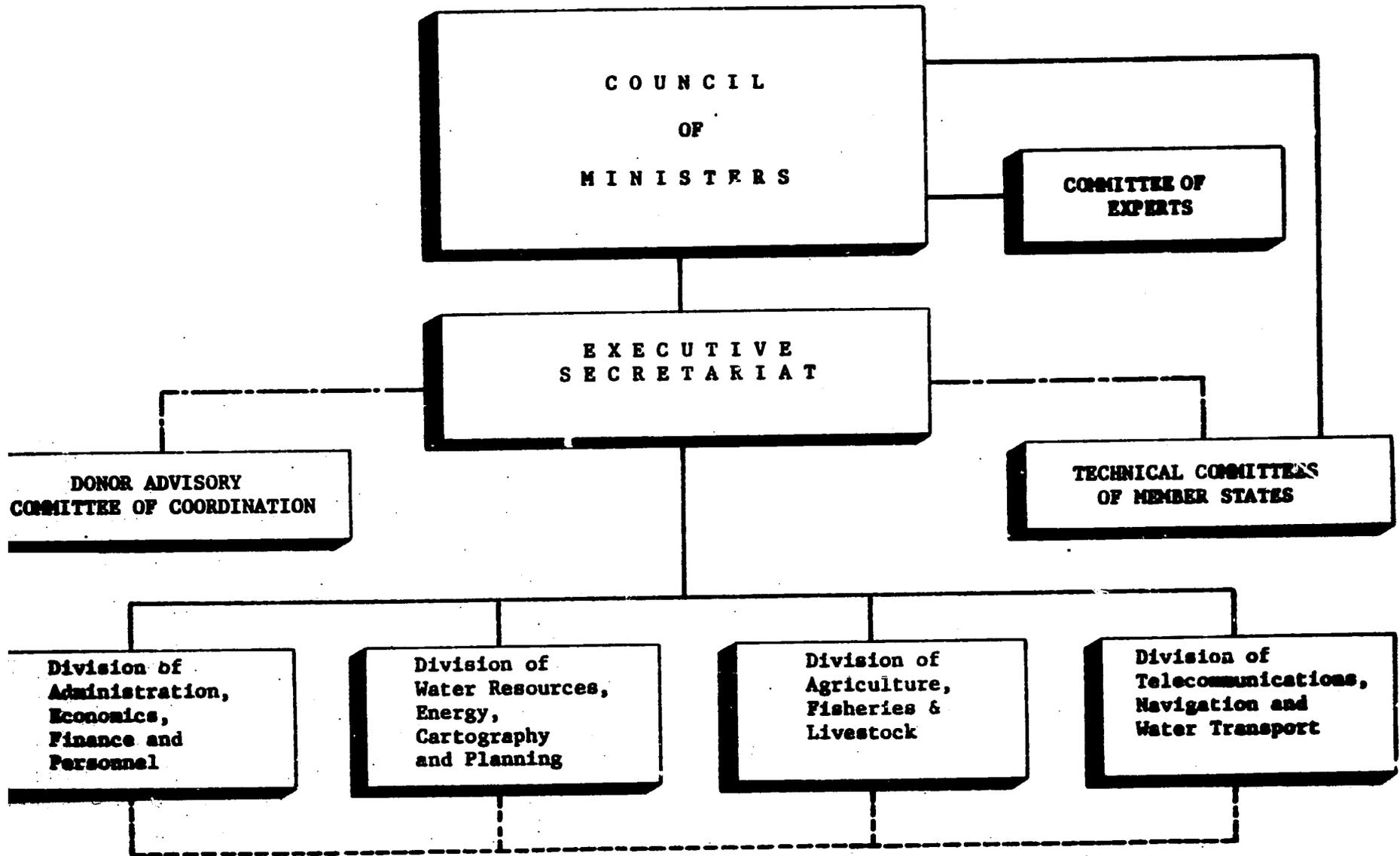
A principal objective of this project is to assist the RNC develop a fully functioning Executive Secretariat which will be capable of continuing on with the required coordination and planning for development of the Niger River Basin. It is thus understood that at this point in time the RNC does not have the technical or administrative capability to perform the extensive activities to be undertaken during the five-year Action Program which will follow upon completion of the initial phase being funded by this project.

The organizational structure for the future technical and administrative operations of the RNC have been established following discussions between the participating donors and the Executive Secretary and officially approved by the Council of Ministers at their February 1977 meeting in Lagos, Nigeria. This organizational structure is presented in Figure 2. This structure is, however, recognized as being flexible and will be amenable to revision as may be proven necessary by the results of the Diagnostic Study and future operational experience.

Although the RNC, through the Executive Secretary, will retain ultimate authority for the conduct of project execution, it will be assisted in the implementation effort by the expatriate staff and diagnostic study component technicians provided by the combined donors. Overall coordination of donor inputs and project implementation will be provided by the UNDP.

The administrative arrangements thus providing for each donor to separately provide its inputs as previously negotiated with the donors and the RNC, with overall coordination provided by the UNDP, are deemed adequate for successful implementation of this project.

RIVER NIGER COMMISSION
 ORGANIZATIONAL STRUCTURE



- line of direct authority
- - - - - line of coordination
- direct working relations

B. Implementation Plan

As noted, each donor will assume responsibility for the provision of their respective inputs to the project. This will be accomplished through the administrative procedures practiced by each donor. In the case of AID, inputs for the Diagnostic Study will be provided through AID's competitive bidding process with U.S. academic institutions or private consulting firms. The two members of the expatriate staff for which AID has assumed responsibility will be provided through AID personal services contracts or PASA agreements as appropriate. The ADO/Niamey and AID/W will perform normal procedures in the processing and placement of participants for long-term training.

Overall coordination will be conducted in two parallel frameworks by the UNDP. The method to be used in implementing and coordinating the Diagnostic Study will be as follows:

1. UNDP will coordinate the preparation of the Diagnostic Study through a private consulting firm which will be selected with the concurrence of the RNC and the participating donors.
2. Implementation of the separate components will be the responsibility of the various donors, either jointly or individually as shown on Table 1. All consulting firms and experts proposed by the various donors or the UNDP will be subject to the approval of the RNC.
3. The separate component studies will be furnished to the private consulting firm retained by UNDP for use in preparation of the final synthesis report on the Diagnostic Study and the Action Program.
4. The management and performance of the Diagnostic Study, including the component studies, will be effected at the RNC Executive Secretariat headquarters in Niamey, Niger with missions, as

appropriate, to the Commission's Member States and elsewhere. The leader for the UNDP-appointed contractor will be resident in Niamey during the study. All studies and reports will be completed in Niamey in consultation with the RNC to ensure harmony with the Commission's policies and procedures and with other Diagnostic Study contractors.

In terms of increasing the institutional capability of the RNC, the UNDP will provide a planning coordinator who will serve as the senior advisor to the Executive Secretary. The coordinator will receive comprehensive back-stopping from UNDP and the donors through UNDP headquarters in New York. His latitude of action on behalf of the donors will be defined in consultation with the RNC and the individual donors. The balance of the expatriate staff, to be provided by AID, CIDA, FAC and the WMO, will be responsible to the RNC and their sponsoring donor through the coordinator.

Implementation of the project will be in accordance with the following calendar of events:

PRIOR COMPLETED ACTIONS

- | | |
|---------------------|--|
| To 15 November 1976 | : Preparation of a revised program for submission to the Council of Ministers, reflecting the consensus reached at the Niamey meeting of RNC experts regarding the initial staffing of the RNC and planned Diagnostic Study. |
| By 15 December 1976 | : Request of the RNC to UNDP to undertake the project in association with interested donors (see Annex G). |
| 10 January 1977 | : Meeting in Paris to (1) finalize a detailed working plan for the Diagnostic Study and to prepare specific terms of reference for the diagnostic management contract and specific |

component elements and (2) to agree on the general content of a 5-year Action Program and the possible contributions to that program by specific donors.

February 1977 : Meetings of the Council of Ministers of the RNC in Lagos.

ACTIONS TO BE IMPLEMENTED

1 May - 30 June 1977 : Selection of a contractor to implement the diagnostic phase with inputs from the donors; appointment of the coordinator and subsequent assignment of specialists to the RNC staff; start Diagnostic Study and staffing of RNC.

1 September 1977 : Component groups submit preliminary analysis of data from component studies to management consulting firm.

1 November 1977 : Component groups submit preliminary findings on component studies to management consulting firm.

15 November 1977 : Submit synopsis on preliminary findings to UNDP for transmittal to Executive Secretary of RNC.

25 November 1977 : UNDP official transmission of synopsis to Executive Secretary of RNC.

1 December 1977 : Component groups submit draft final reports on component studies to UNDP management consulting firm.

15 January 1978 : Component groups submit final reports on component studies to management consulting firm.

- 1 February 1978 : Submit draft of final report on Diagnostic Study to UNDP for transmittal to and review by donors and Executive Secretary of RNC.
- March 1978 : Meeting of donors to evaluate project and discuss comments on draft of final report.
- 1 May 1978 : Submit revised draft of final report to UNDP for transmittal to Executive Secretary of RNC for review by Member States. Meeting of RNC Council of Ministers to evaluate draft of final report.

Submit final report to UNDP.

Monitoring of project execution will be carried out on the part of AID through its normal contract management procedures in collaboration with the UNDP coordination unit. Primary AID responsibility for project monitoring will rest with AFR/DR with field management and monitoring assistance provided by the ADO/Niamey. Close coordination will be maintained between AFR/DR, AFR/SFWA/SDP and appropriate project management units within CIDA (Ottawa) and FAC (Paris) and UNDP (New York) on those Diagnostic Study components which are being undertaken on a collaborative basis. The ADO/Niamey will maintain close coordination between the respective Niamey based missions of CIDA, FAC and UNDP as well as the RNC Executive Secretary.

C. Evaluation Arrangements

Given the nature of this interim phase project the combined, multi-donor evaluation of the end results of the Diagnostic Study and the ensuing proposal for a five year Action Program will constitute the project evaluation. Following the above calendar of events, this evaluation will take place during a donors meeting in March 1978 to discuss the draft report of the UNDP and make final revisions. In addition to review of the draft report this evaluation will

consider all other relevant factors such as performance of the RNC Executive Secretariat during the implementation phase, and the participation, cooperation and evidence of commitment to the longer-term program on the part of the Member States. Also, as part of the Diagnostic Study, AID will finance consulting services to study the feasibility of creating a social and economic evaluation unit within the Commission to carry out evaluative research in support of project design activities as well as result oriented ex post evaluation.

D. Conditions, Covenants, and Negotiating Status

At the January 1977 donor meeting, the issue of long-term commitment and support to the five year Action Program by the member states of the RNC was addressed.

The donors were unanimous in emphasizing the utmost importance of African counterpart staff being assigned to or recruited for the RNC as soon as possible in sufficient numbers to match the expert staff supplied by the donors. Of equally critical importance was the need for the RNC to approve an adequate budget, beginning in 1977, to cover the local costs of the Secretariat, i.e. salaries of counterpart staff, travel, logistical support, office and secretarial services.

Accordingly, the donors recommended the following actions to the Executive Secretary of the RNC:

1. That he forward the report of the donor's meeting to the Council of Ministers of the RNC drawing their attention to the commitments required in respect of the "Start-Up Program";
2. That he submit specific proposals for consideration and action by the Council of Ministers in order that the urgent needs of the RNC Secretariat for the required expansion in its African staffing be approved; and
3. That he prepare a budget covering the 1977 operations of the RNC Secretariat which will make

adequate provision for the increased costs of supporting a greatly expanded program for 1977 and subsequent years.

The Executive Secretary duly presented these matters to the RNC Council of Ministers meeting in Lagos in February 1977 for consideration and resolution. Following recommendations by the Committee of Experts, the following resolutions were approved by the Council of Ministers:

1. Adoption of a 1977 budget in the amount of 88,575,849 (\$355,000) which represents a 33 percent increase over the 1976 budget.
2. Authorization for the Executive Secretary to recruit additional professional staff from among member state nationals who will become permanent full-time members of the RNC indigenous staff. The approved positions include an hydrologist, an assistant hydrologist, a water resources engineer, an agronomist, a director of administration and an assistant director of administration.
3. Endorsement of the requirement for the Executive Secretary to prepare an adequate functioning budget to meet the future year requirements of the five year Action Program.
4. Approval of the structural reorganization of the RNC Secretariat to conform with the requirements for the implementation of the Diagnostic Study and future year operations (see Figure 2). This reorganization comprises the establishment of four technical divisions as follows:

Division I - Water Resources, Planning, Energy and Cartography

Division II - Navigation, Water Transport and Telecommunications

**Division III - Agriculture, Fisheries and
Livestock**

**Division IV - Administration, Personnel, Eco-
nomics and Finance**

The donor community thus feels that required conditions placed upon the RNC have been met in sufficient fashion to allow individual donors to proceed to the stage of project preparation and approval. Prior to actual disbursement of funds by any of the donors the RNC Executive Secretary will be required to supply evidence that sufficient dues have been paid by member states to cover the approved RNC operating budget of 88,575,849 FCFA.

As a separate condition attached by AID it was stipulated that AID would like to be reasonably assured of the amounts, type and timing of assistance to be provided by other donors during this start-up period. While reassured on this point by the separate statements presented by UNDP, CIDA and FAC at the January 10 donors meeting in Paris, AID will place a condition in its Project Agreement with the RNC that Grant Agreements in general conformance with the types and amounts of assistance outlined in this Project Paper will have been duly executed between the RNC and the other donors prior to the disbursement of funds under the AID Grant Agreement.

ACTION MEMORANDUM FOR THE ACTING ASSISTANT ADMINISTRATOR FOR AFRICA

FROM : AFR/DR, John L. Withers *Stephen Klein for*

SUBJECT : Preparation of Niger River Basin Project Paper

Problem: To authorize preparation of a Project Paper which, when approved, would enable AID to provide \$1,000,000 in grant technical assistance by May 1, 1977 as its contribution to a multi-donor technical assistance project in support of the Niger River Commission.

Discussion: The ECPR reviewed on April 7, 1975 the PRP on Niger River Development Planning (see attachment #1) and endorsed the concept and the content of the PRP but deferred approval given the uncertainty of other donor support to complement the planned A.I.D. assistance. Since September 1976 major progress has been made, under the leadership of the UNDP, in designing and negotiating with several donors (i.e. UNDP, France, Canada and A.I.D.) and the Niger River Commission) the content of a multi-donor assistance program for the NRC. Full agreement in principle has been reached (see attachments #2 and #3) with the involved donors and the NRC Secretariat and the NRC Committee of Experts on the nature of technical assistance to be provided, the manner in which the assistance will be provided, and the sharing of costs among other donors.

On the basis of the accomplishments of the past several months, the Assistant Administrator for Africa approved on January 10, 1977 a statement (see attachment #4) which was delivered at the Second Donor Conference on the Niger River Basin, outlining A.I.D.'s intent to provide \$1.0 million in FY 1977 in technical assistance to the NRC as the U.S. contribution to the multi-donor assistance program. The UNDP, Canada and France issued similar statements of support (see attachment #2, pages 6-9).

It was the collective opinion of the donors and the NRC that the first phase of the program should be limited to conducting necessary baseline and feasibility studies and to the organizing and staffing of the NRC Secretariat with expatriate and African personnel who will oversee the execution of these studies and who will insure continuity in the anticipated transition from this initial "diagnostic" phase to a larger and longer term institutional development phase. The first phase is to be accomplished over a 24-month period beginning May 1977. Funding for the entire 24-month period would be made available from FY 1977 regular program funds. The components of the multi-donor assistance program proposal for AID financing in FY 1977 are as follows:

	(\$000)
-Agricultural assessment of the Niger River Basin	300.0
-Topographic mapping assessment and thematic map production	200.0
-Water Resources Planning Advisor (24 mm)	155.0
-Land Classification Advisor (24 mm)	155.0
-Participant Training	
-Long-Term (72 mm)	75.0
-Short-Term Observation	50.0
-Other Studies	50.0
-Commodities	15.0
<u>TOTAL</u>	<u>\$ 1,000.0</u>

In view of the high priority of this project and its feasibility study nature, it is recommended that we immediately proceed with the design of the PP to enable AID to meet the May 1, 1977 start-up date agreed to in principle by the donors and the NRC at the January 10-14 multi-donor conference. Handbook 3, Part 1, Transmittal Memo #1, #14 Feasibility Studies, pp. 7-5, provides for contingencies of this nature.

If the results of Phase I warrant further consideration of assistance from A.I.D. and other donors a follow-up three year Project Paper will be prepared for AID FY 1978 consideration.

Recommendation: That you authorize DR, SDP, and RDO/Niamey to prepare the Project Paper for the Niger River Basin covering Phase I of the multi-donor assistance program in support of the Niger River Commission.

APPROVED *[Signature]*
DISAPPROVED _____
DATE 2/15/77

Clearances:

AFR/SFWA:DShear *[Signature]*
AFR/DR:JKelly(draft) *[Signature]*
AFR/DP:EDonoghue(draft) *[Signature]*
AFR/DR:JWithers(draft)
AFR/CC:STisa *[Signature]*
PPC/DPRE:JWelby(sub) *[Signature]*

AFR/SFWA/SDP:DTinsler:2/10/77

DIAGNOSTIC STUDY OF NIGER RIVER BASIN

TERMS OF REFERENCE

FOR

AGRICULTURE

Diagnostic Study of Niger River Basin

Terms of Reference

Agriculture

I. Introduction

A. Study Objectives:

The objectives of the diagnostic study of agriculture of the Niger River Basin are:

1. To document and evaluate available data and information in terms of their utility, completeness and quality;
2. To document existing land and water use systems used by Niger Basin residents, with special emphasis on their potential for development; quantify available agricultural and land resources;^{1/} identify the local and national constraints to improving agriculture in the basin; estimate production potential under different development strategies with and without water control and other inputs; and isolate and define immediate and mid-term development opportunities that are consistent with the objectives outlined in the basic Project Document.^{2/}
3. To prepare a five-year Action Program which defines the analytical, research, field studies and pilot projects required for development of a comprehensive plan and investment program for the Niger River Basin to be undertaken by the Niger River Commission (NRC), and member states as appropriate.
4. To identify available data and information that will be required during the course of the five-year Action Program, determine feasible means of

^{1/} The land resources of the Basin must be evaluated in liaison with the consultant for the "Water Resources" component of the Diagnostic Study.

^{2/} UNDP, CIDA, USAID, IBRD & FAC, "Development of the Niger River Basin: Technical Preparatory Meeting of the Meeting of Donors," Paris, 12 pages with Annex I of 33 pages, 6-8 September, 1976.

transferring needed data and information to NRC Headquarters (Niamey, Niger), and elaborate on equipment, facility and manpower requirements for the storage, processing and handling of data and information in Niamey.

II. Study Area and Scope

With a length of over 4000 km, and a basin area of 1.9 million km², the Niger is one of the world's great rivers. The Upper Niger flows into the agriculturally-valuable and hydrologically-complex Interior Delta of Mali and the Lower Niger, which emerges as a much smaller river from the Interior Delta, flows through the desert, and is then joined by successively larger tributaries until it reaches the Bight of Benin via a second conventional delta in Nigeria.

For the purposes of this study the agricultural analysis will be limited to the area contained within the watershed of the Basin. Also for this study, agriculture will be defined to encompass land and water resources, fisheries, farm enterprises, both crop and livestock, and will cover rainfed, flood recession, natural submersion and controlled irrigated agriculture.

III. Scope of Work

The contractor shall, drawing mainly from existing information supplemented by necessary field inspection, perform the following services:

A. Agricultural Resources

1. General

Provide an assessment of land and water suitability for crop, livestock and fisheries production in the Basin, giving full consideration to the technical, agronomic, biological, economic, social and environmental considerations which constrain existing or may constrain future production and of marketing potential.

2. Land & Water Suitability

The contractor should locate, map and assess the following agricultural lands:

- a. Potential arable lands;
- b. Existing lands under dryland farming, including a descriptive analysis of existing dryland farming systems and their potential for development;
- c. Potential dryland farming areas;
- d. Existing irrigated lands, including a descriptive analysis of existing irrigated agricultural farming systems and their potential for development.

For the potential arable lands and the existing irrigated lands, the contractor should assess the suitability of the potential on existing water supply source. This assessment will be made in close cooperation with the consultant conducting the Water Resources component of the Diagnostic Study.

In assessing the suitability of land and water resources of the Basin, the contractor is to pay attention to those factors affecting crop development. For the potential arable lands and the existing irrigated lands, particular consideration should be directed to appraising the characteristics and conditions of:

- low gradients
- topographic lows
- windfall and river flooding
- salted land
- depths to and fluctuations of water table
- surface and sub-surface drainage

- soil factors including depth, permeability, iron oxide crusts and pans
- salinity and acidity
- low cation exchange capacity and base saturation
- moisture retentivity

The contractor should conduct field appraisal to determine land characteristics, conditions, use and management in order to identify constraints and development opportunities.

In conducting the assessment of existing irrigated agricultural systems, the contractor will determine present production levels and identify constraints that retard increased output. The contractor will evaluate each system in terms of the adequacy and quality of support services available to project area farmers including, but not limited to provision of inputs, and extension services. Special attention is to be directed to the adequacy of system operation and maintenance capability and the role project beneficiaries play in operating and maintaining projects works. The consultant will draft recommendations including detailed Terms of Reference for follow-on actions that will improve project output, including rehabilitation of project works and provision of necessary support services including formation or strengthening of irrigation associations.

3. Present Agricultural Situation: Constraints, Opportunities and Alternatives

a. Present Technology

Describe, by major farming systems, techniques (e.g. planting arrangement, date of planting, method and frequency of weeding, disease and pest control measures, inorganic and organic fertilizer application, power sources used, etc.) currently used in the Niger River Basin by farmers in terms of crop enterprises under both irrigation and dryland conditions. An analysis of existing livestock systems is also to be made with special reference to the

interrelationship between crop and livestock systems. With respect to irrigated agriculture the analysis of existing practices should differentiate between flood recession, natural emersion, and crop production with partial water control and crop production with full water control.

b. Factors Affecting Agricultural Development

Assess the existing constraints and problems faced by farmers in the River Basin (e.g. disease problems, pest problems of rice eating fish, low yields, water use compared with water requirements, lack of market access, etc.). Likewise, identify and describe those factors favoring agricultural development in the Niger River Basin.

c. Available Technology

Assess the availability of technology to overcome the constraints and problems, outlined in 3b. above. As far as feasible, assess appropriateness of available technology in terms of its technical feasibility, economic profitability and social acceptability to the individual farmer and its compatibility with existing farming systems.

4. Agricultural Development Zones

On the basis of the information provided by the surveys carried-out under Sections III. A. 1, 2, and 3, the contractor will identify and subsequently divide the Basin, based on factors which include the development potential of existing production systems as well as on agronomic, climatologic, hydrologic and/or other relevant factors into agricultural development zones.^{3/}

^{3/} Two studies have attempted to sub-divide the Basin into zones. See: "Niger River Commission Study"; Holmes and Narver, Inc., 1968 (financed by U.S.A.I.D.); "Potential Areas for the Development of Large-Scale Irrigation in the Upper Valley of the Niger", May, 1974, by J. Argoullon; published in L'Agronomie Tropicale.

The contractor will present the analysis of constraints and potential of the agriculture sector in terms of these agricultural development zones. Based on this analysis, the contractor is to rank order each zone on the basis of the zone's agricultural development potential (high to low). The contractor is to present the data for each agricultural development zone and for the Basin as a whole in the form of small scale (1:1,000,000) maps supported by appropriate quantitative analysis and written narrative.

B. Cost and Returns in Agricultural and Livestock Production

Provide detailed quantitative descriptions of the major farming systems in the Niger River Basin. In particular construct household budgets (farm management type) for representative farming systems in the various Agricultural Development Zones. Farming systems should be defined to include the following:

- Crop enterprises on dryland, flood recession, natural subemersion, irrigation with partial water control and irrigation with full water control.
- Livestock enterprises.
- Off-farm enterprises (e.g., trading, forestry, manual labor.

Adequate attention is to be given to the variations between farms within each representative system. Full attention is to be given to the following:

1. Land
 - Land area controlled and percent farmed and fallow by household
 - Area devoted to alternative crops and livestock
 - Land development cost for irrigated land: cost of development to be classified by type of land prior to development and level of final development. Land development

costs to handle on-farm water delivery systems i.e. farm ditches, laterals, bunds and heat gates; and surface and subsurface drainage systems.

2. Water

- Assess crop water requirements, rate and frequency of application
- Cost of water, e.g. fees paid to water authority, on farm costs of pumping water, etc.

3. Livestock

- Type and value of livestock owned and age/sex distribution; use for animal powered equipment
- Productivity and performance of the livestock, i.e. growth, calving and mortality rates, etc.
- Livestock husbandry techniques and costs.

4. Capital

- Quantity and value of fixed capital, i.e. buildings, machinery and equipment, including animal power equipment.

5. Labor

- Stock of labor in the household, including age/sex distribution, educational level, division of labor as it relates to different economic activities; distribution of projects among household members, with special reference to the extent women benefit from agricultural development.

C. Food and Fiber Demand and Supply Situation

1. Assess and update present and likely future demand for food crops, livestock and fish produced in the Niger River Basin. Particular attention should be paid to crops likely to be produced under irrigated agriculture, e.g. rice, sugar cane, cotton, wheat and vegetables. Demand is to be broken down into the domestic demand of each country as well as regional (West African) demand and if possible by agricultural development zone as outlined in Section II.A.4.

2. Assess the present and future supply situation if present policies including projects already close to execution are implemented for the crops, livestock and fisheries as mentioned above.

3. A special effort should be made by the consultant to liaise with the working groups of the Club des Amis du Sahel dealing with markets and price policy, irrigated and dryland agriculture, livestock and fisheries. These groups are in the process of making similar assessments on a country basis for RNC riparian states who are members of CILSS, i.e. Mali, Niger, Chad, Upper Volta.

D. Agricultural Service and Development Institutions

1. Market and prices: Evaluate the functioning of market institutions for agricultural inputs and output with special attention to food crops. Examine the traditional and formal (State) marketing institutions and their effect on price determination. Identify bottlenecks in the marketing system and price structure that are likely to hamper the development of the identified agricultural development zones.

2. Credit: Examine existing agricultural credit programs and determine their effectiveness in encouraging agricultural development, particularly irrigated agriculture.

3. Storage: Briefly describe the different types of farm and non-farm storage facilities used in the identified agricultural development zones. Assess storage costs including the amount of loss in each system. Identify likely bottlenecks in storage facilities in the agricultural development zones.

4. Research: Briefly describe the applied research institutions responsible for agriculture in each member country with special emphasis on food. Describe the research underway or completed that would be of value to the NRC and outline programs of future research which would be of mutual value to national research efforts as well as the planning work of the NRC. Assess the availability and reliability of data on the yield increases to be expected from adoption of improved practices, especially irrigation.

5. Extension: Describe the organization of the agricultural extension system in RNC member states. Outline major constraints by country in improving extension efficiency and effectiveness, particularly in priority agricultural development zones, with emphasis on extension activities to farmers in irrigated areas and extension support to water-user organizations.

E. Fisheries

The contractor shall conduct a comprehensive analysis of the existing studies and information, augmented by limited field inspection, on two aspects of fisheries development:

- (1) captive fisheries in the Niger River Basin and
- (2) fish farming.

The assessment of the fishing industry will include documentation of the present

fishing catch by species groups, methods used, numbers of boats and fishermen, and history of the fishing industry. Tabulation of catches by country will be required as well as a record of historical catches and international exchanges of fishery products. Data on non-fish species such as frogs, turtles, shrimp, snakes or shellfish should be included if possible.

The analysis of previous studies of the fishing industry in the various countries will include lists of the recommendations and findings of previous study teams. Where recommendations were not carried out, the reasons should be studied and if projects resulted from these recommendations the reasons for success or failure of the projects should be evaluated.

The fishery management organizations of the respective countries should be described as well as any international organizations and international fisheries agreements pertaining to the Niger River. The fishing regulations of each country should be described, the ability of the countries to enforce the regulations evaluated, and international conflicts or disagreements documented.

Marketing and processing procedures for fish should be described. Demand and price structure for the various types and qualities of fishery products both in urban and rural areas should be analyzed.

An analysis of the natural fisheries resources of the River Basin should be conducted including some rough estimates of abundance of various species or potential production of the species. Meteorological and man-caused environmental changes affecting fish production should be noted.

The analysis of fish farming to the extent that it exists while parallel in some aspects to the study of fisheries, will also have important distinctions.

Present fish farming activities should be described in detail with data on harvests by country and species.

Methods used, sources of fingerlings, feeds used, and manpower involved should also be documented.

An appraisal of resources available for use in fish farming should be conducted. These resources will include water supplies, soils, land not suitable for agriculture, feeds, organic agricultural wastes and manures, and labor. The potential for construction of small and large reservoirs which could serve multiple uses including fish production should be examined.^{1/}

A review of previous studies of the potential for aquaculture will be made, including a summary of the conclusions, recommendations, resulting action, successes, and failures emanating from these studies. Reasons for failures should receive special attention.

Market demand for cultured fish species, and procedures for preservation and distribution of products should be described.

The five year action program for fisheries will include recommendations for the provision of additional studies required to fill noted information gaps as well as the terms of reference for studies, pilot projects and research, to test or develop methods for improving the harvest of fishery resources through better management, improved methods and the identification and development of new activities relevant to the development of fisheries in the Niger River Basin.

The contractor will also list and inventory all available studies, information and data on fisheries and the fishing industry in the Niger River Basin and make arrangements or recommendations for its transfer to the Documentation Center of the River Niger Commission.

^{1/} This aspect of the study must be carried out in close consultation with the contractor responsible for the water resources component of the diagnostic study.

IV. Contractor's Proposal

A. General

The Proposal shall respond to the guidelines set forth in these terms of reference and to all applicable provisions and procedures of the AID Capital Projects Guidelines (MO 1442.1) dated March 1971. The Contractor is expected to submit a proposal which presents his best concept for satisfying objectives herein set forth. All costs for preparation and submittal of the proposal shall be borne by the Contractor.

B. Time Frame

It is desired that completion of study shall be in 9 months, with one additional month allowed for editing and publishing of the final report.

C. Metric System

The metric system shall be used exclusively.

D. Scope

The study is a joint undertaking of A.I.D. and the Canadian International Development Agency (C.I.D.A.). Each Agency will retain a contractor to carry-out certain sections of the study. It is understood, however, that A.I.D., and in turn the A.I.D. financed contractor, is the lead organization and is therefore responsible for the overall methodology to be employed in executing the study, quality control and for insuring the timely completion and publication of the final report. The C.I.D.A. contractor, working within the overall methodological framework designed by the A.I.D. contractor, will be responsible for the following sections:

III D. Agriculture Service and Development Institutions

III E. Fisheries

III F. Forestry

All other sections will be the responsibility of the A.I.D. Contractor.

The Contractor's proposal shall describe clearly and precisely how the Contractor proposes to undertake the study, with particular emphasis on methodology to be applied in executing the study.

The Contractor shall indicate the number and personal qualifications to its staff proposed for assignment to the project and their anticipated period of assignment. The Contractor shall also indicate the qualification of any outside Consultants proposed and their anticipated period of assignment and their personal qualifications. French language capability at the FSI (Foreign Service Institute) 3 level or higher is essential for key members of the study team. A network of proposed activities, and schedules of major events shall be presented in CPM or PERT form together with descriptive information. The Contractor shall also comment on the requirements for counterpart support and organization.

E. The selection of the firm to perform these professional services will not be made on the basis of price, and price should not be included in the proposal. Inclusion of cost will make the firm ineligible for consideration. However, the proposal shall indicate the number of months proposed, international travel, external inputs, and other relevant information.

F. Contract

The firm selected to accomplish this study will be expected to negotiate and enter into a cost-plus-fixed-fee contract with A.I.D. in accordance with AID Capital Project Guidelines.

V. Implementation

The study will be executed by the contractor under the broad policy supervision of A.I.D. and C.I.D.A. and under the direct field supervision of a consulting firm to be retained by UNDP who will be responsible for insuring consistency among the various sectoral studies, and their timely integration into a five year Action Program for the Niger River Commission. The study will be undertaken in Niamey, Niger.

DIAGNOSTIC STUDY OF NIGER RIVER BASIN

**TERMS OF REFERENCE
FOR
WATER RESOURCES**

DIAGNOSTIC STUDY OF NIGER RIVER BASIN

TERMS OF REFERENCE

WATER RESOURCES

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WATER RESOURCES

1. BACKGROUND

The River Niger Basin (RNB) has extensive water resources, the development of which could provide a basis for long-term economic and social growth. Such growth would derive from the creation of benefits through improvements in agriculture (irrigation for example), through the development of hydroelectric energy, river navigation facilities, flood control and fisheries, and through the improvement of municipal, industrial and other water supplies including both quantity and quality aspects. By implementing a comprehensive programme of study of the resources of the RNB, the River Niger Commission (RNC) is embarking on a planning exercise aimed at attaining a managed water regime in the basin. The planning exercise will result in the preparation of a Plan of Development, the implementation of which will be carried out in stages, each being self-contained with identifiable benefits justifying its implementation, and each contributing to economic growth in the Member States of the RNC and the attainment of a managed water regime.

The subject-matter to be covered under the water resources diagnostic study includes:

- a) Meteorology and climatology
- b) Surface water hydrology
- c) Hydrogeology and groundwater
- d) Potential water supplies and demands.

A substantial amount of data and information is already available on these topics at, for example, the headquarters of RNC in Niamey, the offices of ORSTOM and BRGM in Paris, other regional organizations in Africa (e.g. CILSS, CIEH^{1/}), and offices of water resources agencies of the Member States of RNC. Such data and information include, for example, precipitation

^{1/} CIEH, Ouagadougou, has retained TAMS, an American consulting firm, to make a water and land inventory for the Sahel.

and stream flow records and analyses of these data, water quality data, and a regional synthesis of the hydrogeology and groundwater resources of the Sahel. Significant sources of information and pertinent documents known to be available for the use of consultants undertaking the diagnostic work are listed in an attachment to these terms of reference.

2. OBJECTIVES

The objectives of the water resources diagnostic survey are as follows:

- a) To document and evaluate available data and information in terms of their utility, completeness and quality;
- b) To document existing conditions, quantify the climatic, water and land^{1/} resources largely from published information, and isolate immediate and mid-term development opportunities according to the Objectives and Strategy outlined in the basic Project Document^{2/};
- c) To prepare a five-year action programme which defines the analytical and field studies required for development planning activities to be undertaken by the RNC;
- d) To identify available data and information that will be required during the course of the five-year RNB study, determine feasible means of transferring needed data and information to Niamey, and elaborate on equipment, facility and manpower requirements for the storage, processing and handling of data and information in Niamey.

3. SCOPE OF WORK

3.1 General

The Consultant is expected to provide all the necessary professional and technical services, logistics support and equipment required to fulfill the objectives of the study. To this end the Consultant will engage in discussions with officials of the RNC, agencies of Member States and donor organizations involved in the overall diagnostic phase of the RNC project, as may be required to gain a complete understanding of the project. The Consultant's work will include desk studies of available data and information with

1/ The land resources must be evaluated in cooperation with the Consultant for the "Agriculture" component.

2/ UNDP, CIDA, USAID, IBRD and FAC, "Development of the Niger River Basin; Technical Preparatory Meeting of the Meeting of Donors", Paris, 12 pages with Annex I of 33 pages, 6-8 September, 1976.

ORSTOM and BRGM, Paris, and others; limited field visits to gain first-hand familiarity with water resource conditions in the basin, and consultations with other knowledgeable experts. Of particular importance will be the need to cooperate and consult on a continuing basis with consultants who may be engaged in other component diagnostic studies (i.e. agriculture, engineering, etc.), and with the overall project management consultant having responsibility for integrating the results of the various diagnostic studies into a coherent program.^{1/}

For projects recommended for early follow-up to the diagnostic phase, the Consultant will be expected to prepare complete terms of reference suitable for the calling of proposals and/or tenders to undertake necessary surveys and studies.

3.2 Meteorology and climatology

Knowledge and data of meteorology and climatology is needed to determine viable cropping patterns, crop water requirements and supplies for rainfed and irrigated conditions. Such data, namely rainfall, solar radiation, evaporation, temperature, wind velocities and cloud cover form the basis for water balance studies and water supply and demand studies. In addition, rainfall data in the upper basin will be needed for design flood studies. Thus the Consultant will be required to:

- Evaluate the network of climatological stations in terms of its coverage and in terms of the quality, consistency and continuity of data that have been and are being collected^{2/};
- Evaluate the field methods and instrumentation being used with a view to evaluating data accuracy and identifying possible improvements required;

^{1/} The Consultant is expected to supply the mapping consultant with drafts of thematic maps showing e.g. Niger Basin with the river system, gauging stations, rainfall stations, etc.

^{2/} The UNDP/WMO AGRHYMET program is doing some of this work, and some recent climatological studies of West Africa are available (The Rockefeller Foundation, 1975, App. B; Winstanley, 1974; and Lamb, 1973).

- Evaluate the operating and maintenance procedures of the network with specific attention to the calibration of instruments;
- Evaluate the data-handling and reporting methods with a view to outlining methods that will ensure that data will be available for use in the RNC programme on a timely basis.

3.3 Surface water hydrology

Data and information on surface water resources, notably river discharges are needed to determine the distribution in time of available flows and water levels at strategic locations along the rivers. The Consultant will be required to undertake network and data evaluations as indicated under paragraph 3.2.

A select number of the 200 river gauging stations should be examined to obtain an indication of channel stability and the accuracy of the discharge data, the consistency of historical data, and the likely precision of current data collection programmes.

The Consultant should review available sediment data, the current status of sediment transport measurements and river regime and morphologic studies and suggest future needs in these aspects.

The Consultant should review the limited data available on the chemical contents of the river waters. Available analyses show that the the river water is slightly acid, which has a corrosive effect on structures.

The Consultant must assess information pertaining to flood-prone areas and outline investigations and studies relevant to flood damage reduction and control in such areas.

3.4 Hydrogeology and groundwater

Planning on a comprehensive basis for development of the water resources of the RNB will require a knowledge of

the groundwater resources of the basin, in particular of:

- The location and hydrogeology of major aquifers;
- Critical analysis of data on recharge (from rainfall, from floods or from rivers laterally);
- Evaluation of possible effects of irrigation on behaviour of water table;
- Groundwater quality.

Within the context of the foregoing the Consultant is expected to assess the current state of knowledge of regional hydrogeology, groundwater dynamics, water table depths, aquifer characteristics and chemical aspects of water quality, and to outline future investigations that may be needed to expand present knowledge of these aspects. Such investigations may include test drilling, testing and monitoring of wells, installation of observation wells and study of phreatic fluctuations and groundwater flow. In making his proposals the Consultant should be cognizant of the general economics of groundwater development in the basin and of the social and environmental conditions that may constrain technological development.

3.5 Potential Water Supply and Demand^{1/}

The Consultant for the Engineering phase of the diagnostic survey will supply available reports on water supply/diversion/disposal projects to the water resources consultant. The latter will compile from these reports relevant data for all major sources and consumers (municipal, industrial, agricultural, quality maintenance, etc., as listed in the terms of reference for "Engineering").

^{1/} At least four reports are available on development potentials: IBRD (June 1975) and Argouillon (1972) for irrigation in Niger Basin; FAO (March 1976) for agriculture in the Sahel; PAC/SCET (1976) for water resources in the Francophone Sahel. Italconsult (1962) has prepared a report on the effect of proposed projects on the Niger river.

Gaps in information must be identified and recommendations made with respect to surveys and studies needed to acquire the necessary planning data. The water resources Consultant will undertake the following tasks:

- 1) Review the validity and consistency of available water demands and disposal requirements;
- 2) Extrapolate the principal demands to all major cities, potentially-irrigable areas, major industries including mining, etc.;
- 3) Make a first estimate of the aggregate effect of the requirements in terms of quantity and quality on the water supplies in the basin;
- 4) Indicate the degree of river regulation needed for meeting these requirements; and
- 5) Recommend methods for estimating and projecting requirements for water supply and disposal.

4. PLAN OF WORK

The Canadian International Development Agency (CIDA) and Fonds d'Aide et de Cooperation de la Republique Francaise (FAC) will organize full cooperation for the water resources diagnostic study. In this regard, following an existing agreement between FAC and RNC, FAC is already in the process of financing hydrological studies being undertaken by ORSTOM in the interior delta of the Niger River in Mali. In addition, BRGM, under the auspices of FAC, is undertaking a groundwater resource evaluation of the francophone portion of the basin. It is expected that results of these studies will be available for use during the diagnostic phase.

The following division of responsibilities between FAC and CIDA is tentatively made:

CIDA

- Meteorology and climatology aspects in all of the basin;
- Hydrogeology and groundwater aspects in the Nigeria portion of the basin;

- Preparation of the report of the water resources diagnostic study. The report will be issued as a joint CIDA-FAC study.

FAC

- Hydrogeology and groundwater aspects in the francophone portion of the basin;
- Participation of ORSTOM's resident hydrologists in the basin as information sources concerning data collection programmes.

CIDA and FAC

- Will share responsibility for surface water hydrology and water supply/demand aspects. In this respect FAC is funding an updating of Monograph Number 2 (Monographie Hydrologique du Bassin du Niger, 1970) work on which is currently in progress by ORSTOM in Paris.

The following schedule of activities for executing the work is suggested, having in mind the necessity to accomodate the schedule of progress of the overall diagnostic phase:

<u>1977</u>	<u>Activity</u>
1 May	Consultant selected by CIDA; BRGM groundwater report made available by FAC;
1 June	Consultant mobilized; Initial contacts and interviews with other donors and RNC completed;
1 August	Assembly of basic information, data checking and field visits completed;
1 September	Submit preliminary results to management consulting firm.
1 November	Interim report submitted to management consultant for use in reporting to Council of Ministers.
 <u>1978</u>	
1 January	Final report submitted to management consultant.

Initial contacts will include officials and experts of RNC, UNDP, USAID and FAC, and the consulting firms selected by other donors for the diagnostic phases. Such contacts will be made primarily by the team leader for the purpose of becoming acquainted with the experts involved and discussing in some detail the various schedules of work in relation to each other. The responsibility for making such contacts will be left to the Consultant. The full team of experts will be engaged in the collection and compilation of basic data and information and the follow-up field visits. Thus the schedule as suggested above would provide for approximately two months of active travel and field work followed by a two-month synthesis and analysis period involving largely desk studies, and terminating with submission of the interim report to the management consultant.

5. MANPOWER AND COST ESTIMATES

5.1 CIDA component

Execution of the water resources diagnostic phase is expected to require some 40 man-months of Canadian consulting services in the fields of hydrology, hydrogeology, water resources engineering, economics, potable and industrial water supply and other specialties. An estimate of cost of providing these services through a professional consulting firm is as follows:

	<u>Dollars</u>
Services, 40 man-months, including salaries, management fees, overhead, and fringe benefits.....	240,000
Travel, international, local, including per diem living costs.....	40,000
Report preparation, including drafting, typing, reproduction.....	10,000
Contingency and miscellaneous expenses.....	30,000
TOTAL	<u>\$320,000</u>

5.2 FAC component

	<u>Dollars</u>
Hydrology (including monograph updating).....	231,000
Hydrogeology.....	<u>125,000</u>
TOTAL	\$356,000

DIAGNOSTIC STUDY OF NIGER RIVER BASIN

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ENGINEERING

DIAGNOSTIC STUDY OF NIGER RIVER BASIN

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ENGINEERING

1. BACKGROUND

The Niger River Basin (NRB) has extensive water resources and significant hydro-electric potentials, the development of which could provide a basis for long-term economic and social growth. Development of the NRB involves the creation of economic and social benefits through the development of irrigation, agriculture and improved land use in general, the development of the hydro-electric energy, navigation improvements, flood warning and control and fisheries, and the improvement of municipal and other water supplies including both quantity and quality aspects.

By implementing a comprehensive program of study of the NRB, the River Niger Commission (RNC) is embarking on a planning exercise aimed at attaining a managed water regime in the basin. The exercise would lead to a Comprehensive Plan of Development, the implementation of which will be carried out in stages, each being a self-contained step with identifiable benefits justifying its implementation, and each contributing to economic growth in the Member States of RNC.

Integrated power systems planning should become an essential feature of West African development. Available energy resources in the form of oil, natural gas, hydro-electric power, and coal need to be surveyed and inventoried. Efficient development of the energy resources requires a high level of regional cooperation. Local hydropower developments such as the proposed dams at Kandadji and Tossaye cannot be evaluated without consideration of alternatives. For example, the CIDA-financed transmission line from Kainji Dam (Nigeria) to Niamey (Niger) has reduced significantly the cost of electricity in Niger. Nigeria is building additional hydropower dams and is burning natural gas which can be used for fertilizer manufacture and/or the generation of electricity. It is probable that Nigeria can export more cheap electric energy to Francophone West Africa.

It is not suggested that comprehensive energy studies be conducted under RNC auspices. However, RNC would be expected to supply information on the hydro-electric potentials in the Niger Basin to the appropriate authorities for this' purpose. The surface-storage and hydropower potentials must be determined. This involves identification of suitable dam sites on the main river and its tributaries with first estimates of their water storage and electric generation capabilities, and their probable costs and multi-purpose benefits. Evaluation of such sites will require topographic mapping, new aerial photography, geological investigations, drilling and functional analyses. These requirements must be identified in the diagnostic-phase study.

Attractive hydropower sites are likely on the steeper Niger tributaries rather than on the main stem of the Niger River. Nigeria is a RNC Member State which is developing a national electric power grid with major generating stations at Kainji (hydro) and Sapele (natural gas). Nigeria has substantial reserves of petroleum and natural gas which could be used to complement and balance West African power systems with significant hydropower components. Nigerian thermal and Francophone African hydropower plants could be integrated into an efficient West African International Interconnected Power System for the RNC members plus the West African coastal states.

The Niger River has important tributaries with gorges, stream confluences and rock abutments in the steeper uplands, which can serve as surface water storage reservoirs with dams of moderate size and minimum loss of valuable agricultural lands. The more viable storage sites will be on the tributaries in the high-rainfall uplands of Guinea, Mali, Benin, and Northern Nigeria. Because of their higher elevation, it is possible to (a) exploit a higher proportion of the

hydro-electric potential by successive run-of-the river generating installations, supplied by one or more reservoirs at higher elevation, and (b) provide river regulation for navigation and for gravity irrigation of a high proportion of the basin lands.

RNC would inventory the surface storage and hydro-electric potentials of the tributaries by aerial and field surveys at reconnaissance level (probably under contract), and conduct desk studies of the functional and cost aspects of the promising sites at pre-feasibility level. These sites would be assigned priorities for feasibility study for which RNC would prepare the Terms of Reference. Feasibility studies for the larger projects could be contracted to qualified engineering firms by the Member State in which the site is located, possibly with the assistance of the RNC in contract negotiation and supervision. RNC would be required to evaluate the inter-state effects of projects. RNC and the Member States play an important role in the continuing process of identification, evaluation and ranking of projects. RNC should be responsible for conducting or reviewing the economic analyses, recommendations on program priorities and implementation schedules.

The subject matter covered under the engineering program comprises:

- a) Review of project studies
- b) Dam-site studies
- c) Construction materials and access
- d) Feasibility studies
- e) Comprehensive basin plan

2. OBJECTIVES

The overall purpose of this component study is to provide sufficient information under each of the objectives listed below to facilitate the Diagnostic Study Management Group's preparation of an action program for the Niger River Basin.

The objectives of the engineering diagnostic survey are as follows:

- a) To document and evaluate existing engineering reports, data, and past and current studies related to projects in terms of their utility, completeness and quality;
- b) To document existing conditions; quantify the available resources in minerals, oil and construction materials largely from published information; and isolate immediate and mid-term development opportunities according to the Objectives and Strategy outlined in the basic Project Document^{1/};
- c) To prepare a five-year action program which defines the analytical and field studies required for development planning activities to be undertaken by the RNC. This includes preparation of complete terms of reference for the initial components of the recommended program of surveys, investigations and pre-feasibility and feasibility studies; and
- d) To identify available data and information that will be required during the course of the five-year RNB study, determine feasible means of transferring needed data and information to Niamey, and elaborate on equipment, facility and manpower requirements for the storage, processing and handling of data and information in Niamey.

3. SCOPE OF WORK

3.1 General

The Consultant is expected to provide all the necessary professional and technical services, logistics support and equipment required to fulfill the objectives of the study. To this end the Consultant will engage in discussions with

^{1/} UNDP, CIDA, USAID, IBRD and FAC, "Development of the Niger River Basin; Technical Preparatory Meeting of the Meeting of Donors", Paris, 12 pages with Annex I of 33 pages, 6-8 September, 1976.

officials of the RNC, agencies of Member States and donor organizations involved in the overall diagnostic phase of the RNC project, as may be required to gain a complete understanding of the project. The Consultant's work will include desk studies of available data and information with Electricite de France, ORSTOM, BRGM, and FAC of France, NEDECO of The Netherlands, consultations with other knowledgeable consulting firms and experts, and limited field visits to gain familiarity with site conditions in the basin. Of particular importance will be the need to cooperate and consult on a continuing basis with the consultants who will be engaged in other component diagnostic studies (i.e. agriculture, water resources, environment, etc.), and with the overall project management consultant having responsibility for integrating the results of the diagnostic studies into a coherent report.^{1/} For projects recommended for early follow-up to the diagnostic phase, the consultant will be expected to prepare complete terms of reference suitable for the calling of proposals and/or tenders to undertake necessary surveys and studies.

3.2 Review of project studies

Several studies of completed and proposed projects are available with the Member States, various French Government agencies and other donors. These project reports must be inventoried and documented by the consultant and include:

- a) Municipal and domestic water supply and sewerage projects;
- b) Industrial water supply and disposal projects;
- c) Irrigation projects;
- d) Hydro-electric generation projects;
- e) Navigation studies and programs;
- f) Flood control projects and programs;
- g) Mining projects^{2/};

^{1/} The Consultant is also expected to supply drafts of thematic maps to the mapping consultant showing e.g. the regional geology, dam sites, mineral deposits, construction materials, and other relevant features.

^{2/} Information is needed on: the geographical location, extent and quality of mineral and oil deposits; the projected water and energy demands for recovery and refinement; the disposal requirements and methods for mineral and other toxic wastes; and the potential navigation requirements. RNC interest in mining is limited to the water resources aspects, i.e., how mining operations would affect Niger Basin water supplies in terms of quantity and quality, as well as their effect on other water-based projects and programs. Suggestions for further exploration and study are appreciated and will be transmitted to the RNC Member States for their use. This work must be done in cooperation with BRGN, Paris.

- h) Waste disposal projects;
- i) Water quality maintenance requirements; and
- j) Combinations of the above.

The review of these projects would include evaluation of:

- a) The conceptual soundness of the project -- that it does/can serve its intended purpose;
- b) Limitations, if any, of project or structure;
- c) Suitability of structure types;
- d) The soundness and safety of the design;
- e) Cost effectiveness -- use of appropriate materials and local skills, economy of design, construction procedures and scheduling, and reasons for high project cost;
- f) Suggested improvements.

The Consultant is expected to make the project reports available to the Consultant for the Water Resources phase of the diagnostic survey. The latter will review the report data on water supply/demand/disposal for accuracy and consistency, develop water supply/demand/disposal projections and determine river regulation requirements from these estimates. The Engineering Consultant will indicate how the required regulation can be provided and/or outline procedures or studies needed to resolve this matter.

3.3 Dam site studies^{1/}

Surface water storage and hydro-electric potentials of the Niger River Basin must be established. The diagnostic phase study would comprise:

- a) Identification and evaluation of existing hydraulic structures on the Niger River and its tributaries for water storage, diversion, or regulation. The characteristics of the facilities: structural conditions, storage capacity, elevations, heads, siltation, costs, etc.
- b) Identification of known potential regulatory storage sites, ranging from those already studied in detail to those located from preliminary studies. A brief evaluation of the storage and power potential of each site with any statistical data available. Definition of further site inventory survey requirements and preparation of terms of reference for that purpose.

^{1/} This portion of the Engineering diagnostic program will be done in close cooperation with Electricite de France (EDF) who has conducted most of the past studies. See also the EDF note "Etudes hydroelectriques, Iere phase: Inventaire et Diagnostic, Point 4: Champ d'action et descriptif des etudes", pages 13 and 14 of these terms of reference.

- c) Recommendations for future studies of multi-purpose water resource projects, their relative priorities, and recommendations regarding any projects which appear to have adequate justification for immediate feasibility study.
- d) Review of information on the regional and site geology.
- e) First estimates of the hydro-electric potential of the Basin.
- f) Available estimates of projected electrical energy demands. 1/

Actions to be recommended may include:

- a) Surveys and studies of the hydro-electric potential of the Basin.
- b) Reconnaissance inventory of additional sites.
- c) Acquisition of additional data for identified sites, e.g. mapping of reservoirs and dam sites, site geology, water supply and electric generation studies and sedimentation studies.

3.4 Construction materials and access

The Niger River Basin appears to have poor resources in most categories of construction materials. The Consultant needs to document and evaluate available information on local sources of supply and imports of gravels, stone, cement, steel, oil and coal for brick firing; available estimates of the regional demand for these items; current modes of transportation and existing handling facilities; materials transportation and handling costs; and unit cost estimates for materials delivered at current centers of construction activity. The RNC program may have to include a program of identification and evaluation of a) local supply sources of

1/ EDF will provide available projections for electricity demands for the Francophone Member States. The Canadian consultant must gather the Nigerian demand projections. This background information will provide a) RNC insight into the electric energy situation in the Niger Basin and b) valuable background material for the Economic Commission for Africa (ECA) under whose aegis an energy resources survey for West Africa will be conducted with the active involvement of UPDEA, an organization of African electricity producers and distributors. A meeting on the implementation and modalities of the energy survey will take place in Abidjan in February 1977.

construction materials, b) facilities required for their processing and handling, and c) economic modes for their transportation to future construction centers. The Consultant may need to prepare terms of reference for a survey of local resources of construction materials.

3.5 Feasibility studies

The Consultant should document and evaluate completed feasibility studies for water resources projects and report on the status of project studies in progress. The Consultant should make recommendations as to the role of RNC in undertaking project studies for large-scale projects through the pre-feasibility stage, ranking of projects on that basis, recommending projects for feasibility study, preparing terms of reference^{1/} for that purpose and possibly supervising their execution under contract. For small projects, all work from project identification through feasibility would be done by the Member States governments who may obtain guidance from RNC if this is a practical proposition.

The Consultant should provide guidelines on the management of feasibility studies under the RNC program and estimate the staffing requirements for this purpose.

3.6 Comprehensive basin plan

The Consultant should enumerate in as much detail as possible all engineering activities required for developing a comprehensive basin plan during the five-year action program, bearing in mind the urgent need for increased food production and the long-term energy requirements in the basin. Quick-return, short-gestation projects will be given priority. The Consultant should coordinate his efforts with the consultants engaged in other component diagnostic studies and particularly with the overall management consultant so as to arrive at a manageable work program leading to a comprehensive plan of development for the Niger River Basin.

1/ Which will include an Environmental Impact Statement.

4. PLAN OF WORK

CIDA and FAC will organize full cooperation for the engineering phase of the diagnostic study.

The following division of responsibilities between FAC and CIDA is tentatively made:

a) CIDA

- Overall coordination of the work and preparation of the report of the engineering diagnostic study. The report will be issued as a joint CIDA-FAC study.
- Review of project studies.
- Construction materials and access
- Feasibility studies
- Dam-site studies in the Nigeria portion of the basin.
- Comprehensive basin plan.

b) FAC

- Damsite studies in the Francophone portion of the basin. ^{1/}
- Participation of EDF and ORSTOM as sources of information concerning the other four subprograms under "Engineering".

c) CIDA and FAC

- Will share responsibility for the damsite studies and those portions of the report on which work is done jointly by Canadian and French experts.

The following schedule of activities for executing the work is suggested, having in mind the necessity to accomodate the schedule of progress of the overall diagnostic phase:

^{1/} EDF has prepared a note "Etudes hydroelectriques, Iere phase: Inventaire et Diagnostic, Point 4: Champ d'action et descriptif des etudes".

<u>1977</u>	<u>Activity</u>
1 May	Consultant selected by CIDA; Preliminary EDF report made available by FAC;
1 June	Consultant mobilized; Initial contacts and interviews with other donors and RNC completed;
1 August	Assembly of basic information, data checking and field visits completed;
1 September	Submit preliminary results to management consulting firm;
1 November	Interim report submitted to management consultant for use in reporting to Council of Ministers;
 <u>1978</u>	
1 January	Final report submitted to management consultant.

Initial contacts will include officials and experts of RNC, UNDP, USAID and FAC, and the consulting firms selected by other donors for the diagnostic study. Such contacts will be made primarily by the team leader for the purpose of becoming acquainted with the experts involved and discussing in some detail the various schedules of work in relation to each other. The responsibility for making such contacts is left to the Consultant. The full team of experts will be engaged in the collection and compilation of basic data and information and the follow-up field visits.

In the conduct of the study the Consultant will liaise closely with the technical staff of the RNC Secretariat, EDF and ORSTOM in the preparation of the report. Information must also be obtained from international development agencies such as CILLS, the Club des Amis du Sahel, IBRD, ADB, FAO, WMO, WHO, etc., as well as the national governments and other institutions and individuals within and outside the region that have conducted studies or have relevant information.

The schedule outlined above would provide for approximately two months of active travel and field work followed by a two-month synthesis and analysis period involving largely desk studies which would terminate with the submission of the interim report to the management consultant. A skeleton staff would continue work with the management consultant terminating with the submission of the final report.

5. MANPOWER AND COST ESTIMATES

5.1 CIDA component

Execution of the engineering diagnostic phase is expected to require some 50 man-months of Canadian consulting services for home office management (4 man-months), team leader in water resources engineering (10), hydro-electricity (10), hydrology (4), engineering geology (4), potable and industrial water supply (6), economics (4) and other disciplines (8). The estimated cost of providing these services through a professional consulting firm is:

	<u>Dollars</u>
Services, 50 man-months, including salaries, management fees, overhead, and fringe benefits.....	300,000
Travel, international, local including per diem living costs.....	80,000
Report preparation, including drafting, typing, reproduction.....	15,000
Contingency and miscellaneous expenses.....	35,000
TOTAL	<u>\$430,000</u>

5.2 FAC component

At the time of the Paris meeting, cost estimates had not yet been prepared but EDF prepared a note^{1/} containing a description of the components on which it can contribute. From that note and Section 4. Plan of Work which was prepared

1/ See pages 13 and 14 of these terms of reference.

jointly by FAC and CIDA, it may be concluded that the FAC contributions would comprise:

- a) Documentation and interpretation of reservoir and damsite studies conducted in the Francophone portion of the Niger Basin;
- b) Documentation of available electricity demand projections for member states of RNC;
- c) Cooperation with CIDA in arriving at a first estimate of the water storage and hydro-electric potentials of the Niger Basin;
- d) Joint preparation of relevant sections of report including terms of reference for future studies of dam sites; and
- e) Transfer of background information to RNC Niamey.

FAC should be asked to prepare its cost estimates for the above five points taking into account the general contents of these terms of reference, an earlier draft of which was approved by the French delegation at the Paris meeting of 10-14 January.

PROGRAMME POUR LE DEVELOPPEMENT DU BASSIN DU NIGER

ETUDES HYDROELECTRIQUES^{1/}

1ère phase : INVENTAIRE ET DIAGNOSTIC

Point 4 : Champ d'action et descriptif des études

Les études s'étendent à l'ensemble du bassin du fleuve Niger et intéressent les pays membres de la Commission du Niger, à savoir :

Guinée, Mali, Haute-Volta, Niger, Nigéria, Bénin, République Fédérale du Cameroun, Cote d'Ivoire, Chad.

Pour cet ensemble, il sera procédé :

- 1°) au recensement des ouvrages hydroélectriques ou de régularisation existants (à l'exception des petits réservoirs agricoles) en précisant leurs caractéristiques,
- 2°) au recensement des études à caractère hydroélectrique ou mixte électricité-navigation, électricité-agriculture,
- 3°) à une analyse de ces études précisant leur nature, leur qualité, les caractéristiques et objectifs des ouvrages projetés,
- 4°) à un examen des documents cartographiques, photographiques (photos aériennes), hydrologiques et géologiques ayant pour but de dégager les sites non encore étudiés qui pourraient être équipés en vue d'une régularisation des débits ou d'une production hydroélectrique,
- 5°) pour chacun des pays concernés, à une appréciation de la demande d'énergie de la distribution publique prévisible à moyen terme,
- 6°) à la définition des études à entreprendre pour compléter la connaissance des ressources hydroélectriques du bassin et aboutir à un plan d'équipement intégré de ce bassin, plan qui sera l'objet de la deuxième phase des études ; et proposer un ordre de priorité des études,

7°) à l'établissement des termes de références des études prioritaires.

Les travaux visés par les points 1 à 5 ci-dessus seraient menés séparément par les consultants canadiens pour le Nigéria et par Electricité de France pour les pays francophones.

Pour les points 6 et 7, chacune des parties fera des propositions pour la zone qui la concerne, ces propositions seront discutées en commun en vue de la rédaction définitive du dossier.

DEVELOPMENT OF THE NIGER RIVER BASIN

TERMS OF REFERENCE

FOR

DIAGNOSTIC STUDY COMPONENT ON

TOPOGRAPHY, MAPPING AND REMOTE SENSING

DEVELOPMENT OF THE NIGER RIVER BASIN

TERMS OF REFERENCE FOR DIAGNOSTIC STUDY
COMPONENT ON TOPOGRAPHY, MAPPING AND REMOTE SENSING

CARTOGRAPHY

1. Background

The River Niger Commission (RNC) is committed to a long-term effort to aid in the development of resources in the River Niger Basin (RNB). The effort will commence with a nine month Comprehensive Diagnostic Study, the goals of which are: (1) to identify and provide initial expatriate advisory staff, (2) to initiate long-term training for future indigenous staff, (3) to prepare a comprehensive diagnostic study report, and (4) to elaborate a five year action program.

The Diagnostic Study will be coordinated by a management consultant which will oversee the efforts of a number of X consultant groups conducting diagnostic research in the areas of ...

It is clear that cartographic related resources (maps, remote sensing imagery, ground control) for the RNB are not adequate to satisfy the requirements of the various RNC research consultant groups either during the Diagnostic Study or over the longer term. Furthermore, what materials do exist are dispersed among several different locations (eg., IGN-Paris; FAO-Rome). Maps and imagery are also of widely varying quality and recency. The establishment of a Cartographic Unit at Niamey is aimed at: (1) facilitating the acquisition and evaluation of cartographic related resources, (2) providing cartographic consultation and basic map drafting services to RNC Diagnostic Study consultant groups, (3) initiating the training of indigenous cartographic personnel.

The cartographic program for the Diagnostic Study will be carried out in two stages. Stage I, to be completed during the nine month term of the Diagnostic Study, will evaluate existing cartographic resources and determine future needs, provide cartographic services, and initiate a cartographic training program. Stage II will culminate in the production of a thematic atlas of the River Niger Basin. It is anticipated that the cartographic unit will be reactivated during the five year program (which follows the Diagnostic Study).

All references to study area, unless otherwise stated, include the areas of the nine African nations which comprise the River Niger Basin.

2. Objectives - Stage I

The objectives of the cartographic work to be completed during the Diagnostic Study fall into three main categories, each resulting in a specific product or products:

a) Inventory and Evaluation - To determine and specify mapping remote sensing, and ground control requirements for the five year program. Consistent with these requirements, to inventory and evaluate existing topographic maps, imagery, and control and existing special purpose thematic maps. The specific products resulting from Inventory and Evaluation are: (1) the actual inventory of maps, imagery, and control, including an assessment of same, and (2) the preparation of a five-year action program which defines cartographic related activities to be undertaken by the RNC.

b) Service - To provide: (1) consultation to Diagnostic Study consultant groups in matters relating to cartography, and (2) basic cartographic drafting services to Diagnostic Study Consultant Groups. Furthermore, under the overall guidance of the management consultant firm and in close cooperation with study consultants, to select and prepare maps, tables, and other information which will be synthesized into a thematic atlas of the River Niger Basin during Stage II.

c) Training - To employ and train to the maximum extent possible, African draftsmen-cartographers. Also to prepare a five-year plan for training African cartographers.

3. Scope of Work

3.1 General

The Consultant shall provide all necessary professional and technical services, logistical support, and equipment required to fulfill the objectives of the study. The Consultant will consult with and cooperate closely with officials of the RNC, agencies of the member nations and donor organizations involved in the overall diagnostic phase of the RNC project, as may be required to gain a complete understanding of the project. The Consultant will be required to travel as necessary for the purpose of preparing a map inventory and consulting with other knowledgeable experts. Of particular importance will be the need to cooperate and consult on a continuing basis with consultants who may be engaged in other component diagnostic studies (i.e., agriculture, water resources, etc.), and with the overall project management consultant having responsibility for integrating the results of the various diagnostic studies into a coherent program.

For projects recommended for early follow-up to the diagnostic stage, the Consultant will be expected to prepare complete terms of reference suitable for the calling of proposals and/or tenders to undertake necessary surveys and studies. The Consultant will report directly to the UNDP management consultant in charge of the Diagnostic Study.

3.2 Inventory and Evaluation

An assessment of both projected long-term cartographic needs and existing resources (maps, imagery, control) are needed prior to the start of the five-year study. Toward this end, the Consultant shall:

- in consultation with consultants engaged in other component diagnostic studies, identify cartographic requirements for the five year study. These requirements shall include ground control, imagery, topographic maps, and special purpose thematic maps.
- in view of the identified cartographic requirements, the Consultant shall jointly conduct with IGN-Paris a thorough inventory and evaluation of existing control, imagery, and maps. The inventory shall be prepared in the form of a document and will include item description, source, scale, area of coverage, recency, and other appropriate information.
- Consistent with the goals of the RNC project, the Consultant will prepare a five year action program for acquiring necessary ground control, imagery, and maps.

3.3 Support

Throughout the terms of the diagnostic study, other diagnostic study contractors will require a central source of information on matters relating to cartography as well as a source of cartographic drafting services. The Contractor shall provide such support including coordinating and standardizing cartography related activities of Diagnostic study consultants as appropriate and useful.

Additionally, the Consultant will compile all materials required for producing a thematic atlas of the River Niger Basin. The atlas will ultimately include: (1) thematic maps, (2) tabular data, and (3) an inventory of existing map coverage, imagery, and ground control in the Niger Basin. More specifically, the Consultant shall:

- in cooperation with the management consultant and other diagnostic study consultants, select appropriate and most useful maps and tabular data for inclusion in the atlas.

- Compile draft maps from existing graphics, data, and data collection activities of diagnostic study consultants.
- draft maps onto translucent mylar or other stable-base film. These maps are to be made available to all diagnostic study consultants in the form of Ozalid reproductions. The mylars will also be used for the production of the atlas to be carried out in Stage II.

Thus, all information necessary for the ultimate production of the atlas shall be compiled by the cartographic consultant during the diagnostic study.

For the information of the Consultant, the atlas of the River Niger Basin is conceptualized as follows:

- a) Scale-1: 5 million
- b) 20" x 24" page format (or closest metric equivalent)
- c) all text in both French and English
- d) contents - 50 to 75 maps, tabular data, and inventory of existing maps, imagery and control.

3.4 Training

The Contractor shall employ African draftsmen-interns to the maximum extent possible. He shall also provide these interns with adequate on the job training and supervision. Additionally, the Consultant shall draft a five-year action program for training African draftsmen and cartographers. Ideally, this five-year plan should include provisions for both African based academic training in cartography and field experience.

4. Plan of Work

The Contractor shall establish a cartographic unit in Niamey and base all operations from that site. The following schedule of activities for executing the work is suggested.

- | | |
|---------|--|
| Month 1 | Consultant selected by A.I.D. |
| | Consultant, with assistance of UNDP, will enter into a contractual agreement with IGN-Paris for joint execution of this study. |
| Month 2 | Consultant mobilized |

- Month 3 Contractor makes initial contacts with diagnostic consultants to determine cartographic requirements for diagnostic study and five-year study.
- Consultant begins inventory work jointly with IGN.
- Month 4 Inventory continues
- Contractor establishes training-drafting facility
- Month 6 Contractor meets with other contractors to redefine long term cartographic needs and contents of atlas of Niger River Basin.
- Contractor submits preliminary inventory and atlas outline to management consultant for comments.
- Month 9 Consultant submits final cartographic inventory, atlas compilation, and all terms of reference to management consultant.

5. Manpower and Cost Estimates

Professional services (cartographers - 13 months, remote sensing specialist - 2 months, geodesist/engineer - 2 months) 17 man months x 2,100 x 75% (\$1575) + \$1230 per diem	\$ 83,365
Support staff (2 cartographic technicians, 3 African draftsmen, secretary/office manager). Technicians (\$1000 base x 75% + \$1,230 per diem), Indigenous draftsman (\$3,000/year), Secretary/office Manager (\$1,200 base x 75% + \$1,230 per diem).	\$ 92,610
Travel	\$ 25,000
Cartographic equipment and supplies (drafting tables, chairs, machines; Kargyl enlarger, Ozalid, etc.) . . . Including air shipping.	\$ 20,000
Office space (including rent, telephone, utilities), \$1000/month	\$ 9,000
Contingency and miscellaneous (secretarial supplies, vehicle rental, purchase of maps, etc.	\$ 25,000
TOTAL	\$254,975

DEVELOPMENT OF THE RIVER NIGER BASIN

TERMS OF REFERENCE

FOR

DIAGNOSTIC STUDY COMPONENT ON EDUCATION AND TRAINING

1. BACKGROUND

Early attention and high priority must be given to the determination of manpower and training requirements for operation of the integrated Niger River Basin, development and control system. This will include assaying the manpower available to the responsible organization and initiation of a training program to ensure a staff that is adequate, both in numbers and levels of competence, will be available to the River Niger Commission (RNC) at each stage of development of the river basin. Herein, RNC is treated as the agency responsible for the river operation and control of the Basin's reclamation and water utilization and control system.

2. OBJECTIVES

The overriding objective of this phase of the diagnostic study will be to prepare an action program which will define the analytical and field studies required for development planning activities to be undertaken by the RNC, including the drafting of complete terms of reference suitable for calling of proposals and/or tenders to undertake necessary surveys and studies.

Other specific objectives may be summarized as follows:

- a. Determine the fields of competence that should be included in the RNC staff.
- b. Estimate the number of individuals that will be required at each level (e.g. department head, functionary, technician, etc.) in each professional area.
- c. Assay the availability of relevant professional and para-professional personnel in RNC member countries.
- d. Estimate the number of individuals who must be trained at each level in each field for the initial staffing of the RNC, and the numbers

that will be needed for subsequent levels of development of the Niger River (to the extent these levels presently can be foreseen).

- e. Recommend the means for accomplishing this training.
- f. Estimate the cost of the training included in item 2e, above.
- g. Estimate the continuing training requirements for the RNC to maintain its capabilities at the required level.
- h. Explore the means of satisfying the requirements for continuing training.
- i. Explore the feasibility and desirability of establishing a Niger River Research and Training Station, the functions of which would be:
 - (a) To operate a hydraulic laboratory (and possibly other laboratories; e.g. materials, soils, water quality, etc.).
 - (b) To serve as the engineering design and analysis center for the Niger River System.
 - (c) To provide technical training for RNC staff and trainees.
 - (d) To serve as a conference center and to provide living and other facilities for visiting professionals.

The Station should be located along the Niger River and close to a university. It well might be modeled along the lines of the U.S. Army Corps of Engineers Waterways Experiment Station or the Poona Research Station in India. This Station could be organized as an arm of the RNC, as a division of a university, or as a division of some other regional organization. Its extent and structure would likely evolve gradually as the needs for its services arise and are identified as the RNC matures.

3. DETAILED SCOPE OF WORK

The objectives set forth in the preceding section also delineate in most instances the associated scope of work. The following more detailed scope is presented in the order the items are listed in Section 2, above. The consultant will coordinate closely with the other component study groups in completing the required tasks.

- a. Prepare a detailed listing of the disciplines required to operate a multi-objective international river-reservoir system. Guidance can be obtained from the staff make-up of various United States and European river organizations (e.g., the Mississippi River Commission, the Rhine River Control Commission, the Saskatchewan-Nelson River Basin Board).
- b. Develop at least a skeleton Table of Organization, with categorical staff numbers estimated. Again, guidance can be obtained from examination of the structure of comparable established organizations.
- c. Extract, collate, and analyze relevant data available in published sources, and from governmental agencies in RNC member countries.
- d. In estimating training requirements it should be assumed that no more than, say, 5 to 10 per cent of the manpower identified in item 2c, above, could be made available to the RNC. The balance will have to be trained. Estimates of the time-table for development of RNC responsibilities and the corresponding manpower requirements will have to be developed in cooperation with RNC staff. Recognition shall be taken, of course, of the individuals who will be trained by donor countries during 1977-1979 to provide RNC with a Nucleus staff.

- e. The RNC-country capabilities for training the required manpower are to be assessed. This may require a visit to RNC member country universities and to organizations like WARDA, although much of the required data likely are available in published sources. Recommended levels of training, locations (in African or foreign schools, and which ones), and estimated costs are to be set forth. It is to be recognized that some part of the training, at least at the lower (technician) level, can be done by RNC. Topics which are to be covered by short courses presented in RNC countries by expatriates will be recommended and the short-course content outlined. It is to be recognized that in this course a wide range of training, from purely applied to strongly analytical, will be required. In the planning it will be assumed that progressively more of the training will be accomplished by RNC staff. The facilities to accomplish this training are to be identified and their cost estimated.
- f. No amplification needed.
- g. Data for this estimate can be obtained from examination of similar information on parallel organizations (see item 3a, above), and from anticipated organization growth patterns and expected personnel attrition rates.
- h. See item 3e above.
- i. No amplification needed.

The consultant conducting this study will provide all of the necessary professional and technical services required to fulfill the objectives of this study. To this end, the consultant will engage in discussions with officials of the RNC, agencies of the Member States, donor organizations, and other groups

as may be required to gain a full understanding of the objectives of this study and of the RNC.

4. PLAN OF WORK

It is estimated that this study will require approximately 4 months and should commence after the other component study groups have begun their field work and had an opportunity to make initial investigations.

5. MANPOWER AND OTHER REQUIREMENTS

The individual conducting this phase of the diagnostic study should be an experienced educator who is also knowledgeable about the many facets of multi-objective operation of river basins under institutional constraints. The manpower estimates are included in item 6, below.

6. STUDY COST ESTIMATES

Salaries and wages

Principal investigators

4 p/m at \$3,000/mo \$12,000

Secretary

2 p/m at \$750/mo \$ 1,500

Total salaries and wages \$13,500

Per-diem 120 days x \$41 \$ 4,920

Overhead and fringe benefits

75% of salaries and wages \$10,125

Travel expenses

1 trip to evaluate RNC-country universities \$ 3,500

Miscellaneous and contingency \$ 2,955

GRAND TOTAL \$35,000

DEVELOPMENT OF THE RIVER NIGER BASIN

TERMS OF REFERENCE

FOR

DIAGNOSTIC STUDY COMPONENT ON HEALTH AND ENVIRONMENT

**TERMS OF REFERENCE FOR DIAGNOSTIC STUDY
COMPONENT ON HEALTH AND ENVIRONMENT**

I. Background

Integrated development of the Niger River Basin, will ultimately have impacts on both the physical and human environments. Impacts can be positive or negative (i.e. beneficial or detrimental), the trade-offs between these two types of impacts being the determining factor in project selection

An example of trade-offs to be considered in the physical environment is in the construction of a dam. Such water impoundment may provide beneficial hydro-electric power, yet have detrimental impacts such as flooding natural resource areas, deteriorating the water quality, reducing the water volume downstream, and providing habitat for disease vectors. Similarly, in the human environment, improvement of an area for agricultural development may bring about increased crop yields. At the same time, however, this may also result in an influx of people, which in turn could create extensive public health problems.

It will, therefore, be necessary to review the component studies of this program in terms of the environmental impacts, which could possibly result from future implementation of projects identified in the ultimate Indicative Plan for the Niger River Basin development. Any proposed activity should carry with it the assurance that the end results are such that adverse environmental impacts are minimal and beneficial results maximized.

II. Objective

The objective of the environmental study is to prepare a comprehensive report including, but not limited to, the following:

1. Determine and state the existing environmental condition,

relationships, resources, policies, and controls within the Niger River Basin.

2. Determine the major areas of possible environmental impact resulting from implementation of either specific activities or general types of activities and assist the other component study group team members in writing environmental guidelines and terms of reference for possible projects. These guidelines and terms should consider:

- a. both positive and negative environmental effects,
- b. the primary and secondary environmental consequences of activity,
- c. long and short term effects,
- d. alternatives to the activity reviewed in terms of environmental benefits, costs and risks; also considering "no project,"
- e. adverse environmental effects of the activity which cannot be avoided.

Environmental considerations should include, but not necessarily be limited to the following:

- a. resource linkage, e.g. relationship to natural resources;
- b. physical aspects, e.g. effects on geographic location;
- c. socio-cultural aspects, e.g. effects on culture, values, etc.
- d. public health aspects, e.g. effects on health, sanitation, etc.

III. Scope of Work

Extensive coordination between the environmental analysis team and the agriculture, water resources and engineering team staffs will be required. Liaison with technical personnel from the RNC member countries, IRAT (Tropical Agronomical Research Institute), ORSTOM (Overseas Scientific and Technical Research Office), Sahel Club (teams for irrigated agriculture and ecology), FAO, and donor agencies will also be required.

A. Physical Environment

1. Non-renewable natural resources

Using data collected by the diagnostic study teams and other available sources, determine type, quantity and location of non-renewable resources (i.e. mineral deposits) in the project areas.

2. Other natural resources

(a) Using data collected by the diagnostic study teams and other available sources, determine the present environmental conditions in the basin. This determination should include, but not be limited to, the following areas:

(1) Identify the various wildlife species in the basin by type, location and estimated population. Note especially if any of these animals are on the international or local endangered species lists;

(2) Identify the major plant species in the project area. Note any plants, or plant diseases which could be a threat to expanded agriculture within the area..

(3) Locate the existing fishing areas and determine the extent of the fishing industry within these areas.

(b) Assist the component study groups in preparing guidelines and terms of reference for environmental studies of specific projects they may identify or general categories of projects which may be envisaged for future study. Such guidelines and terms of reference should:

(1) Consider effects on public health, surface and ground-water, natural resources, etc., resulting from water impoundment.

(2) Ensure that the impacts resulting from both in and out-migration related to these areas are studied wherever water supply systems are to be established.

- (3) Ensure that wherever pesticides, fertilizers, and other agricultural chemicals which may be proposed for use that the potential environmental impacts of these chemicals resulting from direct application and runoff are analyzed.
- (4) Include study proposals for minimizing possible adverse public health, environmental and social effects resulting from water management schemes.
- (5) Ensure that all projects are ecologically sound by giving consideration to all other possible aspects such as overgrazing, depletion of forests, erosion, etc.

B. Human Environment

1. Public Health

- (a) Collect and organize all data pertaining to public health in the Niger River Basin as related to water resources; this is to be presented on a zone or area basis.
 - (1) Tabulate existing data on vector borne and agriculturally related diseases such as schistosomiasis, malaria, trypanosomiasis, onchocerciasis, dracontiasis, hookworm and other intestinal parasitic infections.
 - (2) Present types, prevalence and uses of domestic water supply and sanitation.
 - (3) Collect, chart and present existing data on chemical and bacteriological water quality of the Niger River and its tributaries.
 - (4) Make detailed assessments of capabilities within the RNC member states for the control and prevention of the further dissemination of malaria, schistosomiasis and other vector borne diseases.
 - (5) Recommend areas of institutional change or additions which would improve existing programs through the

establishment of a public health methodology and infrastructure dealing with these problems.

(6) Based on the data analysis and observations make recommendations on the possible or potential institutional modifications within the RNC and member states that may be required to monitor, lessen and/or eliminate deleterious public health hazards which may result from, or be increased due to the implementation of project identified activities.

2. Animal Health

Data on animal health is to be collected and organized in a manner similar to that cited above for human health. Special attention is to be given to data on trypanosomiasis. Recommendations as outlined in item b. above are also to be made for this area of study.

3. Socio-cultural

a. Determine the present population centers as well as rural ethnic groupings in the RNC area. Also consider nomadic peoples and their moving patterns.

b. Locate and determine the degree of importance of archeological sites, religious grounds, and similar areas of cultural importance in the project area.

c. Assess probable impacts of dams and other water management schemes on both upstream and downstream resident users (both present and future) with special emphasis on their economic support systems and the socio-cultural implications of relocation.

C. Integration of Data

1. Based on the data collected and analyzed under items A and B, make necessary recommendations for the following:

a. Data collecting, surveys, studies, or investigations which should be conducted to completely assess

environmental impacts of project related development activities.

- b. Possible or potential institutional modifications that may be required to monitor, lessen and/or eliminate deleterious environmental pollution hazards which may result from, or be increased due to project related development activities.
- c. Specific environmental studies which should be carried out for the entire RNC area, as related to the various diagnostic study areas, including suggested strategies for the reduction of negative impacts.

IV. Personnel and Manpower Requirements

- 1. (1) Civil/environmental Engineer-team leader should have knowledge and experience in studying integrated/complex 90 days ecosystems, public health, and agricultural practices.
- 2. (1) Mineralogist - geologist 30 days
- 3. (1) Aquatic biologist/chemist 60 days
- 4. (1) Biologist/Ecologist
- 5. (2) Epidemiologist/Public Health Specialist each 60 days
- 6. Veterinarian/Animal Health Specialist 30 days
- 7. (1) Sociologist/Anthropologist should have experience 60 days in rural/tribal societies and ability to perform demographic analyses

Total

15 person months

Cost Estimates

<u>Direct Labor</u>	<u>Man- Days</u>	<u>Burdened Daily Rate</u>	<u>Total</u>
Environmental/Civil Engineer	90	\$293	26,370
Mineralogist/Geologist	30	236	7,080
Aquatic Biologist/Chemist	60	293	17,580
Biologist/Ecologist	60	293	17,580
(2) Epidemiologist/Public Health Specialists	120	311	37,320
Veterian/Animal Health Specialists	30	311	9,330
Sociologist	60	252	<u>15,120</u>
Sub-total			
Sub-total Direct Labor			\$130,380
<u>Per Diem</u>			
450 Days at \$40.00			<u>\$ 18,000</u>
<u>Travel</u>			
International 8 at \$1,700 (assume depart Washington, D. C.)			\$ 13,600
Excess Baggage			500
In-Country Transportation within Africa			<u>4,000</u>
(Amounts based on assumption that transport will be shared with other investigatory staff)			
<u>Sub-total Travel</u>			\$ 18,100
<u>Other Direct Costs</u>			
Physical 8 at \$50.00			400
Passport, visas, shots 8 at \$50.00			400
Telephone, telegraph, postage, etc.			800
Report reproduction, secretarial, etc.			10,000
Workmen's Compensation (20% base salary)			<u>11,560</u>
<u>Sub-total Other Direct Costs</u>			\$ 23,160
<u>Grand Total</u>			\$186,640
<u>Rounded to</u>			\$190,000

DEVELOPMENT OF THE RIVER NIGER BASIN

TERMS OF REFERENCE FOR MANAGEMENT

AND SYNTHESIS OF THE COMPONENTS

OF

DIAGNOSTIC STUDY

RIVER NIGER DEVELOPMENT/DIAGNOSTIC STUDY

I. BACKGROUND

The overall purpose is to collect and evaluate all existing data and to prepare a detailed action and institutional development program which will allow the RNC to initiate a rational and sustained process of planning and investment for the development of the Niger River Basin.

The main components of the diagnostic study are:

- (i) Agriculture: soils surveys, land classification (land resources, hydroagriculture potential and socio-economic surveys). Rainfed agriculture and recession agriculture are also included.
- (ii) Water resources: hydrology, hydrogeology, meteorology and water demands.
- (iii) Engineering: review of project studies, dam sites studies, construction materials and access feasibility studies, comprehensive basin plan.
- (iv) Topography, mapping and satellite imagery.
- (v) Education and training.
- (vi) Health and environment.
- (vii) Legal and institutional aspects.
- (viii) Management and synthesis of the diagnostic study.

II. OBJECTIVES OF THE MANAGEMENT AND SYNTHESIS OF THE COMPONENTS OF THE DIAGNOSTIC STUDY:

The objectives are:

- to manage and coordinate the activities to be implemented

under the above listed components (i) to (vii) in order to achieve within a 9-month duration an effective and complete diagnostic study which in turn will lead to a five-year action program for the RMC;

- to perform a study on the legal and institutional aspects under (vii) above;
- to identify available data and information that will be required during the course of the five-year RMC study to determine feasible means of transferring needed data and information to Niamey and to elaborate equipment, facility and manpower requirements for the storage, processing and handling of data and information in Niamey;
- to study and analyze the national development plans of the member countries and to identify other macroeconomic variables for the purpose of outlining the proposed five-year action program;
- to synthesize the studies completed under the various components (i) to (vii) above into an integrated report on the five-year action program, including a priority listing of studies by sector along with supporting detailed terms of reference.

III. SCOPE OF WORK:

1. Management:

- (a) Coordinate component groups to ensure proper phasing, scheduling and timely completion of work recommending corrective actions as necessary.
- (b) Continuously monitor component groups for consistency and

recommend corrective action as necessary, first to the team leaders and then, if necessary, to responsible donor.

- (c) Work with RNC to ensure study conforms to RNC policies and procedure.
- (d) Periodically review the progress of work with RNC and with sponsoring donors.
- (e) Establish in conjunction with component team leaders guidelines to ensure consistency among component studies on such matters as data on demography and agriculture, etc.
- (f) Control reception of data and information collected during diagnostic study from the component groups to the Commission.

2. Legal and Institutional Aspects:

To study, analyze and make recommendations regarding:

- (a) - The role of the Commission in effecting the development of the resources of the River Niger Basin;
 - The most effective organization for accomplishing this development.
- (b) To identify the legal aspects of river basin development, including water rights, and recommend procedures for their allocation.
- (c) To recommend procedures for obtaining an integrated data management system.

3. Socio-Economic Analysis of National Plans:

To receive, review and analyze all pertinent component studies relating to socio-economic aspects prepared by respective teams and not covered elsewhere; to verify their consistency and introduce desirable modifications in consultation with the component teams. The analysis of the national

development plans in particular should bring out their implications for the development of the basin.

4. Synthesis and Integration:

Information obtained from the component studies as well as from the basic socio-economic analysis, including the analysis of development plans, should lead to a synthesis within which the ranges of development targets could be envisaged. Such alternatives for the region and the riparian countries should be worked out in coordination with the RNC to ensure consistency with the development objectives of the individual countries. This work should produce a report on a detailed five-year action program leading to the development of land, water and human resources of the RNB.

IV. PLAN OF WORK:

1. Management:

In order to perform the management function described under Section III, 1. "Scope of Work", the Management Consulting Firm is required to:

- (1) Designate a project director based at the home office. The latter will be entrusted with the overall responsibility to ensure proper technical and administrative backstopping of the field personnel.
- (2) Appoint a team leader to be assigned in Niamey on a permanent basis with responsibility over the day-to-day operations and namely:
 - the organization of periodic review sessions with participation of the leaders of the component groups or their representatives as well as a representative of the RNC. The team leader shall have the responsibility and authority to convene such meetings as he deems necessary;

- the preparation of progress reports on a monthly basis. These documents should cover the major activities, identify the problems encountered and include a schedule of activities planned over the coming period;
- completion of final studies and reports with frequent consultations with the RNC to ensure consistency with Commission policy and procedures.

2. Component Studies:

The performance of the activities described under Section III, 2, 3 and 4 "Scope of Work", consists of:

(a) Legal and institutional aspects.

Analysis of the legal aspects will include the following:

- (i) Review of the status of existing property rights and identification relating to land and water use for basin development
 - (ii) Review of the legal provisions and suggestion of amendments to the RNC basic agreement to deal adequately with the externalities which are likely to occur in international basin development and more particularly with water rights allocation
 - (iii) Examination of the administrative structure and suggestions for the cooperation required to enhance the development of the water resources and the land of RNB
- b) Socio-economic analysis of national development plans.

An overall review of the national plans, including available sector studies and supporting statistics, should be carried out to identify and derive the macro-economic and sectoral objectives as related to RNB. This review should yield information on key

sectors and identify the needs for additional data to be generated. The review should cover:

- (i) Identification of significant existing manufacturing industries and their characteristics and review of sectoral projections for each basic industry in each country, marketing, external demand etc. (not covered elsewhere)
 - (ii) Estimates of availability of each important mineral resource and projected output. Foreign and internal demand for these resources.
 - (iii) Inventory of present transportation networks and examination of projected improvements in these networks with special reference to the interconnections between the member countries (not covered elsewhere).
 - (iv) Identification of actual and potential funds (private and public) for basin development.
 - (v) Identification of exports and imports intra- and extra-region and potential developments.
 - (vi) Identification of marketing and distribution systems as they pertain to movement of nonagricultural products.
- (c) Human Resources:

The review of human resources should provide a description of the total population, its distribution within each relevant country and historical growth rates. In particular, it should provide a demographic profile of households in the high potential areas of the river basin in terms of age, sex and geographic distribution. Detailed terms of reference should be prepared for additional studies that might be needed.

3. Synthesis and Integration:

The consulting management firm is required to integrate the results and recommendations from the component groups and its analysis of national development plans of the Member States into a five-year action program that will enable the Member States to achieve their national development objectives.

This five-year action program will:

- (i) reconcile data and study needs of the component studies into a single systematic program, with established priorities, of data generation and studies;
- (ii) delineate procedures and schedules for preparing a comprehensive plan of development of land, water and human resources for RNB;
- (iii) recommend the immediate feasibility studies that can be undertaken. Projects with short gestation periods will be considered as high priority;
- (iv) recommend immediately implementable pilot projects;
- (v) recommend a program for education and training;
- (vi) recommend procedure that will assist the RNC to develop the necessary physical plan, logistic, communication and data systems required for efficient basin management and planning over time.

An outline of methodology for the execution of projects under (iii) and (iv) above should be prepared.

Based on the studies of the role and organization of the RNC prepared as a part of the legal and institutional component and in collaboration with the Executive Secretary of RNC, the management consultant firm will prepare a program to provide institutional development assistance to the RNC.

V. RNC SUPPORT TO MANAGEMENT CONSULTANT FIRM:

1. For the personnel assigned to the diagnostic study, the RNC will take such steps as may be necessary to facilitate their entry and travel in the States of the River Niger Commission and other countries for purposes of performing duties as contemplated under the study. The RNC will provide necessary liaison to effect the degree of cooperation with the Ministries of the Member States and other institutions and agencies for the performance of the study.
2. The RNC will assist in arranging for office space, secretarial services, and other forms of logistical support for the study. The RNC will provide this support to the extent possible with available facilities and services at the RNC's Executive Secretariat.
3. The RNC will assign a staff member to assist in the reception of data and information collected during the course of the study and in the elaboration of systems to be recommended to the Commission for the collection, processing, storage and retrieval of data and information for each of the component studies.

VI. SCHEDULE OF ACTIVITIES:

- | | |
|-------------------|---|
| 1 April 1977: | Select management consulting firm to implement diagnostic study. |
| 1 May 1977: | Appoint field team leader of management consulting firm and start diagnostic study. |
| 1 September 1977: | Component groups submit preliminary analysis of dates from component studies to management consulting firm. |
| 1 November 1977: | Component groups submit preliminary findings on component studies to management consulting firm. |
| 15 November 1977: | Submit synopsis on preliminary findings to UNDP for transmittal to Executive Secretary of RNC. |

- 25 November 1977: UNDP official transmission of synopsis to Executive Secretary of RNC.
- 1 December 1977: Component groups submit draft final reports on component studies to management consulting firm.
- 15 January 1978: Component groups submit final reports on component studies and management consulting firm.
- 1 February 1978: Submit draft of final report on diagnostic study to UNDP for transmittal to and review by donors and Executive Secretary of RNC.
- March 1978: Meeting of donors to discuss comments on draft of final report.
- 1 May 1978: Submit revised draft of final report to UNDP for transmittal to Executive Secretary of RNC for review by Member States. Meeting of RNC Council of Ministers to evaluate draft of final report on decided date. Submit final report to UNDP.

II. MANPOWER REQUIREMENTS

Socio-economic studies and analysis of national plans	8 man-months
Legal and institutional	2
Management	11
Synthesis & integration	7
Final revision	2
TOTAL	<u>30 man-months</u>

POSITION DESCRIPTION - WATER RESOURCES PLANNER

Supervision Received

Under the supervision of the Executive Secretary of the Niger River Commission, the Water Resources Planner is responsible for the formulation of broad multiple-purpose water resource development plans. He has wide latitude in the exercise of professional judgment, and his work is reviewed primarily for conformance with the policies of the Commission.

Representative Duties

The Water Resources Planner is responsible for integrating the technical studies of a wide variety of professional experts, both permanent members of the Commission's technical staff and experts utilized for short term assignment, into the formulation of viable alternative water and related land resource development plans to meet the problems and needs of inhabitants of the Niger River Basin. The potential multiple purposes include irrigation, municipal and industrial water supplies, hydroelectric power, flood control, navigation, and fishery resource enhancement. The plans are based on studies of water supply and utilization, productive capability of agricultural lands, studies of agricultural and general economy, engineering and geologic studies, social and environmental assessments, and related concerns. The studies shall conform to accepted engineering and economic practice with appropriate consideration of special conditions in the Niger River Basin. The Water Resources Planner shall consult with appropriate representatives of the member states of the Niger River Commission to determine the relevance of their national development plans to the alternative plans for Niger River Basin development.

The incumbent provides on-the-job technical training to counterparts in the Secretariat technical staff and advises on the selection of staff for out-of-country training, both at academic institutions and with practicing agencies.

Qualifications

The Water Resources Planner shall have qualifications equivalent to those required for a grade GS-13 or GS-14 in the United States Civil Service or equivalent international standards. The applicant shall have had at least 4 years of broad experience in water resources planning, with demonstrable ability to integrate the studies of other professional disciplines into viable multiple-purpose plans. For appointment at equivalent of the GS-13 grade, the applicant shall have had at least one year at the equivalent of the GS-12 grade; for appointment at the equivalent of the GS-14 grade, the applicant shall have had at least one year at the equivalent of the GS-13 grade.

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This is an interdisciplinary position, open to applicants qualified in the fields of engineering, economics, soil science, and geology. In addition to the required experience, the applicant shall have at least a bachelor's degree in one of the fields from an accredited university. A master's degree in one of these fields may be substituted for one year of experience and a doctor's degree for two years of experience.

POSITION DESCRIPTION - SOIL SCIENTISTSupervision Received

Under the supervision of the Executive Secretary of the Niger River Commission, the Soil Scientist is responsible for land classification and land use studies required as input to formulation of multiple-purpose water resource development plans. He has wide latitude in the exercise of professional judgment, and his work is reviewed primarily for conformance with the policies of the Commission.

Representative Duties

The Soil Scientist is responsible for land classification, land use, and related studies that are required as input to formulation of multiple-purpose water resources development plans. These include, but are not limited to, the following:

- . Developing standards for economic classification of arable land, based on parameters of soils, topography, and drainage. The standards are developed in cooperation with the Regional Economist.
- . Performing land classification and mapping of potential irrigable lands, based on standards for economic land classification.
- . Evaluation of the drainage requirements of potentially irrigable lands, based on standards for economic land classification.
- . Performing laboratory analyses of soil and water samples as required in land classification and water quality studies.
- . Classifying lands for other uses besides agriculture, as may be necessary in connection with water resource or related projects. Such other uses may include residential, commercial, industrial, recreational, or for fish and wildlife enhancement.

The Soil Scientist works with the Hydrologist on studies related to water requirements for agriculture and quantity and quality of return flows from irrigation.

The Soil Scientist may request short-term consultations by appropriate specialists, such as drainage engineers, to assist him in performing the above duties.

The incumbent provides on-the-job technical training to counterparts on the secretariat technical staff and advises on the selection of staff for out-of-country training, both at academic institution and with practicing agencies.

Qualifications

The Soil Scientist shall have qualifications equivalent to those required for a grade GS-13 or GS-14 in the United States Civil Service or equivalent international standards. The applicant shall have had at least 8 years of experience in land classification for water resources development, with demonstrated ability to apply the appropriate principles to a wide variety of problems. For appointment at the equivalent of the GS-13 grade, the applicant shall have had at least one year at the equivalent of the GS-12 grade; for the equivalent of the GS-14 grade, the applicant shall have had at least one year at the equivalent of the GS-13 grade.

In addition to the required experience, the applicant shall have at least a bachelor's degree in soil science or agronomy from an accredited university. A master's degree may be substituted for one year of experience and a doctor's degree for two years of experience.

HYDROLOGIST - FUNCTION DESCRIPTION

Supervision Received

Under the supervision of the Executive Secretary of the River Niger Commission, the Hydrologist is responsible for the hydrologic studies conducted for the project investigations being carried out in the Niger River Basin and all collection and analysis of basic hydrologic data. He has wide latitude in the exercise of professional judgment and his work is reviewed primarily for conformance with the policies of the NRC.

Representative Duties

The Hydrologist works in a wide range of activities associated with the water resources development in the Niger River Basin. He works with the NRC staff, assisting, advising and training and in general involving staff members in all of his activities. The hydrologist is responsible for the following activities but is not necessarily limited to these activities:

- Compiles and evaluates all data covering surface water and ground water supplies as well as climatological data. He identifies areas where additional data are required and initiates programs to gather these data. If these programs are conducted under contract, he assists with preparation of the contract specifications and assists in monitoring the contracts.
- Conducts studies required in the investigation of water resource projects. These activities include preparing area-capacity data, determining all water requirements, calculating evaporating rates, conducting operational studies of proposed reservoirs, determining design floods and conducting flood routing studies, determining runoff and cross drainage requirements, conducting sedimentation studies and conducting tailwater studies downstream from proposed reservoirs and other studies of channel hydraulics.
- Prepares mathematical hydrologic models of the Niger River Basin or portions thereof. These programs may be conducted through a contractor, in which case the hydrologist assists with contracting and monitoring the contract.

He makes field visits to assist in getting site selections, to review project sites and to review other field activities.

He coordinates all the NRC hydrologic activities with other local and international agencies involved in similar or related programs, such as the UNDP, WHO, etc.

He cooperates with geohydrologists in evaluating ground water supplies.

The hydrologist receives assistance from the Soil Scientist in estimating water requirements for agricultural production.

The Hydrologist may request short term consultations by specialists as needed to assist him in performing his duties. These specialists may include geohydrologists, sedimentation experts, and others.

The Hydrologist provides on-the-job training for counterparts on the technical staff of the Secretariat. He also advises on selection of staff for out-of-country training to academic institutions or with practicing agencies.

Qualifications

The Hydrologist shall have qualifications equivalent to those required for a grade GS-13 or GS-14 in the United States Civil Service or equivalent international standards. The applicant shall have had at least 8 years of experience in hydrologic activities in the study and development of water resource projects, with demonstrated technical ability. Experience in ground water studies is desirable. For appointment at the equivalent of the GS-13 grade, the applicant shall have had at least one year experience at the GS-12 level; for the equivalent of the GS-14 grade the applicant shall have had at least one year's experience at the equivalent of the GS-13 grade.

In addition to the required experience, the applicant shall have at least a bachelor's degree in engineering from an accredited university. A master's degree may be instituted for one year of the required experience and a doctor's degree for two years of experience.

Position Description - Regional Economist

Supervision Received

Under the supervision of the Executive Secretary of the Niger River Commission, the Regional Economist is responsible for economic, demographic, social, and environmental studies required as input to formulation of multiple-purpose water resource development plans. He has wide latitude in the exercise of professional judgment, and his work is reviewed primarily for conformance with the policies of the Commission.

Representative Duties

The Regional Economist is responsible for economic and associated studies that are required as input to formulation of multiple-purpose water resources development plans. These include, but are not necessarily limited to, the following:

- . Economic studies of agricultural enterprises, based on farm budget studies or other appropriate analyses, to estimate benefits from agricultural lands. These studies should be done in consultation with economists of member states to assure consistency and avoid duplication.
- . Project economic studies, including studies to estimate other potential project benefits (such as power and navigation) economic justification, cost allocation, and appropriate studies of potential project repayment capabilities. The economic justification studies may be based on benefit-cost analyses or internal rate of return, or both.
- . Studies of national and world economics, including marketing and price policies, to consider such questions as the optimum crops to be grown in certain areas under certain conditions.
- . Demographic studies necessary to support the above economic studies, including such things as projections of population, work force, urbanization, industrial expansion, and gross national product.

- . Assessment and evaluation of social impacts resulting from alternative water resource development plans.
- . Assessment and evaluation of potential impacts on human and natural environment of alternative water resource development plans.

The Regional Economist consults with the ministries in charge of economic development of the member states to ensure that economic studies are consistent with the objectives of national development plans.

The Regional Economist works with other specialists as necessary for special studies, such as: with the Soil Scientist in developing standards for economic land classification; and with the Agriculturalist in deciding upon projected cropping patterns.

The Regional Economist may request short-term consultations by appropriate specialists to assist him in performing the above duties. These may include environmental specialists and social factors analysts.

The incumbent provides on-the-job technical training to counterparts on the Secretariat technical staff and advises on the selection of staff for out-of-country training, both at academic institutions and with practicing agencies.

Qualifications

The Regional Economist shall have qualifications equivalent to those required for a grade GS-13 or GS-14 in the United States Civil Service or equivalent international standards. The applicant shall have had at least 8 years of experience in water resources economics, with demonstrated ability to apply the principles of economics to a wide variety of problems. For appointment at the equivalent of the GS-13 grade, applicant shall have had at least one year at the equivalent of the GS-12 grade; for the equivalent of the GS-14 grade, the applicant shall have had at least one year at the equivalent of the GS-13 grade.

In addition to the required experience, the applicant shall have at least a bachelor's degree in economics from an accredited university. A master's degree may be substituted for one year of experience and a doctor's degree for two years of experience.

POSITION DESCRIPTION - CIVIL ENGINEER

Supervision Received

Under the supervision of the Executive Secretary of the Niger River Commission, the Civil Engineer performs the duties assigned in the preparation of preliminary designs and costs estimates of project features of proposed water resource developments. The Engineer has wide latitude in the exercise of professional judgment and his work is reviewed primarily for conformance with the policies of the NRC.

Representative Duties

The NRC is involved in a wide range of planning and development activities associated with the Niger River. Many potential projects have been identified in the past and evaluated to varying degrees. The Engineer works with the staff of the NRC in the preparation of preliminary designs and costs estimates for selected projects. This work requires the gathering of detailed costs information from all the countries involved in the basin, and the preparation of standard unit costs applicable to specific projects under study.

The Engineer assists the NRC in the preparation of specifications and bidding documents for the contracting of topographic, mapping control surveys, aerial photography, and the preparation of speciality maps such as hydrographic and demographic maps. The Engineer assists in monitoring the contracts to ensure conformance with the contract specifications.

The Engineer assists the NRC staff in the preparation of preliminary engineering designs and quantity computations for storage and diversion dams, primary canals and secondary irrigation distribution systems, drainage systems, on-farm irrigation facilities, power plants, pumping plants, and other engineering facilities associated with multi-purpose water resource development projects.

In cooperation with the economics staff of the NRC, the Engineer assists in plan formulation studies. He will also cooperate with the land classification staff and assist in preparation of the land development costs.

The engineer assists the NRC in the development of detailed specifications and bidding documents for the contracting of detailed project investigations and the preparation of final designs. He will assist in the review of all engineering designs and estimates submitted by the contractor to ensure compliance with the specifications.

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The Engineer, with NRC staff, visits sites of major project features for preliminary field assessment of conditions such as foundations, available construction materials, potential construction problems, access, etc.

The Civil Engineer, with the NRC staff, assists in the preparation of specifications for and contracting of the Secretariat buildings and housing quarters.

The Engineer assists with the setting up of program schedules for activities in his area of operation. He works with the NRC staff to provide them on-the-job training and advises in the selection of staff scheduled for out of country training, both at academic institutions and with practicing agencies.

Qualifications

The Civil Engineer shall have qualifications equivalent to those required for a grade GS-13 or GS-14 in the United States Civil Service or equivalent international standards. The applicant shall have had at least 8 years of experience in water resources engineering with demonstrated ability to apply the principles of engineering to a wide variety of problems. For appointment at the equivalent GS-13 grade, the applicant shall have had at least one year at the equivalent of the GS-12 grade; for the equivalent of the GS-14 grade, the applicant shall have had at least one year at the equivalent of the GS-13 grade.

In addition to the required experience, the applicant shall have at least a bachelor's degree in civil engineering from an accredited university. A master's degree may be substituted for one year of experience and a doctor's degree for two years of experience.

Position Description - Agriculturalist

Supervision Received

Under the supervision of the Executive Secretary of the Niger River Commission, the agriculturalist is responsible for providing technical assistance on a broad variety of agricultural practices and problems associated with water and related land resource development. He has wide latitude in the exercise of professional judgment, and his work is reviewed primarily for conformance with the policies of the Commission.

Representative Duties

The Agriculturalist is responsible for providing technical assistance on a broad variety of agricultural practices and problems associated with water and related land resource development. At the micro level, this includes advice and assistance on such factors as types of farm enterprises, suitable cropping programs, and various kinds of livestock development and programs. Extension programs are developed to disseminate information on the above factors to individual farmers. Training and research programs are also developed and implemented to assist farmers in making effective use of water applied to on-farm irrigation. At the macro level, the duties include providing technical advice related to and necessary for development of agricultural policies of the Commission. These include policies related to storage, marketing, and pricing of food and fiber products. The agriculturalist advises the Executive Secretary regarding the integration of member state goals for food and fiber production into basin-wide goals. The incumbent is responsible for providing advice and developing programs related to enhancement of fisheries production.

The agriculturalist may request short-term consultation by specialists as needed to assist him in performing his duties, such as those related to livestock programs and fishery resource enhancement.

The agriculturalist works with the Regional Economist in studying various types of cropping programs and farm enterprise budgets. He also works with the Civil Engineer in studying and advising on operation and maintenance activities of irrigation projects.

The Agriculturalist provided on-the-job training for counterparts on the technical staff of the Secretariat. He also advises on selection of staff for out-of-country training at academic institutions or with practicing agencies.

Qualifications

The Agriculturalist shall have qualifications equivalent to those required for a grade GS-13 or GS-14 in the United States Civil Service or equivalent international standards. The applicant shall have had at least 8 years broad experience in field of agricultural practices and programs, including practical experience in irrigation. For appointment at the equivalent of the GS-13 grade, the applicant shall have at least one year of experience at the GS-12 level; for the equivalent of the GS-14 level, the applicant shall have had at least one year of experience at the GS-13 level.

This is an interdisciplinary position, open to applicant in the agricultural related fields of agronomy, agricultural economics and soil science. In addition to the required experience, the applicant shall have at least a bachelor's degree in one of these fields from an accredited university. A master's degree may be substituted for one year of experience, and a doctor's degree for two years of experience.

POSITION DESCRIPTION - HYDROLOGIST (FORECASTING)

Supervision Received

Under supervision of the Executive Secretary of the River Niger Commission, the Hydrologists (Forecasting) will be responsible for studies leading to the implementation and operation of hydrological forecasting systems throughout the Niger Basin. He will have wide latitude in the exercise of professional judgment and his work will be reviewed primarily for conformance with the policies of the River Niger Commission.

Representative Duties

The Hydrologist (Forecasting) will work within the context of a wide range of activities related to water resource and other development in the Niger River Basin. He will work with the River Niger Commission staff, assisting, advising and training, and in general involving staff members in all his activities.

The Hydrologist (Forecasting) will be responsible for the following activities in consultation with the Hydrologist in areas of common interest but will not necessarily be limited to these activities.

- In association with the Hydrologist, to assess the requirements for observation station networks, taking into account the specific requirements for operation of forecasting systems;
- to undertake analytical studies of existing hydro-meteorological data, taking into account related studies completed or in progress;
- to assess the requirements for the systematic collection of observational data and for the dissemination of hydrological forecasts, through the establishment of basin-sector, national and regional centres;
- to study telecommunication or other requirements for rapid data and forecast transmission;
- to assess priorities for development of a forecasting system throughout the Niger Basin;
- to undertake the implementation of forecasting system throughout the Niger Basin;
- to assess the requirements for model studies and applications for flood and low flow forecasting, taking into account systems currently operated, and envisaged studies of stream flow simulation models;

- to study the feasibility of flood warning systems.

Qualifications

Extensive experience in the field of hydrometeorology including network design and instrumentations; data analysis, processing, and the establishment of data banks; the development of computer evaluations of real-time data and the operation of computer centres; experience in the design of telecommunication networks and the design and application of forecasting models.

The applicant shall have at least a bachelors degree in a related field, with working experience in the organization and administration of a hydrological forecasting service.

Supervision Received

Under the supervision and authority of the Executive Secretary of the Niger River Commission, the Senior Advisor/Coordinator is responsible for providing high level technical and related policy advice to the Executive Secretary on a broad range of natural and human resource development considerations with emphasis on multiple-purpose water and related land and human resources development. He has wide latitude in the exercise of professional judgment, and his work is reviewed primarily for conformance with the policies of the Commission.

Representative Duties

The Senior Advisor/Coordinator is responsible for providing high level technical advice to the Executive Secretary of the Niger River Commission on a broad range of natural and human resource development considerations, with emphasis on multiple-purpose water and related land and human resource development. This advice takes into account the short-term and long-term needs and desires of the member states and their national development plans. Consideration is given to rain-fed and irrigated agriculture, energy development, water requirements of other resource development (such as minerals), navigation and transportation, municipal and industrial water supplies, flood control and fishery resource enhancement. Emphasis is placed on inter-country significance or implications of integrated basin development.

The Senior Advisor/Coordinator advises the Executive Secretary regarding the technical implications of policy programs under consideration by the Commission. He also recommends to the Executive Secretary policy programs that he believes would be desirable based on studies performed by the technical staff of the secretariat to promote the most effective integrated development of the natural and human resources of the Niger River basin.

The Senior Advisor/Coordinator assists the Executive Secretary in coordinating and maintaining contact with the UNDP and other international organizations, with donor countries, and with other river basin commissions, all as related to technical activities of the Commission. He advises the Executive Secretary regarding technical aspects of discussions and deliberations during meetings of the Commission and international meetings in which the Commission participates.

The Senior Advisor/Coordinator works closely with the technical staff and other advisors of the Secretariat in their performance of studies pertaining to water and related land and human resource development.

Qualifications

The Senior Advisor/Coordinator shall have qualifications equivalent to those required for a grade GS-14 or GS-15 in the United States Civil Service or equivalent international standards. The applicant shall have had at least 10 years of broad experience in water resources or related resources planning, with demonstrated ability to provide useful and appropriate technical advice to a high level administrator. For appointment at the equivalent of the GS-14 grade, the applicant shall have had at least one year of experience at the GS-14 level; for the equivalent of the GS-15 grade, the applicant shall have had at least one year of experience at the equivalent of the GS-14 grade.

This is an interdisciplinary position, open applicants in the fields of engineering, economics, soil science, sociology and natural resource development. In addition to the required experience, the applicant shall have at least a bachelor's degree in one of these fields from an accredited university. A master's degree may be substituted for one year of the required experience and a doctor's degree for two years of experience.

A C T

REGARDING NAVIGATION AND ECONOMIC CO-OPERATION
BETWEEN THE STATES OF THE NIGER BASIN

Adopted at the Conference of the Riparian States
of the River Niger, its tributaries and
sub-tributaries

held at Niamey from 24-26th October, 1963

The Federal Republic of Cameroon, the Republic of Chad, the Republic of Dahomey, the Republic of Guinea, the Republic of the Ivory Coast, the Republic of Mali, the Republic of Niger, the Federal Republic of Nigeria, the Republic of Upper Volta,

CONSIDERING their attainment of independence and the need for regulating by new agreement the question of the utilisation of the River Niger, its tributaries and subtributaries of which they are the riparian States ;

DESIROUS of developing close co-operation for the judicious exploitation of the resources of the River Niger basin as well as to guarantee the freedom of navigation on the River, its tributaries and sub-tributaries and to ensure equality of treatment to those who use it ;

CONSIDERING that, in the wake of technical progress, several of the riparian States have already drawn up plans for hydraulic developments such as irrigation, water supply, hydro-electric installations, civil works , soil and river basin improvement, and also plans for dealing with the problems of water pollution, exploitation of fishery resources, the improvement of agricultural practices and industrial development of the basin ;

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CONSIDERING that the schemes planned in each State are likely to affect the regime of the River and the use of its water by other riparian States ;

CONSIDERING the need to establish a joint institution to increase co-operation amongst the States interested in common projects concerned with the basin of the River Niger and to ensure the maintenance and application of the agreed major principles ;

SOLEMNLY AFFIRM the following principles which will govern the measures of co-operation for the purpose of achieving the objectives of the present Act and declare that :

ARTICLE 1.- The General Act of Berlin of 26th February, 1885, the General Act and Declaration of Brussels of 2nd July, 1890, and the Convention of Saint-Germain-en-Laye of 10th September, 1919 are and remain abrogated as far as they concern the River Niger, its tributaries and sub-tributaries.

ARTICLE 2 - The utilisation of the River Niger, its tributaries and sub-tributaries, is open to each riparian State in respect of the portion of the River Niger basin lying in its territory and without prejudice to its sovereign rights in accordance with the principles defined in the present Act and in the manner that may be set forth in subsequent special agreements.

The utilisation of the said River, its tributaries and sub-tributaries, shall be taken in a wide sense, to refer in particular to navigation, agricultural and industrial uses, and collection of the products of its fauna and flora.

ARTICLE 3 - Navigation on the River Niger, its tributaries and sub-tributaries, shall be entirely free for merchant vessels and pleasure craft and for the transportation of goods and passengers. The ships and boats of all nations shall be treated in all respects on a basis of complete equality.

ARTICLE 4 - The riparian States undertake to establish close co-operation with regard to the study and the execution of any project likely to have an appreciable effect on certain features of the regime of the River, its tributaries and sub-tributaries, their conditions of navigability,

agricultural and industrial exploitation, the sanitary conditions of their waters, and the biological characteristics of their fauna and flora.

ARTICLE 5 - In order to further their co-operation for the attainment of the objectives of this Act, the riparian States undertake to establish an Inter-Governmental Organisation which will be entrusted with the task of encouraging, promoting and co-ordinating the studies and programmes concerning the exploitation of the resources of the River Niger basin. The composition, the functions and the procedures of such Inter-Governmental Organisation shall be the subject of a subsequent agreement.

ARTICLE 6 - The Inter-Governmental Organisation of the River Niger shall establish appropriate close relations with the competent specialised agencies of the Organisation of African Unity and shall also maintain useful relations with the United Nations Organisation, its specialised agencies, and other international organisations.

ARTICLE 7 - Any dispute that may arise between the riparian States regarding the interpretation or application of the present Act shall be amicably settled by direct agreement between them or through the Inter-Governmental Organisation referred to in Articles 5 and 6 above.

Failing such settlement, the dispute shall be decided by arbitration, in particular by the Commission of Mediation, Conciliation and Arbitration of the Organisation of African Unity, or by judicial settlement by the International Court of Justice.

ARTICLE 8 - The present Act, the French and English texts of which are equally authentic, shall be submitted for ratification to the signatory States and shall come into force immediately after ratification by all the signatory States.

The instruments of ratification shall be deposited with the Government of the Republic of Niger which shall notify each signatory State of the deposit of the said instruments.

ARTICLE 9 - The Government of the Republic of Niger shall register the present Act, upon its coming into force, in accordance with Article 102 of the Charter of the United Nations.

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IN WITNESS WHEREOF the plenipotentiaries
being duly authorised by their respective Govern-
ments have signed the present Act.

DONE at Niamey on the 26th day of Octobre, 1963

one copy each in English and French to be deposited
in the archives of the Government of the Republic
of Niger, authentic copies thereof to be distributed
to each of the signatory States, and one copy to be
deposited with the Secretariat of the Organisation
of African Unity and one with the Secretariat of
the United Nations.

FEDERAL REPUBLIC OF CAMEROON

REPUBLIC OF THE IVORY COAST

REPUBLIC OF DAHOMEY

REPUBLIC OF GUINEA

REPUBLIC OF UPPER VOLTA

REPUBLIC OF MALI

REPUBLIC OF NIGER

FEDERAL REPUBLIC OF NIGERIA

REPUBLIC OF TCHAD

RIVER NIGER COMMISSION

COMMISSION DU FLEUVE NIGER

A G R E E M E N T

CONCERNING THE RIVER NIGER COMMISSION
AND THE NAVIGATION AND TRANSPORT ON THE
RIVER NIGER

Revised on 2nd February, 1968 and 15th June, 1973

THE CONTRACTING PARTIES

HAVING adopted at the Conference of the Riparian States of the River Niger, its tributaries and sub-tributaries, held at Niamey from the 24th to the 26th October, 1963, an Act regarding the navigation and economic co-operation between the States of the River Niger Basin,

DESIROUS of giving effect to Article 5 of the said Act, by which they have undertaken to establish an Inter-Governmental Organisation entrusted with the fostering, the promotion and the co-ordination of studies and programmes relating to the utilization and development of the resources of the River Niger Basin,

DESIROUS of specifying some questions relating to navigation and transportation on the River,

HAVE AGREED AS FOLLOWS :

HEADING I

RIVER NIGER COMMISSION

Chapter I - NATURE OF THE COMMISSION

ARTICLE 1 - There shall be established an Intergovernmental Organisation as mentioned in Article 5 of the Act of Niamey of October 26, 1963, which shall be called RIVER NIGER COMMISSION.

The headquarters of the Commission shall be at Niamey.

ARTICLE 2 - The Commission shall have for all purposes the status of an international organisation.

Chapter II - OBJECTIVES AND FUNCTIONS OF THE COMMISSION

ARTICLE 3 - The Commission is entrusted with the task of encouraging, promoting and the coordination of studies and programmes concerning the exploitation and the development of the resources of the Basin.

ARTICLE 4 - The Commission shall have the following functions:

a) to prepare general regulations which will permit the full application of the principles set forth in the Act of Niamey, and to ensure their effective application.

The general regulations and the other decisions of the Commission shall, after approval by Member States and after a time limit fixed by the Commission, have binding force as regards relations among the States as well as their internal regulations;

b) to maintain liaison between Member States in order to ensure the most effective use of the waters and resources of the River Niger Basin;

c) to collect, evaluate and disseminate basic data on the whole of the basin, to examine the projects prepared by the Member States, and to recommend to the Governments of the Member States plans for common studies and works for the judicious utilization and development of the resources of the basin;

d) to follow the progress of the execution of studies and works in the basin and to keep the Member States informed, at least once a year thereon, through systematic and periodic reports which each State shall submit to it;

e) to draw up general regulations regarding all forms of navigation on the River including coastal trade;

f) to draw up staff regulations and to ensure their application;

g) to examine complaints and to promote the settlement of differences;

h) to make request for financial and technical assistance on a bilateral, multi-lateral or international basis for the execution of studies and works for the development of the River Niger Basin and to enter into agreement for the same provided that any such agreements involving financial obligations from Member States shall become binding only after approval by the Member States concerned;

i) to supervise the implementation of the provisions of the Act of Niamey and the present Agreement.

ARTICLE 5 - In order to achieve maximum co-operation in connection with the matters mentioned in Article 4 of the Act of Niamey, the Member States undertake to inform the Commission as provided for in Article 4 d) hereabove, at the earliest stage, of all studies and works upon which they propose to embark

They undertake further to abstain from carrying out on the portion of the River, its tributaries and subtributaries subject to their jurisdiction any works likely to pollute the waters, or any modification likely to affect biological characteristics of its fauna and flora, without adequate notice to, and prior consultation with, the Commission.

ARTICLE 6 - The taxes and duties payable by the vessels and goods using the river, its tributaries and subtributaries, and facilities thereof, shall be in proportion to the services rendered to navigation, and shall in no way be discriminatory.

ARTICLE 7 - The roads, railways and lateral canals that may be constructed for the special purpose of avoiding the non-navigable portions of the River or of improving certain sections of the waterways, shall be considered in their use as means of communication, as integral part of the River Niger, and shall be equally open to international traffic within the framework of specific regulations set up by the Commission and approved by the Member States.

On these roads, railways and canals only such tolls, shall be collected as are calculated on the cost of construction, maintenance and management. As regards such tolls, the nationals of all States shall be treated on the basis of complete equality.

ARTICLE 8 - The River Niger Commission shall establish general regulations to ensure the safety and control of navigation on the understanding that such regulations shall be designed to facilitate, as much as possible, the movement of vessels and boats.

HEADING II

THE ORGANS OF THE COMMISSION

ARTICLE 9 - The Commission shall have the following organs :

- The Council of Ministers
- The Executive Secretariat.

Chapter I - COUNCIL OF MINISTERS

ARTICLE 10 - The Council of Ministers shall be the organ for orientation and of decision of the Commission.

It shall consist of Ministers, one for each Member State. Each minister may be assisted by experts.

ARTICLE 11 - The quorum of the Council of Ministers shall be six. The decisions of the Council of Ministers shall be taken by a majority of two-thirds of the Member States of the Commission.

ARTICLE 12 - The Council of Ministers shall meet in ordinary session once a year on the invitation of the Chairman. It may meet in extraordinary session at the joint request of any three Member States by notification addressed to the Chairman of the Council.

The meetings of the Council of Ministers may take place either at the Headquarters of the Commission or in any of the Member States. Each meeting shall be preceded by a meeting of experts of the Member States

ARTICLE 13 - The Council of Ministers shall elect a Chairman in rotation among the Member States and he shall hold office for a period of one year.

The Chairman of the Council of Ministers shall represent the Commission between two sessions of the Council of Ministers.

He shall take decisions within his competence, and within the limit of the powers delegated to him, on the directives of the Council of Ministers.

ARTICLE 14 - The Council of Ministers shall establish the Rules of Procedure for the Commission.

Chapter II - EXECUTIVE SECRETARIAT

ARTICLE 15 - The Executive Secretariat shall be the organ of execution of the Commission.

ARTICLE 16 - The Council of Ministers shall, by a two-thirds majority vote of Member States, appoint the Executive Secretary from among the candidates proposed by Member States.

Each Member State is entitled to nominate a candidate for the office of Executive Secretary.

The Executive Secretary shall hold office for a period of three years and shall be eligible for re-appointment. The conditions of his service shall be defined in the Staff Regulations.

ARTICLE 17 - The Executive Secretary exercises such powers and performs such duties as may be determined by the Council of Ministers. He is responsible to the Council.

The Executive Secretary shall carry out the decisions of the Council of Ministers and shall report regularly on the execution of the decisions to the Chairman of the Council.

ARTICLE 18 - The Council of Ministers may, by a two-thirds majority vote, remove the Executive Secretary from office.

Article 19 - The Executive Secretary shall be assisted in the performance of his duties by such staff according to the staff provision approved by the Council of Ministers. The conditions of service of the staff shall be defined in the Staff Regulations.

ARTICLE 20 - The Executive Secretary shall be in charge of the Staff of the Commission.

ARTICLE 21 - The Executive Secretary shall be accorded diplomatic privileges and immunities by the Member States. The other staff of the Commission shall be accorded such privileges and immunities as accorded to officials of the Organisation of African Unity of equivalent status.

HEADING III

GENERAL PROVISIONS

ARTICLE 22 - The Council of Ministers shall establish an annual Budget for the Commission.

The Member States shall make contributions towards the regular Budget of the Commission in proportions to be determined by the Commission.

Any expenditure incurred in respect of special services rendered to a State by the Commission shall be paid by that State.

ARTICLE 23 - This Agreement forms an integral part of the Act of Niamey and shall enter into force immediately after its ratification by all the signatory States. The instruments of ratification shall be deposited with the Government of the Republic of Niger who shall notify the deposit of these instruments to each Member State.

ARTICLE 24 - The Act of Niamey together with this Agreement may be denounced by any one of the Member States after the expiration of a period of ten years from the date of its coming into force. Denunciation shall take the form of a written notice addressed to the Government of the Republic of Niger who shall acknowledge its receipt and shall inform the other contracting States and the Executive Secretary. It shall take effect one year from the date of acknowledgement of its receipt, if not withdrawn earlier. In the absence of agreement to the contrary it shall not affect obligations to any programme of studies and works agreed to before such denunciation.

ARTICLE 25 - The Act of Niamey and this Agreement may be amended upon the written request of one-third of the Member States addressed to the Government of the Republic of Niger. Any proposal for revision shall require the approval of two-thirds of the Member States, and shall take effect six months after the date of its adoption.

ARTICLE 26 - Upon the coming into force of the present Agreement, the Government of the Republic of Niger shall register it in accordance with Article 102 of the United Nations Charter.

IN WITNESS WHEREOF the Plenipotentiaries being duly authorized by their respective Governments have signed the present Agreement.

ANNEX ERIVER NIGER COMMISSION APPROVED BUDGET FOR 1977

Chapitre - Personnel

Article	Description	Approuvé 1976	Proposé 1977
1	Secrétaire Exécutif	2.400.000	2.640.000
2	Directeur Centre de Documentation	1.680.000	1.848.000
3	Deux Ingénieurs, Hydrologie, Ressources en eau	3.360.000	3.696.000
4	1 Agronome	1.680.000	1.848.000
5	Comptable	1.058.400	1.164.240
6	Traducteur bilingue	1.440.000	1.584.000
7	Traducteur	756.000	831.600
8	Trois documentalistes	3.024.000	3.326.400
9	Deux archivistes	1.056.000	1.161.600
10	Un Analyste	528.000	580.800
11	Un Aide-bibliothécaire	480.000	528.000
12	Deux Secrétaires	1.356.000	1.491.600
13	Deux Sténo-dactylo	1.161.000	1.277.100
14	Deux Dactylographes	915.600	1.007.160
15	Deux Commis	628.000	910.800
16	Une Téléphoniste	201.000	221.100
17	Un Planton, Un Huissier	475.000	522.500
18	Quatre Chauffeurs	1.152.000	1.267.200
19	Deux gardiens-jardiniers	302.400	332.640
20	Un Cuisinier	172.800	190.080
21	Un Commissaire aux Comptes	70.000	70.000
22	Indemnités de Résidence	3.989.000	4.387.900
23	" de Fonction	1.134.000	1.247.400
24	" de Logement	2.119.980	2.331.978
25	Allocations Familiales	870.000	870.000
26	Sécurité Sociale	1.995.780	2.318.658
27	Frais médicaux	700.000	770.000
		34.907.360	38.424.756

PERSONNEL A RECRUTER POUR L'ANNEE 1977

Description	Approuvé 1976	Proposé 1977
1 Directeur Administratif		1,848.000
1 Secrétaire Administratif		1,200.000
1 Hydrologue Adjoint		1,200.000
1 Boy		144.000
Indemnités de Résidence		878.200
Indemnités de Logement		936.000
Total		6,206.200
Report de la page 1		38,424.756
Total du Chapitre 1		44,630,956

RESUME DU BUDGET 1977

CHAPITRE	I	-	Personnel	!	44.630.955
"	II	-	Matériel et Entretien			!	7.790.000
"	III	-	Transport et Déplacement			!	4.300.000
"	IV	-	Véhicules			!	4.500.000
"	V	-	Conférence	!	2.500.000
"	VI	-	Logement			!	10.804.890
"	VII	-	Equipement		..	!	3.300.000
"	VIII	-	Publications		..	!	10.000.000
"	IX	-	Divers			!	750.000
						!	88.575.840

DRAFT GRANT AGREEMENT

Annex I - Project Description

This Agreement provides funding for the implementation of a project designed to: (1) Undertake specific study efforts throughout the Niger River Basin, which will provide the basic information and data required for the elaboration of a three to five year action program leading to a comprehensive Indicative Plan for the long-term development of the water and related resources of the Niger River Basin; (2) Undertake initial efforts to assist the institutional development of the River Niger Commission and its Executive Secretariat through the provision of U.S. technical advisors to the staff of the RNC Executive Secretariat, the long-term academic training of Member State nationals for future assignment to the technical staff of the Executive Secretariat, short-term training for Executive Secretariat documentalists, a short-term study tour in the United States for Member State representatives, and the preparation of architectural design plans for the physical facilities required by the Executive Secretariat headquarters in Niamey, Niger.

This project is being implemented as a multi-donor activity and requires the full coordination of complimentary actions by all participating parties, including the United States (AID), Canada (CIDA), France (FAC), the United Nations (UNDP) and the River Niger Commission (RNC). The project will be implemented pursuant to the outline approved by the River Niger Commission

Committee of Experts at their October 1976 meeting in Niamey, Niger; detailed at the January 1977 Donors meeting in Paris, France and endorsed by the River Niger Commission's Council of Ministers, February 1977 meeting in Lagos, Nigeria.

The coordinated, multi-donor project in which AID will participate will specifically provide:

(1) A diagnostic study to collect and evaluate all existing data and information on the River Niger Basin considered essential in planning activities for the development of water and related resources in the basin; transfer, as possible, all collected material to the Documentation Center of the River Niger Commission; and identify additional information and study programs required to fill information gaps as noted during the diagnostic phase.

The diagnostic study will include component studies in the following areas:

- a. Agriculture (jointly conducted by AID and CIDA)
- b. Water Resources (jointly conducted by CIDA and FAC)
- c. Engineering (jointly conducted by CIDA and FAC)
- d. Topography, Mapping and Remote Sensing (jointly conducted by AID and FAC)
- e. Education and Training (conducted by AID)
- f. Environment (conducted by AID)
- g. Legal and Institutional (conducted by UNDP)
- h. Synthesis Report (conducted by UNDP)

(2) The preparation of a five-year Action Program which will form the basis of possible continued support by AID and other

donors to a multi-donor assistance program of long-term institutional development of the River Niger Commission and the elaboration of an Indicative Plan for the comprehensive and coordinated development of the Niger River Basin resources.

This Action Program will be prepared following a review of the conclusions and recommendations of the individual component sections of the Diagnostic Study.

(3) Initial efforts to begin the long-term institutional development of the River Niger Commission and its Executive Secretariat.

- Long-term professional advisory services of technical and managerial expertise will be provided to the Executive Secretariat in the following fields by the indicated donors:

- (a) Senior Advisor and Coordinator (UNDP)
- (b) Forecasting Hydrologist (UNDP)
- (c) Regional Economist (CIDA)
- (d) Hydrologist (CIDA)
- (e) Civil Engineer (FAC)
- (f) Agriculturalist (FAC)
- (g) Water Resources Planner (AID)
- (h) Soils Scientist (AID)

- A program of long and short-term training to initiate efforts to ensure the development of African technical and managerial manpower necessary to fully staff the RNC Executive Secretariat and Member State water resources agencies over time. This training will include:

- (a) Long-term graduate level academic training to the masters degree for Member State nationals who will ultimately be assigned to the technical staff of the of the Executive Secretariat in the fields of cartography, systems analysis, environmental science, hydrometeorology, civil engineering, and hydrogeology.
- (b) Long-term academic training for technicians to be assigned to Member State agencies related to river basin development.
- (c) Short-term training of documentalists from the Executive Secretariat's Documentation Center.

- Financial Support to initiate efforts for the ultimate provision of the necessary physical plant required by the Executive Secretariat for efficient basin development management and planning over time.

AID, Other Donor, and RNC Contributions and Understandings

In assisting the River Niger Commission and the other donors in implementing this interim phase project, this Agreement provides a grant of \$_____ to cover the full costs of AID's contribution as detailed below. This Agreement and AID's participation in the interim phase does not constitute a commitment on the part of AID to provide continued support to the five year action program which will be elaborated as a result of this project. Any such future participation and contribution by AID will be determined following a review and analysis of the diagnostic study, the

proposed action program and evidence of continued and sustained support to the long-term program by the Member States of the River Niger Commission and the international donor community.

The AID grant of \$ _____ will cover the costs of providing the following services in cooperation with those provided by other donors:

- (1) Consulting services of U.S. technicians, firms or institutions to undertake component elements of diagnostic studies in Agriculture, Health and Environment, Education and Training, and Topography, Mapping and Remote Sensing.
- (2) The provision of two (2) U.S. technician (Water Resources Planner and Soils Scientist) for a two-year assignment to the technical advisory staff of the Executive Secretariat.
- (3) Long-term graduate-level training to the masters degree for six (6) Member State nationals for ultimate assignment to the technical staff of the Executive Secretariat. This training will be undertaken in U.S. universities.
- (4) Short-term training of six months for three (3) documentalists from the Executive Secretariat's Documentation Center. This training will take place in third-country African countries, FAO/Rome and the United States as appropriate.
- (5) A study tour of River Basin development projects in the

United States for one representative from each of the Member States for a total of nine (9) persons.

- (6) Limited equipment, supplies and logistical support to the operations of the Executive Secretariat.

Provision of AID's contribution is contingent upon the successful execution of similar respective agreements between the River Niger Commission and the UNDP, CIDA and FAC following the agreements reached at the January 1977 donors meeting in Paris.

UNDP

UNDP will provide the services of a consultant to manage and coordinate the various component elements of the diagnostic study. The consultant will further be responsible for the Legal and Institutional component of the diagnostic study and for the preparation of a final synthesis report and the elaboration of the five year action program. The UNDP will also furnish a hydrological forecaster to the technical advisory staff of the Executive Secretariat as well as a senior advisor/coordinator who will assume responsibility for assisting the Executive Secretary in the coordination of the advisory team in their work functions.

CIDA

Following the general terms of reference prepared for the component elements of the diagnostic study at the January 1977 donors meeting in Paris, CIDA will provide technicians, consulting groups and related services to undertake specified portions of diagnostic studies in the fields of Agriculture, Water Resources

Engineering, and Environment.

CIDA will additionally provide two technicians (hydrologist and regional economist) for long-term assignment to the technical advisory staff to the Executive Secretariat.

FAC

FAC will provide the services of various specialized agencies of the French Government to undertake specific portions of diagnostic studies in the fields of Water Resources, Engineering, and Topography and Mapping. They will additionally provide two technicians (civil engineer and agriculturalist) for long-term assignment to the technical advisory staff of the Executive Secretariat.

Following the resolutions passed by the River Niger Commission's Council of Ministers at the February 1977 meeting in Lagos, the River Niger Commission will provide the Executive Secretariat with a operating budget for 1977 in the sum of \$81,575,849 FCFA and begin immediate recruitment to fill present vacancies in approved staff positions for a hydrologist, a water resources engineer, an agronomist, an assistant hydrologist, a director of administration and an assistant director of administration.

Although each donor is responsible for the mobilization and financial management of their individual contributions to the start-up program, it is understood that the UNDP will be responsible for the official coordination of donor inputs through its headquarters in New York.

COMMISSION DU FLEUVE NIGER
SECRETARIAT

B.P. 729

NIAMEY (Niger)

Té1 : 72-29-82

ANNEX C
RIVER NIGER COMMISSION
SECRETARIAT

P.O. BOX 729

25 November, 1976

Référence : No. 275/CFN/TEC.40

The Chairman
~~Le Secrétaire-Exécutif~~

2803-015
M. Chellins

RAF- 175 / 038

Mr. Michel Doo Kingue,
Assistant Administrator,
Regional Bureau for Africa,
United Nations Development
Programme,
866 United Nations Plaza,
New York, N.Y. 10017.

copy to Mr. Isidore, then file pl.

Dear Mr. Assistant Administrator,

RAF/75/038 - River Niger Basin

I have the honour to refer to your letter RAF/75/038 of September 29, 1976 addressed to the Executive Secretary, River Niger Commission in connection with the multidonor meeting held in Paris from September 6 to 9, 1976.

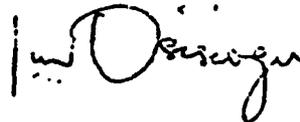
You are aware that a meeting of experts/technicians of our Commission and representatives of donor countries held in Niamey on October 25-27 had examined and discussed the documents in (a) and (b) of your letter under reference and had made sensible recommendations in the interest of the Commission.

I have been briefed by the Executive Secretary on the outcome of the Paris and Niamey meetings. I learnt that the question of appointing the Executing Agency for the initial phase is to be discussed in another meeting to be held in Geneva in early January, 1977.

I share the view and recognise the importance to proceed with the execution of the initial phase (diagnosis) which involves collection of all the data and information required for the Programme of Action and will take six to nine months to complete. To avoid delay, I convey official endorsement of the RNC to enable you proceed with necessary arrangements for the execution of the diagnostic phase.

The Council of Ministers at the next meeting in February, 1977 will have ample opportunity to discuss the recommendations made by the experts and representatives of donor countries at the October meeting in Niamey and will give further directives.

Please accept, Mr. Assistant Administrator, the assurance of my highest consideration.



Prof. I.U.W. Osisioju,
Current Chairman,
River Niger Commission,
Federal Commissioner for
Water Resources,
Lagos, Nigeria.

Federal Ministry of Water Resources
LAGOS

COMMISSION DU FLEUVE NIGER

SECRETARIAT

B.P. 729

cc RR's Benin
CNR
Chad
Guinea
IVC
Mali
UPV
Ekh
Niger

NIAMEY (Niger)
Tel : 72-29-62

RIVER NIGER COMMISSION
SECRETARIAT

P.O. BOX 729

22 November, 1976

Référence : No. 273/CFN/SEC 40

Le Secrétaire Exécutif

Mr. Alan Doss,
Resident Representative a.i.,
U.N.D.P.,
Niamey.

RAF/75/038

Dear Mr. Resident Representative,

RAF/75/038 - Indicative Development Plan
for the River Niger Basin

Contacts with representatives of the donor agencies who attended the meeting of Experts/Technicians last month in Niamey examined the advisability of holding another meeting between the donor agencies and the Executive Secretariat of the River Niger Commission. The purpose of the meeting is to coordinate donor assistance for initiating the first five-year Programme of Action examined by the Experts and to seek more assistance from other sources. The idea received the support of those contacted.

The proposed Programme of Action for which pledges made so far amount to no more than half of the estimated cost cannot, however, be finalized until it is elaborated in more detail. The benefit of the details will assist the six to nine months' diagnosis phase beginning in early 1977 (collecting and compiling all data and information, identification of gaps, etc.). A final report on the diagnosis submitted to the Secretariat in September, 1977 would afford ample time for review and evaluation before it is presented to the Ministers in December, 1977.

Meanwhile, the Executive Secretariat has identified areas of activities for the first two years of the Programme of Action which can be started without delay. The Start-up Assistance Package (two years), recommended to the Council of Ministers for approval by the Experts, is considered to be the minimum of assistance (training, institutional support, first priority studies including the diagnosis) required by the Commission to initiate the Programme of Action. A working document on the Start-up assistance plan is being prepared for use at the next meeting of donors and the

It has been brought to my attention that the UNDP may be willing to sponsor and organize the meeting which could commence on January 10, 1977 in Geneva for a few days. I am now making a request through you to UNDP in New York to arrange the meeting in two sessions as follows :

- (a) the first is to review the working document including any modifications to the Start-up Assistance Package and the Terms of Reference for the Diagnosis dealt with at the October 25-27 meeting in Niamey;
- (b) the second session will be devoted to discussing the sharing of responsibilities, the means by which the donor agencies intend to make their assistance effective, the standardization of RNC counterpart support to the donor agencies, the coordination of schedules of donors among themselves and with the RNC with respect to the execution of the first two years of the Programme.

The working document could then be completed by the Secretariat after the session to reflect the proceedings in (a) and (b) above. Chapters pertaining to donor coordination, for example, would be based almost entirely on the proceedings.

The following countries/agencies should be invited to the meeting: CIDA, FNC, USAID, EED, OECD, the British Government, the scandinavian countries (Denmark, Finland, Norway, Sweden already contacted after the Paris and Niamey meetings). Representatives of donors should be prepared to discuss the extent of their Governments'/Agencies' participation in the Start-up Assistance Plan for the Programme of Action.

Please accept, Mr. Resident Representative, the assurance of my highest consideration.


A. E. Dehinde
Executive Secretary

AED/jm:

PROJECT PERFORMANCE TRACKING (PPT) NETWORK															
COUNTRY: REGIONAL	PROJECT NO.: 625-0915	PROJECT TITLE: NIGER RIVER DEVELOPMENT PLANNING						DATE: 4-18-77	<input type="checkbox"/> ORIGINAL <input type="checkbox"/> REVISION		APPROVED:				
FY-77	MONTH	0	1	2	3	4	5	6	7	8	9	10	11	12	13
PRIOR ACTION: - Project Paper Approval - Advice of Allotment - Invitation for Bids - Personnel Recruitment - Donor Coordination	1	Project Agreement		7	Expatriate Staff on Board			13	Draft Final Synthesis Report Complete				POST ACTION: - Completion of 24 month contracts for expatriate staff - Continuation of long-term training to Masters level - Thorough review and analysis of final report - Preparation of Project Paper for long-term assistance		
	3	Ag. Diagnostic Team		10	Documentalists Begin Training			14	Donors Meeting						
	5	Cartographic Diagnostic Team		9	Environmental Diagnostic Team			15	Documentalists Complete Tng.						
	6	Water Resources Diagnostic Team		11	Participants Begin Long-Term Tng.			16	Final Report Complete						
	4	Engineering Diagnostic Team		8	Education/Training Diagnostic Team			17	End of Project						
	2	UNDP Diagnostic Management Team		12	Final Diagnostic Component Reports										

CRITICAL PERFORMANCE INDICATOR DESCRIPTION

Project Purpose:

To prepare the basis for the implementation of long-term, multi-national support to the River Niger Commission through the preparation of a comprehensive diagnostic study, the provision of initial expatriate advisory staff, the initiation of long-term training for future indigenous staff, and the elaboration of a five year action plan.

CPI Description**I. Prior Actions**

In order to initiate the tasks required for completion of the work plan within the proposed time-frame, it will be necessary to undertake preliminary actions precedent to the formal signing of the Project Agreement with the RNC. Considering the formal execution of the Project Agreement as the starting point of project implementation the following schedule of events must be undertaken on the part of AID.

1. Approval of Project Paper (AID/W)
2. Advice of Allotment (AID/W)
3. Invitation for Bids released for contracting of diagnostic study components funded by (AID/W).

4. Recruitment search for personnel service contractors to serve on expatriate advisory staff (AID/W).

5. Coordinate approved actions with other donors and reach final agreement on individual responsibilities (AID/W, ADO/N).

II. CPI's

1. 5/30/77 - Project Agreement signed (ADO/N, RNC).
2. 5/30/77 - UNDP Diagnostic Management/Synthesis on board at RNC headquarters in Niamey. (AID/W, CIDA, RNC)
3. 6/30/77 - Agriculture Diagnostic Team in place and functioning at Niamey. (AID/W, CIDA, RNC)
4. 6/30/77 - Engineering Diagnostic Team in place and functioning at Niamey. (CIDA, FAC, RNC)
5. 6/30/77 - Topography/Cartographic Team in place and functioning at Niamey. (AID/W, RNC)
6. 7/30/77 - Water Resources Diagnostic Team in place and functioning at Niamey. (CIDA, FAC)

CRITICAL PERFORMANCE INDICATOR DESCRIPTION

- 181 -

7. 9/30/77 - Expatriate technical advisory staff to the RNC Executive Secretariat in place and functioning at Niamey. (AID/W, CIDA, FAC, UNDP, RNC)
8. 9/30/77 - Education/Training Diagnostic Team in place and functioning at Niamey. (AID/W, RNC)
9. 10/30/77 - Environmental Diagnostic Team in place and functioning at Niamey. (AID/W, CIDA, RNC)
10. 11/30/77 - Documentalists from Documentation Center of RNC Executive Secretariat begin short-term training in third-country location. (ADO/N, RNC)
11. 1/15/78-- Six participants begin long-term graduate level training at U.S. universities. (ADO/N, AID/W, RNC)
12. 1/30/78 - Final diagnostic component studies completed and submitted to Diagnostic Management for preparation of synthesis report. (ADO/N, CIDA, FAC, UNDP, RNC)
13. 2/30/78 - Synthesis report completed in final draft for submission to donors and RNC Executive Secretary for review (UNDP).
14. 3/30/78 - Meeting of Donors and RNC Executive Secretary to discuss draft report and agree on final version for formal submission to RNC Council of Ministers. (ADO/N, AID/W, CIDA, FAC, UNDP, RNC)

15. 5/30/78 - Documentalists complete training. (ADO/N, RNC)
 16. 5/30/78 - Final report on results of Diagnostic Study including proposed five year action program submitted to RNC for review and deliberation by Council of Ministers (UNDP)
 17. 5/30/78 - End of Project Status. Five year action program proposal in existence. Expatriate technical advisory staff functioning within RNC Executive Secretariat. Six member state nationals undergoing academic training for subsequent assignment. Center functioning at increased level of efficiency.
- III. Post Actions
1. Completion of 24 month contracts by expatriate staff.
 2. Continuation of long-term academic training to the Masters Degree level by participants.
 3. Thorough review and analysis of final report by donors to determine scope and extent of possible continued assistance to the RNC in the implementation of the five-year action program.
 4. RNC initiates efforts to elicit pledges for assistance from international donor community.

CRITICAL PERFORMANCE INDICATOR DESCRIPTION

5. Donor community prepares individual, coordinated Project Papers for their continued assistance to the long-term program.

ANNEX I

NO 10-2-11-72

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK
(GOAL PURPOSE)**

Life of Project:
From FY 77 to FY 78
Total U. S. Funding 1,350,000
Date Prepared 3/20/77

Project Title & Number: Niger River Development Planning 625-0915

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>The goal of this multi-donor project is to assist the River Niger Commission design and undertake a coordinated program for the development of the land, water and human resources of the Niger Basin for the benefit of the basin population. Attainment of this goal is dependent on realization of two project sub-goals:</p> <ul style="list-style-type: none"> - formulation of an internationally recognized Indicative Basin Plan and Investment Program which will insure the rational development and utilization of basin resources for the benefit of the resident population; - establishment of an institutional structure with sufficient technical and managerial capability to mobilize necessary resources and assist member states in the future implementation of the basin plan and supporting investment program. 	<p>Measures of Goal Achievement:</p> <p>The existence of a comprehensive plan for the regional development of the Niger River Basin endorsed by the member states of the RNC, and evidence that coordinated efforts are being initiated to implement development activities, both regional and national, in consonance with its basic outlines.</p> <p>The existence of fully institutionalized and staffed secretariat within the RNC capable of continuing with the conduct of studies for the dynamic refinement of regional planning efforts and assisting member states in the execution and coordination of development activities.</p>	<ul style="list-style-type: none"> - Future project reports and records - Reports of RNC Council of Ministers meetings - On-site inspection 	<p>Assumptions for achieving goal targets:</p> <ul style="list-style-type: none"> - RNC member states able to recruit competent personnel for training and assignment to RNC ExSec. - Member states continue to support the concept of regional coordination through RNC - Donor community continues to support long-term action program following start up phase.
<p>Project Purpose:</p> <p>The purpose of this "start-up" assist-project is to:</p> <ul style="list-style-type: none"> - establish the analytical base (Diagnostic Study) and planning framework (Action Program) required for the preparation of the indicative basin plan and investment program. - commence the process of strengthening the institutional capability of the RNC to carry-out an effective program of planning and development for the Niger River Basin over time. 	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ul style="list-style-type: none"> - Sufficient technical information provided through the Diagnostic Study to enable the design of a detailed five year plan of action for multi-donor support in pursuit of the project goal. - Expatriate advisory staff functioning and capable of assisting the RNC and its existing and future indigenous staff in the implementation of the five-year action plan. 	<ul style="list-style-type: none"> - Project reports and records - On-site inspection 	<p>Assumptions for achieving outputs:</p> <ul style="list-style-type: none"> - Member states will provide complete cooperation to Diagnostic Study teams. - Donor coordination and cooperation functions smoothly.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK CONTINUED (Page 2)
(OUTPUTS)

Life of Project: _____
 From FY 77 to FY 78
 Total U.S. Funding 1,350,000
 Date Prepared: 5/28/77

Project Title & Number: Niger River Development Planning 625-0915

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Outputs:</p> <p>1. Diagnostic Study</p> <ul style="list-style-type: none"> - Comprehensive diagnostic study which defines the existing and potential Basin resources and the scope and requirements of long-term efforts for the preparation of an Indicative Plan (through a five year action program). <p>2. Institutional Development</p> <ul style="list-style-type: none"> - Established and functioning expatriate advisory staff. - Expanded indigenous staff assigned and functioning within Executive Secretariat of RNC and documentation center operations improved. - Future indigenous staff undergoing academic training. - Increased comprehension of river basin development and coordination requirements by member states of RNC. 	<p>Magnitude of Outputs:</p> <p>1. Completed diagnostic studies which will:</p> <ul style="list-style-type: none"> (a) Identify, document and evaluate available data and information and define the analytical and field studies required for developing planning activities in (1) agriculture, (2) water resources, (3) hydraulic engineering, and (4) environmental considerations; (b) Determine the extent and quality of mapping and geodetic surveying requirements; (c) Determine the long-term staffing and requisite training requirements for a fully functioning commission; (d) Document the necessary economic, social, demographic, legal and institutional parameters, and (e) Synthesize and integrate the above components into a final report. <p>2. Institutional Development</p> <ul style="list-style-type: none"> (a) Fully functioning permanent advisory staff of eight expatriate technicians. (b) Increase of six indigenous members of NRC permanent, professional staff members including a hydrologist, assistant hydrologist, water resource engineer, agronomist, administrative director and administrative assistant. (c) Three presently assigned documentalists receive short-term third country training. (d) Six participants enrolled in U.S. institutions for graduate level academic training. (e) Study-tour of U.S. river basin development projects for one representative from each of the nine RNC member states. 	<ul style="list-style-type: none"> - Project reports and records - RNC reports and records - On-site inspection 	<p>Assumptions for achieving outputs:</p> <ul style="list-style-type: none"> - Member states provide necessary budget support to RNC ExSec. - Donor inputs provided on a timely basis. - Terms of reference for diagnostic study are adequate.

PROJECT DESIGN SUMMARY

LOGICAL FRAMEWORK CONTINUED (Page 3)
(INPUTS)

Life of Project:
From FY 77 to FY 78
Total U.S. Funding 1,350,000
Date Prepared: 6/29/77

Project Title & Number: Niger River Development Planning 625-0915

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Inputs:</p> <ol style="list-style-type: none"> 1. Short-term contract personnel and logistics for preparation of diagnostic studies. 2. Long-term technical assistance. 3. Long-term participant training. 4. Short-term training/study tours. 5. Architectural design service. 6. Logistical support 7. Increased permanent indigenous staff and budgeting support to the RMC. 	<p>Implementation Target (Type and Quantity)</p> <ol style="list-style-type: none"> 1. <u>Diagnostic Study:</u> <ol style="list-style-type: none"> (a) Agriculture Component: USAID - \$300,000 (24 p/m TA, logistics, supplies) CIDA - \$200,000 (14 p/m TA, logistics, supplies) (b) Water Resources Component: CIDA - \$320,000 (40 p/m TA, logistics) FAC - \$356,000 (Contract Services in Hydrology and Hydrogeology) (c) Hydraulic Engineering Component CIDA - \$430,000 (50 p/m TA, logistics) FAC - \$400,000 (Contract Services) (d) Topography, Mapping and Remote Sensing Component: USAID - \$255,000 (35 p/m TA, logistics, supplies) FAC - \$50,000 (Contract Services with IGN, provision of maps) (e) Education and Training Component: USAID - \$35,000 (4 p/m TA, logistics) (f) Environmental Component: (15 p/m TA) USAID - \$65,000 UNDP - \$65,000 CIDA - \$65,000 (g) Social Survey Research Unit: USAID - \$50,000 (6 p/m TA, logistics) (h) Management/Synthesis Component: UNDP - \$270,000 (30 p/m, logistics) 	<ul style="list-style-type: none"> - Project reports and records - RMC reports and records - On-site inspection 	<p>Assumptions for providing inputs:</p> <ul style="list-style-type: none"> - Qualified technical consultants and advisors can be recruited by donors. - Funds authorized by all donors. - Agreements successfully executed between RMC and respective donors.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK CONTINUED (Page 4)

Life of Project:
 From FY 77 to FY 78
 Total U.S. Funding 1,350,000
 Date Prepared 4/20/77

Project Title & Number: Niger River Development Planning 625-0915

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	<p>2. <u>Long-Term Expatriate Advisory Staff</u></p> <p>(a) <u>USAID</u> Water Resources Planner - \$180,000 (24 p/m) Soils Scientist - \$180,000 (24 p/m)</p> <p>(b) <u>CIDA</u> Hydrologist - \$180,000 (24 p/m) Regional Economist - \$180,000 (24 p/m)</p> <p>(c) <u>FAC</u> Civil Engineer - \$180,000 (24 p/m) Agronomist - \$180,000 (24 p/m)</p> <p>(d) <u>UNDP</u> Senior Advisor/Coordinator - \$180,000 (24 p/m) Hydrologist - \$180,000 (24 p/m)</p> <p>3. <u>Long-Term Training</u></p> <p>(a) <u>USAID</u> Six participants - \$75,000 (72 p/m)</p> <p>(b) <u>CIDA</u> Eight participants - \$100,000 (96 p/m)</p> <p>4. <u>Short-Term Training Study Tours</u></p> <p>- Five week study tour in U.S. for nine persons - \$50,000</p> <p>- Three documentalists in third country training - \$30,000 (18 p/m)</p> <p>5. <u>Contract Services with local or third country architectural design firm</u> USAID - \$80,000</p>		

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK CONTINUED (Page 5)

Life of Project:
 From FY 77 to FY 78
 Total U.S. Funding \$ 150,000
 Date Prepared: 6/28/77

Project Title & Number: Niger River Development Planning 625-0915

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	<p>6. <u>Logistical support, office supplies, contingency</u> (a) USAID - \$50,000 CIDA - \$50,000</p> <p>7. Increase in six permanent staff members - \$40,000 (RNC) Regular budgetary support for staff and logistics - \$315,000 (RNC)</p>		

AMC MANDATORY: 3, App CC	Final number of	Effective DATE	PAGE no.
	3:	November 10, 1976	6C(1)-1

6C(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Security Supporting Assistance funds.

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights?

Ultimate results of study will lead to development for benefit of rural river basin populations.
2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the U.S. unlawfully?

N.A. due to regional nature of project involving 9 countries.
3. FAA Sec. 620(a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying supplies to or from Cuba?

No
4. FAA Sec. 620(b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement?

Yes
5. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government?

No explicit cases among the 9 governments. Benin and Guinea, though recalcitrant, have generally lived up to commitments to U.S. contractors.
6. FAA Sec. 620(e) (1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

Same as 5 above. Benin has generally been slow to settle nationalization issues.

7. FPA Sec. 620(f); App. Sec. 1C2. Is recipient country a Communist country? Will assistance be provided to the Democratic Republic of Vietnam (North Vietnam), South Vietnam, Cambodia or Laos? **No**
8. FPA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? **No**
9. FPA Sec. 620(j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? **No**
10. FPA Sec. 620(l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason? **No**
11. FPA Sec. 620(o); Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters, **No**
- a. Has any deduction required by Fishermen's Protective Act been made?
- b. Has complete denial of assistance been considered by AID Administrator?
12. FPA Sec. 620(o); App. Sec. 504. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default? **Guinea has frequently been in a situation of temporary default, but has always responded to U.S. Embassy pressure and has paid sums due.**
13. FPA Sec. 620(s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? (Consideration of these points is to be coordinated with the Bureau for Program and Policy Coordination, Regional Coordinators and Military Assistance Staff (PPC/RC).) **varies widely among the 9 countries, no sophisticated weapons.**

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- 14. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption? **No**
- 15. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget? **States vary widely among the 9 countries.**
- 16. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism? **No**
- 17. FAA Sec. 655. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA? **No**
- 18. FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology, without specified arrangements on safeguards, etc.? **No**
- 19. FAA Sec. 911. Has the country denied its citizens the right or opportunity to emigrate? **No**

FUNDING CRITERIA FOR COUNTRY

- 1. Development Assistance Country Criteria
 - a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment. **Yes**
 - b. FAA Sec. 201(b)(5), (7) & (8); Sec. 209; 211(a)(4), (7). Describe extent to which country is: **Varies widely among the 9 countries.**
 - (1) Making appropriate efforts to increase food production and improve means for food storage and distribution.
 - (2) Creating a favorable climate for foreign and domestic private enterprise and investment.

81b

- (3) Increasing the public's role in the developmental process.
- (4) (a) Allocating available budgetary resources to development.

(b) Diverting such resources for unnecessary military expenditure and intervention in affairs of other free and independent nations.
- (5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.
- (6) Oversee planning to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

c. FA Sec. 601. Is the country among the 40 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made?

Yes

d. FA Sec. 602. Will country be furnished in same fiscal year, either security support or assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid to non-international organizations, or special programs?

No

2. Security Support to Assistance Country Criteria

a. FA Sec. 601. Is the country engaged in a deliberate pattern of gross violations of internationally recognized human rights? Is there non-concordance with policy of the United States?

No

b. FA Sec. 602. Is assistance to be furnished to a friendly country, organization, or body eligible to receive assistance?

Yes

c. FA Sec. 602. If conditions are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

N/A

AND HANDBOOK 3, App 6C	FRANK W. BIRD, JR. 3:17	EFFECTIVE DATE November 10, 1976	PAGE NO. 6C(2)-1
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6C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY. HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b)

(a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project;
(b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure plus 10%)?

This project was presented in the FY 1977 Congressional Presentation. Any changes would be brought to the attention of the Congress through the normal Congressional notification procedures.

Yes

2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

No legislative action required for studies.

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

No water-related land construction intended in this study phase.

4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?

N/A

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

A.

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multi-lateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate?
- Yes, Niger River Commission is regional organization.
7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.
- N/A
8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).
- Study phase will attempt to maximize use of U.S. contractors to perform study tasks.
9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.
- NRC will provide local currency to extent possible to cover local costs.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?
- Foreign currency owned by U.S. applicable only in Guinea and will be used to support U.S. contracts working in Guinea, (as appropriate.
- B. FUNDING CRITERIA FOR PROJECT
1. Development Assistance Project Criteria
- a. FAA Sec. 102(c); Sec. 11; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?
- Study phase will not directly involve participation of poor or develop cooperatives.

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b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: [Include only applicable paragraph -- e.g., a, b, etc. -- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.]

- (1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;
- (2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;
- (3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;
- (4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:
 - (a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;
 - (b) to help alleviate energy problem;
 - (c) research into, and evaluation of, economic development processes and techniques;
 - (d) reconstruction after natural or manmade disaster;
 - (e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;
 - (f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

Study project only principally aimed at integrated River basin development which would necessarily ultimately lead to the agricultural and rural development of the rural poor in the basin areas.

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(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

Multi-donor program involving U.S., Canada, Franch, UN thus 25% requirement not applicable.

d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing?

N/A

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

Study will examine wide range of problems which should ultimately affect all aspects listed in this section.

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

NRC will draw upon trained African manpower to complement expatriate study teams.

- g. FAA Sec. 201(b)(2)-(4) and -(9); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?
- h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.
2. Development Assistance Project Criteria (Loans only)
- a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.
- b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.
- c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?
- d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

Study will be critical to commencement of coherent, integrated economic development of Basin's resources. It is consistent with the DAP's of the countries involved.

AID funding will be channeled to use of U.S. contractors to extent possible compatible with good project management.

N/A

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e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

3. Project Criteria Solely for Security Supporting Assistance

N/A

FAA Sec. 531. How will this assistance support promote economic or political stability?

4. Additional Criteria for Alliance for Progress

N/A

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

6C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by exclusion (as where certain uses of funds are permitted, but other uses not).

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

- | | |
|--|---|
| <p>1. <u>FAA Sec. 602</u>. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed?</p> | <p>Requests for Proposals for various studies to be published in Commerce Business Daily.</p> |
| <p>2. <u>FAA Sec. 604(a)</u>. Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him?</p> | <p>Yes</p> |
| <p>3. <u>FAA Sec. 604(d)</u>. If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed?</p> | <p>N/A</p> |
| <p>4. <u>FAA Sec. 604(e)</u>. If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity?</p> | <p>N/A</p> |
| <p>5. <u>FAA Sec. 608(a)</u>. Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items?</p> | <p>N/A</p> |
| <p>6. <u>MMA Sec. 901(b)</u>. (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.</p> | <p>Yes</p> |
| <p>7. <u>FAA Sec. 621</u>. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized.</p> | <p>AID Regulations on provision of technical assistance will be enforced.</p> |

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are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

8. International Air Transport. Fair Competitive Practices Act, 1974

Yes

If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?

B. Construction

N/A

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed \$100 million?

C. Other Restrictions

1. FAA Sec. 201(d). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?
2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?
3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S.?
4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction?

N/A

N/A

Yes

Yes, AID regulations on vehicle procurement will be applied.

5. Will arrangements preclude use of financing:
- a. FAA Sec. 114. to pay for performance of abortions or to motivate or coerce persons to practice abortions?
 - b. FAA Sec. 620(g). to compensate owners for expropriated nationalized property?
 - c. FAA Sec. 660. to finance police training or other law enforcement assistance, except for narcotics programs?
 - d. FAA Sec. 662. for CIA activities?
 - e. App. Sec. 103. to pay pensions, etc., for military personnel?
 - f. App. Sec. 106. to pay U.N. assessments?
 - g. App. Sec. 107. to carry out provisions of FAA Sections 209(d) and 251(h)? (transfer to multilateral organization for lending).
 - h. App. Sec. 501. to be used for publicity or propaganda purposes within U.S. not authorized by Congress?

Study program and as such all questions in this section are not applicable.

DEVELOPMENT OF THE NIGER RIVER BASIN

**TECHNICAL PREPARATORY MEETING
OF THE MEETING OF DONORS**

Paris, 6-8 September 1976

REPORT

1. Purpose of the meeting

The main potential donors expected to finance the programme of action for the preparation of the Master Plan for the development of the Niger River basin met at UNESCO Headquarters at the expert level. The meeting had been convened by the United Nations Development Programme (UNDP) on behalf of the Niger River Commission (NRC) in accordance with the letter dated July 1976 from the Executive Secretary of the NRC.

The purpose of the meeting was to reach a consensus on a joint programme of action and on the desirable institutional support to be provided to the NRC.

2.1 Participants

CIDA	Mr. L. LAVAL-GOBEIL, Representative of CIDA
	Mr. PERON, From the Canadian Embassy in Paris
	Mr. N. MAASLAND, CIDA consultant
IBRD	Mr. D. KING, Department for West-Africa, Project Division
	Mr. A. A. MEINARIS, Agriculture Division
FAC	Mr. BIDAUT, Minister of Cooperation - France, Division for Development
	Mr. G.E. MATON, Technical Adviser, Ministry of Cooperation
NRC	Mr. A.E. DEHINDE, Executive Secretary
	Mr. C.L. JOYCE, Technical Adviser
US AID	Mr. A.R. BARON, US AID Representative in Niamey
	Mr. L.A. COHEN, Office of Development Resources, African Bureau

Mr. J.G. HOWE, US AID Technical Adviser

UNDP Mr. M. DOO KINGUÉ, Assistant Administrator and Director,
Regional Bureau for Africa

Mr. R. BERTHELOT, Senior Technical Adviser, TAD

Mr. J. FRIPPIAT, Project Officer, OPE

Mr. M. LINCOURT, UNDP/OPE Consultant

WMO Mr. W. KLOHN, Technical Staff-member, Department of Hydrology
and Water Resources.

2.2 Observers

Club des amis du Sahel: Mr. R. STACEY, US AID Representative

The Netherlands: Mr. H. FROGER, The Netherlands Embassy, Paris

The meeting was opened by Mr. Doo Kingué, of UNDP. It was chaired by Mr. A.E. Dehinde, Executive Secretary of the NBC. The UNDP delegation took the responsibility of the preparation of the report.

3. Summary of Discussions

The discussion was articulated along the broad lines of the base document prepared by UNDP for this purpose. This document reconciled the proposals included in the main reports on the development of the Niger River Basin and presented comprehensive schematic analyses.

Agreement in principle appears on the following points:

- a) The NBC should be the focal point for the execution of the programme and for the channelling of technical assistance;
- b) It is recognized that a close collaboration between, on the one hand, the Ministries and National Agencies for development in charge of national programmes and the regional organizations such as, the Liptako-Gourma Authority, and, on the other hand,

/...

the NEC, responsible for multi-national activities, is an essential condition for success. In fact, at the present time, there is no such systematic collaboration - for instance the NEC is not kept posted on the studies of SELINGUE, KANDADJI, TOSSAYE. It is indispensable that this collaboration be established at the soonest.

- c) The NEC should enjoy the unfailing political and financial support of its member states;
- d) The NEC needs assistance to strengthen its technical capability in the areas of the basin development considered by the programme of action;
- e) The Programme of Action should include an initial phase of data collection and critical analysis of information (basic data, completed studies, studies currently in process, possible lacunae, national development plans, trends of bilateral assistance, technical resources, human resources, etc.); this initial phase can be executed simultaneously with specific feasibility projects or even implementation of projects in the case where previous studies justify it;
- f) The NEC should be provided with modern means of analysis and management of the river: streamflow simulation model for the planning of water resources, system analysis models, flood forecasting system, hydrologic and climatological networks, computer capacity, telecommunications, etc. The establishment of these operational components should take into account existing activities and completed activities in this area, notably UNDP/WMO Programmes

/...

(AGROMET and hydrology forecasting of the Upper Niger/Guinea-Mali), the FAC programme (Anomalies of floods in the Inner-delta).

- g) Studies which lead to investments on short-term basis should be executed simultaneously with comprehensive studies (see e) above). These studies concern specifically, the dams, the hydro-electric plants, the irrigation perimeters, in-land navigation and fisheries.
- h) As regards the strategy to ensure the development of the river basin, or in other words, the compatibility between on the one hand, the contents of the action programme and the articulation of its activities and, on the other hand, the treatment of human and physical problems in the basin, several points remain to be clarified: among others, the criteria for the selection of the scope and the scale of mapping, the criteria governing the up-dating of some previously executed studies of considerable interest, the criteria determining the economic aspects of irrigated perimeters or rain-fed perimeters considered for development. Moreover, additional information would be necessary in order to specify the mining component of the Niger River Basin's development, justification of some activities such as health studies, studies of fauna and flora and the systematic reconnaissance studies of dam sites; even more important is the problem of training and transfer of technology which pre-supposes that the prevailing conditions of "supply and demand" in technicians be clearly specified. It is understood that this strategy would have to be specified during the first phase (inventory of data, projects, national plans, resources in assistance, human resources. etc.).

/...

- i) The training of technical and managerial personnel is a very important point; since there is a severe shortage of cadres in the riparian countries, the only solution is systematic training of personnel necessary to run the programme and to implement the Niger river development in due course. In this respect, from the outset of the first phase, the specific evaluation of the human resources in technicians, sources of training and the needs of the NEC in technicians should be made clear.
- j) In due course, additional studies should be undertaken in the following areas: legal problems; problems of water sharing; problems of management of the hydrologic structures; the health problems and the ecological problems.
- k) The streamflow simulation model of the river basin should be capable of: simulating the streamflow of the Niger and its upper tributaries, in water levels and instantaneous discharges, in every point of the hydrologic system, with sufficient accuracy on the basis of data already available from the previous years; including fundamental modifications of the morphology of the river basin such as, large scale embankments, shortage, closure of river branches, etc.

4. Conclusions

Several conclusions resulted from the discussions which are presented below according to the order of discussion. The participants agreed on the following:

4.1 Diagnosis

- to arrive at a diagnosis;
- by diagnosis, it is meant the collection of existing data including the files of previously executed studies and contemplated studies:

the studies of national development plans, the list of sources of bilateral aid, the critical examination of projects and on-going activities, the evaluation of natural, technical and human potentials of the region, a description of the characteristics of the basin, its problems and the development opportunities it offers.

- to support the action programme by the elaboration of such a diagnosis, the nature and the scope of activities of the action programme will depend on the outcome of the diagnosis. However, the undertaking of this diagnosis should be considered by no means as questioning the necessity of the overall programme.

4.2 Objectives

- The underlying objectives which govern the orientation of the programmes are the improvement of the socio-economic conditions of the populations of the riparian states of the Niger, and the augmentation of the national income.
- Accordingly, it is necessary to develop in an appropriate manner, the potential of the natural resources of the Niger river basin, in particular its water and land resources;
- It is also necessary, to develop its human resources for the intelligent use of its natural resources;
- to establish, by means of a master plan, which would integrate in a harmonious manner, the various activities of the action programme, the development priorities according to the requirements;
 - i) irrigation;
 - ii) electrical energy;

- iii) navigation;
- iv) water supply for human consumption and possible mining developments and water use disposal;
- v) fisheries;
- vi) flood warning and flood control

4.3 Strategy

- To steer the action programme according to a selective rather than an exhaustive approach, that is to say, concentrate on activities likely to yield concrete results in the near future;
- To determine the orientation of the studies according to the most pressing needs of the member states;
- To carry out simultaneously, studies and technical surveys for the overall basin and activities in given areas for the implementation of specific projects already studied and falling into the scope of the action programme;
- To initiate the action programme by a phase of inventory and diagnosis and have this phase followed effectively by the execution of studies specified in the first phase; up to a point, these two phases of work may overlap and each phase may be executed by different teams;
- To integrate continually, the sectorial activities of the action programme by means of a synthesis which will be in fact, the planning of the overall basin;
- To consider the impact of multi-national repercussions resulting from the river harnessing;
- To pay due attention to the training of cadres, professionals and technicians and to transferring technology.

4.4 Activities of the action programme

- Provision of institutional support to the NRC by means of high-calibre professionals: teams of 5 to 9 full-time expatriate experts supported by as many national technicians: more precisely, these expatriates will be included in 2 teams, performing one after the other: the first team will include short-term consultants during a period of 6 to 9 months in order to prepare the initial diagnosis and specify in details the action programme: the second team will comprise long-term experts to assist the Secretariat of the NRC for the entire duration of the action programme; this second team will have to perform the following tasks:
 - management of the projects;
 - provision of technical coordination;
 - preparation of interim synthesis reports and the final synthesis report;
 - The control of the technical quality of the work;
- Provision of the appropriate budget for the effective performance of these teams;
- In addition, to this budget, provide logistics and subsistence support as necessary;
- Construction of buildings in order to house the Secretariat of the NRC;
- Construction of the lodgings necessary to house the personnel of Secretariat of the NRC.
- Organization of programmes of training and transfer of technology, which may include the following components:
 - on-the-spot, and/or overseas training for senior staff:

- on-the-job, and/or overseas training for junior professionals who will be assigned to the basin development;
- on-the-job training for technicians;
- training of the population, in particular the farmers;
- seminars;
- dissemination of information;
- training in the use of system analysis, methods, models, etc.

Undertaking or sub-contracting to specialized firms the following studies and technical surveys:

- topographic surveys in mapping in the basin;
- hydrology and hydro-meteorology;
- hydrogeology;
- soil surveys;
- power survey;
- hydro-agricultural survey;
- study of the aquatic fauna of the river;
- study of the aquatic flora of the river;
- survey of the rain-fed agricultural potential;
- survey of the mining potential of the basin;
- studies of the health and sanitary conditions;
- demographic surveys;
- socio-economic surveys;
- streamflow simulation model;
- flood forecasting;
- anomalies of floods.

Undertaking or sub-contracting to specialized firms, technical studies for specific problems:

- study of possible canals, embankments, etc.

- feasibility studies for specific projects, including feasibility studies of small-scale hydro-agricultural projects.

4.5 Time-table

- The duration of the programme of action is 5 years, but it is recognized that the planning in the basin is a continuous activity. This 5 year duration will make it possible to establish budgetary projections and necessary adjustments;
- The precise time-table of the work programme will be specified during the first phase of inventory and diagnosis.

4.6 Initial budget

- To define the order of magnitude of the budget for the action programme which will be as follows (US\$ 1976).

(a) institutional support (5 years)

initial diagnosis	500,000
Professionals	2,500,000
Logistics and operations	2,000,000
Construction of the Secretariat	900,000
Construction of lodgings (10 units)	400,000
TOTAL	6,300,000

(b) training and transfer of technology

1,200,000

(c) studies and technical surveys:

- topographic surveys and mapping in the basin;	1,500,000
- hydro-meteorology	800,000
- hydrogeology	800,000

- soil surveys	800,000
- power surveys	400,000
- hydro-agricultural studies	1,000,000
- study of the aquatic fauna	500,000
- study of the aquatic flora	200,000
- rain-fed agriculture	500,000
- irrigated perimeters potential	500,000
- mining potential	300,000
- health and sanitary surveys	800,000
- demographic studies	300,000
- socio-economic studies	800,000
- streamflow simulation model	1,200,000
- flood forecasting	1,100,000
- anomalies of floods	200,000
	<hr/>
TOTAL	11,800,000

(d) Technical studies of the specific projects:

- analysis of possible dam sites	1,000,000
- feasibility studies including small hydro-agricultural projects	<u>4,600,000</u>
TOTAL	5,600,000
Total budget	24,900,000
miscellaneous 10%	<u>2,490,000</u>
GRAND TOTAL	<u>27,390,000</u>

Note: The project allocations should be considered as an order of magnitude since the studies are not yet precisely defined

4.7 Institutional frame-work

The participants of this meeting have agreed to convene periodically at least once a year. The meeting will include representatives of the NBC and the sources of financing in order to review the progress of the action programme and to make the necessary provisions for its timely implementation.

Annex I - Summary Description of the Activities of the Action Programme

Annex II -

UNDP Working Document

- 1 "Aménagement du bassin du fleuve Niger/Document de travail en vue d'une réunion de stratégie des principaux bailleurs de fonds", September 1976

UNDP Documents

2. "Hypothèses d'un programme-synthèse et de trois enveloppes budgétaires", September 1976
3. "Developpement of the Niger River Basin", IBRD, 5 June 1975.
4. "Communication of Mr. Doo Kingué, UNDP to the Council of Ministers of NBC", February 1976
5. "Sub-Chapter on River Niger Basin of the Water-Resources Chapter of Volume II of the AID Report to Congress; Proposal for a long-term Comprehensive Development Programme for the Sahel", US AID, April 1976.
6. "Assistance Needs for Developing the Niger River Basin", ACIDI, 14 May 1976.

ANNEX I

SUMMARY DESCRIPTION OF THE ACTIVITIES OF THE ACTION PROGRAMME

	<u>Page</u>
I. INSTITUTIONAL SUPPORT TO THE NBC SECRETARIAT	3 - 10
II. SECTORIAL ACTIVITIES	
1. Surveys and Mapping	11
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3. Hydrogeology	14
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8. Demographic studies	22
9. Socio-economic studies	23
10. Study of the Flood Anomalies in the Inner-Delta of the Niger	24
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12. Feasibility Studies	27
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14. Hydrological Forecasting System	29

The description of the institutional support and the sectorial activities is extracted from the working documents prepared by CIDA and US AID.

- "Assistance needs for Developing the Niger River Basin"
CIDA, Mission Report, May 14, 1976;
- Sub-Chapter on River Niger Basin, of the Water Resources Chapter of Volume II of the AID Report to Congress:
"Proposal for a Long-term Comprehensive Development Program for the Sahel", US AID, April 1976.
- The costs for sectorial activities indicated in this annex are the original estimates of CIDA or US AID, it was deemed inappropriate, and therefore no attempt has been made, to tailor inputs suggested by CIDA and US AID in order to reconcile their estimates with the cost estimates given in the report of the Preparatory Technical Meeting on page 10.

I. FUNCTIONAL SUPPORT TO THE NEC SECRETARIAT (5 year duration)

In order to carry out its functions, the Niger River Commission will require an organization as shown in Chart I. The Small Projects Unit and the Basin Analysis Unit are shown in detail in Charts 2 and 3.

The Secretariat of the NEC should be strengthened accordingly, on the one hand by providing the logistic and structural support, and on the other hand, by expanding its staff to include appropriate talent and expertise. Appropriate training to enable timely transfer of technology is an essential component of assistance to the NEC. The total cost during a 5 year period is estimated at \$6,300,000.

a) Logistic and structural support

- i) Buildings
- ii) Equipment (Office and Field), Laboratories
- iii) Transport (Ground and River)
- iv) Budget support
- v) Housing

b) Staff requirements

- i) Project Coordinator responsible for: Member States Cooperation; Accounting and budget control; Housing, equipment and transport supervision.
- ii) Architect responsible for Secretariat building and Housing construction.
- iii) Staff of Small Project Unit comprises of Senior Agriculturist; Irrigation and Drainage Engineer; Soil Scientist, Project Economist;
- iv) Staff of Basin Analysis Unit includes Water Resources Planner;

**Senior Economist; Senior Agronomist, Transportation Engineer;
Land Use Expert; Senior Civil Engineer; Soil Scientist;
Hydrologist; Groundwater Specialist; Hydraulic Engineer;
Cartographer.**

- v) **Short-term Experts include Dam-site Geologist; River Control Engineer; Financial Analyst; Design Engineers; Municipal/Sanitary Engineers; Demographer; Tropical Health Expert, Power Systems Planner; Marketing Specialist; General Economist; Others are required.**
- vi) **Training Organizer, with support from expert staff and probably with CUSO and the Peace Corps assistance.**
- vii) **Bilingual Translator with existing staff support.**

The Secretariat of the NEC will be staffed as listed above on a gradual basis, especially for basin planning. Complete staffing of the Small Projects Unit is an immediate requirement and this Unit could be expanded by other donors. Since the training of hydrologist and agro-meteorologist technicians is under the multi-donor CILSS/WMO programme AGRHYMET BAF/74/080, which includes a computer, at Niamey and telecommunication facilities between Mali, Upper Volta and Niger, it is desirable that NEC coordinates its activities with that programme. France and Holland may wish to supply ORSTOM hydrologists, and Nedeco hydraulic, respectively, river control and navigation experts; preferably personnel who have been associated with earlier studies executed by these institutions.

The Training Organizer will coordinate the following programmes;

- a) **Professional training - furnishing scholarships to suitably qualified Member State Nationals for training in Africa or overseas;**

- b) Technical training - coordinate on-the-job training of soil surveyors, junior hydrologists, draftsmen, and other sub-professionals;
- c) Rural Training - organize rural training programmes possibly with CUSO or Peace Corps support.

Functions of the Technical Assistance Unit

The Small Projects Unit (Chart 2) will identify and assist in preparing small-scale irrigation projects within individual Member States on request.

The unit will advise on:

- project preparation;
- priorities among projects;
- mobilizing farmers' participation, and
- government support services.

The Basin Analysis Unit (Chart 3) will review national and interstate objectives, evaluate and develop an inventory of the basin resources base, review proposed and active projects, conduct cost and benefit analyses, make optimization studies, assist in bringing projects to implementation, make water management studies, and develop economic and financial controls. The unit will also conduct programme analyses, prepare Terms of Reference for studies and surveys, and assist in preparing a project portfolio.

Recommended initial programme

Following approval of the first five-year assistance programme by the Council of Ministers, an 18-month initial programme of planning would be launched. This initial programme includes a six-month start-up period and a 12-month period of planning and analysis, covering one annual hydrologic cycle.

a) Months 1 through 6 - Programme begins and includes:

- i) Orientation visits to Member States (2 man-months each) to gather data and to establish working relations with the Technical Committees;**
- ii) Review of data and reports;**
- iii) Field trips to projects and project sites;**
- iv) Preparation of work programmes for both basin planning and small-scale projects preparation;**
- v) Development of methods and standards for analysing projects and programmes.**

b) End of Month 6 period - Inception Report with:

- i) Inventory of data base (soils, land capability, topography, hydrology, meteorology, aerial photo coverage, ground and surface water);**
- ii) Evaluation of training and research facilities in Region and in Member States;**
- iii) Catalogue of Member States' Projects and Programmes;**
- iv) Review of organization and statutory powers of NRC;**
- v) Identification of small-scale projects for immediate implementation, particularly in the irrigation/flood area;**
- vi) Definition of scope of work for initial planning programme;**
- vii) Terms of Reference for survey programmes to bridge data gaps.**

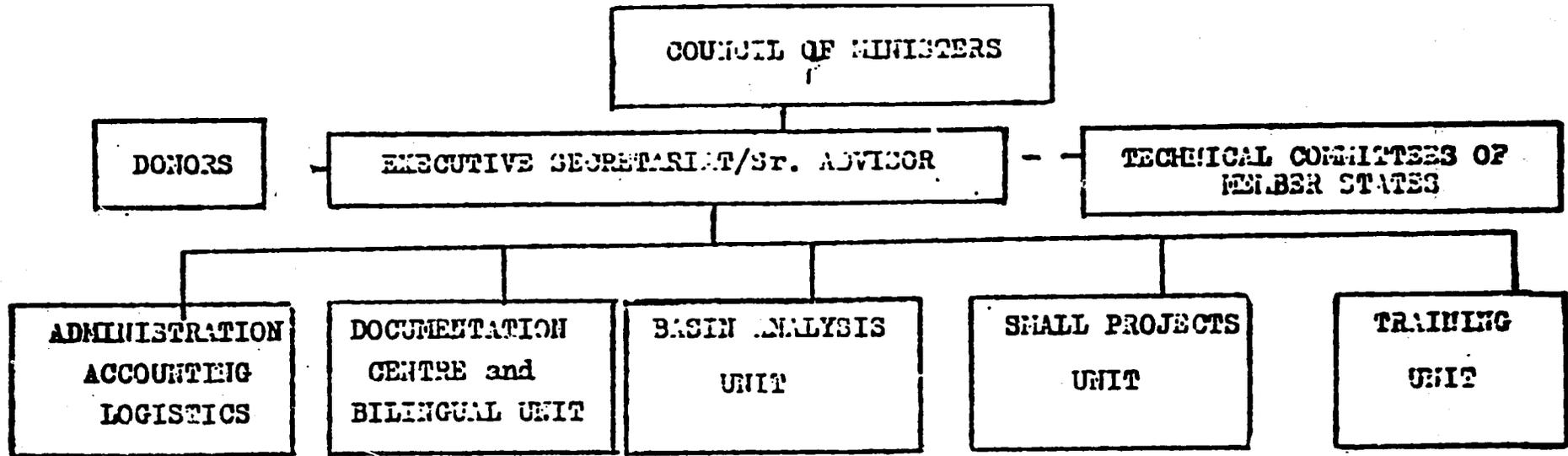
c) Month 18 - Status Report on Indicative Plan

Report to contain:

- i) Physical Development Potentials;**
- ii) Sub-division of Basin on Basis of Physical Units and Resources;**

- iii) Development and Mobilization of Human Resources;
- iv) Development Objectives;
- v) Institutional Support Needs;
- vi) Projects Identified for near-future Implementation and Feasibility Studies;
- vii) Priorities and Sequencing;
- viii) Requirements for Project Models; and
- ix) Future Planning Needs and Programme.

PROPOSED ORGANIZATION FOR RIVER NIGER COMMISSION

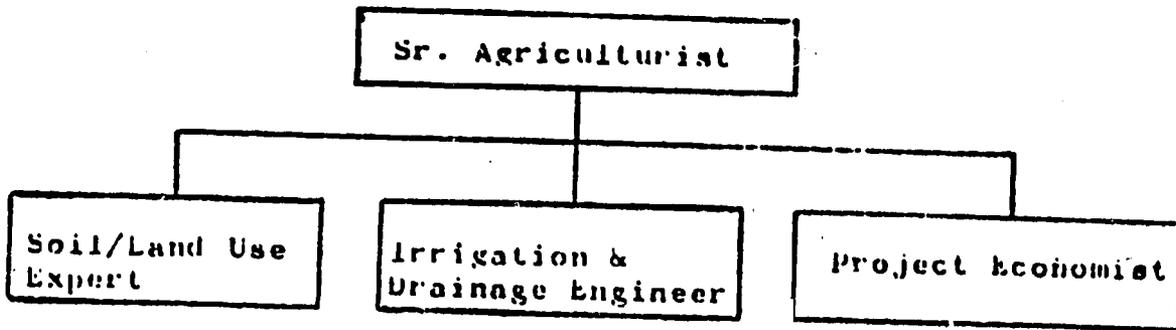


Notes to Organization Chart:

In addition to technical functions, major aims are :

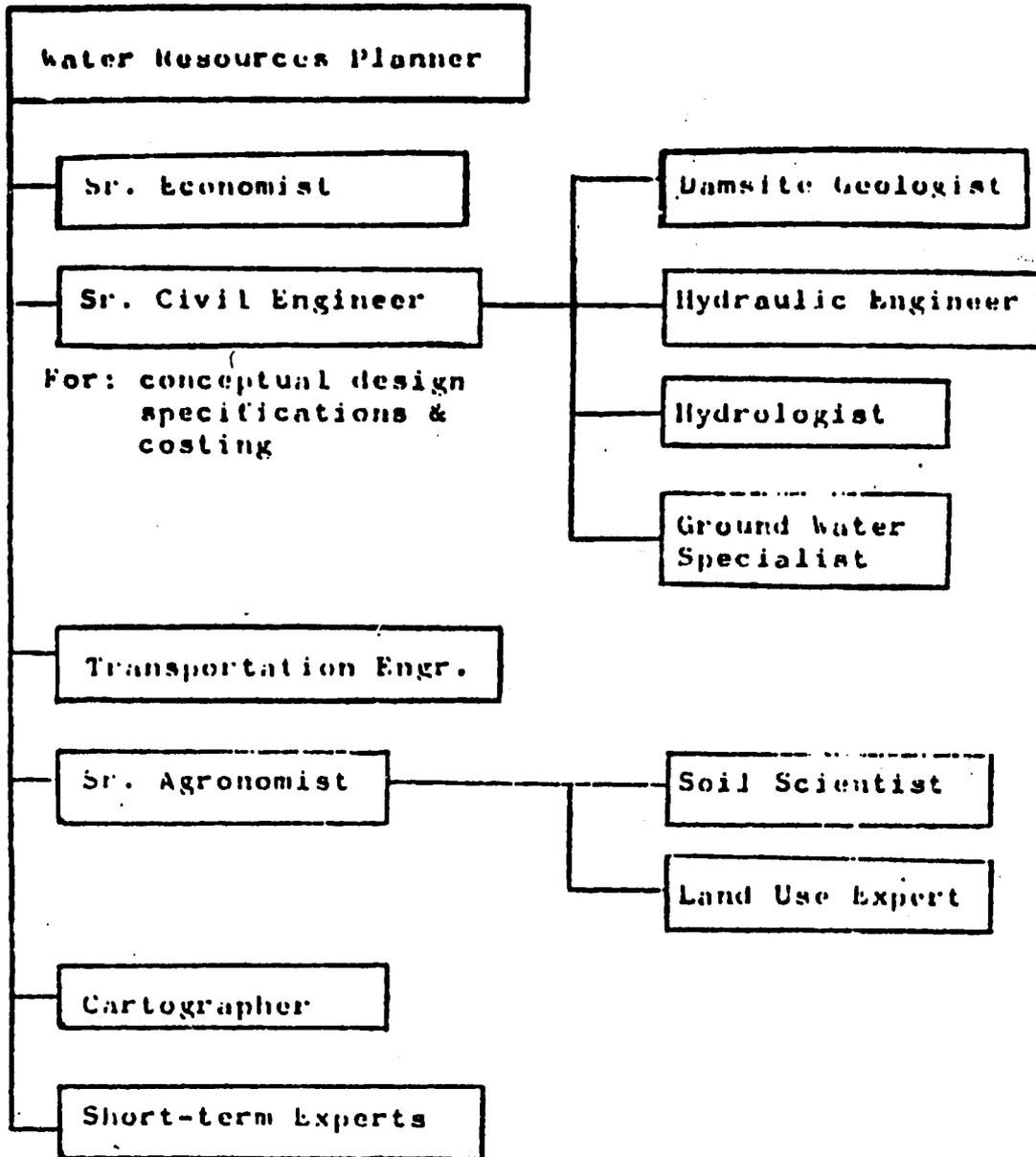
1. Establishment of linkages between Member States and Commission.
2. Training: . a) On-job
b) At Commission
c) At African institutions
d) Seminars
e) Overseas scholarships.

Chart 2: Small Projects Unit



Note: More projects can be brought to early implementation by adding staff.

Chart 3: Basin Analysis Unit



II.1 Surveys and Mapping

1.1 Aerial photographic support is essential for river and land development planning. Additional large-scale photography will be required for projects and problem areas, for topographic mapping adequate for project preparation and for pre-feasibility and feasibility studies. Aerial photography should be repeated at appropriate intervals during the annual hydrologic and cropping cycles to identify more accurately present land use patterns, and to identify opportunities for small and large irrigation and drainage projects and for flood control.

The aerial photography would be used as a base for topographic mapping at large scale for irrigation projects and storage reservoirs, as well as for dam site surveys. Adequate primary, secondary and tertiary base lines and benchmarks need to be established. Channel surveys are needed for the uniform analysis of hydrological data for the river basin, and to establish the possibilities for water conveyance for both irrigation and drainage.

1.2 The preparation of the mapping programme would require the services of a land survey consultant to install ground control throughout the basin. A private firm would execute aerial photography under contract and prepare 1: 20,000 map sheets with one meter contour on land with slopes less than 1% where required, and greater contours intervals elsewhere. An estimate of 30 man-years of expatriate would be employed over a five year period and at least three riparian nationals would be trained in the management of the full process.

The first phase to identify topographic mapping requirements a complete mapping of essential initial areas is estimated to cost at least \$1,500,000.

II.2 Hydro-Meteorology

This programme provides for the uniform analysis of hydrological data for the land and water development studies in the Niger Basin. Four major tasks are (a) analysis of available data (b) processing of these data for a data bank, (c) maintenance and calibration of equipment and (d) support of current data gathering and processing. Useful information for agrometeorological hydrology will be obtained from AGRHYMET whose interests and priorities may however differ from those of the planning group with ENC.

2.2 A first task would be to coordinate with the Agrometeorology Project of WMO/UNDP and establish a basic network of daily real-time reporting of rainfall and river stage/discharge stations in order to provide flood warning, flood recession planting schedules, water availability information and improvement of both basin and project planning capability.

- a. Personnel - senior hydrometeorologist, 5 years; two hydrologist for 3 years each; one communications technician for two years; and one system analysis engineer for 3 years.
- b. Training - one equipment specialist per country (9) trained in the U.S. for 10 months; 10 Nigerians, 6 Nigeriens, 1 Cameroonian, 1 Chadian, 5 Beninese, 2 Voltans, 9 Malians, and 7 Guineans trained at various short courses in the basin in gauge maintenance, sediment measurements and analysis, evaporation, raingauges, calibration of flow meters, chemical and biological quality of water, etc. and on-the-job, 2 communications specialists per country trained at the Agromet center. Up to 20 riparians in system analysis and computer utilization (at Agromet Center in Niamey or at NPD of Corps of Engineers in Portland, Ore.).

- c. **Equipment** - Recording gauges (limbometers) for key stations, and staff gauges for the remainder network^{1/} of 100 teleautomatic rain-gauges (using Agromet network, where applicable), use of Agromet communications for reporting daily readings, forecast and warning dissemination.

2.3 Five year project cost estimate,

a. Personnel	1,120,000
b. Training	690,000
c. Equipment	<u>790,000</u>
	<u>2,600,000</u>

1/ (Proposed hydrolic network in Niger Basin):

Guinea: Mainstream-Siguiri, Kouroussa, Faranah; tributaries-Mandiana, Fifa, Kenkou, Keromane;

Mali: Mainstream - Bamako, Segou, Mopti, Timbuctou, Geo; tributaries - Niono (Office du Niger), D'nzarra, Bougouni, Kangara.

Dahomey: Mainstream-Malanville; tributaries-Malanville, Bensakou, Sinacougourou, Keremon

Niger: Mainstream - Ayorou, Niamey, W. Gaya; tributaries-Maradi, Yatakala, Bessebangou

Nigeria: Mainstream - Onitsha, Shintaku, Kainji Dam, Yelwa; tributaries, Lokoja, Makurdi, Yola, Kaduna, Ka, Sokoto

Cameroon: Tributaries - Garoua

Chad: Tributaries - Lere

Upper Volta: Tributaries - Bilanga, Idptougou

Ivory Coast: Tributaries - Kribirila Sud, Senhala, Saginoco.

II.3 Hydro-geology

3.1 One rapid method of expanding irrigation in the Niger River Basin is through groundwater exploitation wherever possible. The objective of the groundwater programme would be to assist in assigning priority areas for well development and in the specification of desirable types of wells and methods of drilling in relation to regional conditions on both economic and technical grounds. The programme may thus be divided into three categories:

- Hydrogeology;**
- Well engineering and economics; and**
- Well monitoring for hydraulic performance and agricultural response.**

3.2 A team will be provided to pull together existing knowledge and conduct field training of riparian technicians in groundwater investigation and analysis and the preparation of basin groundwater maps showing extent, depth, quality, and quantity of groundwater and pertinent draw-down and recharge information.

- a. Personnel - consultant for one year to analyze all existing information and prepare a qualitative report; prepare map indicating where lack of adequate hydrogeological investigations; contract team of five well-drillers experts to conduct program and train riparian staff of at least one technician from each country (3 years, 120 man-month).**
- b. Training - on-the-job for 9 technicians/engineers, plus two 3-week seminar/workshops for up to 20 riparians each during 2nd and 3rd year of contract.**
- c. Equipment - 5 drilling rigs and bolts, spares, casing etc. to drill up to 2,000 deep well per year for community water supply, irrigation, stock watering points and provide necessary data on groundwater.**

3.3 Four-year project cost estimate:

a. Personnel	1,120,000
b. Training	270,000
c. Equipment	<u>660,000</u>
TOTAL	<u><u>2,050,000</u></u>

A first phase would consist in consultant missions, in order to analyse existing information, prepare a programme and initiate training and equipment procurement. The estimated cost for this phase is \$800,000.

II.4 Soils and Land Use Surveys

4.1 Reconnaissance soils and land-use surveys are an integral part of river basin studies and are needed for project identification. Similar surveys at a semi-detailed level are required for project preparation. Provision of one or more soils laboratories to NBC Member States will be needed under the general programme. A soil scientist should be included as a member of the Basin Analysis Group. The undertaking of large to medium-scale surveys requires additional personnel, equipment and vehicles on a contract basis.

4.2 Requirements are:

- a. Personnel - consultant for 6 months to analyse existing information and prepare programme of obtaining additional data to prepare basin-wide land use and land capability maps; team of two experts to obtain missing data and supervise preparation of maps, while training riparian staff - 2 years.
- b. Training - one chief soils specialist for service as counterpart to consultant and on-the-job training to continue Secretariat programme of soils studies and analysis; 9 technicians for two years to work with contract team in on-the-job training and up to 20 technicians each as participants in two 2-week seminar/workshops.
- c. Equipment - maps, aerial photographs, satellite photos and tapes, planimeters and other drafting equipment and supplies..

4.3 Three year project cost estimate:

a. Personnel	315,000
b. Training	230,000
c. Equipment	<u>30,000</u>
TOTAL	<u>575,000</u>

In addition, a second phase estimated at some \$200,000 needs to be defined.

II. 5 Study of Hydro-electric Potential

5.1 Integrated power systems planning should become an essential feature of West African development. Available energy resources in the form of oil, natural gas, hydro-electric power, and coal need to be surveyed and inventoried. Efficient development of the energy resources requires a high level of regional cooperation. Local hydropower developments such as the proposed dams at Kandadji and Tossaye cannot be evaluated without consideration of alternatives. For example, the CIDA-financed transmission line from Kainji Dam (Nigeria) to Niamey (Niger) will significantly reduce the cost of electricity in Niger. Nigeria is building other hydropower dams and is burning natural gas which can be used for fertilizer manufacture and/or the generation of electricity. It is probable that Nigeria can export more cheap electric energy to Francophone West Africa.

Attractive hydropower sites are likely on the steeper Niger tributaries rather than on the mainstem of the Niger River. Nigeria is a EAC Member State which is developing a national electric power grid with major generating stations at Kainji (hydro) and Sapele (natural gas). Nigeria has substantial reserves of petroleum and natural gas which could be used to complement and balance West African power systems with significant hydropower components. Nigerian thermal and Francophone African hydropower plants could be integrated into an efficient West African International Interconnected Power System for the EAC members plus the West African coastal states.

5.2 It is not suggested that energy studies be conducted under EAC auspices. However, EAC would be expected to supply information on the hydro-electric potentials in the Niger Basin to the appropriate authorities for this purpose. The surface-storage and hydropower potentials must be determined. This involves identification of suitable damsites on the main river and its tributaries with first estimates of their probable costs, water storage and generation capabilities and multi-purpose benefits. Proper evaluation of such sites will require large-scale topographic mapping, based on new aerial photography and surveys, geological investigations, drilling at certain sites and a functional analysis.

5.3 The estimated cost of this study is \$1,500,000 of which \$400,000 have tentatively been included in the budget.

II. 6 Study of Aquatic Fauna

6.1 The objective of this study is to increase the net annual quantity of fish protein recovered from the Niger River and its tributaries.

The fish harvest of the Niger River is about 150,000 tons annually and the losses in storage, transportation and marketing are as high as 30 to 40 per cent. Expert evaluation (Meschkat, 1970) suggests that the catch be increased by 300 to 400 percent and the subsequent losses reduced significantly, thus raising the level of available animal protein.

The potential benefits are large: If the annual catch is increased by 1/3 or 50,000 tons and subsequent losses are reduced by some 50 percent or a net gain of 20,000 tons there would be a net gain of some 60,000 tons of fish. The catch, preservation, storage, transportation and marketing of fish quantities of these magnitudes could present major investment opportunities.

Following confirmation of Meschkat's findings, the project would consist of:

- A. A research programme to develop information on:
 - Principal fish species; their life cycles and breeding grounds; and the effects of water quality, temperature and turbidity as well as river currents and other fluvial characteristics on species;
 - The possibility of increasing desirable species and introducing new ones;
 - The beneficial use of existing lakes and artificial ponds for enhancing fish production;
 - The annual generation of nutrients;
 - Methods for increasing the catch and reducing losses in storage, transportation and marketing; and
 - Methods for minimizing possible adverse effects of river regulation on the fish catch.

- B. Preparation of a report on feasible methods for increasing the net annual quantity of fish protein recovered from the Niger River Basin. The report will include the costs of required equipment and facilities, a program for implementing recommended measures and benefit/cost analyses of the principal program components.

6.2 Requirements are:

- a) Personnel: One fish biologist, a fish conservation expert and a storage marketing expert, a total of 4.5 man years and 18 month duration.

- b) Training: Three to four technicians would go for training abroad for one year each and would return to HNC or their national government to participate in the second phase of the proposed concerned with the implementation of this research program.
- c) Equipment: Two fiber-glass boats with out-board motors, trawling nets, other nets, vehicles and laboratory equipment.

II. 6.3 The estimated cost is \$1,800,000.

II.7 Study of Aquatic Flora

7.1 This program will examine the kinds of aquatic weeds existing in the basin and determine magnitude of water and other losses attributable to them, then devise a control and/or eradication program using modern and economic biological chemical and mechanical control techniques consistent with ecological safety, while training a riparian staff member to carry on the program.

7.2 Requirements are:

- a) Personnel - up to three experts for two and a half years.
- b) Training - one riparian biologist/weed specialist on-the-job for Secretariat position and eight riparians for on-the-job training in field sampling and laboratory testing and field trials.
- c) Equipment - Fibre glass boat with outboard motor, vehicle field and laboratory scientific equipment.

7.3 The cost estimate for a three year duration is \$200,000.

II.8 Demographic Studies

8.1 Demographic research is needed to study migratory and nomadic trends and to identify the size of populations in project areas and project-affected areas (such as reservoirs created by new dams). Population sizes in project areas and planned reservoirs are best determined by a combination of photo-interpretation and ground-truth sampling.

8.2 A team of one social anthropologist and one sociologist will identify valuable solutions for integrating migratory peoples in permanent farm settlements.

8.3 The estimated cost is \$300,000.

II.9 Socio-economic studies

9.1 Comparative farm economic studies would focus on designing programmes which correspond to farmers' opportunities and capabilities. Such programmes would be designed to provide farmers incentives to exert their initiative and to induce them to pay reasonable amounts for subsidized inputs and development schemes. The economic studies would compare traditional agricultural practices with specific improvement programmes, such as low-lift pump or groundwater irrigation, small water-control works, drainage improvements, high-yielding varieties, and fertilizer and pesticide inputs. Since many farmers are currently operating at subsistence and/or barter levels, shadow prices must be established for their produce to determine the real costs and benefits to the farmer and the national economy.

Combined with the above studies, socio-economic and land-tenure studies would be carried out for selected development areas to design systems for ensuring farmers' acceptance of and participation in development projects. Both these and the comparative farm economics studies would require survey teams with questionnaires, extensive data compilation, and therefore, additional vehicles and personnel.

9.2 This study requires a three-man team of a period of three to four years and would include equipment supplies and training component.

9.3 The estimated cost is \$800,000.

II.10 Study of the flood anomalies in the Inner Delta of the Niger

10.1 In a note entitled "Modification du régime Hydrologique du Niger à Niamey depuis 1961", ORSTOM observed the apparent changes in the regime of the Niger between MOPTI/DIRE (MALI) and Niamey(Niger). The problem was presented to the RNC which convened a meeting in BAMAKO (Mali) on 15 June, 1972 to elaborate 2 study programmes to determine the reasons for the anomalies in the regime of the River Niger. Present at the meeting were experts of the RNC, the Mali Republic, UNDP, FAC, ORSTOM and BDPA.

The following is an extract from the minutes of the meeting.

10.2 "Having noticed the interdependency of these different objectives, the sub-Commission concluded that the studies to be carried out must tend the overall considerations of all the problems in the lacustrine basin. However, taking into account the difficulty to obtain immediately all the means required, the sub-Commission recommended to proceed by stages.

A first stage, having to consist in gathering basic data, will be based on the NASA ERTS B Project (Teledetection of natural resources).

The works will be divided as follows:

NASA : aerial photographs at high altitude by the Satellite
ERTS B;

ORSTOM : hydrologic survey in the field;

B.D.P.A. : Interpretation of the aerial photographs;

ORSTOM & BDPA : Interpretation of the whole data.

Duration of the project : 2 years.

Cost of the intervention of ORSTOM : 520,000 French Francs

Cost of the intervention of B.D.P.A. : 172,500 French Francs

Cost of the annex operation of IGN: 40,000 French Francs

or about \$150,000

An agreement was concluded between the EHC and the FAC for the financing of the first phase of the project (approximately 36,000,000 FC A), and the work has been underway since mid-1975 and is due to conclude on 1 April, 1977. Two reports have been published entitled Rapport de la Première Année d'Etudes sur les Anomalies and Rapport d'Activité et Annuaire 1975.

The first phase will define the content and costs of the succeeding phase or phases. The conclusions of the first phase have not yet been made available to the Commission.

10.3 An estimate of \$200,000 has been made for the completion of the studies.

II.11 Survey of Resources in Construction Materials

11.1 This survey is required as part of the inventory of resources and prior to undertaking feasibility studies.

The Niger River Basin appears to have poor resources in most categories of construction materials and a thorough survey of this sector is needed with particular attention to gravels, stone, cement and steel. The survey should provide estimates of regional demand for these items, and define supply sources. It would identify the most economic means of transport and handling facilities required, estimate materials transport and handling costs, and make itemized unit cost estimates for materials delivered at assumed centres of construction activity.

II.2 A team of three experts will be needed for about nine months to complete this survey.

II.3 The estimated cost is \$500,000.

II.12 Feasibility Studies

12.1 Project identification and pre-feasibility studies for large-scale projects will be done by the Basin Analysis Unit who will also prepare Terms of Reference for feasibility studies and supervise their execution under contract. For small projects, all work from project identification through feasibility will be done by the Member State Governments who can, upon request, obtain guidance from the Small Projects Unit attached to RWC.

12.2 Up to \$5,600,000 has been earmarked in the budget for the Five-year Action Programme for these studies.

II.13 Small-Scale Irrigation Projects

13.1 The objective of these projects is to expand irrigation areas in the Member States via small-scale, short-gestation projects of 200 to 3,000 ha. each. There is a large potential for these types of irrigation projects. Small-scale schemes give quick returns and prepare the farmers for participation in future larger-scale projects. Mali has the most land areas available for small irrigation schemes. The Niger River stretch between the Mékrou confluence and Malanville in Benin also offers possibilities, as do the "cuvettes" of Niger and the Upper Nigerian floodplains. Most of these areas can be developed without major civil works, and require only small dykes, minor water control structures, low-lift pumps or wells, and some land levelling.

13.2 The projects will be identified, studied and prepared by the Member States which, upon request, will be advised and assisted by the Small Projects Unit of ENC. The Member States will submit the projects to donor countries for funding and implementation. The Small Projects Unit will develop monitoring procedures and feedback systems to determine the impact of these projects on the food supply.

This will be a continuing programme of project identification, preparation and implementation.

13.3 Costs and benefits will be determined in each case from individual small-projects studies. Historic costs have run between \$3,000-\$15,000/ha.

II.14 Hydrological Forecasting System

14.1 A two phase UNDP project entitled "Flood forecasting and warning system of the Upper Niger Basin" has been implemented and is providing forecasts as far downstream as Mopti (Mali) at the entrance of the inland delta. The council of ministers of the EWC at its first meeting (Feb. 1976) adopted a resolution requesting assistance from the UNDP in order to establish a hydrological forecasting system extending over the middle and lower basins of the Niger River. A nine month preparatory phase, financed by UNDP and executed by WHO was completed in April 1976. Two documents entitled "Report on project findings and recommendations" (Geneva 1976) and "Technical Report on hydrological forecasting system for the middle and lower Niger Basins" (Geneva 1976) have been submitted to the Commission's Executive Secretariat and are due to be evaluated by the Commission meeting of experts before the end of 1976. In these documents, it is concluded that the forecasting system is feasible and desirable, and a stage approach, in a modular "building block" is recommended, meaning that the project should commence in some countries first and be extended to the rest of the basin later. Also, forecasts should be provided for the main rivers (Niger and Benoué) first, and be extended to sub-basins later. It makes it clear also, that no data base was available at the time of the study for a streamflow forecasting model in the inland delta, thus being the main hindrance for coupling the existing Niger Forecasting System with the proposed middle and lower Niger System. Personnel training as identified as the main bottle-neck in project execution.

It is proposed that the middle and lower Niger Forecasting System be established in a two phase project. The first phase would include the Niger from the outlet of the inland delta to Abdi near the oceanic delta, including

the Benoué river. The second phase would extend the system to the other countries concerned and to tributaries as required.

(a) First phase (1977-1979)

The first phase will meet the specific requirements for forecasts at specific points on the middle and lower Niger and on the Benoué. The main activity of this phase will be the implementation of a hydrometric network, designed to meet this requirement and the necessary telecommunication facilities. In each country, the stations equipped with telecommunication equipment shall transmit, after primary processing, the observational data to the national centre. This collected information will be transmitted by the national centre to the international centre. It is considered that an exchange of information between national centres would be desirable. Hydrological forecasts will be prepared at the international centre, using an evolutionary model limited during the first phase to the propagation of the flood wave (transfer function). The selection of the forecasting model may be sub-contracted; the operational phase will, however, also require calculating facilities. The international centre will disseminate forecasts to the national centres which will be responsible for their local adaptation and for informing the authorities.

The hydrometric stations will, in their majority, measure discharge and shall therefore be gauged by field teams to be established under the project.

During the first phase, the training of field staff shall be completed; furthermore, training of the scientific staff required

for the second phase shall be initiated. The detailed plans for the second phase and the studies required for the extension of the system shall also be carried out during the first phase.

The existing flood forecasting facility on the Upper Benoué (Cameroon) will be expanded and integrated into the system. The first phase shall have a duration of three years.

(b) Second phase (after 1979)

The second phase will lead to a comprehensive hydrological forecasting system in the middle and lower basins of the Niger River. Its duration and budget will be terminated during the first phase. The forecasting model will be based on the elements of the water balance (production function) and shall include supplementary data (physiographical, meteorological, etc.) concerning the new areas and catchments covered as well as the new forecasting points. The main activities of the second phase will be as follows:

- strengthening of the international centre (equipment and staff);
- establishment of national centres not yet implemented;
- strengthening of the hydrometric network and of the field gauging teams;
- planning and strengthening of meteorological networks;
- strengthening of the telecommunication network;
- training of additional staff;
- sub-contracting model improvements,

Periodic evaluations of the different components of the system shall be carried out during this second phase. Furthermore, all members of the River Niger Commission will be called upon to participate in the system.

14.2 Requirements for a five-year period are:

	Total	1977	1978	1979	1980	1981
Project personnel	472,000	48,000	150,000	254,000	-	-
Subcontr.	60,000	-	50,000	30,000	-	-
Training	11,103,050	267,600	312,150	251,400	224,400	49,500
Equipment	671,218	155,202	485,306	30,630	-	-
Misc	63,750	10,000	35,000	38,750	-	-
Total	12,312,018	480,802	1,042,456	614,780	224,400	49,500

Expenditures covering the Contributions of the Governments for the International Centre

Project personnel	164,013	34,160	40,332	40,332	29,092	21,059
Training	The Governments will pay a salary to the fellows during their training					
Equipment	144,000	17,500	98,000	28,000	-	-
Misc	17,500	3,500	7,000	7,000	-	-
Total	325,513	55,560	145,432	75,332	29,092	21,059

Expenditures covering the Governments' Contributions to their National Centres

Centre (FCFA)						
Personnel	17,560,000	-	-	3,780,000	13,780,000	not indicated
Centre (FCFA)						
Personnel	112,704,000	3,780,000	6,524,400	8,340,300	not indicated	indicated
Equipment	122,000,000	-	122,300,000	400,000	not indicated	indicated
Misc	6,500,000	1,200,000	2,400,000	2,400,000	not indicated	indicated
Total	147,404,700	4,980,000	131,224,400	11,140,300	not indicated	indicated
Centre (FCFA)						
Personnel	7,560,000	-	-	3,780,000	13,780,000	not indicated
Centre (FCFA)						
Misc	115,100,000	-	-	7,560,000	17,560,000	not indicated

Personnel	21,298,800	5,351,400	7,188,750	8,738,800	not	indicated
Equipment	23,700,000	-	23,300,000	400,000	not	indicated
Misc.	6,000,000	1,200,000	2,400,000	2,400,000	not	indicated
Total	<u>30,998,800</u>	<u>6,551,400</u>	<u>32,888,750</u>	<u>11,538,800</u>	not	indicated
Manila (Malpas)						
Personnel	28,548	28,548	38,682	58,236	not	indicated
Equipment	204,500	-	202,000	2,500	not	indicated
Misc.	62,500	15,500	33,000	33,000	not	indicated
Total	<u>409,528</u>	<u>45,048</u>	<u>773,682</u>	<u>90,736</u>	not	indicated

14.3

Budget for the 5 year Programme

A five year programme would cost in the order of magnitude of \$5,000,000.

Financing the External Inputs

The estimated cost of the external inputs over three years is \$2,412,018.

Several sources of assistance are expected to contribute including a proposed initial UNDP financed pilot activity estimated at \$295,750. The pilot activity would basically cover the costs of a project manager for the first phase (3 years) at \$144,000, sub-contracts and consultants amounting to \$72,000 and equipment and miscellaneous at \$79,750.

**MEETING OF DONORS FOR THE DEVELOPMENT
OF THE NIGER RIVER BASIN**

Paris, Thursday 9 September 1976

DRAFT REPORT

1. Purpose of the Meeting

During a preparatory technical meeting held 6-8 September, the same participants had reached a consensus on an action programme and on the desirable institutional support to be provided to the Niger River Commission (NEC).

The purpose of the present meeting, pursuant to the preparatory technical meeting, was to identify the importance, the type and the nature of the contributions of the donors attending this meeting.

2. The Participants

CIDA	Mr. L. LAVAL-GOBEIL, CIDA Representative
	Mr. M. PEBON, From the Canadian Embassy in Paris
	Mr. M. MAASLAND, CIDA Consultant
IBRD	Mr. D. KING, Department for West-Africa, Project Division
	Mr. A.A. MFINARIS, Agriculture Division
FAC	Mr. G.E. MATON, Technical Adviser to the Ministry of Cooperation
	Mr. BIDAUT, Minister of Cooperation, France, Division for Development
NEC	Mr. A.E. DEHINDE, Executive Secretary
	Mr. C.L. JOYCE, Technical Adviser
US AID	Mr. A.R. BARN, US AID Representative in Niamey
	Mr. L.A. COHEN, Office of Development Resources, African Bureau
	Mr. J.G. HOWE, US AID Technical Adviser
UNDP	Mr. DOO KINGUE, Assistant Administrator and Director, Regional Bureau for Africa

Mr. R. M. BERTHELOT, Senior Technical Adviser, TAD
Mr. J. FRIPPIAT, Project Officer, OPE
Mr. M. LINCOURT, UNDP/OPE Consultant
WHO Mr. M. KLOHN, Technical Staff member, Department of Hydrology and Water Resources

Observers

Club des amis du Sahel **Mr. R. STACEY, USAID Representative**
The Netherlands **Mr. H. FROGER, The Netherlands Ambassador, France**

The meeting was opened and chaired by Mr. Michel Doo Kingué, Assistant Administrator and Director, Regional Bureau for Africa, UNDP.

3. Summary of the meeting

In his opening address, Mr. Doo Kingué, specified the catalytic role that UNDP was ready to play in conformity with the request of the Niger River Commission and took into account the agreement of the donors in this respect, as it appeared during the previous meeting. Whereas the assistance and the contributions expected from the donors would be characterized by the importance of their volume, the assistance provided by UNDP would be characterized by its nature.

In accordance with its catalytic role, per se, UNDP would be prepared to provide inputs for the initial phase, to intervene in projects with political sensitivity, and in particular, multi-national projects; to participate actively when appropriate, in the elaboration of the diagnosis, which is the objective of the first phase; and generally speaking to offer its "good offices" in order to ensure the provision of required assistance, possibly from other sources, for the development of the river basin.

The diagnosis will be prepared in close cooperation with the NRC and in consultation with the donors, in order to take into account their particular interests in the development of the river basin.

The Terms of Reference would be prepared in consultation with the donors, including the International Bank for Reconstruction and Development (IBRD). In short, the diagnosis should be acceptable to all parties and, in this respect, the UNDP seems to be the most appropriate institution to ensure good implementation of this cooperative programme.

Mr. Doo Kingué stressed three fundamental points:

- the necessity to initiate the project at the soonest and to this end, to convene a special session of the NRC by the end of October 1976;
- the importance of the level of representation of the Member States, the governing bodies of the NRC. In addition to the Ministerial Council, it seems necessary to also establish the Conference of Heads of States;
- the necessity to form a committee of donors which will meet once a year and would constitute an appropriate interlocutor of the NRC.

Finally, Mr. Doo Kingué, announced that the initial contribution of the UNDP would be in the order of \$2,000,000 and that the assistance of the UNDP would go beyond the initial diagnosis.

The participants were given the floor by Mr. Doo Kingué and the following statements were made.

CIDA

Upon the agreement of the Canadian Government, CIDA is prepared to:

- participate in the preparation of the terms of reference of the first phase;
- assign a civil servant to the committee of donors;
- supply the services of 3 or 4 experts in the Niger basin;
- organize the training of national technicians from interested

- countries, in Canada, or in the countries of the region;
- participate in the supply of equipment for the operation of the Secretariat of the NRC.
 - supply heavy equipment for the execution of projects;
 - finance a revolving fund for the Secretariat of the NRC;
 - finance small-scale projects;
 - participate in specific studies.

In financial terms, the order of magnitude of CIDA's participation would be 25% of the total budget in the order of US\$27,000,000 as estimated during the course of the technical meeting;

The type of assistance provided by CIDA does not include participation in the construction of buildings.

Finally, CIDA expressed its agreement as regards the catalytic role of the UNDP as described by Mr. Doo Kingué.

FAC

The representative of FAC specified that, given the fact that the financing of the FAC programme is made on an annual basis, FAC cannot make any commitment on a multi-annual basis. The representative recalled that moreover, FAC was already engaged in comprehensive actions in the Niger river basin and, as a consequence, its participation in the programme outlined during the preparatory technical meeting would be an additional contribution to the actual assistance of FAC in the Niger river basin.

However, FAC was ready to participate in the logistic support of the Secretariat of the NRC in the form of one or two of the experts required, according to the needs.

On the other hand, given the past action of FAC and other French institutions in the region, FAC is ready to associate itself with the preparation of the

diagnosis, objective of the first phase of activities, by supplying competent experts, for instance from ORSTOM (Office de la Recherche Scientifique et Technique Outre mer), IGN (Institut Géographique (National) BRGM (Bureau de Recherche Géologiques et Minières) and EDF (Electricité de France).

As regards subsequent phases, FAC cannot make any commitment for budgetary reasons and also because the activities related to these phases were not yet specified, but FAC wished to place on the record at this stage, its interest à priori, for subsequent development of the proposed action programme.

US AID

US AID endorsed the joint approach to the action programme, underlined the need for coordination of the technical assistance made available by the donors, supported the idea of a committee of donors, and expressed its agreement on the catalytic role of the UNDP.

The assistance proposed by the US AID over the next 3 years would include the following:

- the supply of expert services;
- the training of national technicians;
- various other activities.

In financial terms, the proposed contribution of the USAID would be in the order of magnitude of \$3 to \$5 million over the 3 years in reference of which \$1,000,000 for fiscal year 1977 (which just began).

The proposed assistance of USAID is subject to the decision of the US Congress, depends on the assistance provided by other sources and presupposes a request of the NRC to this effect.

The assistance of USAID beyond the first three years cannot be specified at this stage, but taking into account the first results, the interest of USAID

in the development of the Niger River Basin may result in increased subsequent assistance.

From the outset, USAID will participate in the preparation of the diagnosis. As far as the action programme is concerned, USAID will endeavour to obtain from the Government of the USA, the means for its participation as outlined above. The decision of the Government of the USA will be communicated to the NEC and the UNDP before the special meeting of the NEC, scheduled for end October 1976.

The Netherlands

The representative of the Netherlands underlined that his government was invited in the capacity as an observer.

The Ministry responsible for technical assistance in the Netherlands had not yet taken a decision as regards the assistance to the NEC, under these circumstances, the representative of the Netherlands was not in a position to elaborate on possible assistance from his government.

A report of the debates of this meeting will be transmitted to the Ministry responsible and it can be expected that the Government of the Netherlands will be favourably influenced.

IBRD

IBRD concurred entirely with the consensus of opinion which had been attained.

IBRD was ready to serve as the Executive Agency for the first phase, a possibility suggested by Mr. Doo Kingué, if such was the wish of all concerned.

The representative of IBRD underlined that the Bank was already financing a number of projects in the region having a bearing on the development of the Niger River Basin, which explained its interest as regards the basin development, now in question.

At this point, Mr. Doo Kingué summarized the assistance offered, noting that, independently from the contributions expected from FAC which cannot be quantified at this stage, the potential contributions amounted to some \$13,000,000, that is to say about half of the budget required, as estimated by UNDP, on the basis of the various reports.

This brings into focus the role which UNDP will have to play to find additional sources of assistance and to ensure the execution of the action programme leading to the development of the Niger River Basin.

Furthermore, Mr. Doo Kingué underlined the coordinating role of the NEC and as a consequence the necessity to strengthen this institution as far as its logistics, its technical and managerial capacity and its regional authority were concerned.

In the ensuing debate the following statements should be noted:

UNDP

Mr. Doo Kingué

Although the contributions made available amount to only half of the total estimated necessary, it is possible and indeed necessary to initiate activities envisaged, as of now.

UNDP reiterated its catalytic role and its offers of "good offices". Since there may be some other potential donors, UNDP could help the NEC to approach them and to interest them in the present undertaking.

In the light of the experience gained in OMVS (Organisation pour la Mise en Valeur du Fleuve Sénégal) where UNDP played a major role, it is felt that the structure of the NEC should be modified from the outset, to enable the NEC to handle incoming investments.

Although in the present project of the development of the Niger River Basin, no emphasis has been placed on health and environmental problems. these

aspects should not be forgotten. Experience gained in this matter, in particular by USAID and UNEP would be most useful.

Finally, the development of the Niger River Basin cannot be conceived without a compatible development of that sub-region's human resources. An appropriate policy should be defined in this respect.

USAID

L. Cohen

USAID wished to express the appreciation of its delegation as regards the role and the performance of UNDP which made it possible to organize this meeting of donors and to attain the present results which met the expectations of USAID.

The joint action programme had been defined, there remained of course, to specify some issues, but as of now, a concerted approach was obvious.

It was decided that:

A press communique would be prepared for the agency France-Press which Mr. Doo Kingué was expected to meet later in the evening.

An annex of the report of the preliminary technical meeting would be prepared for the benefit of technical services of the Governments' donors. It would consist of extracts of the technical reports, which have been utilized as basic data for the synthesis document prepared by UNDP.

The terms of reference for the execution of the diagnosis objective of the first phase of activities would be prepared by UNDP in cooperation with IBRD and the donors and transmitted to the Executive Secretary of the NRC, as early as end September.

The Executive Secretary of the NRC will convene a special meeting of the NRC towards the end of October in order to record the agreement of the NRC

members on the approach which has been defined during the present meeting and its preliminary technical meeting and to embark on the action phase as soon as possible.

**COMPREHENSIVE DEVELOPMENT OF THE NIGER RIVER BASIN
AND
TERMS OF REFERENCE FOR THE INITIAL PHASE**

I. Introduction:

A consensus, among the main potential donors, on a joint action programme for the development of the Niger River Basin, was reached during a meeting convened by UNDP at UNESCO Headquarters in Paris, on behalf of the River Niger Commission (RNC). It is the logical outcome of a comprehensive action undertaken by UNDP on the initiative of RNC (see Annex I: Communication of Mr. Doo Kingué, Regional Director of UNDP Bureau for Africa, to the Council of Ministers of the Niger River Commission [Feb.1976]; Annex II: Document de Travail en Vue d'Une Réunion de Stratégie des Principaux Bailleurs de Fonds). The consensus includes also the desirability of providing institutional support to the secretariat of the RNC in its activities of coordination and monitoring (see Annex III: Aménagement du Bassin du Fleuve Niger - Réunion Technique Préparatoire à la Réunion des Bailleurs de Fonds; and Annex IV: Réunion des Bailleurs de Fonds en Vue de l'Aménagement du Bassin du Fleuve Niger).

The approach to the Development of the Niger River Basin will consist of two different phases which may, whenever applicable, be carried out concurrently.

- An initial phase during which a comprehensive inventory of the data and information available will be made and a diagnosis of the development of the River Basin will be prepared, in order to specify the details and the scope of joint action programme.
- A phase of execution of the action programme, per se.

II. Initial Phase:

CIDA, USAID and FAC indicated their willingness to supply inputs in specialists to achieve the objective of the initial phase in cooperation

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I. Initial Phase:

CIDA, USAID and FAC indicated their willingness to supply inputs in specialists to achieve the objective of the initial phase in cooperation

with UNDP. The IBRD expressed its interest in a coherent approach leading to bankable projects. The meeting underlined also the coordinating function of the secretariat of the RNC.

Pledges in assistance may be expected from other sources, in particular from the Government of the Netherlands.

It is noted that FAC is already financing the feasibility study and final design of KANDADJI, one of the main multi-purpose dam sites of the Niger River.

UNDP will be the executive agency for the initial phase, and in consultation with the IBRD and co-donors will mobilize a team of experts. Expertise or other forms of assistance may be provided by CIDA, USAID, FAC and possibly other sources.

The coordination of activities would be the responsibility of the RNC, assisted by UNDP as required (see paragraph III below).

The initial phase will culminate in a meeting of all the participants under the auspices of RNC during which the diagnosis will be presented, discussed and finalized. The specifics of the action programme for the preparation of a Master Plan including the working plan, the staffing, the organization, the budget and the time frame will also be outlined.

III. Terms of Reference for the Initial Phase:

During a 6 to 9 month period the team of specialists will be expected to perform, in cooperation with technical authorities of the RNC Member States and relevant institutions and agencies based on the Niger River Basin or headquartered elsewhere, the following activities:

1. To identify the sources of information in the Niger Basin and elsewhere and to map out the information thus located. Access to these sources would be facilitated by the secretariat of the RNC, the Member States and UNDP.
2. To collect this information for further study or study it on the spot in order to make a thorough appraisal of this information in terms of

(a) its completeness; (b) its quality; (c) its relevance for the River Niger Basin Development.

3. To prepare separate concise reports preferably according to a standard pattern including the findings, the identification of lacunae, the conclusions, the recommendations as regards the action and programmes to up-date the information; and whenever applicable the data itself in appendices.

4. The above three activities apply to the following areas:

(a) Topography and Mapping:

An evaluation of the work and the cost involved in up-dating topography and mapping according to the foreseeable needs would be required (main sources of information: Archives of National Public Works Ministries and the Institut Géographique National (IGN)).

(b) Hydrology:

An exhaustive evaluation of the data available is required in order to: up-date ratings whenever necessary, derive information by transposition or correlation by modern methods whenever applicable, specify the minimum additional network necessary (its operation, its requirements in staff, equipment and budget), to meet the requirements of the streamflow control (main sources of information: National Hydrologic Departments and Office de la Recherche Scientifique et Technique Outre Mer (ORSTOM)).

(c) Hydro-Geology:

An exhaustive evaluation of the data is necessary in order to design a programme which may include additional drillings, monitoring of wells, study of the aquifer dynamics and its use. An order of magnitude of the costs of such a programme would be required (main sources: Bureau des Recherches Géologiques et Minières (BRGM) and National Departments of Mines and Geology).

(d) Soils Surveys:

A number of separate activities including soils reconnaissance, pedological studies, soils classification, land capability and mapping have taken place over the past decades. The information

produced by these activities responded to specific requirements of the moment. All this information should be traced, retrieved whenever possible, and evaluated according to its relevance to the action programme. Furthermore a programme should be designed to up-date this information, to complete it by means of additional studies and mapping to the scale required for effective land use. Requirements in equipment including laboratories, staff and budget should be given (main sources: Ministries of Agriculture ORSTOM, US Bureau of Reclamations, UN Agencies).

(e) Studies of the Hydro-Energy Potential, Hydro-Agricultural Potential, Navigation and Mineral Resources Potential:

A number of studies (feasibility surveys, reconnaissance surveys...) have been made in the past and completed to varying degrees. The original files should be retrieved, the projects evaluated and useful information recorded. In particular a rather exhaustive list of available reports exists including an inventory of potential dam sites. Access to these reports may be facilitated by FAC, the Documentation Center of the RNC in Niamey, and other national and sub-regional authorities.

(f) Socio-Economic and Demographic Studies:

The approach outlined above applies to this sector. The main source is the Documentation Center of the RNC in Niamey; however substantial information may be available from other sources such as national and sub-regional authorities, UN agencies and specialized institutions of the Governments of France and the United Kingdom.

5. To study the practical utilization of satellite imagery for the River Niger Basin Development, including specifications of the imagery, interpretation equipment, training and permanent facilities as may be required.
6. To carry out a systematic in depth survey of potential resources in technicians and specialists within the Basin area, including existing

capability of the Member States to make available instruction and training (colleges, universities, ministries built-in training, etc...). On the basis of the findings, to design a pragmatic programme of training, to develop the necessary qualitative and quantitative expertise and know-how for a timely transfer of technology as well as responsibility of the overall management and development of the Niger River Basin.

7. To analyze the national development plans in order to determine their relevance to the Niger River Basin Development and to suggest appropriate reconciliations whenever applicable. Particular emphasis should be given to the development of the basin for irrigated crops and the economics of rain-fed versus irrigated crops as well as water supply, power and transport, and to the inter-country significance or implications for integrated basin development. The analysis will also cover the nature the modalities and the trends of application of bilateral assistances to the Member States in order to ensure coordination of potential assistance according to the development requirements of the Niger River Basin.
8. To analyze the implications of the economic "supply and demand" for present and projected production of the region, both internal and external, which will govern the development sequence of the Niger River Basin and in particular set forth the priorities.

The findings, and recommendations in each sector will be integrated into a comprehensive approach to the Development of the Niger River Basin, compatible with the conomic horizon chosen (for instance year 1985 and year 2000). This exercise would constitute the diagnosis of the Development of the Niger River Basin. After thorough analysis discussion and finalization of this diagnosis, in cooperation with the RNC secretariat and the donors, a detailed itemized plan of action aiming at the formulation of a Master Plan will be prepared. Its implementation with all necessary details, including budget allocations, organization, staffing of RNC, time framework and articulation of activities (surveys and project implementation and construction) will then become possible.

INITIAL ENVIRONMENTAL EXAMINATION

Project Location: Sahel Regional

Project Title: Niger River Development

Funding (Fiscal Year and Amount): FY 1977, \$1,400,000

Life of Project:

Date:

IEE Prepared by: J. Graham, AFR/DR/SFWAP April 20, 1977

Environmental Action Recommended:

Concurrence:

Date:

H. Miller, ADO/Niamey

Assistant Administrator's/Director's Decision: Date:

Approved David Miller

Disapproved _____

Contents of Initial Environmental Examination

I. Examination of Nature, Scope, and Magnitude of Environmental Impacts

Description of Project

Identification and Evaluation of Environmental Impacts

II. Recommendation for Environmental Action

Description of the Project

The goal of this project is to assist in the start-up phase of the institutional development of the River Niger Commission (RNC) and the elaboration of a plan for the comprehensive development of the water, land and human resources of the Niger River Basin.

The River Niger Commission is a regional organization of nine West African countries within whose boundaries the Niger River, its major tributaries and drainage basin are located. Its functions include, among others, the coordination of basin related development efforts between the member states to assure the most effective use of the basin resources and the preparation of long-term development plans through the execution of general and project specific studies. This project is a multi-donor activity which, in the interim phase, involves the close coordination of donor contributions from the United States (AID), Canada (CIDA), France (FAC) and the United Nations (UNDP).

Following upon a request to the international donor community by the RNC for assistance in the elaboration of a comprehensive "Indicative Plan" for basin development and the institutional development of the physical and technical capabilities of the RNC, the United States, Canada, France and the United Nations responded by indicating their interest in participating in a five year program of exhaustive study which would culminate in a complete basin development plan and investment program including strengthening the institutional capability of the River Niger Commission to continue on with the coordinated execution of the plan and the on-going planning and study requirements for future development activities.

However, information and data is presently insufficient in readily accessible form for the detailed elaboration of a long-term action program. It is thus necessary to initiate major action through an interim project which is designed to produce that information as well as make the first steps in the institutional development of the River Niger Commission's Executive Secretariat. This project will thus:

- (1) Gather and analyze available information on all aspects of the Niger River Basin through a comprehensive

diagnostic study which will facilitate the preparation of the detailed second phase action program and its budgetary requirements;

(2) Provide the initial expatriate technical advisory staff required for the RNC Executive Secretariat to carry out the action program and provide advice, guidance and on-the-job training to the indigenous staff of the RNC;

(3) Initiate long-term academic training for member state nationals on the permanent staff of the RNC; and

(4) Prepare architectural designs for the physical plant of the RNC required during the second phase.

Although each donor will be responsible for the execution of its individual inputs the UNDP will assume responsibility for overall coordination and direction.

The diagnostic study will include components in the following areas:

- Agriculture (AID, CIDA)
- Water Resources (CIDA, FAC)
- Engineering (CIDA, FAC)
- Topography, Mapping & Remote Sensing (AID, FAC)
- Education and Training (AID)
- Environment (AID, CIDA)
- Legal and Institutional (UNDP)
- Synthesis Report (UNDP)

The expatriate advisory staff will include the following technicians assigned to the RNC on long-term contracts:

- Regional Economist (CIDA)
- Hydrologist (CIDA)
- Civil Engineer (FAC)
- Agriculturist (FAC)
- Soils Scientist (AID)
- Water Resources Planner (AID)
- Forecasting Hydrologist (UNDP)
- Senior Advisor Coordinator (UNDP)

The AID contribution will additionally fund (1) long-term, academic participant training for the initially identified technical staff requirements of the RNC Executive Secretariat, (2) short-term study focus of river

basin development projects in the U.S., (3) short-term, third country training for documentalists of the RNC's documentation center, (4) contract services with a local or third country architectural design firm for the preparation of plans for the physical plant requirements of the RNC Executive Secretariat, and (5) limited logistical support to the RNC.

The end result of this interim project will be the elaboration of a five year action program which will provide the detailed basis for long-term multinational support to the RNC, the existence of an expatriate staff capable of assisting the RNC in the implementation of the action program, and the initiation of efforts to establish the long-term institutional development of the RNC.

In view of the fact that this project envisions only studies, some technical assistance, and some participant training, it is clear that there will be no deleterious effects upon the environment in the project area. In fact, since one major component of the indicative basin plan will be the environment, it can be positively stated that this project will have the effect of heightening host country and donor awareness of the potential environmental implications of various development alternatives.

In summary, no adverse environmental effects should result from the project. It is therefore recommended that a Threshold Decision Recommendation be made by AID/W that this project will not have a significant negative effect on the environment and does not require an environmental assessment or environmental statement and that a Negative Determination be prepared. Attached are the Impact Identification and Evaluation ratings.

IMPACT IDENTIFICATION AND EVALUATION FORM

<u>Impact Areas and Sub-areas 1/</u>	<u>Impact Identification and Evaluation 2/</u>
A. LAND USE	
1. Changing the character of the land through:	
a. Increasing the population -----	N
b. Extracting natural resources -----	N'
c. Land clearing -----	N'
d. Changing soil character -----	N'
2. Altering natural defenses -----	N'
3. Foreclosing important uses -----	N'
4. Jeopardizing man or his works -----	N'
5. Other factors	
_____	_____
_____	_____
B. WATER QUALITY	
1. Physical state of water -----	N'
2. Chemical and biological states -----	N
3. Ecological balance -----	N
4. Other factors	
_____	_____
_____	_____

1/ See Explanatory Notes for this form.

2/ Use the following symbols: N - No environmental impact
 L - Little environmental impact
 M - Moderate environmental impact
 H - High environmental impact
 U - Unknown environmental impact

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IMPACT IDENTIFICATION AND EVALUATION FORM

C. ATMOSPHERIC

- 1. Air quality ----- N
- 2. Air pollution ----- N
- 3. Noise pollution ----- N
- 4. Other factors -----
-
-

D. NATURAL RESOURCES

- 1. Diversion, altered use of water ----- N
- 2. Irreversible, inefficient commitments ----- N
- 3. Other factors -----
-
-

E. CULTURAL

- 1. Altering physical symbols ----- N
- 2. Dilution of cultural traditions ----- N
- 3. Other factors -----
-
-

F. SOCIOECONOMIC

- 1. Changes in economic/employment patterns ----- N
- 2. Changes in population ----- N
- 3. Changes in cultural patterns ----- N
- 4. Other factors -----
-
-

IMPACT IDENTIFICATION AND EVALUATION FORM

G. HEALTH

- 1. Changing a natural environment _____ N
- 2. Eliminating an ecosystem element _____ N
- 3. Other factors _____
- _____
- _____

H. GENERAL

- 1. International impacts _____ N
- 2. Controversial impacts _____ N
- 3. Larger program impacts _____ N
- 4. Other factors _____
- _____
- _____

I. OTHER POSSIBLE IMPACTS (not listed above)

- _____
- _____
- _____

See attached Discussion of Impacts.