

**AGENCY FOR  
INTERNATIONAL  
DEVELOPMENT**



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## **FY 1977**

### **O.M.V.S.**

BEST AVAILABLE

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OF  
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## OVERVIEW

USG participation in the development of the Senegal River Basin is viewed as an important long-range remedial corollary to the relief efforts undertaken in response to the Sahel drought. The primary role of the USG in the basin is to be instrumental in increasing the production of food staples and thereby contribute to correcting the chronic food deficits of the past which have characterized this region. The planning in this basin and the receptivity of donors regarding it is more advanced than the other river and lake basins within the Sahel Region with water resources to be developed. Also food production schemes financed by FAC, FED, and the IBRD in the Senegal River Basin which are now at the stage of initial production are impressive in their design, execution, and operation.

At the first OMVS Donors Conference in July 1974, the USG was in no position to make any substantial financial commitment. Up to then AID had done little work in the Senegal Basin area. The basic documents outlining the indicative plan for the basin arrived just a few days before the opening date. Other donors who were already familiar with the way the development of the basin was being realized, could be more responsive. Furthermore, in keeping with the most recent Congressional mandate given this Agency, the USG indicated then, and has reiterated since that our primary interest is in food production rather than participating in major infrastructure projects. The USG also expressed a willingness to undertake activities in which it could bring a unique technical competence to bear, either from other Federal Agencies such as the U.S. Bureau of Reclamation and Corps of Engineers, or from the engineering capabilities available in the U.S. private sector. Among these the U.S. delegation singled out assistance in the management and operations of the OMVS Secretariat as a coordinative and operational body looking after the interests of riparian states. Prior to this conference the USG had made a commitment to supply equipment and some local budget support (\$960,000) to the three OMVS Agronomic Research Centers to allow them to expand programs of applied research.

The OMVS is now in the process of putting together the funding scheme for the Delta (Diana) Dam totaling some \$30 million. France is the principal contributor to the Diana Dam project, with Iran and Saudi Arabia picking up the remainder. The Peoples Republic of China is in the final stages of its feasibility and engineering studies of the upstream regulatory dam (Manantali). These two dams are the key projects in the overall development of this Basin. The scheduling of other projects and participation of other donors is largely geared to their realization. The delta dam should be completed by 1980, and the upstream regulatory dam within seven to eight years after its financing is assured.

(b)

AID is investigating the possibility of participating in the development of the system of irrigated perimeters outlined in the Indicative Basin Plan. There is an estimated potential of some 428,000 hectares, of which only some 11,000 have been realized to date. During the next eight months AID will be undertaking in-depth studies of perimeters for which initial feasibility and some engineering studies have already been completed. While exploring several possibilities, these studies will concentrate on a 7,200 hectare perimeter near the population center of Matam, Senegal, in the upper basin. If positive in their findings of the engineering, sociological, agronomic, economic and financial aspects of this type of food production scheme, these studies should provide the basis for a loan of between \$15 and \$20 million in FY'76. The USG will seek joint financing of this undertaking with other donors, and has undertaken exploratory discussions with the World Bank regarding such a joint approach. For its part the Bank has requested that AID consider joining with it in perimeter development in the lower basin, so there appears to be a basis for some reciprocity in working out joint funding schemes.

Judging from activities underway and planned in this basin, it appears that the USG can perform in a highly constructive role in this regional grouping. The USG and other donors view these river basins as a front line of defense against further encroachment of the Sahara. With the tremendous pressures from overgrazing now exerted upon the Senegal River Basin during the dry season, it is already in a state of ecological imbalance. In FY'76, AID will make the initial obligation for the \$2.5 million basin-wide environmental impact assessment. This study will have a field contract party of some twenty Americans working in the basin over a two-year period. Preceding them will be a field party of approximately eight technicians doing the in-depth studies of the Matam perimeter which will require eight months. A four-to-five man team of specialists is being considered to assist the OMVS Secretariat in its management and operations and design a long-term training program; it remains to be seen how this team will complement UNDP and other donor assistance in this sector. An equipment specialist will help the OMVS Agronomic Research Stations to establish a logistics system for their equipment and continuing spare parts needs. U.S. participation in this West African regional program could amount to \$25 million in FY'76 and '77, and have as many as thirty contract and/or PASA technicians involved in OMVS projects in the field at the same time. Implicit in a program of these dimensions is a degree of USG support and endorsement for the development of the Senegal River Basin which warrants approval as a matter of policy.

Along with its funding and policy implications are the personnel and support functions which will be required of this agency. Last fall AFR/CWR established the position of OMVS Coordinator to carry on continuing liaison with the OMVS and other donors, and to design the projects in which AID had expressed an interest. The OMVS Coordinator relied upon the Bureau of Reclamation for most of the

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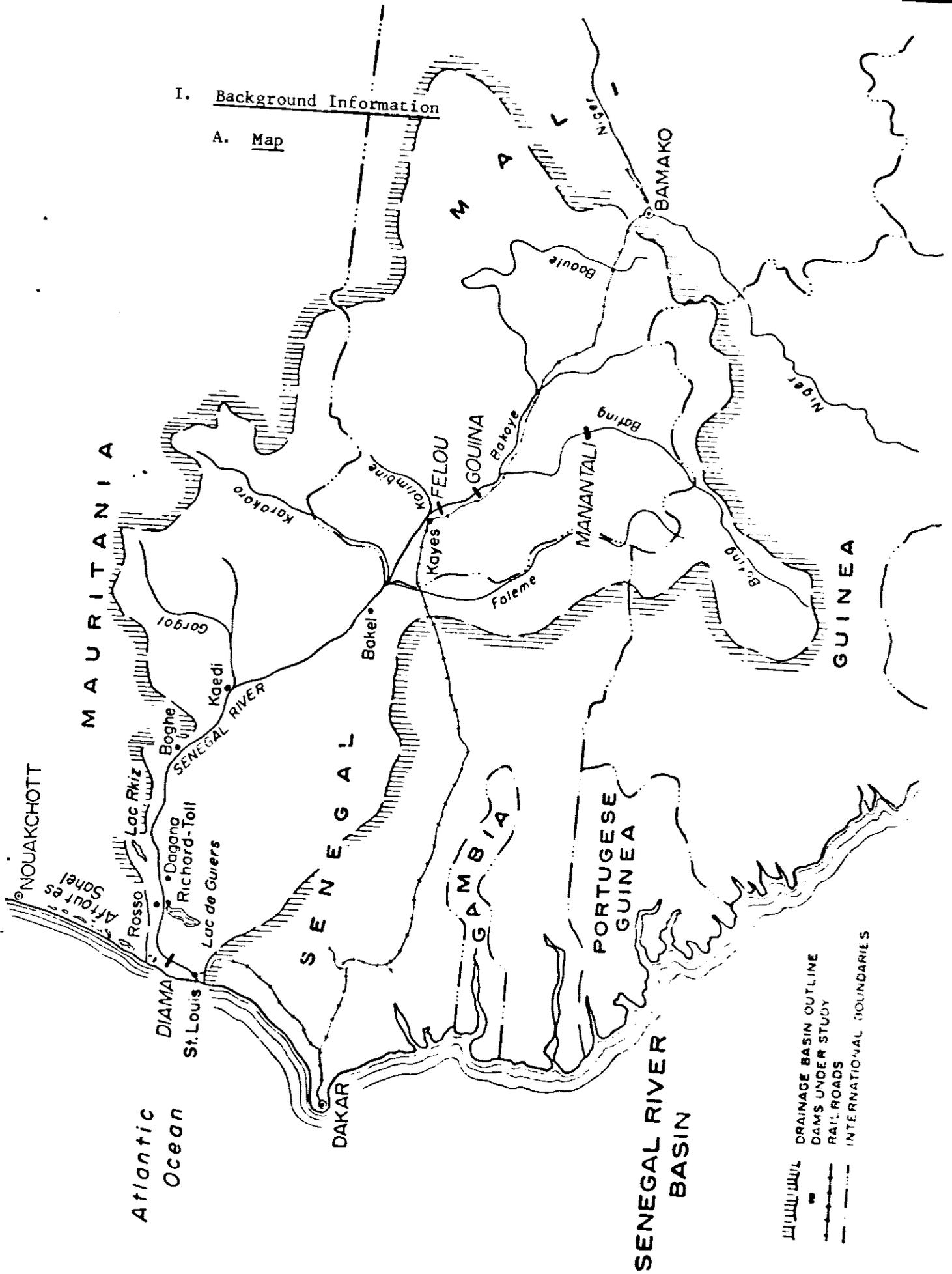
analysis and some of the backstopping required. BuRec can serve a continuing role in the technical backstopping of USG participation in the development of this basin, a role welcomed by the OMVS, the World Bank and other donors in view of the worldwide reputation BuRec has in river basin management. Under a PASA arrangement AID will be financing a professional cadre of four BuRec technicians to serve as a core of expertise for current and future involvement in the affairs of this basin.

What is taking shape here is a significant USG involvement in the long-term development of the Senegal River Basin. In this effort the USG is joined by other traditional donor countries to this area (the Federal Republic of Germany, Canada, Italy, and France); international and regional institutions (the World Bank, the African Development Bank, the European Development Fund); as well as by a new array of OPEC countries who identify with Muslim Mauritania in particular, and the OMVS as a viable regional entity (Saudi Arabia, Kuwait, and Iran). If the Peoples Republic of China finances the Manantali Dam on the main tributary of the Senegal River in Mali, this will be one of the PRS's largest single projects in Africa. AID has been carrying on a continuing dialogue with the OMVS Secretariat regarding the USG's role in the development of this basin. The OMVS feels that in concert with other donors the USG can exert a meaningful influence in basin affairs.

A program of these dimensions will require a limited but competent, highly professional staff in the field (Dakar and/or St. Louis, Senegal) and in AID/W. The OMVS Coordinator will shift from AID/W to the field when the major portions of this program will have had the staff work completed in AID/W and program emphasis will shift to the teams carrying out project design in the basin. This office in the field will require a highly qualified and experienced River Basin Engineer (FSR 1/2) for its technical backstopping, and a Program Staff of a middle grade (FSR 3/4) Program Officer with a junior grade (FSR 4/5) Assistant Program Officer. The OMVS Coordinator (FSR-2) will continue in his role as project designer and principal coordinator and liaison for the USG with the OMVS Secretariat, its individual offices in the three riparian countries, and all of the other major donors and international institutions involved in this basin.

I. Background Information

A. Map



## B. Physical Setting

The Senegal River is the second largest river in West Africa. It is over 1,800 kilometers long, drains a watershed of about 290,000 square kilometers, and produces an annual average flow of over 20 billion cubic meters. The river basin occupies over 14 percent of the area of Senegal, almost 13 percent of Mali and Guinea, and about 7 percent of Mauritania. While 825 kilometers or about 45 percent of its length forms the border between Senegal and Mauritania, almost 55 percent, or 155,000 square kilometers, of the drainage area is in Mali and about 50 percent of the streamflow originates in Guinea.

Geographically, the basin is divided into three regions. The lower 200 kilometers from the ocean to Dagana comprise the Delta. It is a completely flat area with seawater intruding up the full length of the river reach at low river flows. The next 600 kilometers from Dagana to Bakel is the Valley. It is an alluvial plain, 10 to 20 kilometers wide, surrounded by semi-desert. The upper 1,010 kilometers constitute the Upper Basin. This area of mountains and hills provides almost all of the flow of the river.

The Senegal River is formed by the junction of the Bafing and Bakoye Rivers, about 1,060 kilometers upstream from the Atlantic Ocean. The principal tributaries, Bafing, Bakoye and Faleme, together with the minor tributaries Kolombine and Karakoro, supply about 830 cubic meters per second of flow to the Senegal River, or practically all the flow in that stream. No significant flows are added to the Senegal below its junction with the Faleme, some 825 kilometers upstream from the ocean. By the time the river reaches Bakel, about 30 kilometers below the Faleme junction, the flow has been reduced by losses to about 780 m<sup>3</sup>/s. (This apparent loss of 50 m<sup>3</sup>/s may also be due to measuring and estimating errors.) While the rains in the upper watershed occur in the April-October period, the floods in the lower reaches of the river occur in the July-December period. The highest monthly flow generally occurs in September when the average for the month at Bakel reaches about 3,500 m<sup>3</sup>/s. By May, the lowest month, the average flow has diminished to about 10 m<sup>3</sup>/s.

Climatologically, the basin goes from ~~semi-arid in the north~~ to tropical in the south. Average annual rainfall varies from 250 millimeters in the north to 2,000 millimeters in the south. In the north the rainy season lasts only 3 months, July-September while in the south it occurs in the April-November period. Generally, cool and humid trade winds (Alizes) blow in from the coastal regions, however about in March the hot, dry winds of the Harmattan begin from the east. These result in maximum monthly temperatures, averaging about 33° C in May. Minimum monthly temperatures occur in January

averaging about 23° C. Average annual values of relative humidity are generally from 50 to 60 percent, but monthly values range between 10 and 90 percent. Annual potential evaporation varies from 1,500 millimeters in the Guinean area to over 3,000 millimeters in the north of the basin. The effect of this climatic pattern is approximately 1.3 times the evaporation rate, while in the lower basin the evaporation rate is approximately 12 times the rainfall.

#### C. Human Resources

Approximately 1.6 million people occupy the Senegal River Basin: 809,000 in Mali; 300,000 in Mauritania; and 512,000 in Senegal. As soon as hydro-agricultural development gets underway, and if such development can accommodate livestock, the basin can readily absorb an additional 700,000 persons. The population growth rates within the basin, last measured in 1972, indicated a 2.3 percent growth in the Mauritanian portion; 2.4 percent in Mali; and 0.7 percent in Senegal. It should be noted that these are net growth rates, having taken into account the exodus of about 40 percent of the total active male population (approximately 150,000 annually) to cities of foreign countries in search of jobs. The whole development of this river will be limited by this pattern of migration since it will require a more favorable proportion of active male population than is found at present.

The three major activities within the basin, agriculture, livestock and fishing, are totally conditioned by the availability of rain, river and ground water. In the past, average annual overbank flooding covers some 1.5 million acres, of which some 330,000 would be put in flood recession agriculture. An average annual yield of 500 pounds of sorghum per acre allowed a satisfactory subsistence for the population without any surplus to be stored. During recent drought years flood recession agriculture was reduced to 37,500 acres. The precariousness of the equilibrium of life is demonstrated in this latter figure, with subsistence always being threatened by variations in rainfall and fluctuations in the flow of the river. Until at least the flow of the river can be regulated, insecurity will continue to drive a large part of the active male population to leave the basin.

#### D. Livestock

The Senegal River Basin is estimated to contain approximately 2,000,000 head of cattle and 4,750,000 head of sheep and goats. The livestock population of the basin doubled in the past 15 years with effective disease control programs and the digging of wells which allowed the use of previously unexploited pasturelands. With the coming of the drought the basin was subjected to tremendous overgrazing pressures which has left it in a state of ecological degradation. The sparse vegetation in the lower two-thirds of the basin cannot rejuvenate under such pressure.

### E. Fisheries

Prior to the recent drought an estimated 10,000 fishermen harvested between 40,000 and 50,000 tons of fish annually. Most of the catch is consumed locally as fresh fish, and thus constitutes an important source of protein in the diet of the peoples of the basin. About 5,000 tons in Senegal and 3,000 tons in Mauritania are dried and marketed elsewhere. Approximately 90 species of fish have been reported in the Senegal River.

## II. Planning and Organization Within the Basin

### A. Evolution of the OMVS and the Indicative Basin Plan

In Bamako in July 1963 the riparian states of Guinea, Mali, Mauritania and Senegal established the "Comite Inter-Etats pour l'Amenagement du Bassin du Fleuve Senegal". The "Comite Inter-Etats" adopted a resolution stating that the general policy of development of the Senegal River Basin would have as its goals: agricultural development; the production of energy and industrial development; and improvement of the conditions of river navigation. The "Comite Inter-Etats" evolved into "l'Organisation des Etats Riverain du Fleuve Senegal" (OERS) which existed through 1971, when, with the withdrawal of Guinea from that organization, the "Organisation pour la Mise en Valeur du Fleuve Senegal" (OMVS) was formed by the three remaining members.

In January 1970 the OERS Council of Ministers, after having analysed all studies of the basin completed until that time, decided that the fundamental first step in the integrated development of the Senegal River Basin would be the establishment of a regulated year-round minimal flow of 300 m<sup>3</sup>/s. In July 1972 the OMVS Council of Ministers reconfirmed that the first stage of the integrated development of the Senegal River Basin is based on a regulated flow of the river at 300 m<sup>3</sup>/s, with the following major mainstream projects:

- 1) a hydroelectric regulating dam at Manantali on the Bafing tributary in Mali
- 2) the dam at Diama in the Delta to arrest salt water intrusion and provide water for irrigation
- 3) a river and seaport at St. Louis, Senegal and a river port at Kayes, Mali.
- 4) the improvement of ports of call along the river (Rosso, Richard Toll, Dagana, Podor, Boghe, Kaedi, Matam, Bakel, Ambidedi) and of the river bed sills.

In January 1973 the OMVS Council of Minister approved by resolution the principle of a mid-term program of action for the integrated development of the Senegal River Basin. It also established

at that time national coordinating committees for the development of the Senegal River (Comites Nationaux pour la Mise en Valeur du Fleuve Senegal), and decided to convene a meeting of prospective donor countries and organizations to solicit financing of the development program of the Senegal River Basin. As a preparatory step for this first Donors Conference, which was held in Nouakchott in July 1974, the OMVS with UNDP financing attempted to do a synthesis of the some \$10 million in reports and studies done on the basin. This synthesis was to establish a sequential order of priorities and serve as the analytical base for an Indicative Development Plan for the Senegal River. The French firm of Norbert Beyrard completed this synthesis just prior to the Nouakchott meeting, and it has since served as the principal point of reference (along with the Senegal-Consult Study of 1970, and the SOGREAH Delta Dam and Mathematical Model Flow Studies of 1972) in discussing basin planning.

### B. Proposed Development

As presented in the Beyrard report, the programs and projects for the integrated development of the Senegal River Basin will require 35 years (1975-2010) and about 850,000 million CFA (\$3.7 billion)<sup>1/</sup> of investment to complete. The main goals of the proposed development are to improve the living standards in the three countries involved through greater agricultural production and to provide foreign exchange through agricultural and mining product exports. The principal programs proposed to achieve these goals include converting to additional flood recession agriculture in the basin and to intensive double cropped irrigation agriculture, improving and increasing livestock production, constructing agricultural processing plants, and expanding the mining and processing of iron, bauxite, and phosphates. Improvement of inland fisheries, forestry, and tourism is also proposed.

Key projects to be constructed in the medium term (to 1990) period would include a large upstream dam and powerplant at Manantali and a low, water control dam at Diama in the delta. These structures would provide the water and energy needed for expanded agricultural and mining production and processing, and for the river control desired for improvement of navigation.

The 60-meter-high Manantali Dam on the Bafing River would impound 13,500 million cubic meters of water, sufficient to provide a firm water supply for (1) the irrigation of 428,000 hectares of land, (2) the maintenance of a riverflow of 300 cubic meters per second for navigation, and (3) the generation of an annual average of 800,000,000 kilowatt-hours of electrical energy. The powerplant would house eight units with a total generation capacity of 150 megawatts. The dam and three generating units would be constructed in the period 1978-1982.

The Diama Dam would have a normal water elevation of 2.5 meters and impound 310 million cubic meters. Its main functions would be to (1) prevent seawater intrusion, (2) provide a reservoir of fresh water, (3) supply water to the Lac de Guiers for municipal use in Dakar and to Lac R'Kiz for irrigation use, and (4) control flows to the Aftout es Sahel depressions for local irrigation use and for municipal use in Nouakchott. Construction of Diama Dam is planned for 1976-1980.

As water and energy needs increase, the longer term plans call for construction of two reregulating dams and powerplants on the Senegal River between Manantali Dam and Kayes. The first of these, Gounia, is projected to be needed about 1990, and the other, Felou, about 1995. Power generation at these sites is estimated at 600 and 400 million kilowatt-hours, respectively.

By 1990, Beyrard estimates that 158,500 hectares would be under irrigation in the basin. This would grow to 428,000 hectares by 2010. Agriculture processing plants are to be constructed paralleling the increased agricultural production growth. By 2010, needed processing plants should total about 224.

The mining industry is to be brought to full production by 1990. This would include development of iron ore deposits in Mali and Senegal, bauxite in Mali, and phosphates in Mauritania. The iron would be shipped in the form of ore and as pellets. By 1990, Mali and Senegal would each be producing 5 million metric tons of ore and of pellets. Alumina production is projected to reach 600,000 tons by 1982.

To move the mining and agricultural products to market economically, it is proposed that the Senegal River channel and river ports be improved. The plan calls for (1) dredging and rock clearing the river to Kayes to a depth of 1.6 meters by 1980 and to 2 meters by 1985, (2) improving the ports of St. Louis and Kayes by 1982, (3) constructing wharves at Kayar and the Aftout es Sahel by 1984, and (4) preparing other ports of call between 1980 and 2005. It is proposed that the Aftout es Sahel be used for transfer of the mining products rather than the lock at Diama Dam and the port of St. Louis. Where this leaves the justification for the lock and for improvement of the port of St. Louis is unclear.

OMVS MEDIUM-TERM PROGRAM  
 Combined Fund Requirements  
 (In Millions of Dollars)

	<u>Irrigation Investment</u>	<u>Dama Dam</u>	<u>Manantali Dam and Power System</u>	<u>Manantali Combined Total</u>	<u>Gouina or Gourbassi Alternative</u>	<u>Alternative Combined Total</u>
1976	8	1	1	10	1	10
1977	8	4	1	13	1	13
1978	12	15	18	45	10	37
1979	16	15	35	66	20	51
1980	16	7	41	64	20	43
1981	16		53	69	8	24
1982	20		15	35		20
1983	20		13	33		20
1984	20		9	29		20
1985	24		10	34		24
1986	28			28		28
1987	32			32		32
1988	36			36		36
1989	40			40		40
1990	44			44		44
Totals	340	42	196	578	60	442

*↑ when not in*

Figures include planning design, and construction costs but exclude interest during construction and cost of operation, maintenance, and replacement. Figures do not include possible escalation of costs in future years. Irrigation investment is based \$4,000 per hectare.

C. Present Level of Planning

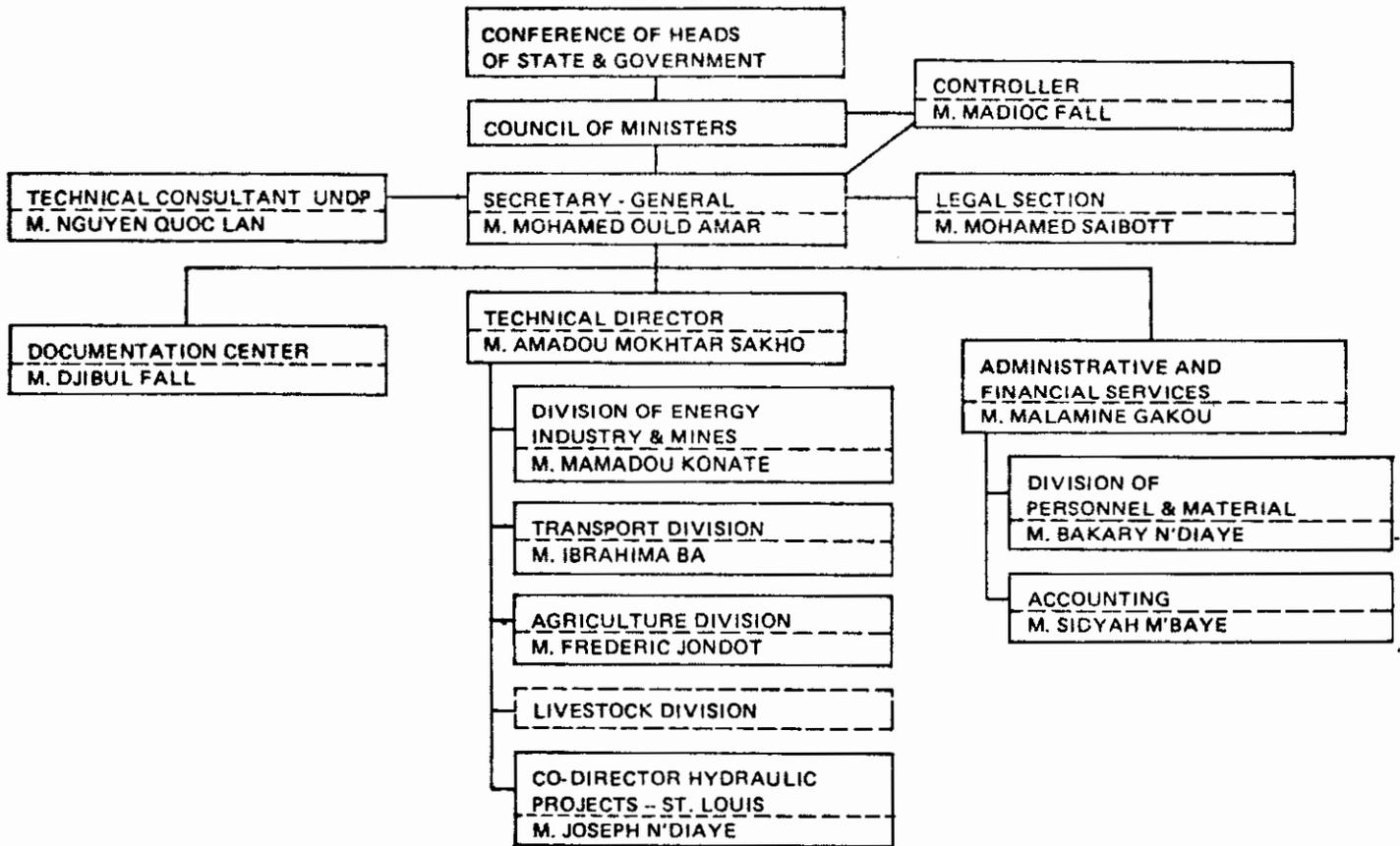
Major concerns of reviewers of the Beyrard report emphasized three areas of deficiency in presentation:

1. A training program to develop the large staff of technicians and managers who would be needed to plan, implement and operate the development programs;
2. A coordinating and managing organism to handle the complex machinery of program implementation;
3. Engineering and technical data to permit checking the accuracy of its premises, validity of its analysis and reasonableness of its conclusions and recommendations.

The Beyrard report, and to a lesser degree the other reports, did not clearly describe all of the physical facilities proposed to be constructed or the development programs to be implemented. Especially in the Beyrard report, it cannot be determined what some of the physical components of the development consisted of, what their dimensions and capacities were, how they were proposed to be operated, or exactly where they were to be located.

The Beyrard report emphasizes economic and financial analysis but is deficient on technical data in support of its proposals. If the needed technical data exist, they should be compiled and made readily available; if they do not exist, they need to be developed. During the data investigative period, OMVS organizational development, management and technical training of OMVS personnel, and agricultural (particularly agronomic) research is required.

D. Structure of the OMVS



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.

The OMVS most valuable asset is its decision-making structure and its ability to make binding decisions at the Council of Ministers level. The treaties pursuant to which the OMVS was created are "La Convention Relative au Statut du Fleuve Senegal" (referred to as the "Statute") and "La Convention Portant Creation de l'Organisation pour la Mise en Valeur du Fleuve Senegal" (referred to as the "Convention-OMVS). Both were signed on March 11, 1972. The de jure creation of the OMVS has thus been effected in accordance with international law as well as the internal laws of the Member States. Other basic operational agreements, such as a Water Rights Charter, are still in the process of being negotiated.

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 mainstream facilities 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.

### III. Proposed USG Role

#### A. First OMVS Donors Conference, July 1974

The completion of the UNDP-financed Norbert Beyrard Synthesis Study gave the OMVS the wherewithal to put together an integrated plan for the development of the Senegal River Basin. The plan is described in the OMVS document, "The Objectives and the Main Outline of the Integrated Development Strategy of the Senegal River," (Objectives Paper) dated May 1974. To discuss this development plan and to enlist financial support for projects composing the plan, the OMVS called a conference of potential donor states and international organizations at Nouakchott, Mauritania from July 11-13, 1974. While the plan envisages continuing investment over a 35-40 year period totaling some \$3.5 billion, the conference concerned itself only with the mid-term (1975-82) projects. The major mid-term projects discussed at the conference were the following:

1. The Manantali Dam with its hydroelectric power station, situated on the Bafing River. This is the kingpin of the entire development scheme, having as its basic purpose provision of a regular year-round flow of 300 M<sup>3</sup>/s.
2. The Diama (Delta) Dam to be constructed about 13 miles upstream from the port of St. Louis, the main purpose of which would be to arrest salt water intrusion which now can be traced some 270 kilometers inland from the estuary during low water season.
3. Irrigation Infrastructure, concentrating on possible irrigated perimeters on the flood plain adjacent to the main channel.
4. Equipment for River Navigation and Channel Maintenance.
5. Improvement of the ocean port of St. Louis and the inland port of Kayes
6. Improvement of the River Channel between St. Louis and Kayes.

In addition to the U.S. and members of the OMVS, the following delegations participated in the Nouakchott meeting:

Belgium *	United Kingdom
Canada	Federal Republic of Germany
Kuwait	Sweden
France	USSR *
Iran	African Development Bank
Italy	IBRD
Japan	FED
Saudi Arabia	UNDP
Egypt *	Economic Commission for Africa
Several other UN Special Agencies	

\*Represented by local Ambassadors attending as observers

The United Arab Emirates, Spain and the Peoples Republic of China were invited but did not attend.

In response to the OMVS proposals, the following pledges were made at the June conference:

1. IBRD - \$30 million during the next four to five years from IDA funds to be used for design and construction of irrigation works and land development.
2. African Development Bank - A total of 50 million units of account (about \$60 million) over five to six years. These funds could be available for any projects requested by OMVS and approved by the Bank's directors after an economic and financial feasibility study.
3. France - 80 million French Francs (approximately \$16 million) which it preferred to put into a consortium to finance the construction of the Diama Dam. France was also prepared to offer suggestions for implementation procedures.
4. Federal Republic of Germany - DM 40 million (approximately \$16 million) untied, at IDA terms to be used for any of the OMVS mid-term projects.
5. Canada - Still had the documentation under study and so could not yet state the size of a commitment. Canada would prefer that its funds be used for port construction and improvement. The Canadian delegate stressed the need for a proper system of planning and management for implementation of the program and a comprehensive plan for training of the large number of skilled personnel which will be needed. Canada was ready to offer technical assistance in these fields.

7. Saudi Arabia - \$10 million in a no-interest, long-term loan for the Basin Development Plan.

8. Kuwait - The representative announced that the Kuwait Development Fund expected to conclude a bilateral agreement with Mauritania for the development of the livestock, agriculture and transportation sectors.

9. Italy - Announced that it would participate in Senegal River Basin Development but the government has, as yet, reached no decisions on the form of participation. However, any participation would be through international organizations of which Italy was a member. Meanwhile, it would offer technical assistance in the design of dams and in the use of water resources.

10. Various UN Special Agencies complimented the OMVS on its imaginative approach to river basin development and approved its objectives. They offered technical assistance in various areas of expertise.

11. United States - The U.S. delegate stressed the need to include in the program alternative irrigation methods to the surface irrigation method proposed, so as to expand the irrigated regions at lower cost and higher efficiency. He also stressed the need to study the environmental impact of the proposed infrastructure to avoid ecological deterioration of the area. He urged that attention be paid to the requirements for trained manpower needed to plan and implement the OMVS program, to operate its facilities and to train farmers in the use of the irrigation systems and in new cultivation and conservation techniques.

The U.S. Delegate further stated that following further review of the various proposals and related documents received, AID would consider practical means to provide assistance for the basin. Among the areas specifically noted where U.S. experience and expertise might be brought to bear in the Senegal River Basin were environmental assessment; organization, management and training of the OMVS Secretariat; agronomic research; alternative methods of irrigation; and overall river basin planning to test if the experience gained in the U.S. Bureau of Reclamation's experience in the southwestern part of the United States would be germane to this region of Africa. Throughout the U.S. Delegate's presentation and subsequent commentary on other issues, the primary interest of the USG in food production in the basin was underlined. It was made clear that the USG would not seek to participate in any of the major mainstream infrastructure projects.

The fact that OMVS received \$160 million in pledges at its first Donors Conference was clearly an endorsement of the program it proposed. Most donors view the development of the Senegal River Basin within the context of the rehabilitation of the Sahel region, so that

probably this amount of pledges would not have been achieved two years earlier before the Sahel drought had drawn so much attention to the area. However, many of the pledges were conditional, and a discouraging factor during the year that has elapsed since this conference has been the inability of the OMVS Secretariat to pursue, pattern and refine these pledges into specific multilateral funding schemes for major projects.

B. Strategy Outlined in the CWR DAP

The basic objective of the OMVS is to develop the resources of the Senegal River Basin so these resources may be used to free the population of the member states from recurring cycles of drought and hunger. AID's strategy for the Sudano-Sahel region places high priority on supporting feasible water resource development programs which promise to break the water shortage constraint on food and livestock production without damage to the ecology of the area. Given this coincidence of interests and objectives, AID has viewed the development of the Senegal River Basin on the westernmost flank of the Sudano-Sahel zone as an important corollary undertaking within the overall rehabilitation effort to rehabilitate that zone. If further encroachment of the desert is to be arrested, the river basins of the Sudano-Sahel region should serve as a first line of defense. The Senegal River appears to be the first of these about to receive a major infusion of capital to realize its vast agricultural potential.

Vegetation  
loss  
from

Within the AFR/CWR FY 1975 Development Assistance Program Conclusions and Project Recommendations, pp. 77-82 outline the basic USG interests and strategy in the Senegal River Basin. The basic strategy discussed there has been adhered to in proposed USG activities discussed with the OMVS and pursued to date, and is furthered in the new activity proposals presented here for FY 1977. As stated in the DAP:

"The United States has an opportunity to play a critical role in helping in these areas of supplementary investments to the basic infrastructure, thereby enabling this infrastructure to have the intended effect on the food and other human needs of West Africa. The U.S. is not likely to participate directly in the financing of the two dams, nor to a large degree in the navigation infrastructure in which Canada has expressed interest. There are four areas, however, in which the U.S. has special expertise and interest: organization and management of the OMVS, training at all levels in both OMVS and the individual countries, environmental safeguards, and agricultural research and development. If the United States moves to play a positive role in the Basin's development, i.e., indicates its support for the objectives of the OMVS and its willingness to participate with both technical and capital assistance, the U.S. through these areas of activity can have a substantial impact on the returns from the entire investment. U.S. inputs in these and related activities over five years might total \$50 million, still a small portion of the total investment expected."

USG  
role

At the time of this writing the two main infrastructure projects which will change and regulate the regime of this river are under active discussion. It appears that a funding scheme for the Diama (Delta) Dam has been patterned, with France being the principal donor and the governments of Iran and Kuwait participating. Reportedly the Diama Dam is now going into a final design stage by French engineering firms, with construction scheduled to begin sometime in CY 1976. Financing of the Manantali Dam appears somewhat less certain. The Peoples Republic of China has been studying this project for the past three years, and following the report of their project design team (which was favorable) in April of 1975, the PRC has not sought to clarify its position regarding eventual financing of the project.

Uncertainty regarding the upstream regulatory dam could have an inhibiting effect on the development of irrigated perimeter projects upstream from the reservoir of the Diama (Delta) Dam, which will be able to provide water for some 30,000 hectares. All other perimeter projects are undertaken in anticipation of upstream regulation coming into effect with the next ten years, which is required for the double cropping for which they were designed. The Manantali Dam will probably take at least seven years from its design to its completion.

C. Activities Discussed, Studied and Undertaken with the OMVS

Following the USG offers of technical assistance made at the first OMVS Donors Conference in July 1974, AID has been attempting to refine these proposals into specific project undertakings. The following is a summary of results to date:

1. OMVS Agronomic Research - A grant of \$960,000 was made in FY 1975 to support and expand ongoing OMVS agronomic research activities. This grant includes \$600,000 for the procurement of agricultural and scientific equipment, pumps, irrigation material, etc., and \$300,000 for local budget support of the three OMVS Research Centers located at Guede, Senegal; Kaedi, Mauritania; and Same, Mali. The AID grant was undertaken in conjunction with UNDP and FAC support of these centers and related experimental plots on perimeters neighboring each.
2. OMVS Organization, Training and Staff Support - A management and training advisory team from the U.S. engineering firm of Stevens, Thompson and Runyan, Inc. went to the OMVS Secretariat and member countries in February 1975. Their preliminary report on proposed AID assistance in operations and management of the OMVS Secretariat, and the training of its personnel has been the subject of discussions since it was submitted in March. It was subsequently refined to incorporate the views of the OMVS Secretary General, and a final report submitted in June.

The UNDP is undertaking a \$1.0 million staff support project of the OMVS Secretariat, and other nations have also been requested to provide assistance in particular aspects of management and operations. The UNDP has asked the World Bank to serve as Executing Agent for its program, and the World Bank is now negotiating such a possible role with the OMVS Secretariat. AID is awaiting the outcome of these negotiations to pattern its assistance to complement that of other donors. Presumably the World Bank's serving as Executing Agent for all such assistance would provide assurance that there would be no duplication or overlap of individual donor activities.

3. Investigation of an Irrigated Perimeter for Possible Capital Financing - In February 1975 AID sent a Project Identification Team to Senegal to investigate the possibility of participation in an irrigated food production project in the river basin. The DAP specified that within the OMVS, Senegal was at this time the only member state with an experienced organization (SAED) which has the capability of managing irrigated perimeters. Accordingly the investigation was limited to the Senegal side of the river. The GOS attached highest priority to the development of an irrigated perimeter at Matam, the first major population center in the upper basin. The team concentrated its efforts there, while not excluding other possibilities in the middle and lower basin. The PRP drafted in the field by the team served as the basis for a series of EPRC reviews, from which has come a Scope of Work for an in-depth investigation of the 7200 hectare perimeter at Matam. The Scope of Work requires some 66 man-months of input from nine different disciplines to be completed over eight months. The final product, if positive in its findings, should serve as the basis for a possible \$15-\$20 million loan. AID would only consider participating in a project of this scope jointly with one or several other interested donors.
  
4. Environmental Assessment of the Senegal River Basin - Initially it was thought that each of the major infrastructure projects on the mainstream could be evaluated separately regarding its individual environmental effects. AID was especially concerned at the speed with which the Diana Dam and the Manantali Dam were progressing, with no apparent in-depth analysis of their effects on the human, animal and plant life in the basin. The former is already in a design stage. In March 1975 AID sent a multisectoral team to draft the terms of reference for an environmental assessment of the basin. Considering the state of this river and the magnitude of effects that each of the major projects will produce upon it, the team established that no single undertaking could be studied by itself from an

environmental standpoint. The composite effects of the major undertakings envisaged in the Indicative Basin Plan are enormous, so the team chose to draft Terms of Reference for an Environmental Study which will address all of the basin below the Manantali Dam. A request for Expressions of Interest from U.S. firms interested in undertaking this two-year study will be published in August 1975. The OMVS will participate in the selection process with AID, and the full contract team should be in the field by early CY 1976.

5. OMVS Multisector Loan - Most recently preliminary discussions were held with the OMVS Secretary General regarding a possible AID loan to be made to this regional organization. As noted, the Convention and Statute establishing the OMVS allow it to borrow funds with its member nations serving as guarantors. All loans made to date for basin activities have been undertaken between the donor and recipient nation where the project was located. The preponderance of these have been in the agricultural sector in Senegal. This proposed loan would allow the OMVS as a regional organization to attempt to correct some of the imbalances becoming more and more evident in the apportionment of development projects to date. While multisectoral in nature, the activities discussed on a preliminary basis would essentially be supportive of, or complementary to, agricultural projects. Further discussions followed by project identification and design teams will take place during the next twelve months, with a view to completing a loan paper during FY 1977.

IV. SUMMARY TABLES

Summary Table - OMVS  
Fiscal Year 1976  
(\$000)

	F&N	PP&H	PEHR	SDP	SCO	Dev. Asst. Subtotal	Support. Ass't.	Total
<b>ONGOING GRANTS:</b>								
Agronomic Research - Irrigated Forage Crops 625-11-120-616 (a)	500							500
Subtotal	<u>500</u>							<u>500</u>
<b>NEW GRANTS:</b>								
Organization, Manpower & Training 625-11-755-619			(600*)					(600*)
Management & Staff Support 625-11-755-620			845					845
Environmental Assessment 625-11-995-617	(2500*)							(2500*)
Study of Matam Perimeter 625-11-190-618	(625*)							(625*)
Subtotal	<u>(625*)</u>		<u>845</u>					<u>845</u>
<b>LOANS:</b>								
Development Loan for Irrigated Perimeters	15000							15000
Development Loan for Irrigated Perimeters - Possible Addl. Subtotal	<u>5000</u>							<u>5000</u>
	<u>20000</u>							<u>20000</u>
* Provided from Special Sahel Appropriations	(3125*)		(600*)					(3725*)



V. ONGOING ACTIVITIES



NARRATIVE DESCRIPTION OF IMPLEMENTATION PROGRESS

OMVS Agronomic Research Project, 625-11-120-616

A Project Agreement for \$960,000 was signed on June 27, 1975 providing \$600,000 for equipment, \$300,000 for local operating expenses, and \$60,000 for a technician's salary for one year. The equipment list was developed with OMVS during the past nine months, and is designed to give the three OMVS research centers (Guede, Senegal; Kaedi, Mauritania; Same, Mali) the wherewithal to expand the areas of test plots at these stations and to undertake applied research under field conditions at irrigated perimeters being developed in neighboring areas. The local operating expenses will cover the costs of implementing these expanded research programs. Both of these inputs were designed in consideration of UNDP and FAO participation in these programs. The equipment technician is now being recruited, and the most likely candidate is ready to proceed immediately. He will also assist in the bilateral program in Senegal, and sharing his services on this basis appears both feasible and economical. He should arrive within the next month. His first task will be assisting in the selection and delivery of equipment to be procured locally, particularly those items required for expanded programs which are now being implemented. During his twelve months at post he is to establish preventive maintenance practices, and logistical support and regular maintenance systems for the optimum utilization of this equipment. Prior to his departure he will visit the Afro-American Purchasing Center in New York to review the specifications and delivery schedules of all U.S. equipment.

There are two subprojects under OMVS Agronomic Research for which Project Identification Documents have been submitted as Appendices to this ABS. These will focus on ongoing traditional agriculture and animal husbandry practices in the hope of improving these while controlled irrigation schemes for which the initial AID assistance in agronomic research was designed are being realized. Both are predicated upon using the base facilities of at least one of the existing OMVS Research Centers, but with no disruption of ongoing programs at these centers. The Irrigated Forage Crop project will fit into current activities at the Kaedi Center, where an FAO forage expert has just been assigned. This project is planned for FY'76, and will be discussed in detail with all concerned in OMVS next month. The second subproject in Flood Recession Sorghum involves both IRAT and the OMVS Research Centers, and is planned to be phased into the OMVS program in FY'77.

ONGOING GRANT PROJECTS FOR THE ANNUAL BUDGET SUBMISSION

Project Name: **OMVS Environmental Assessment** Initial Obligation: **FY 1976** Date Prop/Revision:  
 Project Number: **625-11-995-617** Final Obligation: **FY 1976** Date last PAR:  
 Appropriation: **Special Sahel** Total Cost: **\$2,500,000** Date next PAR:

U.S. dollar cost. (in thousands)

	FY Obligations	FY Expenditures	Unliquidated as of:	FY 1976 and Interim Quarter Obligations by Cost Component/NOI								
				Actual FY 1975	Estimated FY 1976	Estimated Interim Qtr. Proposed FY 1977	Direct Aid '76 IQ	Contract '76 IQ	PASA '76 IQ	Total '76 IQ		
	- 0 -	- 0 -	6/30/75					2,500				2,500
	2,500	1,300	1,200 6/30/76									
		1,200	9/30/76									
		1,200	9/30/77					2,500				2,500

Contract/PASA Funding Periods

Name of Contractor	Contract/PASA Funding Periods			FY 1977 Obligations
	FY 1975 Obligations	FY 1976 Obligations	Interim Qtr. Obligations	
<b>Unknown</b>	- 0 -	2,500	- 0 -	- 0 -

	On Board Personnel			
	6/30 1975	6/30 1976	9/30 1976	9/30 1977
Direct Hire				
PASA				
Contract Participants		18	21	27
ST				
LT				

NARRATIVE DESCRIPTION OF IMPLEMENTATION PROGRESS

OMVS Environmental Assessment, Project 625-11-995-617

The team to establish the terms of reference for this two-year study went to the Senegal River Basin in March 1975, and completed their report by mid-April. The Secretary General of the OMVS circulated these terms of reference among the ministries concerned within the three riparian states, and their commentary and that of the technical personnel within the Secretariat was transmitted for incorporation in the final Scope of Work. Based on these completed Terms of Reference the Project Paper was completed in May and is now in the process of final clearance. A proposed Scope of Work has been completed and the invitation for Expressions of Interest from interested firms is to be published in Commerce Business Daily in early August.

This will be the most comprehensive environmental assessment undertaken by AID, and the most extensive conducted in an African river basin at this stage of its development. It will require some 565 man-months of work (375 professional and technical) being carried out over a two-year period. The four major undertakings in the basin which will have the greatest effects upon the regime of the river (the Manantali Dam; the Diama Dam; the Irrigated Perimeters; and Mainstream Navigation) are to be assessed in twenty-five areas of potential environmental impact. These areas of potential impact affect Human Health, Water Quality and Quantity; Plant and Animal Life; and Socio-Cultural Conditions in the basin. This assessment should provide the data base for the riparian nations to formulate rational policies and programs to capitalize upon beneficial effects and mitigate adverse ones in these four areas.

It is planned for both OMVS and AID to be involved in the selection procedure for and the monitoring of the U.S. firm undertaking this study. OMVS is to create an Environmental Division within the Secretariat for the transmission of the results of this study to its riparian members.



NARRATIVE DESCRIPTION OF IMPLEMENTATION PROGRESS

Study of Matam Perimeter, Project 625-11-190-618

A Project Identification Team visited Senegal in February 1975 to make a preliminary investigation of a possible site for capital investment in food production. Several possibilities were considered and the teams efforts concentrated upon the perimeter accorded highest priority by the Government of Senegal. This is an 8000 hectare perimeter located adjacent to the population center of Matam, in the upper basin. The team produced a Project Review Paper which was the subject of extensive review and discussion. The final ECPR in May recommended that an in-depth study be made based upon a detailed Scope of Work which has now been prepared. This Scope of Work is to be discussed with the OMVS and the GOS Ministry of Rural Development to obtain their concurrence. It will also be discussed with other donors who might consider joint participation with A.I.D. in financing this project.

As presently devised, the Scope of Work for this study requires 66 man-months of professional analysis of engineering, hydrological, economic, agronomic, topographic and sociological factors. The entire study is to be carried out over an eight month time span, and if positive in all of its findings, serve as the basis for an eventual loan. Given the nature and magnitude of this project A.I.D. would consider loan financing only with one or more other donors. As the study progresses other donors will be kept advised of its findings.

The request for proposals by interested U.S. firms should be published in the Commerce Business Daily sometime in August, 1975, and the team fielded this fall.

While Matam will be the area of concentration in reviewing possible sites for irrigated crops, others will also be open to consideration, especially perimeters in the delta and lower basin being studied by other donors.



## NARRATIVE DESCRIPTION OF IMPLEMENTATION PROGRESS

### OMVS Organization, Management and Training, Project 625-11790-619

In January a Management and Training Advisory Team from a private engineering firm visited the OMVS Secretariat and all member nations to survey the management and training needs of this regional organization. Actual and projected needs were delineated according to present and future functions of the Secretariat and the National Committees. The report showed the need for immediate operational assistance in certain functional areas and also outlined a proposal whereby a resident team involved in everyday operations could design a long-range training program. The draft report was transmitted to the OMVS Secretary General in March 1975, and his comments thereon received the following month. These comments were incorporated into the final report which was sent to AID/W in June.

AID is in general agreement with the concept of a resident design team for a long-term training program operating within the Secretariat to obtain sufficient impressions and data for a realistic program. This concept has yet to be discussed in detail with the OMVS, pending the outcome of negotiations now underway between the UNDP, World Bank and the OMVS regarding the UNDP technical assistance program providing needed operational expertise to the Secretariat. UNDP has proposed that the Bank serve as Executing Agent for this program. The OMVS Secretary General is to come to Washington the end of August 1975 to discuss such an arrangement in detail. It is felt that any interjection of an AID proposal in this field now might only complicate the negotiations underway. Once the latter are resolved, AID will be in a better position to fashion its own program to be sure that no overlap or duplication exists.

Also under this project continuing assistance from the U.S. Bureau of Reclamation will be financed through a PASA. BuRec will continue its refinement and strengthening of those sections of the Beyrard Synthesis where technical analysis was found to be weak. There were seventeen areas in the original synthesis where such weaknesses were identified. BuRec will concentrate upon those deemed most important for current planning and imminent projects.



NARRATIVE DESCRIPTION OF IMPLEMENTATION PROGRESS

OMVS Management & Staff Support, Project 625-11-755-620

This project is to provide regular funding of the long-range training and managerial needs of the OMVS Secretariat and the OMVS National Committees. The greater portion of these funds will be obligated based upon the recommendations forthcoming from the Organization, Manpower and Training Studies. These latter studies should produce initial recommendations by the 4th Quarter of FY 1976 in sufficient detail to proceed with the activities envisaged here. Some of the more specialized training requirements are already identifiable, such as training in Remote Sensing Technology and its Applications for crop predictions in the Senegal River Basin. These latter training courses are now being discussed, and certain ones of them should be undertaken by the 2nd Quarter of FY 1976.

APPENDICES



PROJECT IDENTIFICATION DOCUMENT (PID); OMVS AGRONOMIC RESEARCH  
SUBPROJECT (a) - IRRIGATED FORAGE CROPS

I. The Problem and the Proposed Response

A. The Problem

Every year millions of livestock gravitate into the Senegal River Basin as the dry season approaches and intensifies. With the severe drought conditions existing throughout this area during the past several years the grazing pressures on this basin have intensified to a point that it is now in a severe stage of ecological disequilibrium. It is beyond any hope of self-rejuvenation so long as the large number of animals left to range openly by the nomadic herdsmen on their traditional trail routes rely upon it as a principal source of water and forage. Unless this condition is rectified there can only be further deterioration of the environment which will compound itself until finally the entire basin reverts to the desert conditions which are now slowly encroaching upon it.

Thus far no system has been tested which would use the water of the Senegal River to increase forage crops for the nomadic herdsmen passing through the basin. To the contrary, the type of irrigated project which typifies agricultural development to date will only intensify the cleavage and animosities already existing between the sedentary farmers along the river and the herdsmen who converge upon them periodically. Until some method is devised which will allow a mutually complementary relationship to exist between these two groups, there is little hope of restoring an ecological balance in the area which will allow each to thrive.

B. The Proposed Response

Of the three OMVS Agronomic Research Stations in the basin (in Mali, Mauritania and Senegal), the station at Kaedi, Mauritania is ideally located where trail routes converge on the northern side of the river. The Mauritians are principally nomadic herdsmen, and up until now have not attached too high a priority to the development of their side of the Senegal River largely because such development to date presumes irrigated farming as opposed to animal husbandry. This subproject aims to develop and test a semi-sedentary irrigated livestock farming system for the nomads, particularly the Moors of the Western Sahel -- thus integrating those who have suffered the most from the drought into the overall irrigation program. Research and adaptation work is to be centered at Kaedi where the FAO and UNDP have on-going research and other base facilities. The OMVS Research Station here can and is being expanded to include forage

crops, and the personnel at the Center have expressed a willingness to participate in this pilot program. Informal discussions with the Agricultural Division Chief of the OMVS Secretariat indicates that the organization is favorably disposed to include such an important AID-sponsored activity as an important adjunct to its ongoing agronomic research program. The local FAO technicians assigned to the OMVS also lend their endorsement.

Under this project an AID Technician with two Peace Corps Volunteers will be assigned to Kaedi with the equipment and local cost support they require to carry out a three-year program. In this program they will first do a series of trials to determine optimum sorghum and forage varieties and practices. They will then work with pilot growers to test and demonstrate an optimum overall farming system, one which affords adequate income and return on investments while preserving something of the nomads' preferred way of life.

## II. Financial Requirements and Plans

The general plan and schedule of implementation is outlined on the attached PPT Chart.

The technician and equipment should be provided under a university contract, preferably with the same university or consortium which handles the Senegal Livestock Project. The technician should have experience with irrigated livestock production and good general agronomic and livestock training. Two PCVs should be on post through the life of the project to work closely with pilot farmers, not only on the irrigated perimeter but also out on the rangelands.

INPUTS & FINANCIAL PLAN (all figures in \$000s)	FY	1976		1977		1978		3 Years	
		FX *	LC	FX	LC	FX	LC	FX	LC
Livestock Technician	25	25	25	25	25	25			
University Contract Overhead	25			25		25			
Peace Corps Volunteers -- 2			30		30		30		
Participant Tours	10			10					
Vehicles -- 3	20								
Irrigation Equipment for 60 has. land preparation and installation	20			20		10			
animals and ox equipment			15		10		5		
			5		10		5		
Miscellaneous		5	10	5	10	5	10		
t o t a l :	105	85	85	85	65	75	255	245	
*Foreign Exchange & Local Currency		190		170		140		500	

### III. Development of the Project

The first and most urgent task will be the forage crop varietal and practice selection. A variety of forage crops and fertilizer applications should be tested during the first May-October season. This will serve as the basis of the pilot farm operation the following year. Some 5-10 hectares should be planted the first year.

Mauritanian and OMVS officials should be brought to the U.S. on participant tours during the first and second years, to observe sprinkler irrigation and rangeland management practices.

During the second and third year varietal and other trials should continue. In addition, pilot farm trials should be established and closely observed. Various alternative farm system arrangements should be tested. The PCVs should keep careful data and analysis of their operation, not only on the perimeter but on the rangeland. In the third year a whole Moorish community should be settled on irrigated land, to test fully not only the technical but also the social aspects. The final result should be a demonstration community that can convince other Moorish nomads of the feasibility and attractiveness of a semi-sedentary life.

It is proposed that a PRP be submitted for this project in October of 1975, and a PP in December 1975.

### IV. Issues of a Policy or Programmatic Nature

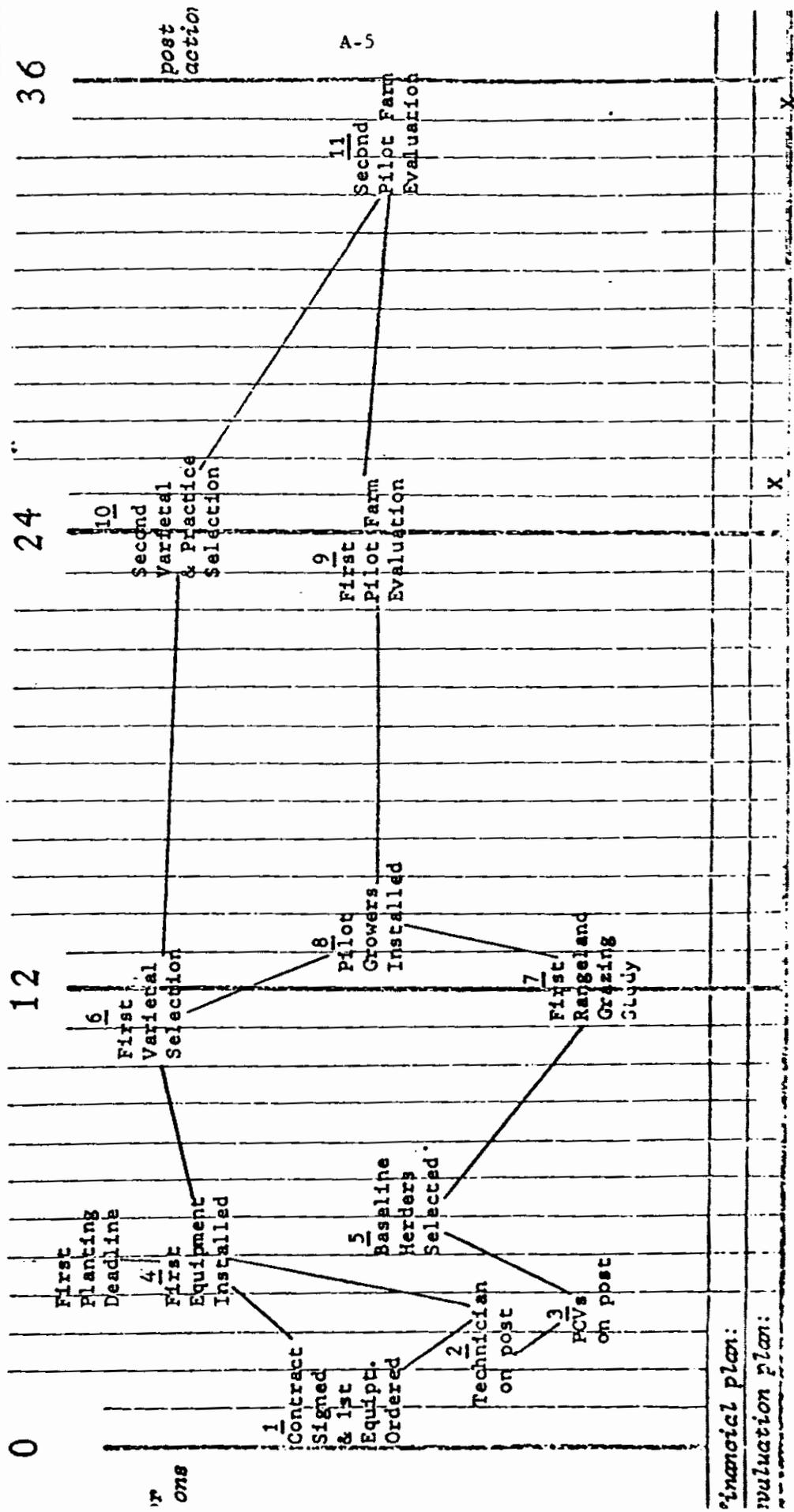
This project should be considered in terms of the main alternative that has been proposed: that state farms, on a commercial scale, grow forage to sell to the nomads. This would leave the nomads with substantially less income than the sedentary farmers. It might leave them with too little income to provide incentive for optimum exploitation of the Sahel rangelands. An integrated family-scale irrigated livestock farming system is important from the point of view of environment. Leaving the nomads out of the OMVS program will exacerbate inequities of income distribution in the region.

The most important impact of the whole OMVS program is the potential stabilization of the Sahel through the elimination of overgrazing. This requires research that is closely and carefully oriented to the nomad operating system.

The project addresses one major social issue: Can the nomads adapt to a semi-sedentary life? Opinions on this question are strong and polar. Foreign observers tend to argue that the Moors cannot be settled. Moorish officials in Mauritania tend to argue that they can. The balance of expertise would seem to argue that semi-sedentarisation is feasible. But the only way to find out is to try.

SAMPLE FORM

country: O M V S	project no: 625-11-120-6162	project title: ONVS AGRONOMIC RESEARCH: LIVESTOCK	date: 6/5/75	/ x / original / / revision#	PPT appr						
1976	1977	1978	1978	1978	1978						
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec



financial plan:  
evaluation plan:

AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT IDENTIFICATION DOCUMENT FACESHEET</b> TO BE COMPLETED BY ORIGINATING OFFICE	1. TRANSACTION CODE (X) ORIGINAL <input type="checkbox"/> CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE	PID DOCUMENT CODE
---	---	----------------------

2. COUNTRY/REGIONAL ENTITY/GRANTEE OMVS - Senegal River Basin	3. DOCUMENT REVISION NUMBER
4. PROJECT NUMBER 625-11-120-616	5. BUREAU A. SYMBOL AFR    B. CODE
6. PROPOSED NEXT DOCUMENT A. <input checked="" type="checkbox"/> PRP <input type="checkbox"/> PP    B. DATE   1   0   7   5	

7A. PROJECT TITLE - SHORT (STAY WITHIN BRACKETS) [ ARS-Improved Flood Recession Cultivation ]	8. ESTIMATED FY OF AUTHORIZATION/OBLIGATION A. INITIAL FY [ 7   7 ]    B. FINAL FY [ 7   9 ]
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7B. PROJECT TITLE - LONG (STAY WITHIN BRACKETS) [ OMVS Agronomic Research Subproject (B) - Flood Recession Sorghum Project ]	9. ESTIMATED COST (LIFE OF PROJECT) (\$000 OR EQUIVALENT, \$1 = ___)
PROGRAM FINANCING	
A. AID APPROPRIATED	AMOUNT 700
B. OTHER U.S.	
C. HOST GOVERNMENT	
D. OTHER DONOR(S)	
TOTAL	
	700

10. ESTIMATED COSTS/AID APPROPRIATED FUNDS (\$000)							11. OTHER U.S. (\$000)		
A. APPROPRIATION (ALPHA CODE)	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE	FIRST YEAR		ALL YEARS		A. PROGRAM TYPE	B. FIRST YEAR	C. ALL YEARS
			D. GRANT	E. LOAN	F. GRANT	G. LOAN			
FN			257		700				
TOTAL			257		700				
							TOTAL		

12. PROJECT GOAL (STAY WITHIN BRACKETS)

[ To raise the income and assure a better food supply for those now farming in the middle valley of the Senegal River, while laying the foundation for local institutional development. ]

13. PROJECT PURPOSE(S) (STAY WITHIN BRACKETS)

[ To increase yields of flood-recession sorghum on most of the acreage now planted by some 75-125% on most of the farms of the middle valley of the Senegal, and to establish viable village-level cooperative units. ]

14. PLANNING RESOURCE REQUIREMENTS (STAFF/FUNDS)

2-3 man-months, field visits by an agronomist, preferably a sorghum expert, and an agricultural engineer familiar with ox equipment - - and possibly an economist.

15. ORIGINATING OFFICE CLEARANCE SIGNATURE <i>Harry Patrequin</i> TITLE OMVS Coordinator		16. DATE RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MO. DAY YR.   0   7   2   9   7   5
		DATE SIGNED MO. DAY YR.   0   7   2   9   7   5

## PID: OMVS FLOOD RECESSION SORGHUM

Goal: To raise the income and assure a better food supply for those now farming in the middle valley of the Senegal River, while laying the foundations for local institutional development.

Purpose: To increase yields of flood-recession sorghum on most of the acreage now planted by some 75-125% on most of the farms of the middle valley of the Senegal, and to establish viable village-level cooperative units.

Planning Resource Requirements: 2-3 man-months, field visits by an agronomist, preferably a sorghum expert, and an agricultural engineer familiar with ox equipment---and possibly an economist.

## I. THE PROBLEM AND THE PROPOSED RESPONSE

A. The Problem

Approximately 120,000 hectares of flood-recession lands along the Senegal River are planted in sorghum each year. The amount varies considerably from year to year, depending on the height of the flood crest. This flood-recession sorghum is the principle source of food and income for the farming population of the middle-valley of the Senegal, in Senegal and Mauritania. It will remain the principle occupation of the valley even after the major upstream dam is built, until a large part of the projected irrigation perimeters have been developed. Even after the high dam has been built, its main function and benefit for many years will be a regularization of the flood-tide which will permit more planting of sorghum.

The varieties and the methods used on this crop are primitive. Yields are low, estimated at 400-600 kgs/ha. IPAT is reputed to have tested varieties some years ago which can almost double yields. Planting is done by punching holes in the ground with a rod, dropping in seeds and covering them over. Acreage and yields are lost by inability to plant fast enough to take full advantage of the recession of the flood waters. Tests have indicated that small applications of fertilizer would be highly profitable, but virtually no fertilizer is used on sorghum in the valley.

Over the years the research stations in the valley have made sporadic efforts to test improved varieties and methods and to present the results to the farmers. There has been no sustained effort on a significant scale, however, to prove out a complete package for this basic crop of the valley and to extend the package to the farmers. There are indications that the farmers have been reluctant to try any new varieties because of the risk element, since they depend on flood-recession sorghum for survival.

B. The Proposed Response

A complete package and a complete project is needed. The preliminary project plan is presented on the attached table.

The first phase is technical assistance, to select the best varieties and methods and prove them out, not only on test plots but on actual farms at different locations in the valley. This may or may not involve a significant agricultural engineering effort, to develop a suitable special ox-drawn apparatus for planting faster.

The next phase is mass outreach, including extension, credit, supply and marketing---all the essential services to enable small farmers as well as large farmers to take advantage of the improved technology. It may require a substantial network of extension agents, albeit with very limited training. Indeed, very limited training will be needed for agents of this basic-crop project. It may require supplies on credit, if fertilizer does prove profitable. It may include ox and equipment sales and financing. Or it may include custom plowing by tractor; conceivably a tractor might be more economical. On the marketing side, some modest storage facilities will enable the farmers to hold their surplus off the market right after harvest and wait for a better price.

## II. FINANCIAL REQUIREMENTS & PLANS

See the attached table. A three-year commitment of a Technical Assistance grant in FY 1977 is followed by a three-year commitment of Capital Assistance starting the next year or two. Note the Internal Rate of Return. If the package has an adequate return to interest one farmer, it should have a very high return for the total project.

The initial project grant should cover the cost of technical assistance plus the field budget of the project for the first two years. That should include full crop insurance, a guarantee that any farmer trying the new crop will get at least the going price on his traditional 500 kgs/ha. After the initial 200 farmers have demonstrated to their neighbors that the new varieties carry no new risks, the others should be eager to try them without subsidy or insurance. In the third year, OMVS or the riparian governments should take over the field budget. In the fifth year, non-concessional credit sources should take over the capital financing.

## III. DEVELOPMENT OF THE PROJECT

A team consisting of a sorghum expert, an ox equipment expert, and possibly an agricultural economist should visit the valley for three or four weeks to draft the PRP and PP.

## IV. ISSUES OF A PROGRAMMATIC NATURE

This will be the first mass-outreach project to work simultaneously on both sides of the river. As such it will raise some fundamental issues of binational policy coordination.

A good example is fertilizer subsidization. Fertilizer is now subsidized on the Senegal side but not on the Mauritanian side. The Senegal

subsidy policy is based on the needs of the Central Peanut Basin, not the Senegal Valley region. Such artificial price differentials can result in uneconomic movements of supplies and crops across the border. The project should cause Mauritania and Senegal to take some first easy steps to coordinate pricing and institutional policies in the Valley. These should eventually be conditions of a loan.

A variety of organizational issues will have to be settled, regarding the role of OMVS and various national institutions, the proper cooperative structure, and the appropriate extension network.

E. Kulp 7/28/75

OMVS FLOOD RECESSION SORGHUM PROJECT

	1977	1978	1979	1980	1981	1982	1983	
1 Increased Income	2	16	111	468	1,630	2,444	3,250	in \$000s, @ \$65 net per farm *
2 Increased Production	30	240	1,700	7,200	20,300	37,600	50,000	in tons of sorghum, @ .5/ha x 2 ha. per farm
3 Improved cumulative Farms new	30	240	1,700	7,200	20,300	37,600	50,000	4 10/vlg in stg A, 30/vlg in stg B, 40 in stg C
5 Villages in stage A in stage B in stage C	3	12	100	200	310	310	310	assuming project is suitable to 80 out of the 100 average farms in a village
8 Field Budget: Monteurs	no cost	number and cost in \$000s						
9 Asst. techniques	3	6	12	12	12	12	12	1/5 vlg @ \$2,000/yr (trained 1 yr in advance)
10 Subsidies etc.	2	6	12	12	12	12	12	1/10 monteurs @ \$4,000/yr + \$3,000 1st yr (car)
11 Misc. Overhead	6	12	50	50	10	10	10	total. crop insurance and free inputs to pilot farms
12 to total	36	104	252	352	302	302	302	higher officers of project carried on Ministry bgt.
13 Credit Expansion	1	4	30	110	262	346	248	@ \$20/new farm
14 Short-Term: Supplies		21	148	550	1310	1730	1240	@ \$100/new farm
15 Medium-Term: Equipment		21	(-5)	143	(-34)	516	(-144)	repaid over five years
16 Long-Term: Warehouses		2	8	70	140	230	230	@ \$700/vlg in stg B (\$30/mm x .7(.4 = 80%)
17 to total	1	27	181	696	1,569	1,860	741	
18 Technical Assistance	50	50	25	25	25	25	25	in \$000s
19 1 Agronomist 30 mos.	50	50	25	25	25	25	25	
20 3 PC Volunteers	15	15	15	15	15	15	15	
21 Contract Overhead	50	50	25	25	25	25	25	
22 5 Vehicles	30	30	25	25	25	25	25	
23 Participant Training	15	25	25	25	25	25	25	
24 Misc. Eqpt & Supplies	10	20	20	20	20	20	20	
25 Total Project Cost	257	349	523	1,048	1,870	2,182	1,043	in \$000s
26 Net Benefits	-255	-333	-412	-580	-550	262	2,207	1984 1985 1986 1987 et seq.
27 Cumulative	-255	-588	-1,000	-1,580	-2,130	-1,868	-433	1984 1985 1986 1987 et seq. through 1991
28 Financial US TA Project	257	349	90	700	1,020	1,880	740	Internal Rate of Return = 47%
29 US Dev. Loan			180	352	700	302	302	
30 Other: Budget			252	352	302	302	302	
31 Credit					550	1,880	740	

\* Individual Farm Program

hectares planted 2.0  
 yield (kgs) x500  
 production 1,000  
 price (= 21CFA) \$0.11  
 gross income \$110  
 less: supplies \$220  
 equipment -23\*  
 net income \$110  
 including interest \$175

AGENCY FOR INTERNATIONAL DEVELOPMENT <b>PROJECT IDENTIFICATION DOCUMENT FACESHEET</b> TO BE COMPLETED BY ORIGINATING OFFICE					1. TRANSACTION CODE (X1 APPROPRIATE BOX) <input checked="" type="checkbox"/> ORIGINAL <input type="checkbox"/> CHANGE <input type="checkbox"/> ADD <input type="checkbox"/> DELETE			PID DOCUMENT CODE		
2. COUNTRY/REGIONAL ENTITY/GRANTEE OMVS - Senegal River Basin					3. DOCUMENT REVISION NUMBER					
4. PROJECT NUMBER			5. BUREAU		6. PROPOSED NEXT DOCUMENT					
			A. SYMBOL AFR	B. CODE	A. <input checked="" type="checkbox"/> PRP <input type="checkbox"/> PP	B. DATE	MO.   0   2	YR.   7   6		
7A. PROJECT TITLE - SHORT (STAY WITHIN BRACKETS) [ OMVS Multisector Development Loan ]					8. ESTIMATED FY OF AUTHORIZATION/OBLIGATION A. INITIAL FY [ 7   7 ]    B. FINAL FY [ ] [ ]					
7B. PROJECT TITLE - LONG (STAY WITHIN BRACKETS) [ OMVS Multisector Development Loan ]					9. ESTIMATED COST (LIFE OF PROJECT) (\$000 OR EQUIVALENT, \$1 = _____)					
					PROGRAM FINANCING			AMOUNT		
					A. AID APPROPRIATED			10,000		
					B. OTHER U.S.					
					C. HOST GOVERNMENT					
					D. OTHER DONOR(S)					
					TOTAL			10,000		
10. ESTIMATED COSTS/AID APPROPRIATED FUNDS (\$000)						11. OTHER U.S. (\$000)				
A. APPRO- PRIATION (ALPHA CODE)	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE	FIRST YEAR		ALL YEARS		A. PROGRAM TYPE	B. FIRST YEAR	C. ALL YEARS	
			D. GRANT	E. LOAN	F. GRANT	G. LOAN				
				10,000		10,000				
TOTAL				10,000		10,000	TOTAL			
12. PROJECT GOAL (STAY WITHIN BRACKETS) [ To provide the Organization pour la Mise en Valeur du Fleuve Senegal (OMVS) capital funding for projects needed to maintain a viable infrastructure and balance in realization of the Senegal River Indicative Basin Plan. ]										
13. PROJECT PURPOSE(S) (STAY WITHIN BRACKETS) [ This loan will be made to the OMVS to allow this regional organization the wherewithal to plan and effect a wider degree of participation in project activities by all riparian nations in the Senegal River Basin. The funds will address regional and riparian infrastructure projects and riparian agricultural programs in the basin to assure that a more equilateral phasing of activities will reinforce riparian nations' interest and commitment to this regional scheme. ]										
14. PLANNING RESOURCE REQUIREMENTS (STAFF/FUNDS) Some preliminary work has been done on certain of the projects being considered. All require appraisal from an engineering, economic standpoint, and most as to their relevance to the evolution of agriculture in the basin.										
15. ORIGINATING OFFICE CLEARANCE						16. DATE RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION				
SIGNATURE <i>Harry Petrequin</i> Harry Petrequin										
TITLE OMVS Coordinator				DATE SIGNED		MO.   0   7   DAY   2   4   YR.   7   5				
				MO.   0   7   DAY   2   4   YR.   7   5						

## PROJECT IDENTIFICATION DOCUMENT (PID); OMVS MULTISECTOR LOAN

I. The Problem and the Proposed ResponseA. The Problem

The Organization pour la mise en Valeur du Fleuve Senegal (OMVS) is the regional coordinative agency created by the riparian states in the Senegal River Basin to assure balanced growth within this area through controlled use of the river's waters. Within the OMVS there are three distinct yet related levels of policy decision and program implementation: (a) the Conference of the Chiefs of State at which the Presidents of the riparian nations will discuss and agree on broad policy issues; (b) the Council of Ministers at which the ministries within the riparian states concerned with various segments of the OMVS program will translate policy into project proposals conforming to the agreed Indicative Basin Plan; and (c) the OMVS Secretariat, made up of technicians in various functional divisions who will implement projects and activities as directed by the Chief of State and Council of Ministers. The Secretariat, in effect, really manages the OMVS program under the direction of its Secretary General, and its managerial functions include technical, financial and organizational responsibilities and overall coordination.

The OMVS Indicative Basin Plan is viewed by prospective donors and potential recipients alike as essentially supplemental to national development plans, although there are obviously certain segments of each which interrelate and might even overlap. The coordinated development of the various segments of this plan is the responsibility of the OMVS, and it must strive for an overall balance in the benefits accruing to its member countries. At the same time it seeks to assure the equilateral apportionment of the water which can be used for irrigation, navigation and power generation, respecting the individual interests of each member country and their common goals as expressed in the OMVS Charter.

At this time most of the major capital investments in the basin have been in the agricultural sector, and the preponderance of these lie in Senegal. The development of irrigated perimeters in Mauritania has been hindered largely because of the lack of access roads into the basin from that side. In Mali the isolation of the western portion of that nation has also inhibited development of projects in this river basin. It is becoming increasingly evident that to counterbalance the growing disparities among the riparian nations, and to seek the greatest degree of coordination and complementarity among their projects in the basin, the OMVS Secretariat should assume an expanded role in the designation and financing of projects according to the Indicative Basin Plan. If not, the present rate of inequities in the pattern of investments to date will probably increase, with a resultant weakening of this

regional organization. The OMVS or similar regional coordinative structure has to be maintained if the development of this river basin is to follow a logical and balanced framework.

#### B. The Proposed Response

The Charter of the OMVS allows for loans to be made to that organization with each of the riparian nations serving as ultimate guarantor on a previously agreed proportionate basis. The Charter also allows for loans purely for agricultural production to be made on a bilateral basis between the donor and riparian nation concerned, and since most projects thus far have been in the agricultural sector, this has been the pattern to date. This project would provide loan funds to the OMVS for that organization to use to regulate imbalances which are now becoming apparent in the evolution of the Senegal River Indicative Basin Plan. Some amounts of this loan would be used for badly needed infrastructure projects to make certain portions of the basin in Mali and Mauritania more accessible for development and provide channels for marketing and migration. Some of these funds could be used for irrigation projects in Mauritania, to be undertaken in proximity to those on the opposite side of the river with a view to developing complementary marketing and perhaps managerial relationships. A portion of this loan would be used for the establishment of a much-needed geodetic network in the basin between St. Louis and Kayes. The funding of these and similar activities as determined by the OMVS will do much toward redressing current disparities among the riparian nations, and accord to OMVS the stature it requires to operate as a regional coordinative agency.

#### II. Financial Requirements and Plans

A \$10 million Development Loan would be made to the OMVS, the terms of which would be determined by the composite of projects it would finance as well as by the terms accorded each beneficiary nation by the IBRD. Each project will be scrutinized on its own merits, and one of the principal criteria for selection will be how any single or combination of these activities will achieve more balanced and equitable development in the realization of the Senegal River Indicative Basin Plan. As prescribed under the terms of the OMVS Charter, the riparian nations will serve as collective guarantors for the total amount of the loan.

#### III. Development of the Project

An assessment will be made of the rate of progress achieved and anticipated over the next five years in the Indicative Basin Plan. As this pattern of activities on the mainstream and in the riparian countries comes into focus, it should indicate actual and potential gaps in required investments in infrastructure and riparian projects. In all likelihood these will exceed the amount

of financing made available under this project, and probably the AID criteria in keeping with the current Congressional mandate will help in further refining the list. Once the AID criteria is applied in the screening process however, the ultimate selection of the final list of projects should be left to the OMVS Council of Ministers.

This loan will set a precedent in designating the OMVS to make the final determination of project activities to be financed under it. The organization is so structured that it can readily accommodate this procedure, which should do much to enhance its coordinative functions and stature among its member nations. Also this method of financing might establish a pattern in which other donors will participate, perhaps even in jointly financing with AID certain of the projects which will meet our mutual criteria.

Within the current listing of projects mentioned in the letter of July 3, 1975 from the OMVS Secretary General to AID confirming initial exploratory discussions of this possible loan, there are several preliminary suggestions. Some of these are in the feasibility stage of study, while others have yet to be evaluated. AID will be in a better position for project selection and evaluation following the next OMVS Donors Conference in October 1975. Following this meeting, a PRP should be developed by February 1976, and the PP by June 1976. Between the two, various types of engineering, agricultural and economic expertise will be required to evaluate possible project undertakings on their individual merits and relative to an overall scheme of sequential priorities in the Indicative Basin Plan.

#### IV. Issues of a Policy or Programmatic Nature

This will be a Development Loan to a regional organization now made up of three riparian nations of the Senegal River Basin, and which by the time the PP is completed could comprise five African nations (The Gambia has applied for membership in the OMVS, and Guinea has announced its intention to join). The mechanics of the loan will be somewhat unique in that each of the OMVS member nations will serve as first guarantor for whatever portion of the loan benefits that particular country, and collectively they will be ultimate guarantors for the full amount. A loan made in this fashion will strengthen the regional organization administering it, and the collective and cooperative esprit and experience of its member states. The USG will pioneer this arrangement with the OMVS and might be joined by other donors in this initial regional loan. In any event the arrangements made should establish a channel for other donors to follow, and as such might serve as an example for other African regional groupings.