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A Study for the

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Organization pour la Mise en Valeur du Fleuve Senegal

Senegal · Mali · Mauritania

June 1975

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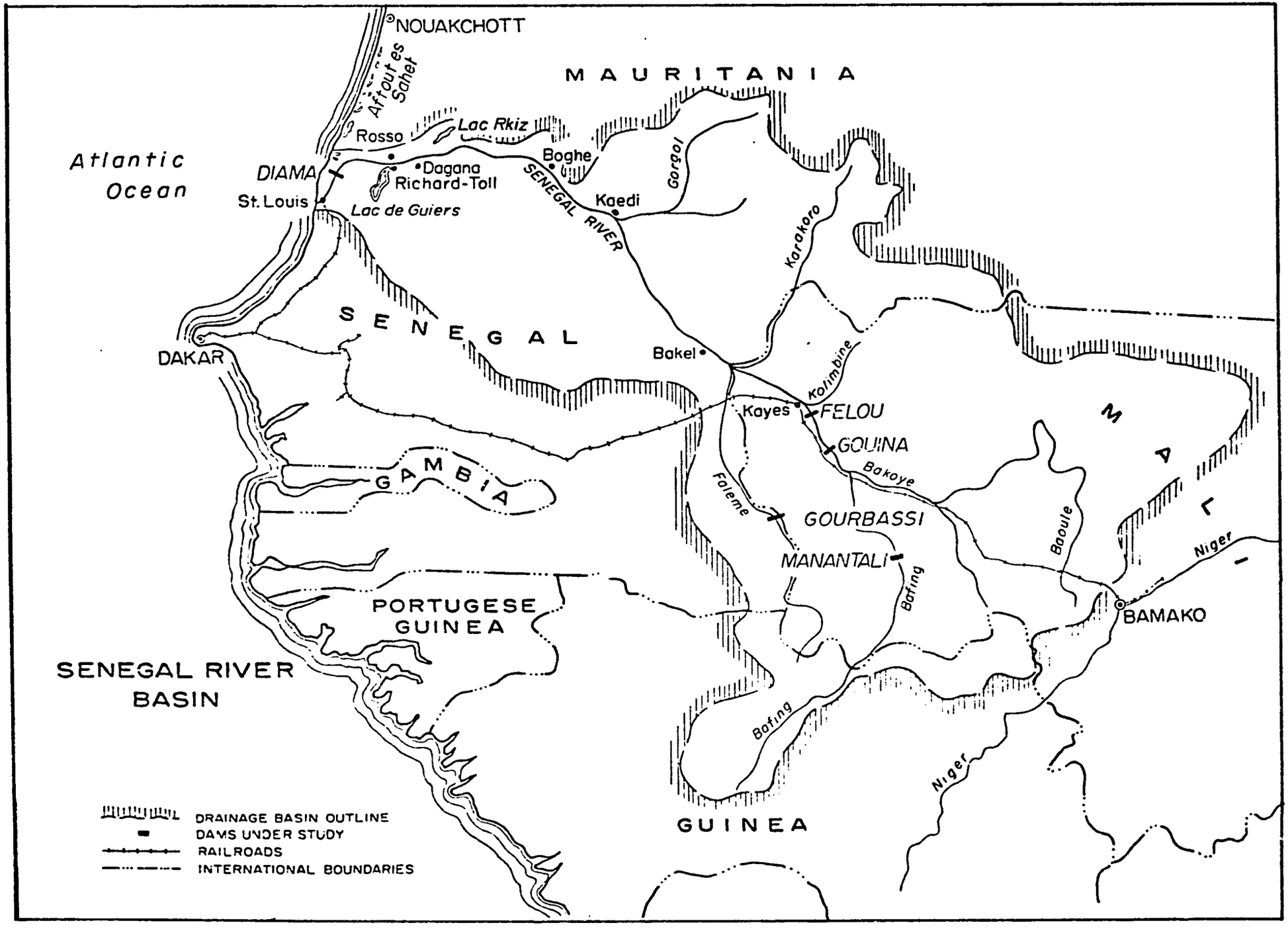
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Atlantic Ocean
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PORTUGESE GUINEA
BAMAKO
SENEGAL RIVER BASIN
GUINEA
DRAINAGE BASIN OUTLINE
DAMS UNDER STUDY
RAILROADS
INTERNATIONAL BOUNDARIES

CONTENTS

INTRODUCTION

OBJECTIVES

The overall objective of the study team was to collect data for a program which would assist the OMVS in developing the organizational structure required to implement the Senegal River Basin Development Plan. Specific objectives were to determine:

- o Policy of the OMVS members towards the formation of an administrative organization
- o Socio-cultural effects of the organization
- o Attitudes of the OMVS towards various types of training programs
- o Scope of services to be used by OMVS in negotiating a contract for the organizational study
- o Professional requirements and composition of the study team
- o Estimated cost of study
- o Implementation schedule of study
- o Reporting requirements of the study team

A further objective of the study team was to formulate whatever recommendations it could for immediate actions by which OMVS could improve its organizational effectiveness.

APPROACH

The study team's approach was to acquire all possible information about OMVS and its member nations. This included information about the governments, the economies, the social structure, health, education, climate, geography, philosophy, religion, attitudes and problems. The process started in the United States with the acquisition and reading of all available printed material about OMVS and the three countries, and with briefings by AID State Department, UNDP and the Embassies of the three nations. The process continued in Africa with direct interviews with OMVS staff and the staffs in the three governments. For the sake of efficiency and to facilitate the determination of individual attitudes, the team was generally broken up for interview purposes with no more than two team members present at any given interview. Inspection tours were made in the Senegal Basin and in the Niger Basin to determine what the three nations have been doing in the area of agricultural and water development and to assess their problems and successes. Team members also took every possible opportunity to engage in conversation with various private citizens, in order to test levels of awareness and attitudes. Interpreters were utilized when necessary. The team effort was greatly enhanced by the fact that three of the four members understood French, although only two were able to speak it effectively.

SUMMARY OF FINDINGS

- o There is a very real and active commitment to and a high priority to the Senegal River Basin Development Program through OMVS in all three member nations.

- o The level of consciousness of the goals of OMVS and of the need for the Senegal River Basin Development is very high in all areas and levels of government in all three countries.

- o The three nations have recognized the critical importance of adequate staffing of OMVS by agreeing to salary levels for the Organization which are considerably higher than levels for comparable positions in the governments of the three countries.

- o Because of the limitations of the higher education systems of the countries and the shortage of candidates for the system, coupled with the growing needs of the three governments for qualified personnel, there will be a long-range problem in the OMVS organization with respect to adequately qualified personnel, regardless of salary levels.

- o The role of OMVS in certain functional areas must be clearly defined before effective organizational planning can be undertaken in those areas.

- o Attitudes toward formation of a functional OMVS organization are generally very affirmative in the three countries and within the present OMVS organization. There is some uncertainty and difference of opinion with respect to the role OMVS should play in certain functional areas. There is a great deal of concern about the danger of duplication of effort.

- o Executives tend to be overloaded in the OMVS countries because of the lack of qualified subordinates to whom they can delegate routine but responsible tasks. This is a danger for OMVS.

- o OMVS is presently under-utilizing capable executives for want of clear definition of responsibilities and almost total lack of staff support.

- o Some concern was expressed to study team members by representatives of some donor organizations about the possibility of conflicting national priorities in connection with the Senegal River Development. No evidence of such conflict was found.

SUMMARY OF RECOMMENDATIONS

The study recommendations comprise a four-point action program for OMVS.

First, initiate a re-organization program which will result in an organizational structure which responds to the functional needs of OMVS, with the responsibilities and duties of key positions within the structure clearly defined. Key requirements for this program are:

- o Retain a consultant capable of assisting OMVS in the step-by-step development and adoption of the organization structure and job definitions. The consultant responsibility will include the following:

    1. Investigation and recommendations aimed at producing a clear definition of the nature and extent of the OMVS role in every functional area where there is any uncertainty. Some of these recommendations could be at a policy level which would necessitate that they be submitted to the Council of Ministers.

    2. Recommendations to the Secretariat as to priorities for organization steps so that the organization effort can proceed first in the areas of most pressing need.

    3. Recommendations for organizational structure accompanied by proposed job and responsibility descriptions, submitted for action in accordance with the priority ranking.

    4. Review of organizational effectiveness as implementation proceeds.

- o The program should be undertaken on an evolutionary basis through progressive interaction between the consultant and OMVS. The complex nature of the situation and the shortage of qualified individuals will necessitate frequent re-evaluation and changing of plans.

Second, as an interim step, designate a Financial Planning Officer reporting to the Secretary General or to the Council of Ministers who will be responsible for investigating and analyzing the detailed conditions of donors pledges for OMVS projects and for recommending steps for the achievement integrated complete and workable financing plan for the Senegal River Development. This, in turn, will allow the OMVS to make timely decisions concerning such steps as the need for seeking alternative financial sources and undertaking specific actions to meet or remove certain donor conditions. The qualifications for this position are exacting. A great deal of knowledge and experience is required and it is not known to the study team whether a man with these qualifications exists within the three OMVS nations at this time.

Third, as a second interim step, detailed descriptions of responsibilities and duties of OMVS officials under the existing organizational structure should be developed at once. This will make possible more effective utilization of the personnel resources presently available to OMVS and will also pinpoint areas where there is immediate need for additional staffing, in order for the organization to function effectively. This step will be valuable preparation of the OMVS staff for the actual re-organization which will follow.

Fourth, that training be regarded as a basic function in the organizational action program, with a training department or division which will plan and coordinate educational and training programs. This should be followed through with a training director in each organizational division who will be responsible for carrying out specialized on-the-job training programs within his division.

For certain categories of personnel who will be required, the training is long and arduous. This applies to both professional and technical-operating categories. Some of these people will not be needed for several years. The numbers and job requirements for such people should be identified as soon as possible so that steps can be taken to identify and recruit candidates and get them into appropriate training and job experience programs, both at home and abroad.

BACKGROUND INFORMATION

GENERAL

The Organization pour Mise en Valeur du Fleuve Senegal (OMVS) was formed in 1972 by the West African Nations of Senegal, Mali and Mauritania. OMVS is a successor to the Organization des Etats Riverains du Fleuve Senegal (OERS), an organization which also included the Nation of Guinea. Membership in OMVS is open to Guinea, but it has not seen fit to join. A good deal of the Senegal River water originates in the mountains of Guinea. The three OMVS nations were all, at one time, a part of French Colonial West Africa and all use French as their official language and bear the imprint of French influence in their customs and governmental organizations. The nations range from Saharan conditions in Northern Mauritania and Mali through Sahelian conditions in all three nations, to tropical conditions in the Casamance area of Southern Senegal. Parts of the Senegal River Basin lie in all three nations. The greatest area with agricultural potential lies in Senegal. The next greatest in Mauritania and the least in Mali. The most significant area for potential agricultural development through irrigation in Mali lies in the Niger River Basin. Senegal has significant additional agricultural development potential in the Saloum River Basin and the Casamance. Mauritania is almost totally dependent on its lands in the Senegal Basin for the development of agricultural potential. All three nations have very strong desires to make themselves self-sufficient in food production. All three nations suffered extreme losses in the recent seven-year Sahelian drought, the worst losses being in the livestock raising sectors in Mali and Mauritania.

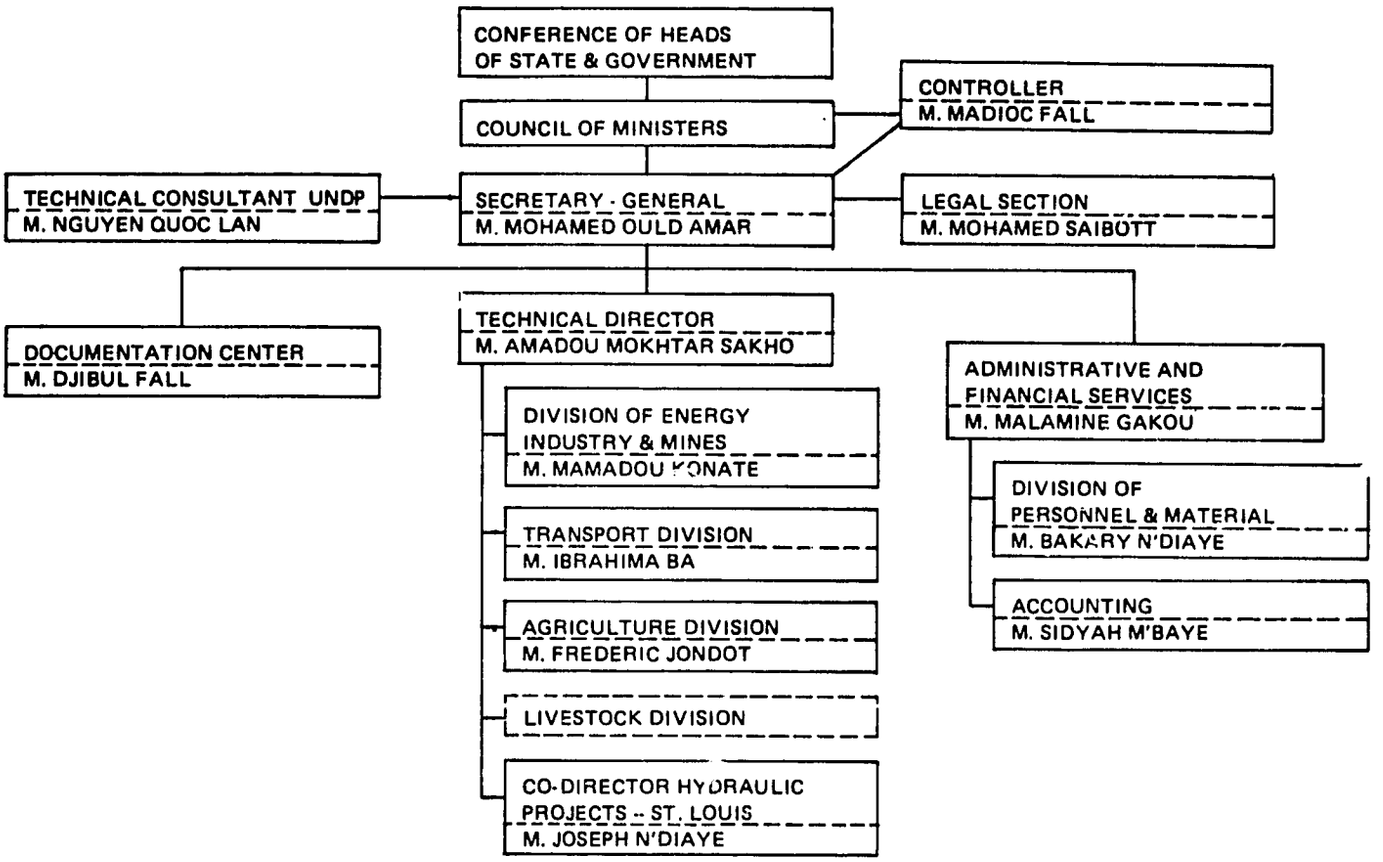
The Senegal River is extremely important to all three nations as a future transportation facility, not only for agricultural products but also for minerals which they hope to exploit in the future. This goal is particularly important to Mali, which is extremely sensitive to its position as a land-locked nation. All three nations are almost totally dependent on oil-fired electrical generation and the recent rise in fuel prices has greatly heightened their interest in development of hydro-electric power. Cheap power is vital to effective mineral exploitation and also to future industrial development within the three nations. The Mali Government appears to be particularly conscious of this and is actively pursuing plans for hydroelectric development in the Niger Basin, as well as in the Senegal Basin.

THE SENEGAL RIVER DEVELOPMENT CONCEPT

The OMVS is a unique international organization which has grown out of the mutual needs and desires of Senegal, Mali and Mauritania, with

respect to Senegal River Basin Development. The scope of the agreement between the three nations is reflected in the May 1974 OMVS document, "The Objectives and the Main Outline of the Integrated Development Strategy of the Senegal River Basin". They have further agreed upon a strategy which calls for a First Stage development which will regulate the flow of the river at 300 m^3/sec. and which includes the following works: the Hydroelectric Regulating Dam at Manantali - the Irrigation and Salinity Control Dam at Diama in the Delta - the river and seaport of St. Louis - the riverport of Kayes - the improvement of the places of call along the river (Rosso, Richard - Toll, Dagana, Podor, Boghe, Kaedi, Matam, Bakel, Ambidebi) and of the riverbed sills. World-wide recognition of development needs of Sahel nations has been such that the OMVS has been able to obtain tentative pledges for financing of most of the First Phase development projects. OMVS needs to organize itself for implementation in order to proceed with the finalization of financing, design and construction arrangements for the projects. There appears to be clear agreement between the nations that the OMVS role shall consist of handling the financing, design, construction and operation of the major facilities named and that the member nations will make their own arrangements for infrastructure. One of the unique features of the OMVS agreement is that each of the three nations assumes, as a general obligation of the nation as a whole, its share of repayment costs for the OMVS project and that any two of the three nations guarantee the share of the third, should it for some reason default. Another unique feature is that a precedent has been established for allocating repayment shares for main project costs on the basis of repayment capability, rather than on a strict ratio of benefits basis. This precedent was achieved in connection with the agreement for sharing of costs of the river navigation project between the three nations. The nations have also declared the Senegal an international river and have agreed to establish a navigation company which will operate the river ports and barges. Under the OMVS concept, it appears that charges will be made for OMVS services such as firm water supply in the river for irrigation, hydroelectric energy and river transport and that an attempt will be made to set these charges at a level which will pay for operation and for project debt service. However, if for any reason it is not possible to do this and still provide the services at a level which will permit actual use, part or all of the debt service component could conceivably be picked up by the treasuries of the three nations. An interest-free development period on major project loans is very important in this connection.

O.M.V.S. ORGANIZATION



OMVS - PRESENT ORGANIZATION

OMVS is presently structured in three main levels. The Conference of Heads of State is the highest level and decides questions of general economic policy. Its decisions must be unanimous and they become binding obligations of the respective states. The Chairmanship of the Conference is rotated.

The next level is the three-man Council of Ministers which is comprised of one individual of ministerial rank appointed by each state. The Presidency is rotated on a 2-year basis. This body defines the priorities for development projects, authorizes the acceptance of loans and grants and apportions repayment obligations among the member states. Here too, actions must be by unanimous vote. The Council President is authorized to represent OMVS with respect to national and international loans and to negotiate and execute treaties within Council directives. Final decision on all matters beyond the policy and fiscal limitations of the Council must be made by the Conference of Heads of State.

The Secretary General is the Executive Officer of the OMVS, and the Secretariat presently contains all staff of OMVS except the Audit Commissioner. The Secretary General is appointed for a three year term by the Council of Ministers and is responsible for executing Council decisions, preparing budgets for Council approval and hiring personnel below the Director level. Directors are named by the Council, and the Audit Commissioner by the Council President.

REPUBLIC OF SENEGAL

Governmental Structure

The highest executive body of the Government, under the President, is the Cabinet which consists of 18 ministries. The following six ministries are most directly involved in the Senegal River Development Project:

Ministere de l'Enseignment Superieur
Ministere de la Sante Publique et des Affaires Sociales
Ministere des Travaux Publics, de l'Urbanisme et des Transports
Ministere du Developement Industriel et de l'Environement
Ministere du Plan et de la Cooperation
Ministere du Developement Rurale et de l'Hydraulique

The Minister of Rural Development, M. Adrien Senghor, represents Senegal on the OMVS Council of Ministers and M. Ousmane Fall, Technical Counselor of the same Ministry, is the OMVS Coordinator with the other branches of the Senegalese Government.

The Ministry of Rural Development consists of five "Directions":

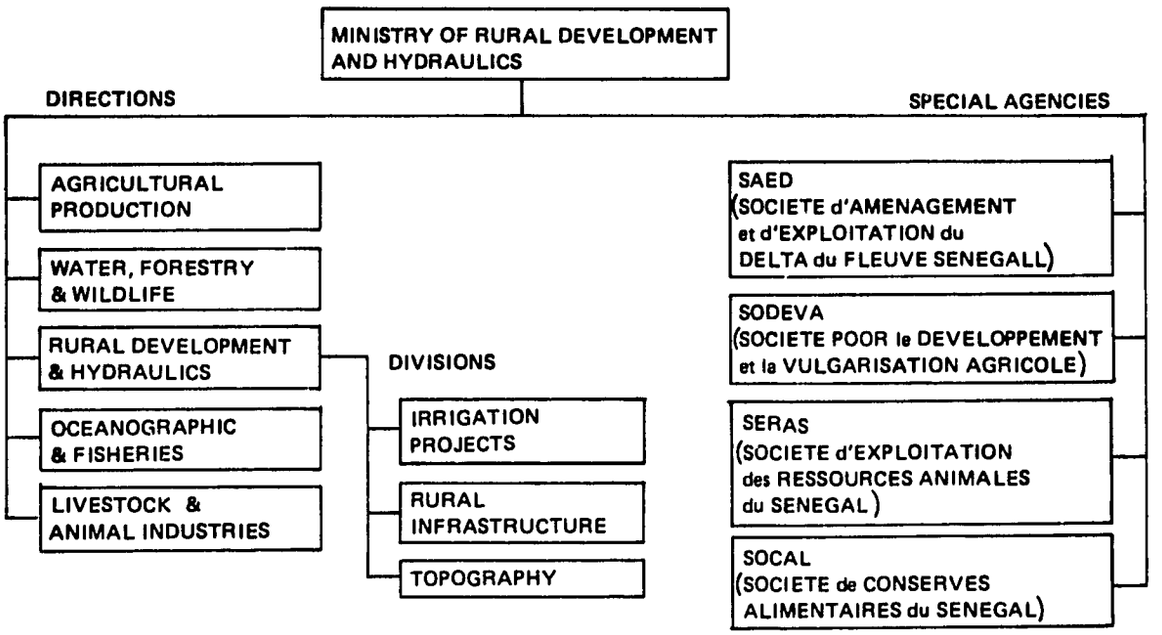
Direction Generale de la Production Agricole
Direction Generale de l'Elevage et des Industries Animales
Direction Generale des Peches Maritimes et de l'Oceanographie
Direction Generale de l'Hydraulique et de l'Equipment Rural
Direction Generale des Eaux, des Forets et de la Chasse

In addition, there are the following specialized agencies under the Ministry of Rural Development which are important within the framework of the Senegal River Projects:

SAED = Societe d'Amenagement et d'Exploitation du Delta du Fleuve Senegal
SODEVA = Societe pour le Developement et la Vulgarisation Agricole
SERAS = Societe d'Exploitation des Ressources Animales du Senegal
SOCAS = Societe de Conserves Alimentaires du Senegal

Each "Direction" has a number of Divisions. The Direction de l'Hydraulique et de l'Equipment Rurale, for instance, has Divisions for Equipment Rural, Etudes et Programmation, and Hydraulique Urbaine et Rurale. Equipment Rural, which may be translated into Rural Public Works, is the construction group of the Direction, although there appears to be some overlapping with the activities of SAED which constructs also roads, canals and other irrigation works within the irrigated perimeters. Equipment rural has two French advisors working directly for the Division. These have been supplied by the French Government and there appear to be French Government advisors in other Directions and Divisions also.

SENEGAL
MINISTRY OF RURAL DEVELOPMENT AND HYDRAULICS
ORGANIZATIONAL CHART



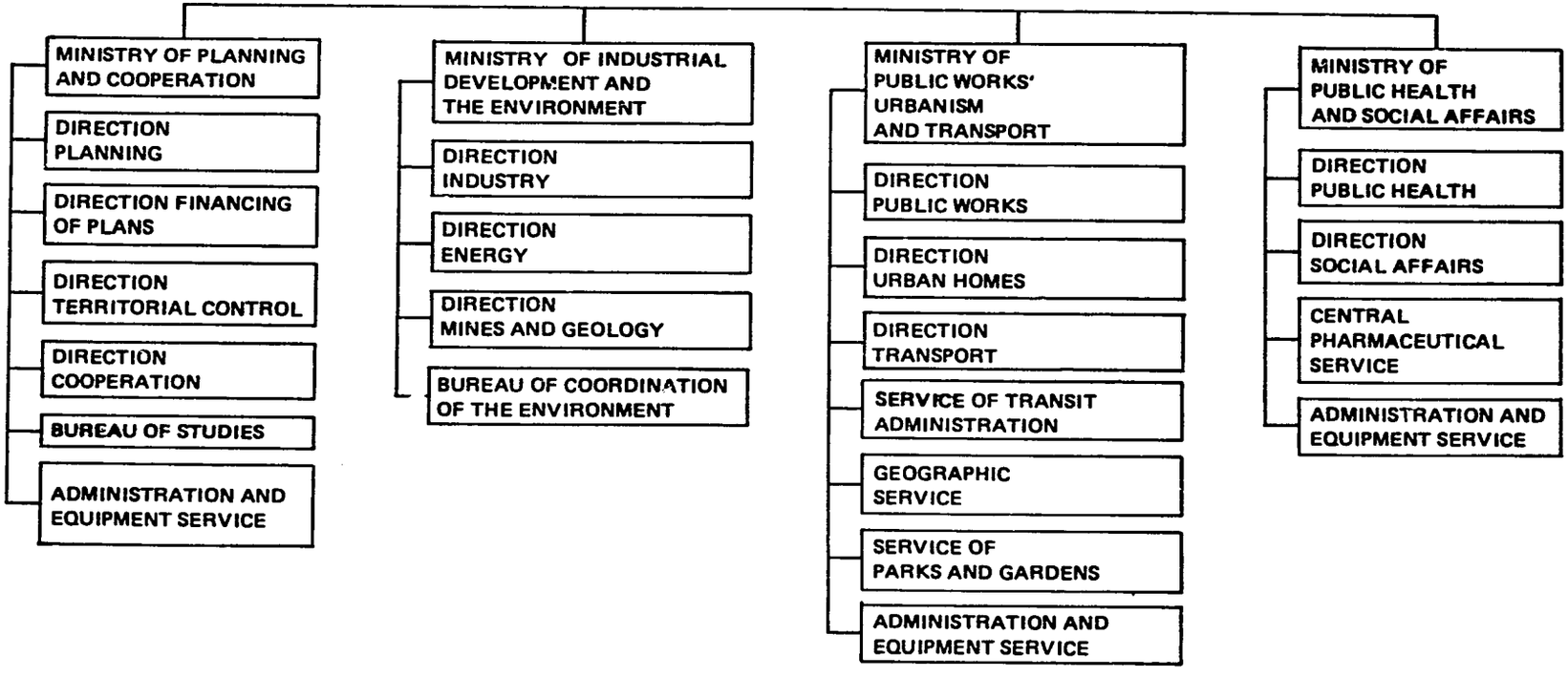
SAED (Director Cheik Cissokho) is in charge of all activities in the irrigated perimeters of the Senegal River Valley within Senegal. This includes construction, agricultural production, pilot projects, machinery maintenance and on-the-job training. At present, all Senegalese irrigation projects are in the Delta or lower valley region. This includes the perimeters of Savoigne, Kassak, Boundoum, Telel, Thiagar, Dagana and Nianga. Projected Senegalese irrigation projects in the upper valley, such as the Matam perimeter, will also be under SAED jurisdiction.

SAED is currently considering a reorganization to decentralize its operations and give greater autonomy to its upper and lower valley projects. It is expected that this would result in more efficient procurement of seed and machinery and improve project management in general.

The organization of other Ministers which are most intimately involved in the Senegal River Project is shown on an accompanying chart.

SENEGAL

OTHER MINISTRIES ESSENTIAL FOR SENEGAL RIVER PROJECT
ORGANIZATION CHART



REPUBLIC OF MALI

Governmental Structure

The supreme policy making body of the country, under the President and Chief of State, is the Military Committee of National Liberation. It is the executive arm of the government and directs the Council of Ministers who administer and carry out the policies. A list of the ministries follows:

Minister of Foreign Affairs and Cooperation
Minister of Justice
Minister of Information
Minister of Defense, Interior and Security
Minister of Transport, Telecommunications and Tourism
Minister of Finance
Minister of Labor
Minister of State Enterprises
Minister of Commerce
Minister of Basic Education, Youth and Sports
Minister of Health
Minister of Higher and Secondary Education and Research
Minister of Production
Minister of Industrial Development and Public Works

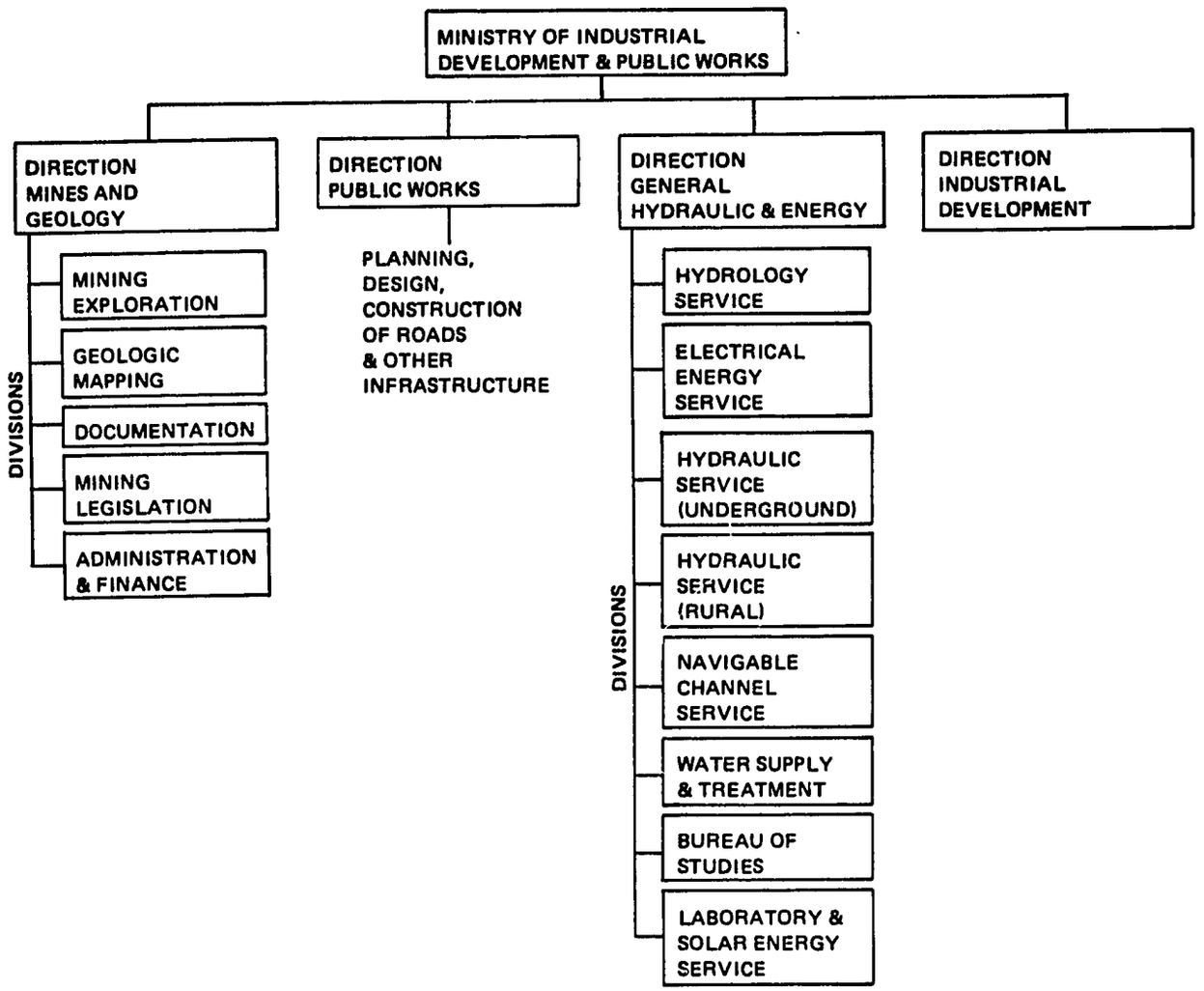
The last four ministries are most directly involved in the Senegal River development project. All ministries also work with the "Direction du Plan" and are represented on the various commissions which prepared and now supervise the National 5-Year Plan (1974-1978).

The Minister of Industrial Development and Public Works (MIDPW), Mr. Mamadou Keita, represents Mali on the OMVS Council of Ministers and Mr. Lamine Keita, the Director of the "Service de l'Hydraulique et de l'Energie" is the OMVS Coordinator to the Mali government. MIDPW consists of the following four "Directions":

Direction de Travaux Publics
Direction de Mines et Geologie
Direction de Service de l'Hydraulique et de l'Energie
Direction de Developpement Industriel

The "Direction de Travaux Public" deals with the planning, design and construction of roads and other infrastructure. The "Direction de Mines et Geologie" (DMG) (Director Sekou Diallo) is concerned with mapping, exploration, prospecting, planning, pilot and actual operating projects for iron, bauxite, uranium, copper and oil. In regard to the Senegal River project, iron and bauxite are the most important minerals due to their power and navigation needs. DMG has the following "Divisions":

MINISTRY OF INDUSTRIAL DEVELOPMENT AND PUBLIC WORKS (MALI)



Division de Prospection Miniere
Division de Cartes Geologiques
Division de Documentation
Division de Legislation Miniere
Division d'Administration et Finances

The "Direction de l'Hydraulique et de l'Energie" (DHE) (Director Lamine Keita) is in charge of research, planning and construction (but not operation) of all types of water and power resources. It consists of the following groups:

Direction Generale
Service de l'Hydrologie
Service de l'Energie Electrique
Service de l'Hydraulique Souterraine
Service de l'Hydraulique Rurale
Service des Voies Navigables
Service des Adductions d'Eau et Assainissement
Bureau d'Etudes
Service de Labaratoire de l'Energie Solaire

In the field of water resources, DHE constructs wells for villages, surface water supplies for irrigation and municipal requirements (including purification plants), dams and related facilities for flood control, power, irrigation and water supply. It also builds navigation channels, loading docks and installs navigation signals. In the field of power, DHE does research in the various power sources (including a solar energy laboratory) forecasts power requirements, plans and constructs hydro-electric and thermal (diesel) generating plants. DHE would thus be primarily involved in the construction of Manantali Dam and its power, water supply, navigation and flood control functions if it were a national rather than an OMVS project.

DHE does not operate the water and power facilities. After construction, the Companie d'Electricite de Mali (CEM) takes over the operation of power generation, transmission and distribution and performs the same function for municipal and industrial water supply. In this respect, CEM is similar to Senelec and Maurelec in Senegal and Mauritania. CEM is 55 percent government and 45 percent French owned. The Companie de Mali de Navigation, a government operated organization, has charge of ships, freight and passenger operations. The Ministry of Production operates irrigation facilities within the irrigated perimeters while the wells become the responsibility of the individual villages. As an example, the "Office de Nigere" of the Production Ministry operates the 46,000 hectare irrigation project which obtains its water from the Markala Dam on the Niger River.

The most immediate large project of the Direction de l'Hydrauligne et de l'Energie is the proposed Selingue Dam on the Sankarani River, a tributary of the upper Niger. Plans for this river regulation and power project are completed and construction is scheduled to commence in 1976. The installed generating capacity will be 44,000 kw. Major benefits in addition to power, would be year-round navigation on the Niger River and irrigation water during the normally dry season for double cropping. A French company, SOGREAH, and an Italian company, LOTTI, are consultants on this project.

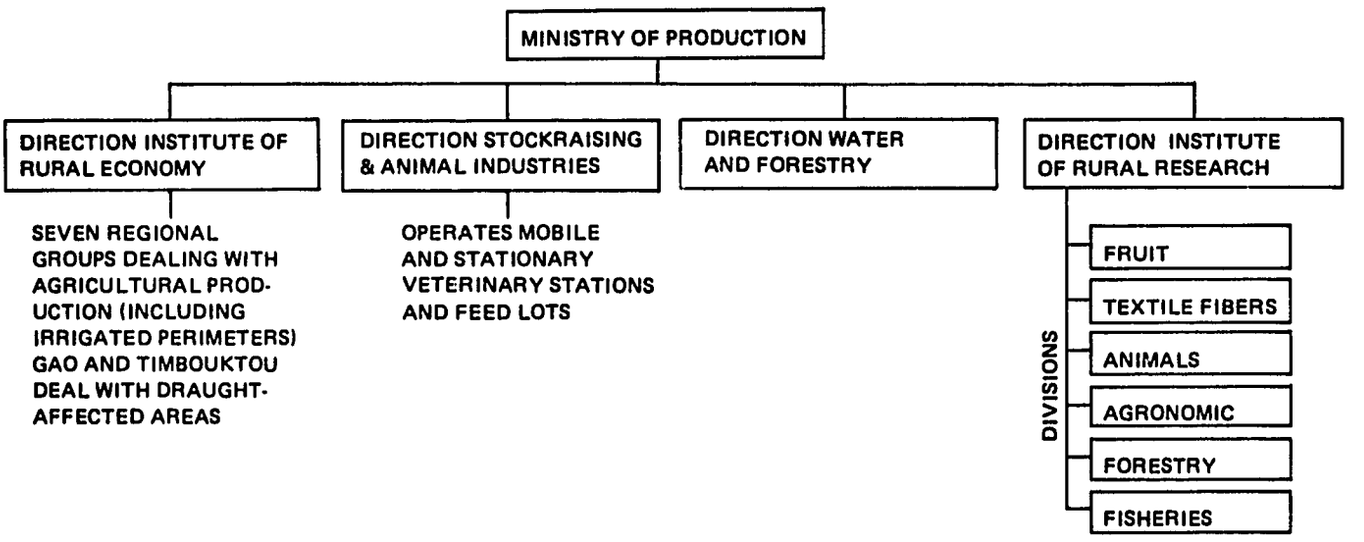
The Direction de Developpement Industrial (Director Seydou Doumbia) is the fourth major group within the Ministry of Industrial Development and

Public Works. In regard to the Senegal River project, the director considers it as "simply fundamental for the industrial development of Mali." Projects to be completed in 1975 include a tannery, a textile mill and a peanut oil refinery, all at the Senegal River port of Kayes. Other food and agriculture related industries have a high priority and include tomato paste plants, cereal plants, fruit canneries, and sugar refineries. Some of these are in operation or construction, while others are in the planning stage. Lack of low cost power is one of the main obstacles to industrialization, especially for potential aluminum plants, iron and copper reduction plants, to be based on the available mineral and ore deposits. Private foreign investments in industry are welcomed by the government and receive favorable treatment with regard to taxes and repatriation of profits. One condition is that the foreign companies train Malian technical personnel.

The Ministry of Production will be responsible for the agricultural projects in Mali that will be built in the course of the Senegal River development, i.e. with the infrastructure of the proposed irrigated perimeters. Three major "Directions" within the ministry are the

Direction de l'Institute d'Economie Rurale
Direction de l'Institute de Recherche Rurale
Direction d'Elevage et des Animaux
Direction des Eaux et Forets

MINISTRY OF PRODUCTION (MALI) - ORGANIZATION CHART



The Direction de l'Institute d'Economie Rurale deals with agricultural production, including the irrigated perimeters, and is divided into seven regional groups. Two of these, the Organization de Gao and the Organization de Timbouktou, deal with the areas that are most severely affected by the drought.

The Direction de l'Institute de Recherche Rurale consists of six groups which specialize in the fields of fruit research, textile fiber research, animal research, agronomic research, forestry research and fisheries research.

The Direction d'Elevage et des Animaux operates mobile and stationary veterinary stations as well as feed lots. It aims to improve the weight and slaughter age of cattle and smaller animals through better health care and improved feeding. Cross breeding is not performed since the existing animal strains are considered well adapted to regional conditions. For instance, the very small N'Dama cattle in southern Mali are resistant to the prevalent Tsetse flies. In the Sahel and desert area of northern Mali, an educational program is in progress to improve the meat and milk production of the Nomadic cattle and goat herds.

Major projects of the Production Ministerium related to the Senegal River development are the following:

A peanut cultivation and processing project to increase production from 54,850 tons in 1973/74 to 81,200 tons in 1978/79;

a sugar cane project at Same (Senegal River valley);

a new agricultural training center at Same;

a forestation project to provide Sahelian villages protection against wind and sand and to provide firewood;

a palm tree reforestation project and a tree nursery project at Kayes on the Senegal River;

a gum arabicum production project;

a project to increase saw timber production in the Kita region on the Senegal River;

a construction and management project, including protection against poaching, for the Baoule National Park.

The Ministry of Higher and Secondary Education will be discussed in the following section on the training and education of personnel for the Senegal River project.

The Direction du Plan is a separate government organization to formulate and supervise the 1974-1978 5-Year Plan. Its stated long-term objectives, to the year 2000, are Economic Independence and Protection from Climatic Problems. The 5-Year Plan has been coordinated with the schedule and objectives of the Senegal River Development (OMVS) and the Direction du Plan consists of the following:

Commission d'Industries et d'Equipment
Commission d' Infrastructure et de Transportation
Commission d'Affaires Sociales
Commission de Finances et de Credits
Commission d'Economie Rurale

ISLAMIC REPUBLIC OF MAURITANIA

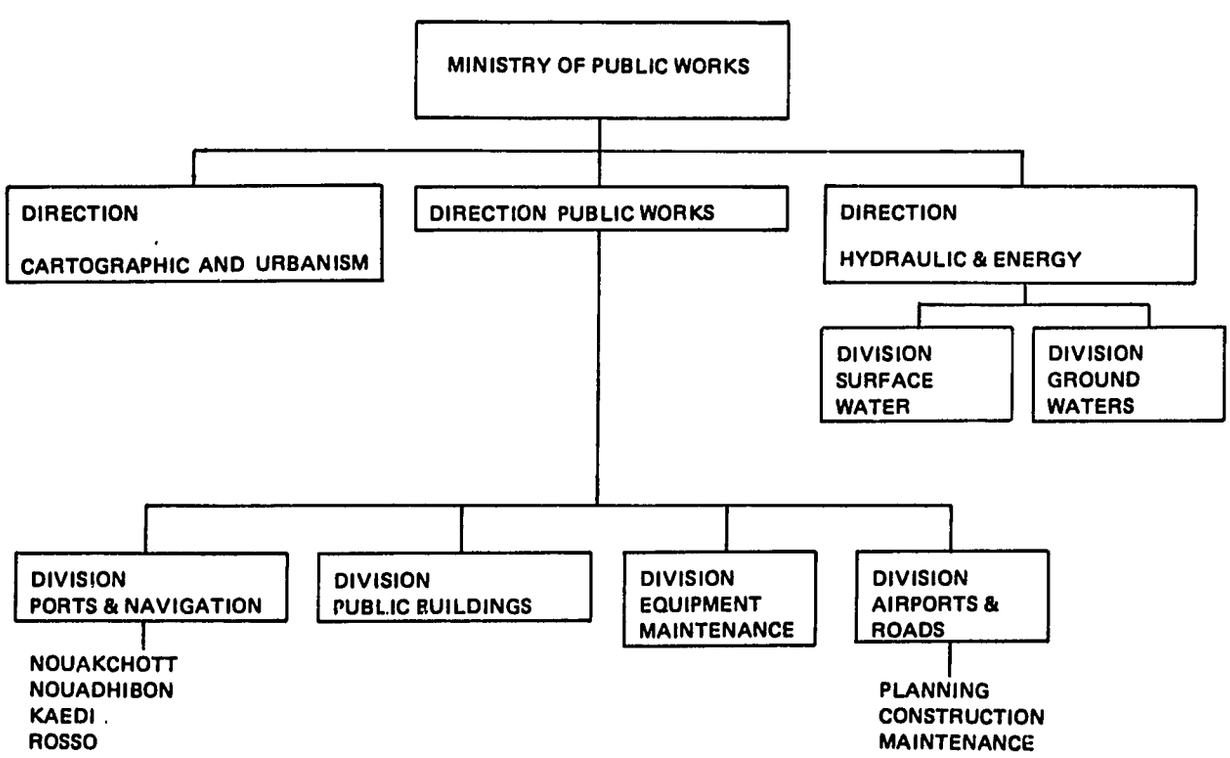
Government Structure

The Council of Ministers, or Cabinet, is the executive branch of the Government. The Ministers are appointed by the President and responsible only to him. The Cabinet consist of the following Ministers:

Ministry of Foreign Affairs
Ministry of Justice
Ministry of Defense
Ministry of Interior
Ministry of Finance
Ministry of Public Administration and Labor
Ministry of Commerce and Transport
Ministry of Health
Ministry of Education
Ministry of Rural Development
Ministry of Industrial Development
Ministry of Public Works (Ministere d'Equipment)
Ministry of Planning

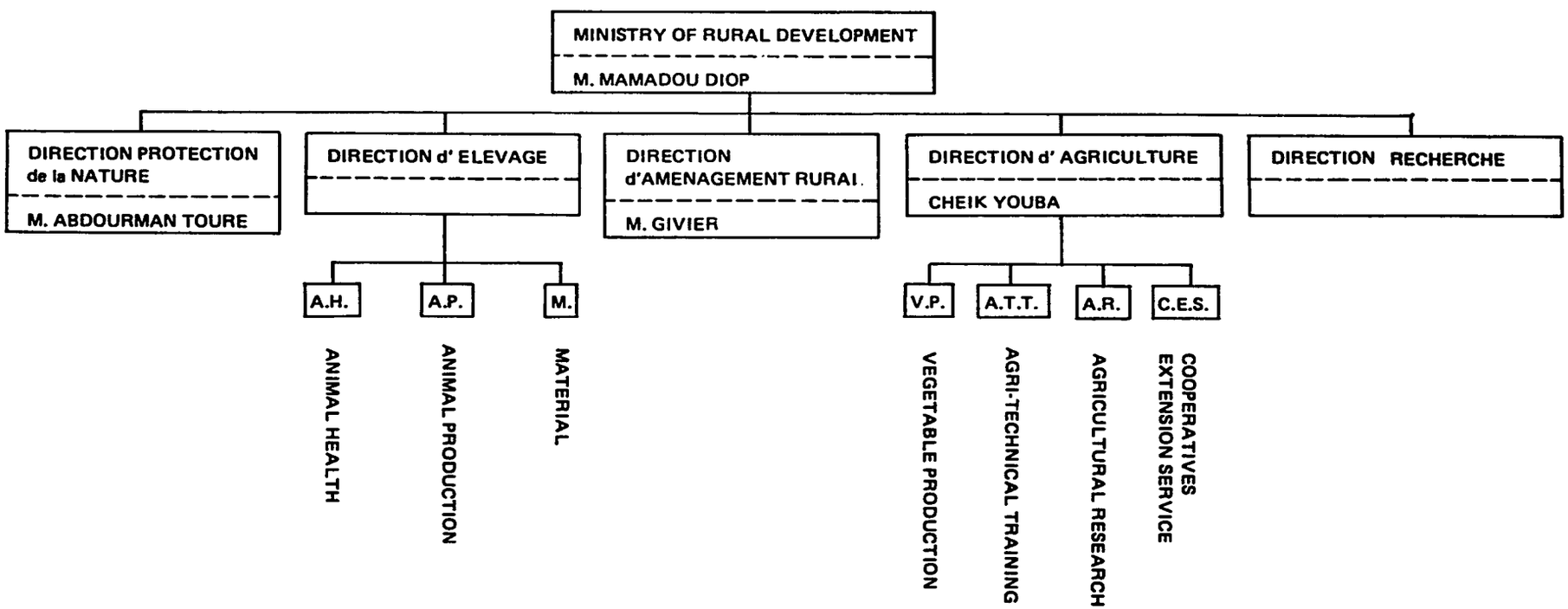
The last five ministries are most directly involved in the Senegal River Development Project. The Ministry of Education will be discussed in a following section on the training and education of personnel for the OMVS project.

MAURITANIA
MINISTRY OF PUBLIC WORKS - ORGANIZATIONAL STRUCTURE



MAURITANIA

MINISTRY OF RURAL DEVELOPMENT -
ORGANIZATIONAL STRUCTURE



The Minister of Rural Development, Mr. Mamadou Diop, represents Mauritania on the OMVS Council of Ministers and the Secretary-General of Rural Development, Mr. Ghanda Gaye, is the OMVS Coordinator with the other Mauritanian Ministers. The Ministry of Rural Development has four "Directions":

Direction d'Agriculture
Direction d'Amenagment Rural
Direction d'Elevage
Direction de Recherches
Direction de Protection de la Nature (Eaux et Forets)

The Direction d'Agriculture (Director Cheik Youba) has four "Divisions" specializing in vegetable production, agri-technical training, agricultural research and cooperatives-extension services.

Major projects in which the Direction d'Agriculture is involved are the 2000 hectare Chinese-built Rosso project, 600-800 hectares of which are presently irrigated and cultivated, the 700 hectare Gogol project which is to be expanded to 3500 hectares in 1976 and the 10,000 hectare UNDP experimental station at Kaedi. Minor projects of 25-50 hectare size are operated at Takane, Dar el Barka, Louboudou, Bakao, Winding, Rindiao, Sorimalo and Oloologo. Another major project is the 1000 hectare perimeter at Boghe for which the plans and the financing are completed and for which bids from contractors have been invited. Nearly all land is in rice or forage for livestock, with the Rosso project producing 4.5 tons of rice per hectare. The Direction d'Agriculture is responsible for the detailed planning, design and operation of the projects, but the Direction d'Amenagement Rurale does the construction. The present goal is self-sufficiency in food production, not exportation. The major difficulty, in addition to lack of funds and equipment, is the shortage of trained personnel.

The Direction d'Amenagement Rural (Director M. Girier) is in charge of constructing irrigation works including pump stations and small dams. Due to the lack of personnel, most of the construction is contracted out. Until one year ago, the Director had only one qualified engineer. Two Mauritanian engineers have been added this year, one for studies and the other for construction supervision. Two additional engineers will be supplied this year by FAO and two more by the French Government. The Direction also has from 35 to 40 technicians.

Present plans envisage the construction of irrigation projects at the rate of 500 hectares per year in 1975, increasing to 5000 hectares per year in 1984.

The Direction d'Elevage has three "Divisions" specializing in animal health, animal production and materiel. The divisions are further

subdivided according to regions and local sectors. Each of the eight regions has a livestock inspector with deputy inspectors for the sectors. An animal research center and laboratory at Nouakchott is also under the Direction d'Elevage.

The drought has destroyed most of the country's pasture with livestock losses ranging from an estimated 90 percent in the west to 20/25 percent in the eastern area towards the Mali border. An inventory taken during 1966-1968 estimated a total of 3,000,000 cattle, 8,000,000 goats and sheep, 700,000 camels, 1,000,000 donkeys and 30,000 horses.

Before the drought, the main emphasis of the Direction d'Elevage was on the control of diseases and an effective vaccination program was going on. Due to the drought, the current emphasis is on feed production, improved pasture and storage for forage. The area south of the Nouakchott latitude will have the most intensive livestock production while the number of livestock must be controlled in the Sahelian zone. The northern desert zone will be limited to camel raising, mostly for the production of camel meat.

A poultry production center near Nouakchott is also under the Direction d' Elevage and additional centers have been started at Rosso and other places.

The Direction de Protection de la Nature (Director Abdourman Toure) was formerly called "Eaux et Forets". Until 1966 the Director was in charge of river fisheries but it deals now only with the forest resources, i.e. mainly with the acacia trees and palm groves which are economically important for firewood, construction material, gum arabicum and food. The Direction has eight forestry engineers who obtained their training at universities in Dakar, Abidjan and France. There are also 15 supervisors, five of whom are now training in Kaedi. The total staff consists of 200 people and most of their work is in fighting brush fires, building fire breaks and brush fences against the invasion of sand and dunes. Little reforestation is undertaking due to the lack of funds and water. Also, most of the suitable land in the river valley is privately owned. Protection of wildlife is another responsibility of this Direction.

With regard to fisheries, it was pointed out that the drought had killed most of the fish resources in the Senegal River. Before the drought, some 14,000 tons of fish were caught in the river annually. Many species were saltwater fish which went as far as 180 kilometers upstream to spawn in the brackish water.

The Ministry of Industrial Development includes the Direction d'Industrialisation and the Direction de Mines et de Geologie. The Direction d'Industrialisation (Director Sidi Ali) is practically a one-man organization although it has two "Divisions" on paper, the Division de l'Industrie and the Division

de Promotion Industrielle. The latter has no staff and interested companies must make their own market studies. An industrial information center is to be established, but competent personnel are not available.

Before 1962, prior to the development of the great iron ore deposits at F'Derick, there was no industry in Mauritenia. Present industries, other than mining, include an abattoir at Kaedi, a match factory and a bottling plant at Nouakchott and fish freezing, fish meal and fish canning plants at the northern port of Nouadhibou near the Spanish Sahara territory. In the planning or construction stage are an Ex-Import Bank financed sugar mill which will refine imported raw sugar; a textile mill at Rosso with a capacity of 15 million square meters of cotton cloth per year (cotton to be imported from Mali) and two Chinese-North Korean financed clothing factories at Nouakchott, the first of which will be operating by July, 1975.

The Direction de Mines et de Geologie (Co-Director Camara) has charge of the great existing and potential mineral wealth of the country. The top personnel have been trained in the USSR, Algeria, France and Canada and 35 to 45 mining specialists are in training at present. The iron mines at F'Derick have been nationalized and export 12 million tons of high grade ore (65/66% iron) per year. It is estimated that the existing high grade deposits will permit mining at the 12 million ton annual rate for 10 years. Deposits of lower grade Hematite (Fe_3O_4) with an iron content of 45/55 percent are estimated at two to three billion tons.

Copper ore at Akjoujit is concentrated at the site to 65 percent and shipped by truck to Nouakchott for exportation. The mines are open-pit and the production of copper concentrate is 25,000 tons per year. The surface deposits (copper oxide) which are currently being worked contain 3 to 4 percent of copper which is being concentrated by a flotation process, using available groundwater. The copper oxide surface ore is expected to be mined within 3 years after which the lower-level copper sulfate ore will be extracted. Reserves of copper sulfate ore are expected to permit exploitation for 14 to 16 years.

Very large gypsum deposits north of Nouakchott are not being worked because of low world market prices.

Exploration for Nickel, Cobalt, Zinc and Chromite is undertaken near the Senegal River by BRGM, a French company. Another French company, CFPS, prospects for radio-active materials and rare earth near the coast. Large deposits of low grade material have been identified so far. Other ore prospecting is for gold, lead, manganese and iron. Phosphate deposits have been located near Kaedi on the Senegal River. Texaco and the Italian company AGIP have the oil exploration rights in Eastern Mauritania, while Shell searches for off-shore petroleum.

The Ministry of Public Works (Ministere d'Equipment) has three "Directions": Travaux Publics, Hydraulique et Energie, and Cartographie et Urbanism. The Direction de Travaux Publics has nine regional offices and is divided into four "Divisions": ports and navigation, public buildings, equipment maintenance and airports and roads. The Division de Ports et de Navigation (M. Bourdette) has charge of the ports of Nouakchott, Nouadhibou, Kaedi and Rosso, also of Senegal River channel maintenance. Senegal River navigation is very important for Mauritania to ship the production from the projected 100,000 hectares of irrigated, double cropped land of the OMVS Project. OMVS will take over the operation of Senegal River navigation, including channel maintenance and river ports.

The Division of Airports and Roads deals with the planning, construction and maintenance of public roads (except in the irrigated perimeters). The Division of Airports and Roads supervised a road construction and maintenance program financed by Canada and Kuwait. An extension of this program is being sought.

A very important current project is the construction of a highway from Nouakchott to Nema, 150 Kilometers from the Mali border. The road would greatly improve transportation in the Senegal River valley. The project has been financed up to 25 Billion Ouguias by the European Common Market countries (FED) but the construction bids have come in too high. A new government agency may be created for this project. Other important transportation projects, as yet in the planning stage, are the construction of a port at Nouakchott and an extension of its airport. It is hoped that the Chinese will finance and construct these facilities.

The Direction de l'Hydraulique et de l'Energie has divisions for surface waters and groundwater. The Direction has a staff of about 70 people, including eight engineers, seven of whom are expatriates. Both divisions do project planning and construction, but the operation of water supply and power facilities is in the hands of Maurelec, similar to the arrangement in Senegal and Mali. Two UNDP teams have been working with the Direction for four years on groundwater exploration by seismic and resistivity methods.

The surface water division does not operate stream gaging stations and has no facilities for flood forecasting. Mali and Senegal measure stream flow in the upper and lower Senegal River, respectively. Power generation in Mauritania is limited to a 5000 KW thermal plant at Nouakchott and several smaller diesel plants at various locations. A 25,000 KW thermal power project is being negotiated with the Peoples Republic of China.

EDUCATION AND TRAINING IN THE REPUBLIC OF SENEGAL

Senegal is the only country within the OMVS membership which is able to offer an education at the university level.

Table 1 shows current enrollment in the four faculties of the university, with reference to Senegalese, Malian and Mauritanian students only.

This is followed by a brief description of educational establishments having the status of University Institutes and then by establishments not having this status.

Table 2 shows the number of elementary and secondary schools, with the number of students engaged in educational programs throughout the Republic of Senegal. These figures reflect the current and forecast situation during the period of the fourth 4-year economic and social development plan, 1973-1977.

Table 3 gives the forecasts for the training of technical students at the intermediate level during this same period.

Establishments Having the Status of University Institutes

IUT (University Institute of Technology)

This establishment offers two-year courses in the following departments: a) Department of Electrical Engineering (with options in electrical and electronic studies); b) Department of Mechanical Engineering (with options in construction, maintenance and manufacturing engineering; c) Department of Chemical Engineering (with options in industrial chemistry, food technology and biological analysis); d) Department of Civil and Rural Engineering. These courses lead to the award of the University Diploma in Technology (DUT). After three years of professional experience DUTs may undertake a year of specialized studies to obtain the title of "Engineer Technician".

ENS (Teachers College)

This establishment offers two-year courses leading to teaching qualifications in state schools. First section, teachers for primary schools. Second section, teachers for secondary schools. Third section (a further two years) leads to a qualification as inspector of primary and secondary schools.

Table 1 **UNIVERSITY OF DAKAR - SENEGAL**

Faculty Of Science

Nationalities	1st Cycle 1st Yr.	1st Cycle 2nd Yr.	1st Cycle Total	Second Cycle	Third Cycle	Totals
SENEGAL	286* (40)	77 (7)	363 (47)	62 (4)	2	427 (51)
MALI	5 ---	5 --	10 ---	5 --	---	15 ---
MAURITANIA	8 (1)	2 --	10 (1)	1 --	---	11 (1)
	299 (41)	84 (7)	383 (48)	68 (4)	2	453 (52)

Faculty of Arts And Human Sciences

Nationalities	First Cycle	Second Cycle	Third Cycle	Totals
SENEGAL	1,168 (218)	326 (70)	5 ---	1,499 (288)
MALI	6 ---	4 (1)	1 ---	11 (1)
MAURITANIA	8 (2)	2 ---	1 ---	21 (2)
	1,192 (220)	332 (71)	7 ---	1,531 (291)

Faculty Of Law And Economics

Nationalities	1st Yr.	2nd Yr.	Total	3rd & 4th Yr.	Third Cycle	Totals
SENEGAL	673 (83)	245 (41)	918 (124)	178 (11)	32 (4)	1,128 (139)
MALI	27 (1)	10 ---	37 (1)	19 (1)	3 ---	59 (2)
MAURITANIA	17 ---	8 ---	25 ---	1 ---	3 ---	29 ---
	717 (84)	263 (41)	980 (125)	198 (12)	38 (4)	1,216 (141)

Faculty Of Medicine And Pharmacy

1. Medicine

Nationalities	1. Pre-Med	2. Pre-Med	3rd Yr.	4th Yr.	5th Yr.	6th Yr.	7th Yr.	Totals
SENEGAL	118 (18)	40 (5)	43 (6)	40 (5)	31 (5)	28 (1)	9 (2)	309 (42)
MALI	4 (1)	3 (1)	3 ---	11 (1)	2 ---	1 ---	--- ---	24 (3)
MAURITANIA	8 ---	2 (1)	2 ---	1 ---	3 ---	- ---	--- ---	16 (1)
	130 (19)	45 (7)	48 (6)	52 (6)	36 (5)	29 (1)	9 (2)	349 (46)

2. Pharmacy

Nationalities	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Totals
SENEGAL	29 (9)	10 (3)	11 (6)	5 ---	4 (1)	59 (19)
MALI	3 (1)	4 (2)	4 (1)	2 (1)	--- ---	13 (5)
MAURITANIA	4 ---	--- ---	1 ---	--- ---	--- ---	5 ---
	36 (10)	14 (5)	16 (7)	7 (1)	4 (1)	77 (24)

3. Dentistry

Nationalities	Second Year	Third Year	Fourth Year	Fifth Year	Totals
SENEGAL	4 ---	2 (1)	7 (4)	2 ---	15 (5)
MALI	--- ---	--- ---	2 (1)	--- ---	2 (1)
MAURITANIA	--- ---	--- ---	--- ---	--- ---	--- ---
	4 ---	2 (1)	9 (5)	2 ---	17 (6)

*Figures in brackets indicate women students

Table 2

Primary & Secondary Educational Forecasts (Senegal) 1973-1977

	1973-1974	1974-1975	1975-1976	1976-1977
PRIMARY				
STUDENTS	37,349	38,918	40,253	42,256
CLASSES	849	884	921	960
TEACHERS	1,061	1,105	1,151	1,200
SECONDARY				
STUDENTS	7,252	7,820	8,432	9,092
CLASSES	181	196	211	227
TEACHERS	235	255	274	295

Table 3

Forecast of Intermediate Technical Students 1972-1977

Number of Years of Study	Class	1972-1973	1973-1974	1974-1975	1975-1976	1976-1977
7	6th	1,120	1,120	2,240	2,240	2,240
8	5th		1,120	2,240	2,240	2,240
9	4th			1,120	2,240	2,240
10	3rd				1,120	2,240
Totals		1,120	2,240	5,600	7,840	8,960
	(Private Education)					2,000
						10,960
	(Students Entered in 1972-73 and left in 1976-77)					1,120
						12,080

CESTI (Center for Scientific Studies and Informational Techniques)

This establishment offers three-year courses leading to a diploma in the various sections of the curriculum which include: socio-economic development, African affairs, world affairs, language studies, communications and public relations.

EBAD (School for Librarians, Archivists and Documentalists)

This establishment offers two-year courses leading to a diploma in librarianship and archivist functions.

Other Establishments Not Having The Status Of University Institutes

CSPA (Administrative Training Center)

This establishment offers a course of 14-months duration for graduates without administrative experience or for civil servants who are changing sector or level of employement. There are eight sections in this establishment offering training in the following categories: administrative secretaries in both national and regional financial capacities, inspectors of economic control, labor controllers, treasury controllers, customs controllers, tax controllers, and chancelery secretaries and registrars.

CFPPS (Training Center for Secretarial Personnel)

This establishment offers two-year courses leading to a diploma as management secretary for both male and female students, in general office practices.

ENPT (National School of Post and Telecommunications

This establishment offers two-year courses leading to qualifications in postal and general services and telecommunications and technical services.

ENETM (Technical High School for Men)

This establishment offers two-year courses leading to a diploma in technical education in the following fields: a) senior instructors charged with training in agricultural practices for farmers and peasant workers; b) practical training in industry and commerce; c) teachers at the technical high school level.

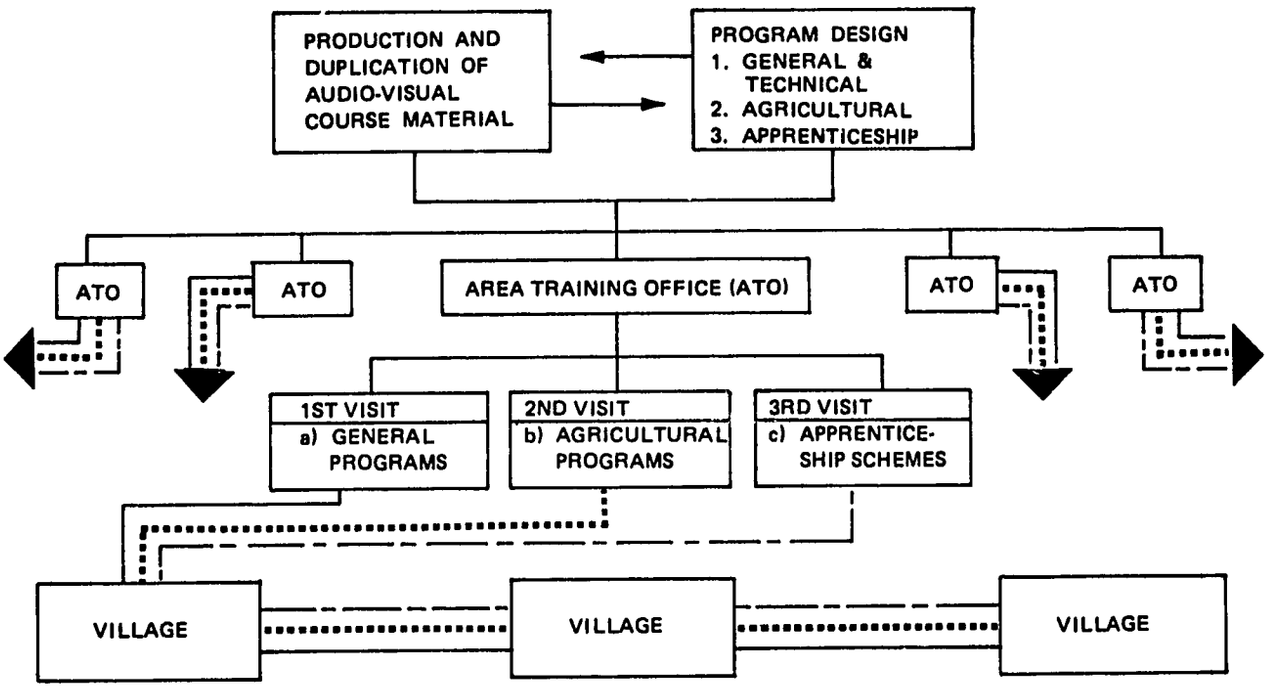
ENFM (National School for Maritime Training)

This establishment offers courses for the training of launch operators, marine mechanics and fishermen. It will be particularly beneficial to OMVS when the navigational projects of the Senegal River development plan come into operation.

ENTPV (National School of Public Works and Buildings)

This establishment offers two-year training courses leading to diplomas for technical assistance for public works, rural engineers and surveyors.

METHOD OF CONDUCTING EXTENSION TRAINING BY SAED (SENEGAL)



The Program Design section and the Material Production section cooperate in the supply of suitable training material to the Area Training Offices (ATO).

Each ATO is responsible for the implementation of the training programs which fall into three categories.

a) General and Technical (well-digging, elementary sanitation, etc.)
b) Agricultural programs (irrigation, cropping, fertilizing, etc.)
d) Apprenticeship schemes conducted by assistant instructor reporting to ATO.

Route legend:

———— General programs

..... Agricultural programs

—-—-—- Apprenticeship schemes

Mobile projection vans visit each village in the area and selected material is shown. First showing is continuous and without comment. Second showing is stop/start-question method. Conclusion is program quality analysis, and questionnaires are completed and returned to ATO.

EDUCATION AND TRAINING IN THE REPUBLIC OF MALI

In compiling the required data regarding education and training in the Republic of Mali, it was necessary to obtain the overall picture of the existing organizational structure followed by a more detailed analysis of current activities, goals and deficits in the specific sections of the structure from which OMVS will recruit the personnel required to successfully operate the plan for the development of the Senegal River.

IPGP (Institute of Productivity and Management Forecasting) and CPS (Higher Pedagogical Center) are mentioned but briefly and graduate doctors from these institutions are entirely absorbed into the national government, local government, diplomatic service and institutions of higher education. At this time, the entire graduate student body is Malian, although it is anticipated that several Senegalese graduates will be enrolled next year.

Due to the absence of key personnel of ENA (National School of Administration) a complete statistical breakdown was unobtainable, but the following facts will assist in forming a picture of the aims and potential of the institution.

ENA offers four-year courses in three departments:

1. Economic Science: Student enrollment of 230 undertaking courses in planning, management and economics.

2. Public Administration: Student enrollment of 170 undertaking courses in business administration and finance.

3. Justice Department: Student enrollment of 88 undertaking courses in legal studies.

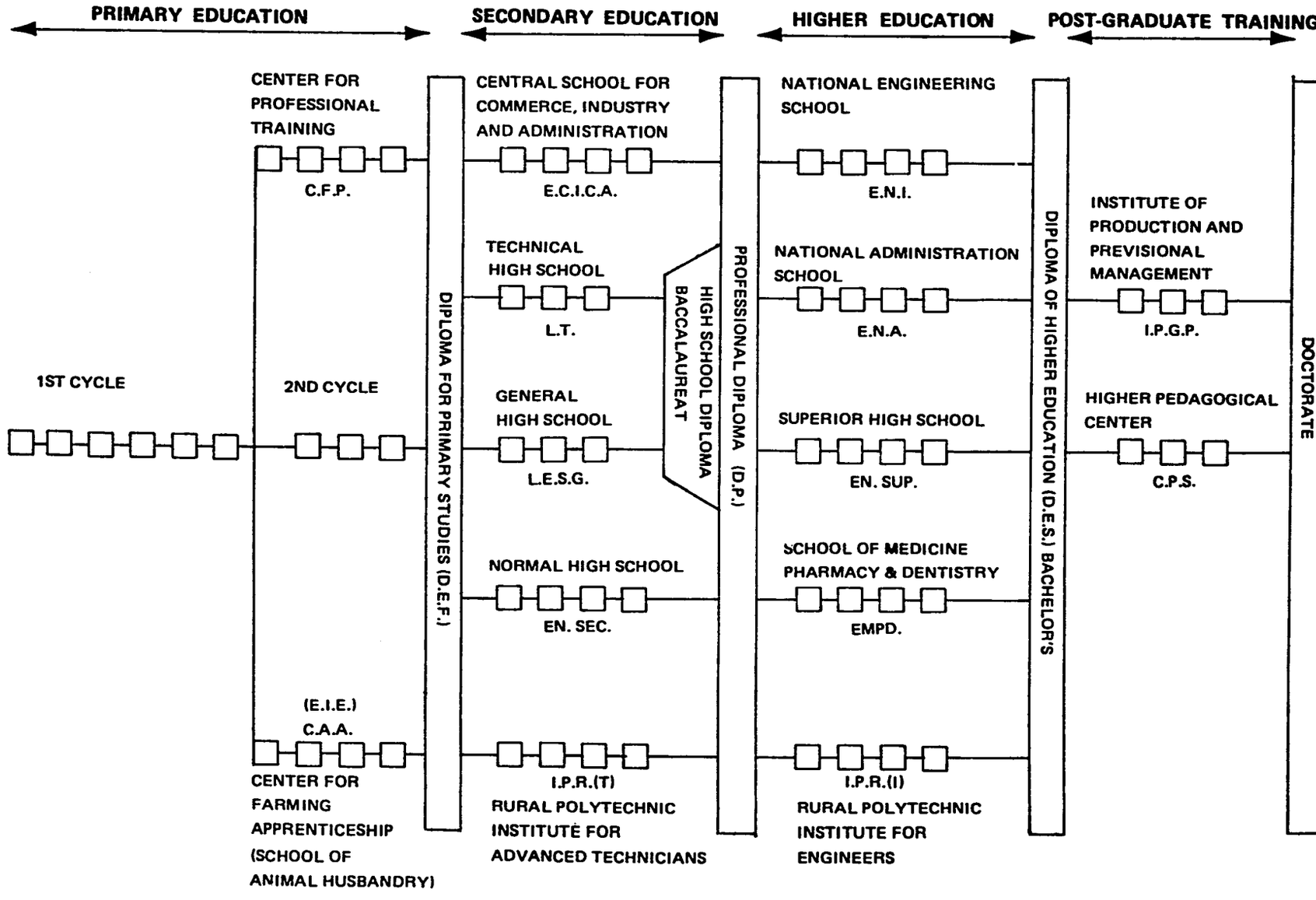
Of the total enrollment of 488 students, 110 are expected to graduate this year, mainly from the department of economic science. It is unlikely that graduates will undertake further studies abroad. The teaching body consists of 7 Frenchman and 1 Russian supplied through the French Cooperation Agency together with 22 Malian teachers, 20 of whom occupy government office and who teach special courses on a part-time basis.

Five Year Development Plan, 1974-1978

The lack of trained personnel in senior, intermediate and lower level categories results directly from inadequate training programs, in certain areas, in the previous development plan.

The aims of the five-year plan are the acceleration of production and the mastery of new techniques by new personnel in training programs.

EDUCATIONAL SYSTEM OF MALI (PRIMARY, SECONDARY, HIGHER & ADVANCED)



Apart from the financial question, the availability of competent specialists is the primary requirement of the successful implementation of the plan.

Personnel requirements in various categories at different levels, together with the location of training establishments, total needs and minimum annual requirements are shown in Table 4.

Table 4

Personnel Requirements 1974 - 1978 Five Year Plan
Republic of Mali

Level	Training	Total Needs	Annual Minimum
ADVANCED SPECIALISTS			
AGRICULTURE	I.P.R.	194	39
ANIMAL HUSBANDRY	I.P.R.	170	34
WATER & FORESTS	I.P.R.	77	15
	I.P.R.	441	88
RURAL ENGINEER, CIVIL ENGINEER	E.N.I.	62	12
ECONOMISTS, TRAINING COORDINATORS	E.N.A.	33	7
VETERINARIANS	(Foreign trained)	27	5
BOOKKEEPERS/ACCOUNTANTS	(Foreign trained)	19	4
TOTAL		582	116
INTERMEDIATE SPECIALISTS			
AGRICULTURE	I.P.R.	363	73
ANIMAL HUSBANDRY	I.P.R.	208	42
WATER & FORESTS	I.P.R.	114	23
RURAL ENGINEER	I.P.R. – E.C.I.C.A.	60	12
	I.P.R.	745	150
SURVEYORS	E.C.I.C.A.	17	3
ACCOUNTANTS	E.C.I.C.A.	44	9
TOTAL		806	162
ASSISTANT SPECIALISTS			
AGRICULTURE	C.A.A.	1,683	337
WATER & FORESTS	C.A.A.	285	57
	C.A.A.	1,968	394
ANIMAL HUSBANDRY	E.I.E.	304	61
TOTAL	E.I.E.	2,272	455

IPR: RURAL POLYTECHNIC INSTITUTE (KATIBOUGOU)
ENI: NATIONAL SCHOOL OF ENGINEERING
ENA: NATIONAL SCHOOL OF ADMINISTRATION
ECICA: CENTRAL SCHOOL OF INDUSTRY, COMMERCE & ADMINISTRATION
CAA: AGRICULTURAL APPRENTICESHIP CENTER
EIE: SCHOOL OF ANIMAL HUSBANDRY

Table 5 indicates the actual and planned programs in the Agricultural Apprenticeship Centers located in various regions of the country. Programs planned for future implementation are dependent upon the availability of financial resources.

Table 5

Training At The Agricultural Apprenticeship Centers – Agricultural Assistants & Veterinary Assistants
(Actual Capacity And Future Capacity After Planned Development)

Location of Centers	*Annual Capacity for Training* Actual	Forecast*
C.A.A. SAMANKO (2ND REGION)	30	75
C.A.A. SAME (1ST REGION)	30	75
C.A.A. M'PESOBA (4TH REGION)	30	75
C.A.A. SOFARA (5TH REGION)	---	
TOTAL C.A.A. 2-YEAR TRAINED	90	300
THIRD YEAR SPECIALIZATION CENTERS		
C.A. BAGUINEDA (2ND REGION)	10	40
C.S.R. DIORO (3RD REGION)	15	40
C.S.F. TABAKORO (2ND REGION)	20	40
C.S.Z. SOTUBA (2ND REGION)	35	40
SCHOOL FOR VETERINARY ASSISTANTS (2ND REGION)	35	40

*Preferably by 1978-79, more probably 1979-80, if the project finances are immediate.
C.S.R.: Specialization Center For Rice Production
C.S.F.: Specialization Center For Forage Production
C.S.Z.: Specialization Center For Zoology

Table 6 shows the estimated numbers of Malian engineers and senior technicians who will graduate from the IPR at Katibougou during the period 1974-1978.

Table 7 shows the estimated numbers of civil engineers, electrical engineers, geologists (including mining engineers) and topographers who will graduate from the National Institute of Engineers during the period 1974-1978.

As a point of interest, a visit to the power station in Bamako found four men on duty. On being questioned as to their respective training backgrounds, the following information was obtained.

> Manager - 6 years technical school in Mali followed by 18 months in an electrical school in France (worked on Rhone hydro-electric system).

Table 6

Estimated Numbers of Malian Engineers and Senior Technicians Graduating from the IPR, Katibougou
1974 - 1978

Level of Training And Specialities	74-75	75-76	76-77	77-78	78-79	Total	Annual Minimum
ENGINEERS (I.S.A.)							
4TH YEAR							
AGRICULTURAL	29	48	38	—	—	—	—
ANIMAL HUSBANDRY	11	23	26	—	—	—	—
WATER & FORESTS	10	85	86	—	—	—	—
	50	85	86	87	100	408	82
3RD YEAR							
AGRICULTURAL	50	40	—	—	—	—	—
ANIMAL HUSBANDRY	25	27	—	—	—	—	—
WATER & FORESTS	15	24	—	—	—	—	—
	90	91	93	106	106	486	96
2ND YEAR							
AGRICULTURAL	42	—	—	—	—	—	—
ANIMAL HUSBANDRY	29	—	—	—	—	—	—
WATER & FORESTS	25	—	—	—	—	—	—
	96	98	113	113	113	533	107
1ST YEAR							
(ESTIMATED ENROLLMENT)	109	125	125	125	125	609	122
TOTAL	345	399	416	431	444	2,035	407
SENIOR TECHNICIANS							
4TH YEAR							
AGRICULTURAL	24	48	43	—	—	—	—
ANIMAL HUSBANDRY	10	25	13	—	—	—	—
WATER & FORESTS	19	33	18	—	—	—	—
RURAL ENGINEERING	9	15	10	—	—	—	—
	62	121	85	147	150	565	114
3RD YEAR							
AGRICULTURAL	50	45	—	—	—	—	—
ANIMAL HUSBANDRY	27	14	—	—	—	—	—
WATER & FORESTS	35	19	—	—	—	—	—
RURAL ENGINEERING	15	11	—	—	—	—	—
	127	89	155	158	158	687	137
2ND YEAR							
AGRICULTURAL	50						
ANIMAL HUSBANDRY	15						
WATER & FORESTS	21						
RURAL ENGINEERING	12						
	98	171	174	174	174	791	158
1ST YEAR							
(ESTIMATED ENROLLMENT)	196	200	200	200	200	996	199
TOTAL	483	581	614	679	682	3,039	608
EFFECTIVE TOTAL	828	980	1,030	1,110	1,126	5,074	1,015

Table 7

National Institute Of Engineers Forecasts 1974 - 1978

	*1974**	*1975* 4th Yr.	*1976* 3rd Yr.	*1977* 2nd Yr.	*1978* 1st Yr.	Total
CIVIL ENGINEERS		29	34	27	39	129
ELECTRICAL ENGINEERS		26	25	25	31	107
GEOLOGISTS (INCLUDING MINING ENGINEERS)		8	6	9	12	35
TOPOGRAPHERS		16	6	9	21	52
TOTAL		79	71	70	103	323

*There were four graduates in 1974 (2 civil engineers, 1 electrical engineer and 1 geologist).

Chief Technician - 3 years technical school in Mali followed by 18 months at Bamako electrical center.

Switchboard Operator - 3 years technical school in Mali.

Technical Assistant - 2 years at advanced electrical school in Mali.

With the successful conclusion of the present plan, a guaranteed annual development of approximately 100 specialists in rural engineering and 150 senior technicans can be anticipated. This will require an increase in the teaching staffs of the Rural Polytechnic Institute and the Agricultural Apprenticeship Centers.

In the planning forecasts for the CAA, an annual training capacity of 80 to 300 instructors is envisioned. However, this falls short of the actual requirement of 500 and consideration should be given to on-the-job training programs in collaboration with the operations division.

The estimated number of specialists to be trained during the 1974-1978 period must be accomplished as far as possible through existing training programs, otherwise the expansion of projected training programs will be jeopardized by lack of numbers at the commencement of the next five-year plan.

In all probability, the IPR at Katibougou will produce, during the period 1974-1978, an annual minimum of 80 agricultural specialists and 115 senior technicians.

CAA develops about 80 instructors annually and the School of Veterinary Assistants at Bamako develops about 30 animal husbandry assistants.

Extension training is used widely in the agricultural areas. Assistant instructors are trained on experimental farms for a six-month period.

The course consists of practical training (a.m.) and theoretical study courses (p.m.) leading to a final examination. At the conclusion of the training the assistant instructor reports to a senior instructor who in turns reports to an agricultural engineer. With an engineer and a senior instructor (1 year trained at Baguineda) in each location, extension training is carried out through collective areas of five villages, each of which has an instructor to individual villages, each of which has an assistant instructor.

At the higher level, 51 veterinarians and 117 agronomic specialists (in various specialties) will return to Mali from overseas training.

Deficits

A marked deficit exists in supply and demand in training. At the senior level, the theoretic deficit is obvious at the commencement of the five-year plan. At the intermediate level, the deficit exists during the first three years of the plan. At the instructor level, the deficit is very obvious over the whole five-year period.

The obvious deficit cannot be entirely eliminated during the period, and it will be necessary to augment training facilities to bring the number of trained personnel in line with minimum requirements of 100 specialist agricultural engineers, 150 technicians and 500 instructors needed for the hydro-agricultural and animal husbandry projects following the construction of the Manantali and Selingue dams.

Secondary Schools

At the present time, secondary education is divided into two cycles. The first cycle, (college), is a general subjects course of four years duration (shortly to be reduced to three) leading to a brevet (Certificate of Completion).

The second cycle, (lycee), is a continuation of the first cycle. Entry requirement is the brevet, and the course lasts for three years, leading to baccalaureat. Toward the end of this course, limited technical subjects are offered.

In Nouakchott there are three colleges (one for girls, two for boys) and one lycee. Two lycees have been established this year in Rosso and Kaedi.

In the Interior there are eight colleges, and the total number of students in the colleges and lycees throughout the country is 5,483.

Industrial Training

In Nouakchott there are two colleges (one a technical college and the other a trade college). The course duration is three years. An available second cycle follow-up is at the technical lycee which offers a two year course leading to an intermediate technical certificate. Subjects offered are: electromechanic, auto mechanic, precision mechanic, marine mechanic, building trades and carpentry. A further four year course is offered beyond this stage, leading to a technical baccalaureat. At this time there have been seven graduates from this institution.

The Centre Mamadou Toure is located at Nouadhibou, in Northern Mauritania, and this institution offers accelerated courses of forty-four hours a week for nine months, to adult students. Subjects offered are the same as those offered by the technical lycee in Nouakchott, with the addition of fishermen training. This institution, though still in its infancy, has proved to be a successful training establishment.

Other Training and Educational Establishments in Mauritania

Ecole Normale d'Instituteur (Teachers School)

Entry requirement: brevet pedagogique. The school has two aims; (1) training of teachers for primary schools (three years), refresher training for teachers (one year), (2) training moniteurs (instructors) (two years practical).

Ecole Normale Superieure (Established this year) (Advanced Teachers School)

This establishment offers a four year course in training teachers to the college and lycee level.

Ecole Nationale de Formations et de Vulgarisation Agricole (National School of Agricultural Training and Extension Services)

Situated at Kaedi, this school is sponsored by FAO, and its aims are limited by lack of finance and personnel. First phase training leads to brevet level (three years) and produces instructors and technical assistants for the water and forestry department. Second phase training, requiring the brevet, produces specialists in agriculture, nature protection, and animal husbandry.

Ecole Nationale d'Enseignement Commerciale et Familiale (National School of Commercial and Family Education)

The commercial section (mixed students) offers two cycles. The first cycle (three years) leads to the brevet commerciale and produces clerks, bookkeepers, stenographers, etc. The second cycle (two years) offers advanced commercial subjects and produces office managers, accountants, and secretaries.

The Familiale Section, for girls only, offers one cycle of three years leading to a diploma in domestic science, family guidance, child and mother care, and kindergarten supervision. (There are approximately 120 students in this section)

L'Ecole Nationale d'Administration (The National School of Administration)

This school has two missions. The first is to provide refresher courses for existing civil servants, and the second is to train students to become civil servants in various categories.

Training of Civil Servants

Training is given in three cycles: First cycle (three years) Cadre Inferieur (lower grade specialists). Second cycle (one year) Cadre Moyen (intermediate grade specialists). Third cycle (one year) Cadre Superieure (high grade specialist). This establishment trains officials for local government, taxation, legal and customs departments.

There are no training facilities for mining engineers, although the potential mining industry requires that at the present time students of mining engineering are receiving professional training in foreign institutions throughout the world.

As yet, there is no university in Mauritania, and students requiring higher education in various professional fields are also obliged to receive such education in foreign universities, mainly in France, but also in Senegal UAR, USSR, etc. The following tables are based on information derived from the second development plan, 1973, but subsequent information taken from the rough draft of the third development plan, 1974-1978, shows that numbers have increased in certain areas, although overseas locations are not specified.

These differences are:

Table 8

	Second Year Plan	Third Year Plan Initial Estimates
LAW AND ECONOMICS	32	105
MEDICINE & VETINARY SCIENCE	47	66
ENGINEERS	34	108
FINANCE & COMMERCE	17	24
TECHNICAL EDUCATION	22	3*
AGRICULTURE & LIVESTOCK	24	28

*Only area where numbers have decreased.

Table 9

Location and Studies of Mauritanian Students Abroad

COUNTRIES

SUBJECTS	FRANCE	SENEGAL	MALI	IVORY COAST	TOGO	GERMANY	ITALY	YUGO-SLAVIA	KUWAIT	U.S.S.R.	U.A.R.	TOTAL
ACCOUNTING	1	—	—	—	—	—	—	—	—	—	—	1
ECONOMIC AND SOCIAL DEVELOPMENT	1	—	—	—	—	—	—	—	—	—	—	1
TECHNICAL EDUCATION	1	—	—	—	—	—	—	—	—	—	21	22
ELECTRO-MECHANIC	1	—	—	—	—	—	—	—	—	—	—	1
MEDICINE (LAB ASSISTANT)	2	—	—	—	4	—	—	—	—	—	—	6
TRAINING SPECIALIST	2	—	—	—	—	—	—	—	—	—	—	2
FISHERIES	—	1	—	—	—	—	—	—	—	—	—	1
RURAL ENGINEER	—	4	—	—	—	—	—	—	—	—	—	4
AGRICULTURE	—	6	—	—	—	—	1	—	—	—	—	7
WATER AND FORESTRY	—	1	—	2	—	—	—	—	—	—	—	3
LIVESTOCK	—	3	1	—	—	—	—	—	—	—	—	4
PUBLIC WORKS	—	1	14	—	—	—	—	—	—	—	—	15
PHARMACY	—	—	—	—	—	1	—	—	—	—	—	1
MINERAL CHEMISTRY	—	—	—	—	—	—	—	3	—	—	—	3
INDUSTRY	—	—	—	—	—	—	—	—	16	—	—	16
PUBLIC ADMINISTRATION	—	—	—	—	—	—	—	—	1	—	—	1
INTERNATIONAL LAW	—	—	—	—	—	—	—	—	—	1	—	1
MEDICINE	—	—	—	—	—	—	—	—	—	13	—	13
GEOLOGY	—	—	—	—	—	—	—	—	—	4	—	4
CONSTRUCTION	—	—	—	—	—	—	—	—	—	4	—	4
MINES	—	—	—	—	—	—	—	—	—	1	—	1
HYDROLOGY	—	—	—	—	—	—	—	—	—	1	—	1
	8	16	15	2	4	1	1	3	17	24	21	112

Table 10

Location and Studies* of Mauritanian Students Abroad at Academic and Specialist Level

SUBJECTS	COUNTRIES										
	FRANCE	SENEGAL	ALGERIA	TUNISIA	U.S.S.R.	GERMANY	BELGIUM	YUGOSLAVIA	U.A.R.	SPAIN	TOTAL
COMMERCE	5	—	—	1	—	—	—	—	3	—	9
LAW	6	5	4	—	—	—	—	—	8	1	24
BUSINESS MANAGEMENT	1	—	—	—	—	—	—	—	—	—	1
ACCOUNTING	—	—	1	—	—	—	—	—	—	—	1
VETERINARIAN	—	4	—	—	—	—	—	—	1	—	5
MEDICINE (SPECIALISTS)	1	17	—	—	3	—	—	—	2	—	23
SCIENTIFIC RESEARCH	1	—	—	—	—	—	—	—	—	—	1
ECONOMIC SCIENCE	—	—	1	—	—	—	—	—	4	—	5
GEOLOGY	—	—	—	—	1	1	—	—	—	—	2
INDUSTRY	—	—	—	—	—	—	—	—	1	—	1
AGRONOMY	—	—	—	—	—	—	1	—	—	—	1
AGRICULTURE	1	—	—	—	—	—	—	1	3	—	5
	15	26	6	1	4	1	1	1	22	1	78

*In relation to OMVS requirements

PROBLEMS

OMVS and its member nations face a number of crucial problems in implementing and operating a Senegal River Basin Development Program.

- o Financing. While it appears that there are tentative commitments for financing for many of the key elements of the First Stage of development, a great deal of analysis and planning, negotiation and supplemental financing must be completed before there is a comprehensive financing plan for the development. It is possible that certain donor conditions may cause serious problems in the development of an integrated financing plan. Some kind of re-payment plan will be necessary before financing arrangements can be consummated.

- o Lack of Trained Personnel At All Levels. This includes management, administration, professional, technical, subtechnical, trades and farming. Not only is there a shortage of such personnel in view of the apparent needs and a shortage of facilities and programs for training such personnel, but it has also been found that there is a shortage of qualified candidates for such training programs. It is obvious that this is a problem to which there will be no rapid or easy solutions. Its solution will be of crucial importance to all three of the OMVS nations, as they struggle to achieve development.

- o Avoidance of Duplication. In view of the limited financial and trained personnel resources of the nations, it is essential that duplication by OMVS of functions existing within the three nations be avoided wherever possible.

- o National Interest. While the three nations have worked out remarkable agreement in principle and on broad objectives, there are countless matters upon which agreement will have to be reached before the Senegal River development is realized. Divergent national interest can cause serious problems in the reaching of such agreement. Creation of a strong functional OMVS organization will help to minimize these problems.

- o Utilization of Expatriates. It is apparent that numerous expatriates will have to be utilized in the implementation of the Senegal River Basin Development, particularly in the early years of activity. This presents special problems which must be dealt with. A traditional theory that expatriate experts can train national counterparts who can eventually take over has not worked well. Well planned in-service training programs will be needed to help solve this problem.

- o Health Problems. There may be serious public health problems, as a result of initiating two and three crop irrigated agriculture

throughout the Senegal Basin, since such development will obviously enhance the habitat for certain disease organisms and at the same time increase the human population in the affected areas.

- o Agricultural Problems. As irrigated agriculture is developed, numerous agricultural problems common to all three nations will have to be dealt with. An example could be salt buildup in heavy soils with high water tables. Another possible example is pesticide, herbicide and fertilizer problems. Still another problem will be animal diseases which may be offered new potential for development through increased numbers of stock and improved habitat for development of disease and carriers. The OMVS role in these matters will have to be carefully planned and clearly defined.

- o Balancing Appointments With Respect to the Three OMVS Nations. So far balancing appears to have been a policy. This may give rise to serious problems as staffing needs become urgent in critical areas, and if strictly adhered to could seriously impair OMVS' functional capability. The three nations simply do not have equal qualified manpower resources to draw upon and all have pressing national needs.

- o Expectations of Individuals With Education and Training. The shortage of qualified personnel has been so great in the three nations that anyone with good educational qualifications could aspire to a high governmental position with relatively little experience. There are many subordinate positions which require individuals with both education and specialized training. It is possible that there will be a problem period during which many individuals will be discontented because positions open to them do not meet their expectations in terms of prestige and authority. This would further complicate the problems of integrating expatriate experts into the organization.

- o Partially Qualified or Underqualified People in Key Jobs. Because of the shortage of professionally educated and experienced people in the OMVS nations, some important government positions have of necessity been filled by individuals almost solely on the basis of educational qualifications, rather than on education combined with experience and performance record. Some of these individuals function well and some do not. Inevitably, OMVS will have a problem in this area as it builds its staff. Some such individuals can be helped by on-the-job training programs. Others might be gradually weeded out.

- o Director Selection Process. OMVS Directors work under the Secretary General or Chief Executive, but are named by the Council of Ministers.

If the Chief Executive is to be held responsible for the performance of the organization, it is essential that he have some real power in the selection and removal of Directors, with his powers spelled out with sufficient clarity to give him effective control over performance. The Council of Ministers could preserve its ultimate authority by reserving the power of confirmation of appointments and removals.

- o Capable Executives in Government in all three countries tend to be overloaded because of the lack of qualified subordinates to whom they can delegate routine but responsible tasks. This has a paralyzing effect and is a danger to OMVS as it builds its staff. The severity of this problem varies among the three countries.

ORGANIZATIONAL FUNCTIONS TO BE FULFILLED

The first step in organization planning is to identify the primary functions the organization must fulfill and the scope and categories of activities which must be carried on. Where each broad function shows no activities in a common subject area with any other functional area, it is probable that organizational lines should follow functional classifications. Where the same activity category occurs in several functional areas, there is strong argument for organizing along lines dictated by the field of activity with a number or functions being encompassed by the department or division. An example of this is navigation, which involves the functions of planning, operations, engineering and construction. A similar activity area is health. Table 11 lists functional areas and activity categories which must be taken into account in the Organizational Action Program of OMVS. Evaluation of the scope of the activities in a given category will define the role of OMVS in that area and this is the starting point of the Action Program. The numbers, people and the skills required will be determined by the adopted scope of activities. The internal functions such as Legal, Finance, Control and Administration can be readily defined. Organizational planning for Administration and Control will depend partly on the scope of activities decided upon for Operation Planning and Engineering and Construction.

Table 11

OMVS Functions

Legal	Finance & Control	Operations	Planning	Engineering & Construction	Research	Administration	Training
			Potential OMVS Activities				
Contracts	Management of Funds	Health	Project	Management of Design of	Health	Personnel	Professional Training
International Agreements		Water Control	Economics	Facilities	Livestock	Public Relations	
	Financial Planning	Energy Production	Hydrology	Management & Control of	Agronomy		Technical Training
Legal Advice			Agricultural	Construction Activities		Administrative Procedures	
	Management of External Debts	Navigation Channel and Bank	Livestock				On-the-job Training
		Maintenance	Energy			Budget Analysis	
	Rate Determination (Water, Power, Transport)	Transport	Industrial				
		Port Operation	Navigational				
	Accounting		Flood Control				
		Flood Forecasting and Control	Mines				
		Fisheries	Fisheries				
			Health				

TRAINING FUNCTIONS WITHIN OMVS

OMVS will have an accelerating requirement for trained personnel in all levels of its activity with particular emphasis on middle management. (Division heads established, with little or no support at this time.)

Each country has indicated its approval of the training of suitable personnel in overseas establishments, but indications are that most job training requirements can be met in existing establishments within the participating countries.

Training can be categorized into three requirements:

1. Higher Level
2. Middle Level
3. Lower Level

1. Professional and Planning

Facilities exist for the training of personnel in the administrative field (planning, control, finance and law), the training of engineers in both technical and agricultural fields and for the training of doctors, veterinarians, pharmacists, etc.

2. Middle Management

Facilities exist for the training of technical and agricultural assistants and for the training of personnel in the transport division (both navigational and land transport).

3. Lower Level

The operational functions of OMVS depend largely upon the acquisition of a work force capable of meeting the demands of its progressive development. Human resources are limited, particularly in Mauritania and therefore staffing must be based on training programs designed for elementary school graduates.

The need exists for considerable and intensive training, particularly at the middle and lower levels, to assure the successful operation of irrigation, maintenance, development and marketing functions within the OMVS program. Such training will be given largely through on-the-job training programs in four main areas: agricultural, mechanical, marketing and administrative and clerical.

Training in the field will best be accomplished by the setting up of experimental farms (these exist under the direction of UNDP and could be taken over by OMVS). In these centralized locations, practical and

theoretical training could be given over limited time span. Technical assistance to agricultural areas with audio-visual training equipment, (successfully operated by SAED) and limited language training for essential personnel in required categories should be given.

Because of the limitations in manpower availability, OMVS will be competing with other national bodies for the services of qualified personnel and suitable trainee material.

An analysis should be made as to the best method of attracting a suitable work force to serve the aims of OMVS. Consideration should be given to sponsorship (or scholarship) of selected candidates with terms of employment outlined by OMVS for sponsored graduates.

To this end, a training division should be established within OMVS. In liaison with the Personnel Division, the functions of recruitment, training and developing the necessary work force should be systematically pursued. A training coordinator, working with the various divisions of OMVS, should implement programs based on the training needs within the divisions. Funding for training should be established by OMVS and administered by the training division within the organizational framework.

Targets should be established for each function and the development of the employees should be progressive through stages, allowing the best performers to progress to a higher level of training.

Initially, as this progression takes place, personnel in key positions below engineer level will have to be recruited from other areas (including expatriate technicians). As qualified personnel become available through the progressive training programs, these foreign technicians will be phased out.

As hydroelectric power generation and subsequent industrial development takes place, it may be necessary for OMVS to develop similar training programs of a more technical nature.

The Documentation Center at St. Louis lists much information relating to training and the following are references taken from the four index volumes* currently available.

Index Volume 1.	Analytical Index Page 87	-	16 entries
Index Volume 2.	Analytical Index Page 87	-	41 entries
Index Volume 3.	Analytical Index Page 66	-	21 entries
Index Volume 4.	Analytical Index Page 80	-	55 entries

*Index Volume 5 is presently being prepared.

FACTORS AFFECTING ORGANIZATIONAL RECOMMENDATIONS

There are a number of key considerations which must be taken into account in recommending the most feasible organizational structure for OMVS. Some of these considerations will involve decisions by the conference of heads of state or by the Council of Ministers. Others may be within the powers of the secretariat. It is important that this be recognized in the reorganization process so that consultant recommendations can be made at the appropriate level for the type of action recommended. A number of these key considerations are identified and analyzed below.

1. The role of OMVS. The general role of OMVS in the Senegal River Basin development is well known. However, before a complete organizational structure can be planned, it will be necessary to formulate and adopt at the proper level of authority a clear definition of the specific role of OMVS and each of the functional areas it must operate in. For areas such as legal, finance, control and administration, the function is basically internal and definition can be accomplished quickly with few significant alternatives. For the areas of operation, planning and engineering and construction, research and training, there are significant alternatives to be weighed before a clear role definition can be made. Examples:

   a. Navigation - The three countries have already agreed that a semi-autonomous navigation company should be set up to operate river transport and ports. It appears to be assumed that this sphere of activities will include channel maintenance and construction. Since it is likely that other vessels than those of the company will also use the channels and since channel maintenance is closely related to stream flow regulation and bank protection, consideration should be given to making the channel construction and maintenance a part of the direct OMVS role, along with dam operations, flood forecasting, etc. This decision obviously effects the organization required for and the financing of both the navigation company and OMVS proper. Possibly this is an appropriate decision for the Council of Ministers, with action based on management consultant analysis and recommendations.

   b. Energy - Here the obvious questions is should the role of OMVS include transmission or should it sell power at the generating plant busbar. There is considerable precedent elsewhere for including transmission as a basic function of the organization. At any rate, the organizational structure cannot be defined until it is determined whether this will indeed be part of the OMVS role.

c. Health - Diseases are no respectors of international boundaries. Since the Senegal River basin will be a cohesive unit in this respect, regardless of boundary locations, consideration should be given to the question of whether OMVS should adopt in health a purely coordination and information role or whether it should undertake definite operational health programs on a basin-wide basis in the interests of all three nations. Obviously this decision has a great effect on the organizational structure in the health sector of OMVS and it is a decision which should be made at a level above the secretariat.

d. Planning - In every separate aspect of the planning function, it will be necessary to make a determination as to the extent of the OMVS role; will it be a coordination and information type of role or will it be an active planning role in depth, dealing with those problems in the basin which are common to the three nations. This decision will have a large effect on the size of staff and the organizational structure required for the planning function. Again the decision is a high level one.

e. Engineering and Construction - This function presents some special problems because of the fact that it is a short-term or intermittent function. It appears that the bulk of actual design and perhaps a good deal of the construction control and inspection will be performed on major project features by consultants. However, OMVS will have to exercise ultimate control and will need a competent staff to do this. The question arises as to whether OMVS should staff completely for this or whether it should make such use as possible of the staff resources of member nations. For example, it has been suggested that OMVS could exercise general engineering and management control over the construction of Manantali Dam by placing a single OMVS project engineer in charge and putting a staff of Malian engineers and technicians at his disposal for the duration of the construction as an alternative to building up a temporary OMVS staff of technical people for this purpose.

f. Research - Research will be required in connection with the Senegal Basin development in many areas such as health, stock raising and agronomy. The question to be decided is whether such research should be left entirely to the member nations with some coordinating effort by OMVS to disseminate information gained and to avoid duplication or gaps in effort, or whether OMVS should

directly undertake research projects in areas where there is a common interest among the three countries in the basin. Again this decision drastically affects the organizational requirements.

g. Training - Exactly the same kinds of considerations relate to the OMVS training effort. Should it be one of planning and coordination with execution to be carried out by the member nations or should OMVS contemplate actually operating some training programs in areas of common need. As a minimum, OMVS will find in-service training programs for its own staff a necessity.

2. Level of Function in the Organizational Structure of OMVS. Before an organization can be designed, it will be necessary to give serious consideration to this question. A good example is the area of finance where the appointment of a finance officer has been recommended to commence analysis of project funding arrangements. Another possible function of this same officer would be rate determination for user charges for OMVS services such as water supply and navigation. Since these matters relate to major policy decisions, the question arises should this officer report to the secretariat or should he report as a separate department directly to the Council of Ministers.

3. The Question of Balance. If OMVS adheres to a rigid policy of balancing key OMVS appointments, there will be serious problems in filling positions in a timely manner with qualified people. In fact, there would be problems in this respect even if balancing is not required. If balancing is required throughout the organization, at all levels, it may prove impossible to fully staff the organization in a manner which will meet development requirements. On the other hand, it must be recognized that if imbalance is permitted to the point which gives the appearance of domination by one nation, the results could be potentially disasterous.

4. Historic Influence. The government institutions of the OMVS reflect to varying degrees the historic French concept of government organization, with strong federal centralization. This ingrained outlook will affect the way that OMVS is actually operated, regardless of the nature of the organizational structure adopted. This factor underscores the need for clear and somewhat detailed definitions of responsibilities and authority for all positions in the proposed organizational scheme.

5. The Development Schedule. In complex major development projects such as the Senegal River Basin Development, it is essential to establish a pace and rhythm of events so that a momentum can be established and maintained. It is difficult for those involved in individual events to attain the perspective to perceive this overall rhythm and sequence, but in hindsight it is easy to see in studying the history of computed successful projects. Failure of OMVS, through lack of organization or staffing, to perform its required functions, at any stage from this point onward could upset the rhythm and destroy or prevent the establishment of the required momentum. It is of critical importance that clear role definition, organization, job description and staffing be achieved at once with respect to the development functions which are current. As a minimum, these include Finance, Planning and Legal, recognizing that the planning function is so broad that it may well be best to subdivide it organizationally. Administration and Control cannot lag organizationally behind these external functions. The sequence and timing for establishing competence in the other functions must be identified at an early date so that the organization can be ready as required. Actual staffing in some areas may be several years off, but a long range staffing plan is an essential part of the Action Program.

6. Cost. Cost is a major consideration in establishing the OMVS organization. The financial resources of the member nations are extremely limited. They cannot afford, in either money or manpower, the duplication of national effort by OMVS or the maintenance of a large, self-serving beaurocracy.

7. Shortage of Qualified Personnel. This in itself is a factor which should affect organizational decisions. It is a fact of life and will continue to be one for a number of years. Organization planning should be oriented toward maximum utilization of qualified people in management, technical and training roles, with a maximum breakdown and definition of routine tasks to permit their performance by relatively untrained personnel.

ACTION PROGRAM FOR ORGANIZATION AND TRAINING

IMMEDIATE ACTIONS

- o Designate a Finance Officer and begin analysis of donors' conditions and the development of a complete financial plan for the Senegal Basin Development.

- o Prepare detailed descriptions of responsibilities and duties of OMVS staff under existing organization and clearly showing lines of assistance of the UNDP advisor.

The immediate action program is described in detail elsewhere in this report.

MEDIUM-TERM PROGRAM FOR IMPROVEMENT OF OMVS

Objective

To transform OMVS into an organization capable of implementing projects and operating the river basin development for maximum benefits.

Approach to Conducting the Program

The program will be carried out by a 5-man resident team backed up by nine specialists. Required qualifications of the consultants are described in a following section. The organizational improvement program should be conducted by direct involvement with OMVS on the part of the consultants conducting the program. It should be accomplsihed as a step-by-step evolutionary process as opposed to the more usual method which would include making a study, preparing a report and finally transmitting a host of recommendations to OMVS. The procedure proposed herein is intended to produce an action program. As each OMVS function is defined, personnel requirements can be specified immediately and recruitment and training initiated. It should not be necessary to wait for all functions to be defined and a final report on the program prior to implementation of individual elements. The technique herein advocated requires that the experts gain full familiarity with OMVS by actually working with its staff for a period of months.

To ensure the necessary familiarity and cooperation, it is required that OMVS appoint at the outset a top-level Team Coordinator and make its "Chefs de Division" available to work with the team on the organizational recommendations. OMVS is also expected to appoint a Training Director in the first phase of the program.

Priorities for concentrating efforts of the specialists should be established by OMVS in consultation with the specialists at the outset of the

program. The first phase work is that of accomplishing satisfactory definition of the OMVS role and activities in each of the functional areas listed on Table 11, and to prepare a general organizational framework for these activities. In several functional areas, the OMVS role is already well defined and the organizational format and personnel requirements can be established without delay. This applies to the functions of Finance, Legal and Administration. Other crucial functions or activities are River Transportation, Construction Management and Supervision, Reservoir Operations, Health and Training. The organization for these activities should also have high priority.

Foreign training, for example, will be necessary for many of the required personnel, perhaps for durations of one year or more. This fact indicates the urgency for starting training as early as possible for operation of facilities as soon as they are constructed.

The project team should very carefully examine the construction schedules for each major feature of the Senegal River Development. The earliest likely starting date for construction of each will indicate the time available for making all decisions relative to OMVS roles and for training the various cadres. For example, the OMVS role or strategy in construction of Manantali and Diama dams may be quite different from each other and therefore both the time and personnel requirements may be different. The point here is that priorities for the work of the project team must be established based on the best estimates of the date that organizational capability will be required. Certain of these functions are clearly crucial to implementation of the first elements of the river basin development.

An overall timeframe of 13 months has been established herein for full completion of the organizational program. That period allows for initial briefings for orientation of consultants and time for preparation of a final report. However, much of the program output in terms of recommendations for specific actions, will be produced within the first six to eight months of effort. Emphasis must be given to early accomplishment of the urgent elements of the program.

Implementation of training programs will require longer time periods than the organizational revisions. These programs must be pursued vigorously also to achieve the earliest possible results.

General Description of the Program

The program has been divided into three phases, each consisting of one or more major tasks as described in greater detail under SCOPE OF WORK in a following section. The program schedule also shows the phases and tasks of the action program. All tasks will be carried out in close cooperation with the OMVS appointed team coordinator, the training director and the present OMVS division chiefs.

Phase 1 - Definition of OMVS Roles

During the first phase, the consulting team will familiarize itself with the existing OMVS staff and its work, the present status and time schedules of the various river development projects, the principal documents relating to the proposed developments and the current OMVS thinking about its role in the planning, construction, operation and administration of the development projects. The team will then identify the functions that must be carried out for the river development program and it will clearly define the specific activities which it proposes for OMVS, as opposed to the activities that will be carried out by the individual governments of Mali, Mauretania and Senegal. The team will also propose priorities within the OMVS organization program. The definitions and priorities must then be approved or revised by OMVS and formally adopted. Following this adoption, the team will then establish a General organizational framework to carry out the agreed activities and this must also be approved and adopted by OMVS.

Table 11 lists provisionally activities that OMVS might perform within the major functional areas. These functions and activities must be clearly defined. For instance, in some functional areas the OMVS activities may include complete operations and maintenance while in other areas OMVS may only do planning or simply coordination between the activities of the three governments. For internal functions such as Administration, Legal and Control, all activities will undoubtedly be performed by OMVS.

Second Phase - Detailed Organization and Training Structure

Following OMVS acceptance of the definition and priorities for the activities aassigned to OMVS, and after OMVS approval of the proposed general organization framework, the consulting team will establish the details of the organization. The team will determine specific staff requirements for each department or group, define lines of authority, prepare job descriptions including the necessary skills, levels of experience and training. The consultants will also set up the schedule for staffing the groups and for the training programs. Priority will be given to the groups most urgently needed, such as administration, financial control, construction supervision and contract administration. Training programs will involve both local and foreign institutions and on-the-job training, the latter being used whenever possible.

Third Phase - Implementation Assistance

Within the limits of their remaining time, the consultants will work with the division chiefs on the implementation of the organization plan, i.e. the actual staffing of the departments and groups and their work programs. The training specialists will be particularly busy during

this period setting up their training programs at existing institutions, organizing on-the-job training and arranging for foreign training where this is advisable.

The back-up specialists will come to Dakar during this phase to assist in the organization and training activities of their special fields.

PERSONNEL REQUIREMENTS

Professional Capabilities of Consulting Contractor

The assignment calls for either an engineering consultant with a strong background in management, organization and training assistance in developing nations (in addition to engineering experience), or a management consulting firm with a strong background in management, organization and training assistance for complex developing nation projects with some physical similarity to the Senegal River Development. In either case, it is quite likely and entirely acceptable that some team members be individuals not in the regular employ of the consultant, but notable experts in their respective fields.

Professional Capabilities of Consulting Specialists

All members of the 5-man resident team should have a working proficiency in spoken and written French. The River Basin Systems Manager as the team leader should preferably be fluent in the French language. The nine backup specialists who will support the resident team should have a reading knowledge of French.

Following are the desired qualifications of the inidvidual members:

Resident Team

- o A River Basin System Manager. This person should be a top quality widely recognized manager or administrator of river basin multi-purpose developments. He must have had high-level responsibility in both planning and operations, and preferably should be experienced in several such river basin organizations, so as not to be wedded to one particular way of doing things. He shall have had international or third-world experience and may presently be on the staff of an organization such an UNDP or FED, etc.

- o A "Pure" Management Specialist. This man may also be in an administrative position in an international, or governmental, or large industrial organization. During the First Phase this man would function as an assistant to the Basin System Manager in defining roles of OMVS and drafting position statements.

His expertise as a management specialist would be required in Phases Two and Three; his involvement in Phase I would be invaluable in providing an understanding of the situation and problems of OMVS.

- o A Personnel Specialist. This man would be needed after Phase One when the activities of OMVS and the general organization framework have been defined and approved. His work in Phases Two and Three would be to assist in determining the specific staff requirements for each group or department, in setting up lines of authority and responsibility, in outlining personnel policies and office procedures. His particular responsibility would be to prepare job descriptions and requirements for all staff levels.

- o A Technical Training Specialist. This position requires a man who has actually worked on a variety of technical training programs. He would be concerned with training personnel for the operation and maintenance of such works as the irrigation, navigation and hydroelectric installations. He should also be familiar with training programs for health, laboratory and water sampling technicians, clerical and administrative personnel. Strong background in on-the-job training is desirable.

- o An Administrative Training Specialist. This man should have heavy experience in the management of training programs. Conceivably he should have gained this experience in a governmental organization or in a large private industry where he supervised a variety of training programs.

Non-Resident Specialists

- o A Civil Engineer. This position may not be necessary if the river basin system manager has suitable background. The man should be familiar with the construction, supervision and management of all civil works common to river basin developments, such as dams, dikes, channels, irrigation structures. He should have a good background in hydraulics and soils and he should know what types of personnel are needed for these activities.

- o A Public Health Specialist. The man should be familiar with the organization and activities of public health units, both mobile and stationary.

- o An Agriculturist-Agronomist. He should be experienced in Sahelian, sub-desert agriculture. Familiarity with irrigated crops, storage and marketing, farm machinery and agricultural chemicals is required. Knowledge of livestock operations very desirable.

- o A Power Generation Engineer. Should be familiar with operations of

a hydroelectric station and the staff required therefor. Knowledge of power transmission, substations and distribution desirable.

- o A Navigation and Ports Specialist. Familiar with administration, operation and maintenance requirements of ships, barges, navigation channels and ports.

- o A Fisheries Specialist. Experienced in West African fisheries, scientific research and fisheries development and harvesting (production). Experience in other game and wildlife operations would be desirable.

- o An Ecologist. This man should have broad experience in ecological chain effects, including sociological impacts. His forte should be in planning, analysis and mathematical modeling. Preferably he should be knowledgeable in public health, fisheries, water quality and especially in forestry.

- o A System Operations Planner. The Planner should be experienced in the operations of a multi-purpose river project. He should know reservoir operations and related activities and he should be familiar with the type of personnel required.

- o An Accountant - Controller. This man should be an expert in the financial operations and procedures of a large river development authority. He should be familiar with methods for establishing rate structures for water, electrical power and river transportation.

In addition, the services of a forest management specialist would be desirable because of the great importance of the forest to the basin population and the foreseeable impacts of the river development on the existing forest. Similarly, an economist-planner would be most useful for future OMVS operations. It is possible that the resident team and OMVS may decide that the assistance of these additional experts is required. Perhaps a number of these specialists can be made available from various U.N. Agencies, or other international organizations. Professional people made available to OMVS by the UNDP should certainly be called upon to provide specific advice in their respective areas of specialization.

SCOPE OF WORK

A. Objectives of the Assignment

The Contractor shall provide the following services and complete the work tasks described below:

The Contractor shall prepare an organization, management and training program which will give OMVS the capability of planning, implementing, administering and operating its functions within the Senegal River Basin Development Projects.

The Contractor shall design a detailed organizational structure for carrying out OMVS functions and activities and he shall assist OMVS in implementing and staffing the basic organizational apparatus to the extent that staffing can be done within the time the Contractor's team is present.

The Contractor shall prepare plans for ongoing manpower training programs to supply qualified staff for OMVS. Organization for these training programs shall be built into the overall organization plan. The training programs should include use of local and foreign institutions as well as on-the-job training.

B. Manpower

To accomplish the objectives, the Contractor shall supply a team of five (5) consultants who shall be resident in Dakar, and nine (9) specialists who shall assist the resident team periodically in the field of their discipline. The team shall consist of the following:

Resident Team

One River Basin Sustems Manager (13 months)
One Management Specialist (8 months)
One Personnel Specialist (5 months)
One Training Specialist (technical and on-the-job training) (10 months)
One Training Specialist (administration and management (8 months)

Back Up Specialist (Each 1 week in USA and 3 weeks in Dakar)

One Civil Engineer (River Basin Development)
One Public Health Specialist (administration oriented)
One Agriculturist-Agronomist (sub-desert irrigated agriculture)
One Hydroelectric Engineer (power generation)
One Navigation and Ports Specialist
One Ecologist (water quality, forestry, pest control)

One River System Operation Planner
One Accountant - Controller

Detailed descriptions of the professional capabilities required for each position are listed in a preceding section of this report.

C. Major Work Tasks

1. Familiarization

a. Briefings: Briefings with AID-Washington and OMVS-Dakar to provide latest information on project financing and design status; background on countries.

b. Document Review: Riview principal documents - OMVS charter, Beyrard Report, UNDP Systhesis Report, etc.

c. Commence Dialogue: Become acquainted with OMVS Division chiefs, OMVS Coordinator and OMVS Training Director. Discussions with other government officials and U.S. personnel (FAO, WHO, UNDP).

2. Definition of OMVS Functions and Activities

a. Identification & Definition

With the assistance of OMVS Coordinator and Division Chiefs, identify the functions necessary to carry out the overall river basin programs; describe clearly the OMVS role in each function, considering the capabilities of the national government organizations; identify the specific activities OMVS will have to perform to carry out its designated role. In a general way the above has already been done but specific definitions are needed before organizational and manpower requirements can be clearly identified.

b. Priorities

Determine relative priorities in terms of the time schedule on which the functions and activities will demand a trained, staffed and functioning organization.

c. Approval

Obtain formal approval of these functions and activity definitions by OMVS, with such revisions as may be necessary. This task is not within the control of the Contractor. Yet, his effort must be directed towards achieving OMVS approval in order to insure timely completion of Contractor's work.

3. Establishment of General Organizational Framework

a. Design

Based on the function and activity definitions that have been approved, design an overall organizational framework for carrying out the required functions and activities. Maintain active dialogue with OMVS staff in the process.

b. Report

Compile a written report explaining and justifying the recommended framework, and make an oral presentation to OMVS and AID.

c. Approval

Obtain formal approval by OMVS of recommended framework, with such revisions as may be necessary.

4. Establish Detailed Organizational Requirements and Implementation Schedule

a. Functional Requirements

For each division, department or group in the adopted framework, determine specific staffing requirements, with job descriptions, experience, education, training and skill requirements. Work with OMVS coordinator and division chiefs in this task.

b. Schedule

In accordance with the earlier adopted priorities, determine the schedule or sequence, for implementing the organization groups and the training program.

c. Training Requirements

Based on staffing requirements determined, assess the training requirements for initial and long term staffing. This should include both on-the-job training and training at foreign institutions. Set up required training programs for all OMVS activities that have been agreed upon. Outline these programs in a written report to OMVS and AID. Assist in implementing programs and training facilities, using on-the-job training and existing institutions as much as possible.

d. Approval

Submit recommendations for detailed organizations of each group to OMVS for approval as it is completed. Make revisions as necessary.

5. Implementation Assistance

Provide advice and assistance to division chiefs in implementation of the plan as it occurs during the period of the program. This may require revisions to the plan to be submitted for OMVS approval as specific organizational, staffing and training problems arise.

6. Final Report

D. Support by OMVS

In addition to supplying a fill-time, high level Team Coordinator, a Training Director and the assistance of the existing Division Chiefs, OMVS will contribute the following support:

Office space including furniture and telephone service. Two bilingual secretaries. Other office help as required. Two cars and drivers.

E. Length of Assignment

The time schedule for the Contractor's work shall span a maximum of thirteen (13) months. The attached schedule indicates the anticipated time requirements for each task and each team member. The schedule also shows OMVS "milestones" which are the dates by which OMVS, at the appropriate level, must make certain decisions necessary for the continuation of the Contractor's work.

The project schedule depends as much on OMVS decisions as on consultant activities. Some of these decisions will define the extent of OMVS activities and, consequently, the limits of the organization and training programs which the Contractor's team has to set up. The attached time schedule is based on the assumption that OMVS will decide to carry out, at an operational level, ALL functions and activities listed on Table 11 of this report. Therefore, the time schedule indicates the maximum organizational and training effort that the Contractor may be required to carry out and the Contractor shall submit his Proposal on this basis.

In the event that it is decided that operational responsibility for some functions listed in Table 11 should be assigned to the individual governments (public health operations relating to river

development, for example) or to a separate autonomous tri-national organization (water allocations, for example), then OMVS will either have no role, or only a coordinating role in these functions and the OMVS organization and the Contractor's assignment will be decreased to that extent.

F. Reports

The Contractor will submit reports as called for in the project Task Description. On completion of the assignment, the Contractor will submit a final report summarizing accomplishments and setting out recommendations for future organizational and training actions.

All reports will be furnished in both English and French. Interm reports will require 10 copies in each language, the final report, 20 copies.

G. Schedule of Completion

The Contractor shall begin work immediately upon receipt of written notification to commence work from OMVS. The Contractor shall compplete his assignment and submit the final report after a maximum of thirteen months following the written notice.

ESTIMATED COST OF THE PROGRAM

The medium-term organizational program described in this report requires a team of five people in residence in Dakar and nine backup specialists for short periods. The accompanying schedule indicates a total of 53 man-months required for the team including back up specialists.

The estimates of time required for the program are believed to be quite ample. It is entirely possible that the work can be accelerated and the overall time reduced from 13 months to perhaps 8 to 10 months. Achieving agreement on the OMVS role and activities appears to be the chief factor affecting the duration of the program.

Cost Elements

The cost estimate is comprised of the following separate elements of cost:

- o Personnel cost, equal to direct salary times a factor of 2.5 to allow for overhead and profit.

- Per diem to cover subsistence (meals, lodging and miscellaneous personal expenses). The rates are $48 per day in Dakar and $24 per day in Washington or New York.

- Travel cost, based on coach-class air fares.

- Miscellaneous costs, including local travel, travel documents, innoculations, etc.

- Cost of report printing, including interim reports and review drafts.

Table 13

COST ESTIMATE

	Days	Rates	Factor	Total	
PERSONNEL COST					
River Basin Systems Manager (13 mos.)	280	$150	2.5	$105,000	
Management Specialist (8 mos.)	172	130	2.5	55,900	
Personnel Specialist (6 mos.)	129	100	2.5	32,250	
Training Specialists (two required- 17 mos.)	366	100	2.5	91,500	
					$284,650
BACKUP SPECIALISTS @ (required) 1 week/man in U.S., 3 wks/man in Dakar $300 per day including all mark-up and overhead. 194 days @ $300				$ 58,200	
TOTAL SALARY COST					$342,850
PER DIEM COST					
a. Briefing in Washington 25-mandays @ $24				$ 600	
b. Residence in Dakar 49-1/2 months = 1,506 days @ $48				72,290	
TOTAL PER DIEM					$ 72,890
TRAVEL COST					
a. Round Trip air fair, Washington to Dakar Estimate 2 round trips for each of the five residents. 10 trips @ $1,130				$ 11,300	
b. 9 round trips for back up specialists, @ $1130				10,170	
c. Interior Travel USA Assume average trip will include distance equivalent of Denver to Washington, round trip. 10 trips @ $252				2,520	
TOTAL TRAVEL COST					$ 23,990
MISCELLANEOUS COSTS, INCLUDING TRAVEL WITHIN THE THREE COUNTRIES					$ 8,000
REPORT PREPARATION AND PRINTING COST					
3 Interim Reports, bi-lingual					
Graphics, typing and translation				$ 4,500	
Printing				3,000	
				$ 7,500	
Final Report				$ 4,800	
TOTAL REPORT COST					$ 12,300

Table 13

OMVS CONTRIBUTION

OMVS should provide office space for the organizational program, including furniture and telephone service. Also two bi-lingual secretaries, other office help and cars with drivers as required.

SUMMARY OF PROGRAM COST ESTIMATE

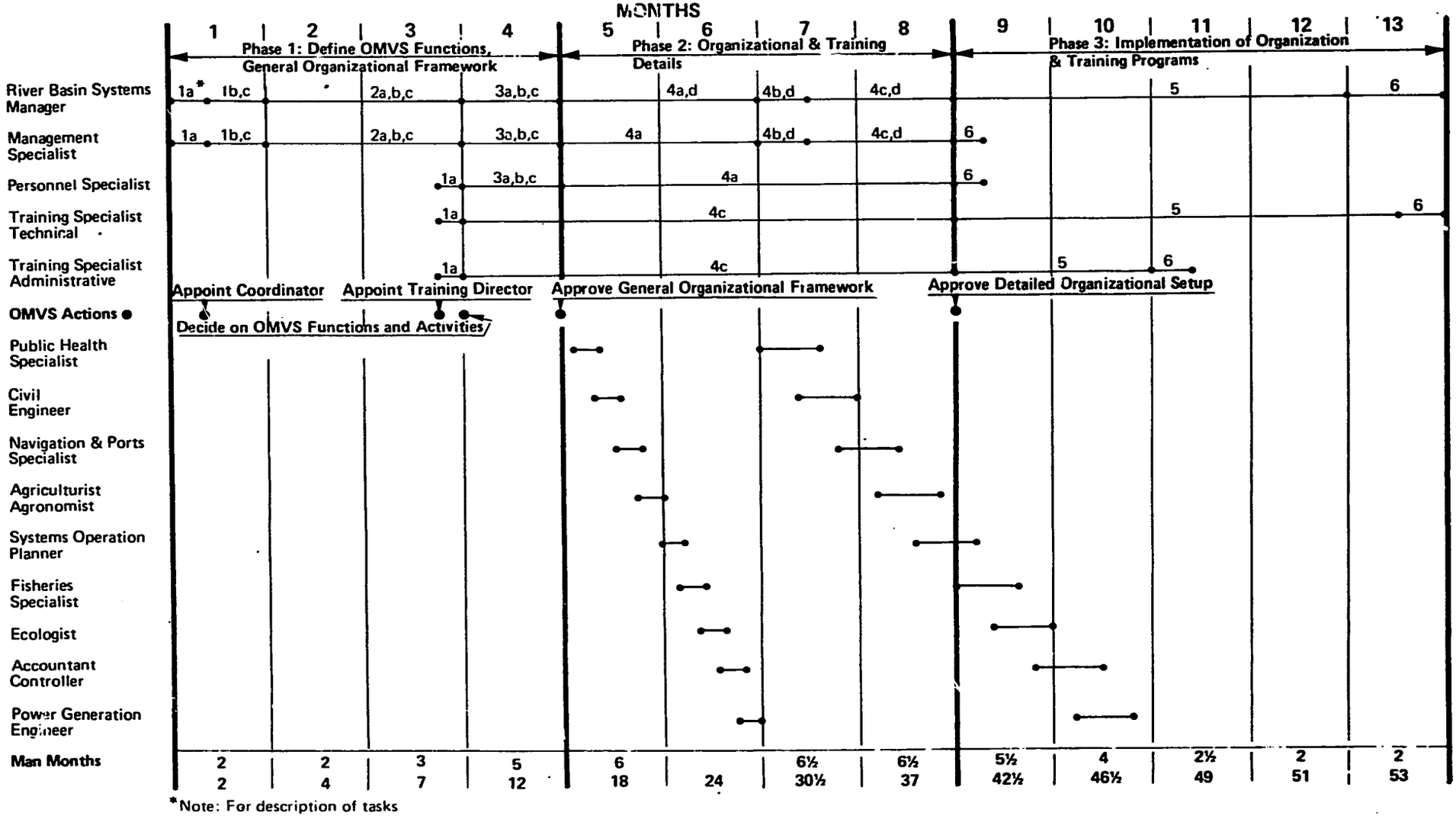
Personnel	$342,850
Per Diem	72,890
Travel	23,990
Miscellaneous Costs	8,000
Report Preparation and Printing	12,300
TOTAL ESTIMATED COST	$460,030
Rounded to	$460,000

DISBURSEMENT SCHEDULE

On the basis of the Program Schedule and the cost of the individual items, the funds will be required as follows:

Months	1	2	3	4	5	6	7	8	9	10	11	12	13
% of Funds Required (Cumulation)	6	10	16	26	37	48	60	72	82	90	94	97	100

PROGRAM SCHEDULE
CONTRACTORS TASKS AND REQUIRED OMVS ACTIONS



*Note: For description of tasks (1a, etc.) see report section, Scope of Work-Major Tasks