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**RIVER BASIN DEVELOPMENT IN THE SAHEL**

Prepared for the U.S. Agency for International Development  
under Contract AID/afr-c-1407

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Boston, Massachusetts  
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APIO-077

This report consists of Parts I and II. Part I is the Terms of Reference (TOR) for the Study - Development of the Gambia River Basin. These TOR are the basis for the terms of the contract between Robert R. Nathan and Associates, Washington, D.C. and AID. The study commenced in July 1978 and was not completed at the time of this writing.

Part II is draft Terms of Reference (TOR) for a Five Year Program - Senegal River Basin. The TOR have been modified as a result of the first field revision in Dakar, Senegal on August 25, 1978. It has been decided to hold these TOR in abeyance until the completion of the Report to the Congress on Infrastructure for the Sahel and the preparation of a position on U.S. Support for the Diama and Manantali Dams.

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PART I

Terms of Reference

Study - Development of the Gambia River Basin

- I. Objective
- II. Scope of Work
  - A. Goals
  - B. Data and Information
  - C. Alternative Strategies
  - D. Analyses of Each Alternative
  - E. Comparative Analysis
  - F. Draft Report and Oral and Illustrated Presentation
  - G. Five Year Action Program
- III. Procedures for Effecting Flow of Data, Information and Experience from UNDP Mission to the Contractor
- IV. Relationships and Responsibilities
- V. Reporting Requirements
- VI. Operational Plan

## I. Objective

The objective of the Study is to prepare possible alternative development strategies for the generation of the orderly, staged and effective development of the water, land and human resources of the Gambia River Basin consistent with the perceived needs of the inhabitants of the Gambia Basin and with the objectives, plans and programs of the Governments of Gambia and Senegal, and of the Coordinating Committee for the Development of the Gambia River Basin (the Coordinating Committee) utilizing work initiated by the UNDP Multidisciplinary Multidonor Mission for the Development of the Gambia River Basin. The alternative strategies shall be addressed to the development of the directly productive sectors i.e. irrigated and rainfed agriculture, livestock, forestry and fisheries and to the necessary supporting infrastructure, such as roads, water resources and institutions and human resources. A strategy would be recommended from which a Five Year Action Program of suitable studies and limited capital investment would be proposed and scaled to meet the current and future needs of the basin population.

The study shall provide a conceptual framework and quantitative analysis of alternative development strategies which would enable the Coordinating Committee, after taking into account the specific interests of the member States, to determine the most appropriate development strategy for a program for the medium and long-term development of the Gambia River Basin.

## II. Scope of Work

### A. Goals

The specific goal of the respective Governments of Gambia and Senegal is to augment the per capita income of the rural population in the basin. Complementary goals are:

- to stimulate employment opportunities for the rural population;
- to provide for a more equitable distribution of wealth;
- to promote agro-industrial and industrial development not only in the study area, but also in other regions of the country.

### B. Data and Information

The Study shall be undertaken exclusively or nearly exclusively on the basis of existing data and information and whatever very limited data collection the contractor may effect for his purposes. The data, information, and studies, including sectoral studies and a synthesis report generated during the course of the UNDP Mission, shall be provided to the contractor by the Team Leader of the UNDP Multi-donor Mission (See Section III Below). The contractor shall review and evaluate all existing technical, economic, financial, sociological, and anthropological studies and plans, project reports, etc., which are relevant to the fulfillment of the objectives of this study.

C. Alternative Strategies

1. The contractor shall examine the basinwide resource base (physical, natural, human, environmental, institutional, infrastructural) and, within the constraints of available data, prepare a base case and at least three alternative development strategies for the Gambia River Basin. The Base case shall be based on the projection of historical development trends in the Gambia Basin without the benefit of the activities which would result from the adoption of any of the alternative development strategies. The base case would include the projection of historical trends as modified by new and/or imminent projects. The three alternative development strategies would be variants of the base case with the deliberate purpose of advancing development under varying sets of assumptions. The analysis shall cover the period from 1980 to 2000.

2. Three alternative developments have been described in general terms by the team. These existing alternatives shall be the departure point for the preparation of conceptual alternatives to be developed and analyzed by the contractor. All alternatives shall be displayed in a matrix format for ease of comparison.

Each alternative shall be analyzed, to the extent practical, using available data, to determine nutritional, economic and income distribution, financial, technical, environmental, health, social, and institutional feasibility. An accounting model will be used in this analysis to show the relationships.

The model which is based on dynamic simulation shall be provided to the contractor. He shall evaluate its utility and use it as a tool to facilitate the analyses. The consultant will refine the alternatives until he is satisfied that at least three of the alternatives represent reasonable development strategies under the various assumptions employed.

3. The contractor shall define the base case and the three alternatives in terms of the assumptions, and projected growth between 1980 and 2000 for the following directly productive sectors and their consequences for:

- rainfed and irrigated agriculture
- livestock
- forestry
- fisheries

and that of the necessary supporting infrastructure and resources to render the forecasts viable such as

- transport (both ground and river)
- water resources (regulation and distribution)
- institutions (e.g. planning, extension, agricultural, etc.)
- human resources.

4. The base case and the alternatives shall be:

- a.) Described narratively and in terms of technical viability and of the required inputs and expected output with assumptions clearly stated for each alternative.

- h.) illustrated graphically, to the extent possible, in terms of thematic overlays (See II(F) below).
- c.) defined and described quantitatively in terms of meeting criteria for nutrition, economic efficiency and equitable distribution of wealth, the agricultural sector, international trade, as well as the impact on the budget and recurrent costs of the Coordinating Committee member states. Likewise the alternative strategies shall be evaluated qualitatively and, to the extent possible, in quantitative terms on their impact on other economic and income distribution factors, the environment, health, sociology of the populations, and the institutions dealing with the basin.
- d.) discussed in terms of the constraints and issues for the execution of each of the alternative strategies, and in terms of sensitivity to the assumptions and factors governing each strategy.
- e.) presented in a matrix format which has been developed by the UNDP Multi-donor team and agreed on by the two countries and the donors. A copy of this format is Attachment A. Data from this matrix will be directly usable in the accounting model. The consultant will review the matrix format and suggest any changes or additions which may be useful to the study. The matrix format will be used to structure and present data to be used in developing and analyzing all alternatives.

D. Analyses of Each Alternative

1. Each of the alternative strategies shall be evaluated primarily on a quantitative basis and qualitatively in terms of the achievement of the goals (See II(A)) as measured by the six goal indices below or others that may be suggested by the contractor and agreed by the financing donors and the Coordinating Committee.

a.) Nutrition - The nutritional level for the rural and urban population in terms of annual amount by weight of per capita cereal and meat consumption and measured by annual per capita caloric and protein intake.

b.) Gross National Product (GNP) - Expressed in monetary terms and measured as the total annual goods and services produced by each country and based on the analyses of the flow of estimated direct and indirect costs of inputs for each strategy and of the generated income and benefits for the period of 20 years using internal rate of return and/or benefit/cost analysis.

c.) Agricultural Sector Contributions to GNP - Expressed in monetary terms and measured by subsistence and cash income for crops, meat, fish, milk, etc., and analyzed similarly to that in (b) above.

d.) Per Capita Agricultural Sector Contribution to GNP and Its Distribution - The distribution and equity characteristics as determined by who (member countries, regions, population groups) bears the cost and to whom the benefits will accrue.

e.) International Trade - Expressed in monetary terms and measured as the agricultural sector's net contribution to international trade.

f.) Capital and Recurrent Costs to the Governments of Gambia and Senegal - Expressed in monetary terms and measured as the capital and recurrent costs for agriculture and other supporting activities such as water resources, transport, institutions, etc., to the Governments for undertaking the alternative development strategies.

2. The contractor shall also undertake a complete and integrated assessment/evaluation of the alternative development strategies in terms of the impact of the strategies on (a) economics (in addition to that in (1) above), (b) the environment, (c) health, (d) sociology and (e) institutions of the Gambia River Basin. For the purpose of consistency the impact assessment of each of the alternatives on each of these five areas shall comply with the following format.

A.) Economics - (i) Summary description of the alternative from the economic point of view; (ii) Description of the positive and potentially negative effects and the identification of potential constraints (marketing, credit, etc.) in achieving the objectives of the alternative; (iii) Discussion of how the negative effects and constraints can be mitigated; (iv) Description, in quantifiable terms if possible, of the unavoidable economic consequences if the alternative were implemented; and (v) Preliminary recommendations from the above economic analysis on

whether or not the alternative is economically sound. If a determination cannot be made then recommend how additional information, data studies, etc. can be obtained and the costs.

- B.) Environment - (i) Description of the environment and discussion of the alternative as related to the environment; (ii) Identification and discussion of the effects and potentially adverse effects of the alternative on the environment; (iii) Description of mitigative measures to reduce the adverse effects of the alternative; (iv) Identification of the adverse consequences and their magnitude which cannot be avoided if the alternative is undertaken; (v) Preliminary recommendations on whether or not the alternative should be implemented and/or whether further assessment is required for additional information and their costs.
- C.) Health - (i) Description of the health situation in the area where the alternative may be introduced including the relevant characteristics to the analysis such as population and health conditions and facilities, diet, disease, water supply, sanitation, etc.; (ii) Description of the beneficial and detrimental consequences of the alternative on the immediate area and people in it in quantitative and qualitative terms when possible; (iii) Description of specific procedures to mitigate or avoid the adverse effects such as alternative sites land use, etc., and procedures

outside of the assessment capabilities of the analyst should be included; (iv) Description of unavoidable adverse consequences such as increased numbers of vectors, concentration of population in areas of inadequate sanitation or nutrition imbalance if the alternatives are undertaken and an estimate of their magnitude and estimates of their significance; (v) By weighting the evidence obtained from the analyses above, make preliminary recommendations on whether the alternative should be implemented or not and under what circumstances. If judgement is not possible, for the assessment and/or studies and their costs should be indicated.

D.) Sociology - (i) Description of the socio cultural environment (values, beliefs, social structure, organization, etc.) in which the alternative may be introduced. Assess sociocultural feasibility of the alternative by determining its appropriateness to the sociocultural milieu, determine how this milieu can best be utilized to facilitate the success of the alternative, match the alternative with the target group most likely to participate in it and/or benefit from it, identify social, political or religious obstacles to the implementation of the alternative; (ii) Assessment of the potential spread effects of patterns of leadership, mobility, the experience with previous projects and the nature of the innovations and the distances over which they

must be spread; (iii) Assessment of how benefits and burdens of the project would be distributed among different geographical, functional or communal groups and of the socioeconomic standings of these groups relative to the national or regional level of income and well-being based on the following criteria:

- access to resources and opportunities,
- access to employment,
- rural displacement, migration and urbanization,
- changes in power and participation.

(iv) Preliminary recommendation as to whether or not the alternative should be implemented and/or identification of new sources of information and their costs before a complete assessment can be made.

E.) Institutions - (i) Description of the functions, capabilities, staffing and facilities of the national, regional and project level institutions with direct and indirect responsibility for the planning and development of the directly productive rainfed and irrigated agriculture, livestock, forestry, and fisheries sectors and supporting infrastructure such as for transport and for water resources for the Gambia River Basin; (ii) Identification and discussion of the effects of the alternative on the existing institutions described in (i) above. (iii) Analysis of the needs for modifications to and/or reinforcement of existing institutions and/or the creation of new institutions for each alternative, and of the feasibility of these.

(iv) Preliminary recommendation on basis of the institutional analysis on whether or not the alternative should be implemented, and/or whether further assessment requiring more data and information are required and their costs.

3. The contractor shall conduct an analysis for each of the alternative development strategies on the sensitivity of the outcome of each of the strategies to changes in the most significant assumptions and factors governing each strategy.

E. Comparative Analysis

1. The contractor shall undertake an comparative analysis of each of the alternative strategies in terms of nutritional, economic including income distribution, financial, technical, environmental, health, sociological, and institutional aspects to provide an initial assessment of the various alternatives to advance the balanced and systematic development of the Gambia Basin for the general benefit of the resident population as expressed in Section II(C) above. The alternative strategies shall be compared against the base case as well as compared to each other.

The primary objective of this comparative analysis is to prepare a characterization of each of the alternative strategies and to present this information in a form to enable the Coordinating Committee policy-makers to determine and select the most appropriate development strategy for a program for the medium and long term development of the Gambia Basin. This characterization is to

emphasize the distribution and equity characteristics of these strategies as determined both by who (member countries, regions, population groups) bears the cost and to whom the benefits will accrue. The contractor must present the information clearly with supporting narrative to facilitate comparison among strategies for use by decision makers.

F. Draft Report and Oral and Illustrated Presentation

Based on the analyses above in (C), (D), and (E), the contractor shall prepare a draft Report consisting of the Alternative Strategies for Development and Comparative Discussion of Alternatives and Recommendations portions of the final report in 50 copies in the English language. The UNDP Multi-donor Mission Team Leader shall coordinate the timely preparation of the French version of the draft report to be financed by UNDP. The contractor shall prepare the requirements for an illustrated presentation including thematic maps, overlays, graphics and matrices to the Coordinating Committee and interested donors. The graphics shall be shown as overlays to give a visual representation of spatial relationships between agriculture, livestock, forestry, fisheries, and the supporting infrastructure for water resources and transportation for each alternative.

At a minimum graphics shall be developed for each alternative to clearly show the following:

- i. Land presently used and to be used in the future for rainfed agriculture.

- ii. Land presently used and to be used in the future potentially useful for irrigated agriculture.
- iii. Present and future forest lands.
- iv. Land presently used and to be used in the future for grazing.
- v. Groundwater in the basin.
- vi. Water resources infrastructure to serve each strategy.
- vii. Transport network to serve each strategy by road class, and navigable waterways.

The contractor shall participate as required in the oral presentation of the alternative strategies to the Coordinating Committee.

G. Five Year Action Program

In order to facilitate the transition from this study to the realization of the development strategy, the contractor shall prepare a detailed Five Year Action Program based on the analyses in (C), (D) and (E) above and on the draft Report, and on the agreed modifications resulting from the presentation of the draft Report to the Coordinating Committee. (See F above).

The contractor shall:

- 1.) Recommend a strategy for the development of the Gambia River Basin.
- 2.) Define a Five Year Action Program of studies, investigations and non-capital and capital projects and their costs required to execute the recommended development strategy.

This program should be presented in a sequential and time phased manner. It is expected that the early part of the program will primarily be technical assistance with some commodity components leading to the execution of capital and non-capital projects although pilot projects and the like could occur early on in the program. The contractor shall provide a general indication of what a second five year program could contain.

3.) Analyze the possible organization alternatives including the division of responsibilities among the Coordinating Committee for the Development of the Gambia River Basin and the agencies of the national governments.

- i. to undertake and coordinate comprehensive basin development;
- ii. to execute and/or to supervise the execution of the necessary macro and project specific planning studies;
- iii. to generate, compile, and store technical and economic data and information;
- iv. for pilot project experimentation;
- v. for the execution of major projects/programs.

4.) In full consultation with the Coordinating Committee after the oral and illustrated presentation and based on the analysis of (G. 3) above, prepare an institutional plan for the development of the Gambia River Basin and recommend staffing at the Coordinating Committee and in the appropriate national agencies to enable the effective planning for the execution of the selected development strategy. The date and time of the consultation shall be agreed jointly by UNDP and the Coordinating Committee.

5.) In full consultation with the Coordinating Committee prepare in as much detail as possible, job descriptions for all staffing positions and indicate which positions would likely be assumed initially by expatriates.

6.) In full consultation with the Coordinating Committee, recommend a short and long term training program, in as much detail as possible, to develop the capability of the Coordinating Committee and the national agencies to plan, manage and monitor the development of the Gambia River Basin.

7.) In full consultation with the Coordinating Committee and based on the requirements of the recommended program, develop detailed inventories of the material requirements (office space, equipment, etc.) and logistics for the Coordinating Committee and the national agencies to perform their functions.

8.) In full consultation with the Coordinating Committee identify the legal and institutional mechanisms required to achieve the smooth and coordinated execution of the selected development strategy.

9.) In full consultation with the Coordinating Committee prepare a budget for the Five Year Action Program of the program for the requirements for external assistance in compliance with the phased execution defined in (2) above.

10.) Prepare terms of reference, in as much detail as possible, for those components in the first five year phase of the program.

11.) Describe the constraints and the issues related to the execution of the selected strategy.

### III. Procedures for Effecting Flow of Data, Information and Experience from UNDP Mission to the Contractor

1. Immediately upon commencement of the contract period, a briefing of the consultant will be held at the Bureau of Reclamation in Denver, Colorado. Participating in this meeting will be the UNDP Multi-donor Mission Team Leader and other key team members and representatives of AID and UNDP. The purpose of the briefing will be (a) to introduce the contractor to the principles involved in the study; (b) elaborate and better explain the terms of reference and provide additional background on the study; (c) discuss the documentation and data available for review and use by the contractor and prepare a detail plan and methodology for the work; and (d) submit study materials to the contractor.

2. Pursuant to (1) above the UNDP Team Leader shall formally submit to the contractor the studies, analyses, data and information and other such data and information, prepared and compiled in a useful form, some of which may be in the French language, which has been collected or generated during the course of the UNDP Multidonor Mission for the Gambia River basin. See Attachment B for the list of materials including those portions of the final report other than the portion on Alternative Strategies for Development Comparative Discussion of Alternatives and Recommendations prepared during the course of the UNDP Multidonor Mission.

3. Subject to specific agreement with the financing donors the contractor is expected to utilize the following expertise made available by different donors for the UNDP Multidonor Mission up to the indicated maximum time that each can be made available. The UNDP Mission Team Leader shall provide the liaison between the contractor and the seconded experts.

<u>Name</u>	<u>Specialty</u>	<u>Donor</u>	<u>Maximum Estimated Time Available (Weeks)</u>
Yves Bajard	Groundwater, drainage water resource planning	CIDA UNDP	8 weeks
George Talbor	UNDP Team Leader Water Resource Planner	AID	8 weeks
Clark Ross	Economist	UNDP	10 weeks
Reter Weil	Antropologist	AID	3 weeks
Jacques Binet	Sociologist (Senegal)	FAC	3 weeks
Dante Caponara	Water law	UNDP	3 weeks
Robert Demers	Transportation & Navigation	CIDA	3 weeks
John Dunsmore	Agronomy (London)	ODM	3 weeks
William Hewitt	Land Classifier	AID	3 weeks
Fred Hubbard	Environmentalist	AID	6 weeks
Henke Moll	Agr. Economist	UNDP	3 weeks
John Ericksen	Agr. Economist Livestock Spec. (Abidjan)	AID	3 weeks
Willy Wagneur	Senegal Agricult- ture (Belgium)	UNDP	3 weeks
Jean Huygen	Forestry Spec. (Belgium)	UNDP	3 weeks

#### IV. Relationships and Responsibilities

1. The contractor shall work under the general administrative guidance and liaison of the UNDP Multidonor Mission Team Leader, George Talbott, of the Bureau of Reclamation for the execution of these terms of reference. Overall policy direction relating to the study content and methodology shall be determined collectively by the interested donors (UNDP, AID, CIDA, FAC and ODM). The Team Leader shall effect the appropriate liaison between the contractor and the interested donors. In this respect at least three meetings shall be arranged:

- a) at the briefing session for the contractor;
- b) for a review and approval of the inception report;
- c) just prior to the oral and illustrated presentation to the Coordinating Committee;
- d) other meetings as may be necessary.

2. The contractor shall direct all personnel assigned for undertaking the work outlined in these terms of reference and shall be responsible for the adequacy and quality of the work and reports.

#### V. Reporting Requirements

The contractor shall:

1. Prepare an inception report in 25 copies in the English language indicating (1) the detailed methodology to be employed, (2) work plan, (3) schedule and (4) a tentative outline for the final report. The inception report shall be submitted to the UNDP multidonor Mission Team Leader for distribution within the first 15 calendar days for

the commencement of the contract, and shall be the subject of evaluation and approval at the second meeting of the Team Leader, the contractor and the donors.

2. Within the first 90 calendar days from the commencement of the contract:

- i. Prepare a draft report in the English language consisting of the Alternative Strategies for Development and the Comparative Discussion of Alternatives and Recommendation portions of the final report and submit 25 copies to the UNDP Multi-donor Mission Team Leader for distribution to the Coordinating Committee and the interested donors. The Team Leader shall coordinate the timely preparation of the French version of the draft report which shall be financed by UNDP.
- ii. Prepare the materials for and participate as required in the oral and illustrated presentation of the draft report to the Coordinating Committee and to the interested donors. See (II) (F) above.

3. The final report shall be based on those portions prepared during the course of the UNDP Multi-donor Mission and the Alternative Strategies for Development and Comparative Discussions of Alternatives and Recommendations portions prepared by the contractor as modified as a result of the oral and illustrated presentation to the Coordinating Committee. The contractor shall have primary responsibility for the Alternative Strategies for Development and the Comparative Discussion of Alternatives and Recommendation portions of the final report,

editorial and substantive responsibility for the other sections with the Team Leader and responsibility for the completion of a coherent final text of all sections of the report. Within 30 calendar days after the notification by the Team Leader to prepare the final report, the contractor shall submit 50 copies of the final report in the English language to the Team Leader. The Team Leader shall coordinate the preparation of the French language version of the final report to be financed by UNDP.

#### VI. Operational Plan

The contractor shall be required to mobilize the appropriate staff, including those who participated in the UNDP Multidonor Mission within five calendar days of the official notification that he has been selected to undertake the work for fulfilling these terms of reference. The following is an illustrative work plan for the execution of the study.

Illustrative Work Plan

## Signing of the Contract and Start of Study

- S + 5 calendar days  
Briefing session for the contractor by the UNDP Multi-donor Mission Leader and interested donors.  
Study materials submitted to contractor. (See Part III)
- S + 15 calendar days  
Inception report submitted by contractor to and reviewed by the meeting of interested donors and the Team Leader.
- S + 80 calendar days  
Draft report submitted by contractor to and reviewed by the meeting of interested donors and the Team Leader.
- S + 90 calendar days  
Oral and illustrated presentation of draft report to Coordinating Committee in Banjul, Gambia. Contractor to participate as requested. Contractor avails himself of the opportunity to work out details of the Five Year Program after the presentation.
- S + 100 calendar days  
Team Leader notifies contractor to prepare final report.
- S + 120 calendar days  
Contractor submits final report in 50 copies in the English language for distribution to the Coordinating Committee and the interested donors and for translation into the French language through UNDP.

**ATTACHMENT A**  
**Illustrative Matrix**

	Base Case				Option a				Option b				Option c			
	Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
<b>AGRICULTURE - IRRIGATED AND RAINFED</b>																
<b><u>IRRIGATED AGRICULTURE</u></b>																
Purposes:																
Outputs:																
Inputs: Investments																
Inputs: Pre-Investments																
Inputs: Institutions - Education																
Inputs: Other																
<b><u>RAINFED AGRICULTURE</u></b>																
Purposes:																
Outputs:																

	Base Case				Option a				Option b				Option c			
	Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Inputs: Investments																
Inputs: Pre-Investments																
Inputs: Institutions - Education																
Inputs: Other																
Preliminary Input Analysis:																
1. Other Economics Factors																
2. Environment																
3. Health																
4. Sociology																
5. Institutions																

LIVESTOCK

Purpose:

Outputs:

25

	Base Case		Option a				Option b				Option c					
	Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Inputs: Investments																
Inputs: Pre-Investment																
Inputs: Institutions - Education																
Inputs: Other																
Preliminary Impact Analyses:																
1. Other Economic Factors																
2. Environment																
3. Health																
4. Sociology																
5. Institutions																

FISHERIES

Purposes:

Outputs:

26

	Base Case				Option a				Option b				Option c			
	Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Inputs: Investments																
Inputs: Pre-Investments																
Inputs: Institutions Education																
Inputs: Other																
Preliminary Impact Analyses:																
1. Other Economic Factors																
2. Environment																
3. Health																
4. Sociology																
5. Institutions																

	Base Case		Option a				Option b				Option c					
	Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
<b>FORESTRY, WILDLIFE, PARKS</b>																
<b>FORESTRY</b>																
<b>Purposes:</b>																
<b>Outputs:</b>																
<b>Inputs: Investments</b>																
<b>Inputs: Pre-Investment</b>																
<b>Inputs: Institutions - Education</b>																
<b>Inputs: Other</b>																
<b>Preliminary Impact Analyses:</b>																
1. Other Economic Factors																
2. Environment																
3. Health																
4. Sociology																
5. Institutions																

	Base Case				Option a				Option b				Option c			
	Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
<b>WILDLIFE AND PARKS</b>																
Purposes:																
Outputs:																
Inputs: Investments																
Inputs: Pre-Investment																
Inputs: Institutions - Education																
Inputs: Other																
Preliminary Impact Analyses:																
1. Other Economic Factors																
2. Environment																
3. Health																
4. Sociology																
5. Institutions																

	Base Case		Option a				Option b				Option c					
	Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
<b><u>BASIC INFRASTRUCTURE</u></b>																
Purposes:																
Outputs:																
Inputs: Investments																
Inputs: Pre-Investments																
Inputs: Institutions - Education																
Inputs: Other																
Preliminary Impact Analyses:																
1. Other Economic Factors																
2. Environment																
3. Health																
4. Sociology																
5. Institutions																

	Base Case		Option a				Option b				Option c					
	Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
<b>ANALYSES</b>																
<b>Achievement of Goal Indices:</b>																
1. Nutrition																
2. GNP																
3. Agricultural Sector Contribution to GNP																
4. Per Capita Agric Contribution to GNP and its Distribution																
5. International Trade																
6. Capital and Recurrent Costs to Gambia & Senegal and Senegal																
<b>Summary Impact Analyses:</b>																
1. Other Economic Factors																
2. Environment																
3. Health																
4. Sociology																
5. Institutions																

Base Case		Option a				Option b				Option c					
Gambia		Senegal		Gambia		Senegal		Gambia		Senegal		Gambia		Senegal	
1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000

Sensitivity Analyses:

Constraints:

Issues:

## ATTACHMENT B

List of Materials to be Submitted by  
UNDP Multi-donor Mission Team Leader to the Contractor

Michel DooKingue, UNDP	Letter dated 17 December 1976 inviting AID to participate in the "Study of the Development of the Gambia River Basin" with attached Terms of Reference.
World Bank	Appraisal of Rural Development Project, The Gambia June 2, 1976
AID	Development Assistance Program, The Gambia April, 1977
AID	Gambia Basin Development (110 pages)
Club of the Friends of the Sahel - Dry Farming Team	Republic of Gambia The Promotion of Dry Land Farming March, 1977
Michael Maddox	Draft Description of Present and Projected Situation in the Gambia River Basin May 18, 1978
Fred Hubbard	Guidelines for Assessment of Part IV, Alternative Development Plans - Gambia River Basin Study Report May 31, 1978
George Talbott	Status Report - Gambia River Basin Study May 19, 1978
Heather Warrack-Goldman International Nutritionists Denver, Colorado	Interim Report - Nutritional Analyses of Production targets - Gambia River Basin May 1-5, 1978
UN Multidonor Mission	UNOFFICIAL DRAFT Report on a Development Programme for the Gambia River Basin March - April, 1977
UNDP Multidonor, Multidisciplinary Mission	Final Report of UNDP Multidonor Mission to the Gambia River Basin - Undated Received at AID, Mid-June, 1978

Yves Bajard	Memorandum to Fred Rogrist Preparation of Development Strategy Model Outline - Gambia Basin Development May 8, 1978
Clark Ross	Memorandum to George Talbott April 11, 1978
Joan-Pierre Huygen	Development of the Gambia River Basin - A Forestry Study of the Basin February - March, 1978
UNDP Multi-disciplinary, Multi-donor Mission	Development of the Gambia River Basin - Programme of Action - Preliminary Summary March - April, 1977
UNDP Multi-disciplinary, Multi-donor Mission	Development of the Gambia River Basin (in three publications) Main Report - Definition of Options Annex 1 - Matrices - Notice Annex 1 - Matrices October 15, 1977
J. Robert Demers, Eng Montreal, Canada (CIDA)	Development of the Gambia River Basin - Multi-disciplinary Mission, March - April, 1977 Transportation Report
Willy Wagneur	Developpement du Bassin du Fleuve Gambia - Etude Agricole de la Partie Senegalaise du Bassin Ferrier - Mars, 1978
John Erikson	Livestock Development Gambia River Basin United Nations Multi-donor Mission

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August 18, 1978

PART II

(First field revision - Dakar -  
August 25, 1978)

DRAFT

TERMS OF REFERENCE

FIVE YEAR PROGRAM - SENEGAL RIVER BASIN

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ATTACHMENT B - KEY REPORTS TO BE EVALUATED

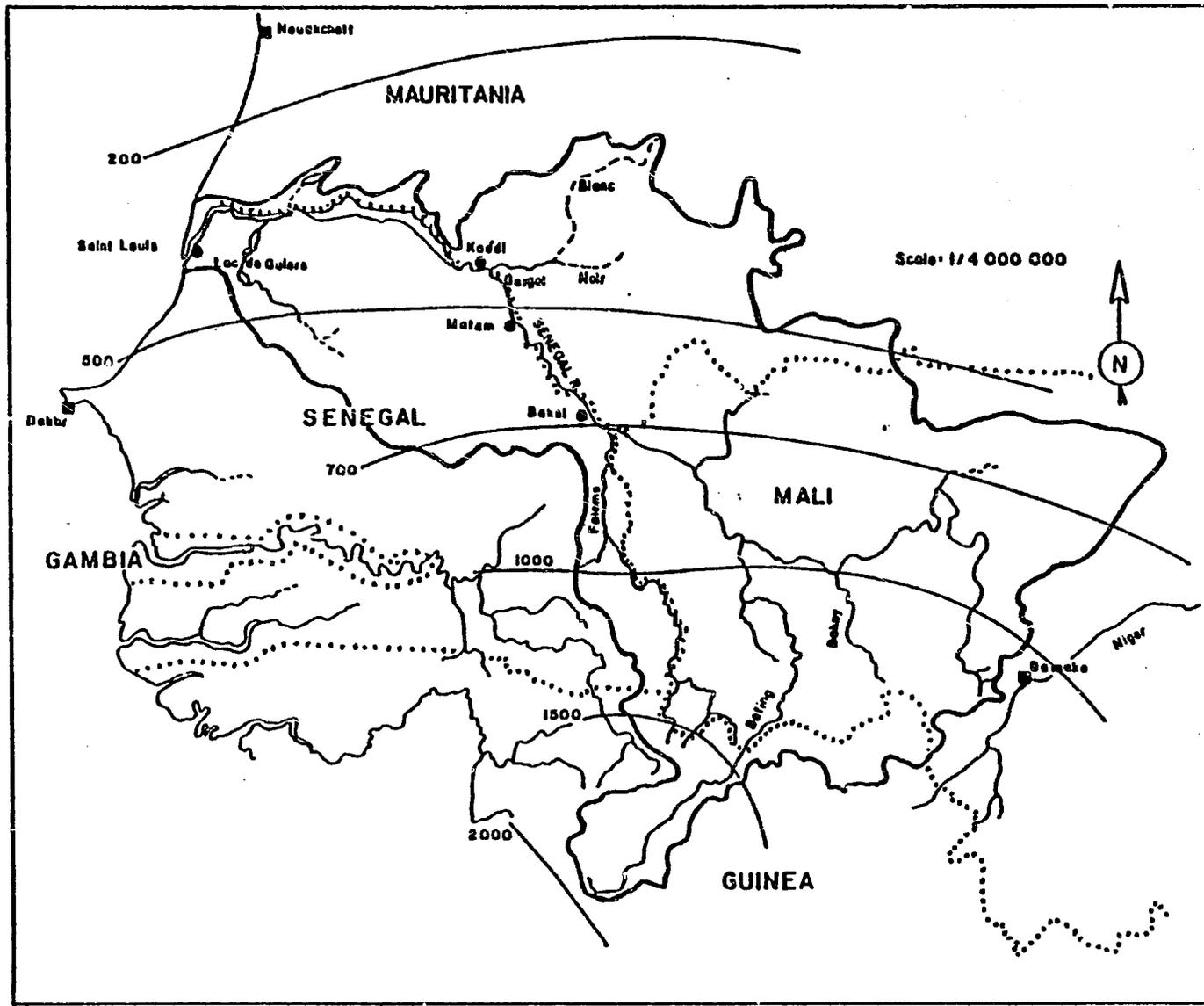


Figure 1. Map showing the location of the Senegal River Basin and isohyetal lines of average annual precipitation (in millimeters).

I. INTRODUCTION

The Senegal River, approximately 1800 km long and having a drainage area of about 290,000 km<sup>2</sup>, is shared by the four West African riparian countries of Guinea, Mali, Mauritania and Senegal. The source of water supply for the river is rainfall. The river rises and flows northeasterly from Guinea, bends and flows northwesterly through western Mali and then forms the border between Mauritania and Senegal for the remainder of its course to the Atlantic Ocean. The basin has an estimated 1.6 million inhabitants or about 16% of the total population of the four states consisting principally of farmers, herdsmen and fishermen. At present the Senegal River is used primarily for agriculture, river transport and in a limited way for serving municipalities and industry. In addition, hydro-electric power potential exists. Up to the present, the use and development of the waters of the Senegal Basin has been done on a country-by-country basis.

Beginning in 1964, the four riparian States created several successive institutions to coordinate the integrated development of the Senegal River Basin. A new organization, "Organisation pour la Mise en Valeur du Fleuve Senegal" (OMVS) was formed in 1972 consisting of Mali, Mauritania and Senegal. The OMVS Council of Ministers reconfirmed in its resolution No. 1/72/CM/SD that the first stage of the integrated development of the Senegal River Basin be based on a regulated flow of 300 m<sup>3</sup>/sec downstream from the proposed Manantali Dam and the design, construction and operation of the following works forming the regional infrastructure for the Senegal

River Basin:

- 1) a multipurpose regulatory and hydro-electric dam at Manantali,
- 2) a 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 points of call along the Senegal at Rosso, Richard Toll, Dagana, Podor, Boghe, Kaedi, Matam, Bakel, and Ambidedi and of the river bed sills. Subsequent agreements among the three States through the OMVS mechanism concern the common ownership and operation of the regional infrastructure and the joint guarantee of the states for the loans obtained by the OMVS for constructing the infrastructure. In addition, the OMVS States have agreed to prepare an integrated development plan for the Senegal Basin. The role of the OMVS in overall basin development has in general been limited to general agreements on the objectives of an integrated development plan, on the need for such a plan, and on the components, ownership and financial responsibilities for the mainstream infrastructure. However, efforts must be made to ensure that the pace of agricultural development will be sufficient to take advantage of the placement of the mainstream infrastructure or in fact contribute to justifying its feasibility.

Although a wider role for OMVS in harmonizing the development of the Senegal Basin has been visualized, it will be some time before OMVS can exercise any coordinating role in the agricultural

sector, for example. With respect to agriculture, the governments have created institutions (OPI for Mali, SONADER for Mauritania and SAED for Senegal) to conceive, design, construct and manage agricultural projects on their parts of the Senegal Basin. There is also an interest in establishing at OMVS a coordinating system which would make possible the harmonization of agricultural development in the three countries.

The development of the Senegal Basin will continue to involve a mix of national and regional activities, that is, the OMVS devoted to mainstream activities and the national governments occupied with the utilization of the waters of the Senegal River for productive purposes. There however may be movement towards more of a coordinating role for OMVS for the sectorial activities involving the three countries. AID programming will therefore have to reflect and support the evolving roles of the national and regional institutions as conceived by the governments of the OMVS States.

The OMVS has entrusted the World Bank to act as executing agency for a UNDP financed Global Study for the Senegal Basin which is scheduled to be completed by mid-July, 1978. Although separate economic evaluations have already been done for the construction of Manantali and Diama Dams, the Global Evaluation would have as its objective the comprehensive economic evaluation of selected integrated alternative strategies based on the phasings of both dams and of combining their functions for energy and irrigation development including the transition from flood recessional to irrigated agriculture, the recharging of the lakes and depressions, river transport and

flood control. The outcome of the Global Study would be the formulation and evaluation of alternative optimum development strategies for fulfilling the development of the Senegal Basin.

AID has had the difficulty of establishing a viable program for assistance to the development of the Senegal River Basin which meets the requirements of the riparian States, OMVS and the roles which the riparian States assign to themselves and the OMVS and the criteria of the OMVS Development Plan and the programmatic and organizational requirements of AID.

Among the current AID activities directly associated with the development of the Senegal Basin are:

- OMVS Environmental Assessment (625-0617)
- OMVS Agronomic Research II Project (628-0605)
- OMVS Data and Institutional Development (628-0620)
- OMVS Senegal River Basin Systems Development (628-0608)
- Small Irrigated Perimeters (Bakel), Senegal (685-0208)
- SAED Training, Senegal (685-0218)
- Agricultural Sector Analysis, Senegal (685-0223)
- SODESP Livestock Production, Senegal (685-0224)
- Health Surveillance, Senegal (685-0225)
- Diagambal Irrigated Perimeter, Senegal (685-0228)
- Matam Irrigated Perimeters, Senegal (685-0229)
- National Plan of National Resources, Senegal (685-0233)
- Senegal Cereals Production - Phase II, Senegal (685-0235)
- Land Use Inventory, Mali (688-0205)
- Agricultural Officers Training, Mali (688-0207)

- Rural Health Services Development, Mali (688-0208)
  - Integrated Agricultural Education and Research, Mali (688-0211)
  - Kayes - Niore Road, Mali (688-0212)
- 
- First Region Pilot Development Project, Mali (688-0215)
  - Renewable Resources Management, Mauritania (682-0205)
  - Rural Assessment/Manpower Survey, Mauritania (682-0211)
  - Grain Services System, Mauritania (682-0210)
  - Project Management, Development and Training, Mauritania (682-0218)
  - Arid Lands Institute, Mauritania (682-0213)
  - Mauritania Rural Roads, Mauritania (682-0214)
  - Village - Based Perimeter Development, Mauritania (682-0216)
  - Strengthening Mauritanian Planning Capacity (682-0217)

## II. OBJECTIVES

1. Critically review the adequacy of basin-wide planning, management and development of the land, water and human resources of the Senegal River Basin and in particular with respect to the technical, economic, financial, sociological, environmental, health and institutional feasibility of the proposed plans of the OMVS and its Member States to develop the mainstream water resources infrastructure in the Senegal Basin.

2. Undertake a broad screening analysis of possible alternative development strategies for the downstream areas commanded by the Manantali and Diama Dams. The screening level analyses of alternatives and the program proposal for AID assistance shall focus on the agricultural/rural/transport sector. Upon completion of the screening level analysis, the contractor shall work with the OMVS, OMVS states and AID to prepare a five-year AID assistance program to the Senegal Basin consisting of national and regional technical and capital assistance programs and projects.

## III. SCOPE OF WORK

The program to be developed from the study shall be prepared on the assumption that the mainstream infrastructure, including Manantali and Diama Dams and their possible phasing, for the Senegal Basin will be established. The study shall proceed from the simultaneous needs of the farmer in the Senegal Basin and the requirement to match the pace of irrigation and agricultural/rural development in general with the establishment of the mainstream infrastructure.

The scope of work for the study is all of the tasks required to fulfill the objectives of the study as indicated in II above. The scope of work for the study shall culminate with the preparation of a proposal for a five-year AID assistance program for the Senegal Basin which shall be derived from the

results and conclusions drawn from the analysis of alternative strategies for the development of the basin.

The contractor's work shall consist of three phases. Phase I and II shall be undertaken consecutively. Phase III shall be implemented after the presentation and review of Phases I and II by the OMVS States, OMVS and AID and upon notification by AID for the contractor to commence Phase III or at the end of the seventh month, whichever occurs first.

A. Phase I - Assessment of Data Base and Recommendations for U.S. Capital Assistance Policy with Respect to the Financing of the Mainstream infrastructure in the Senegal Basin.

1. The contractor shall review and evaluate all existing technical, economic, financial, sociological/anthropological, environmental, health, institutional and other information including plans, studies, project reports, etc., which are relevant to:

(a) the rational integrated basin-wide planning and development of the Senegal Basin and in particular the mainstream infrastructure, and

(b) the planning and the development of the agricultural/rural/transport sector, including research and human resources development, and in power, health and institutional development, including staff training, data generation, management and planning and in the analyses of environmental and sociological consequences as all of these relate to agricultural/rural development.

2. The contractor shall critically review the adequacy of basin-wide planning, management and development of the land, water and human resources of the Senegal Basin and in particular with respect to the technical, economic, financial, sociological, environmental, health, and institutional feasibility of the proposed plans of the OMVS and its Member States to develop the mainstream of the Senegal River.

3. The contractor shall recommend, on the basis of the analyses in (2) above, how mainstream and macro-planning, management and development can be improved in the Senegal Basin.

4. Following from (2) and (3) above, the contractor shall make recommendations for a U.S. policy for capital assistance with respect to the construction of the proposed Manantali and Diama Dams which is consistent with Congressional legislation for ensuring that U.S. participation in infra-structural development in the Sahel is aimed at the rural poor. U.S. policy should also be in harmony with the objectives of the OMVS states and OMVS.

**B. Phase II - Formulation and Analyses of Alternative Downstream Agricultural/Rural/Transport Development Strategies.**

The contractor shall undertake Phase II in collaboration with AID, OMVS, the OMVS member states and other donors.

1. The contractor shall formulate alternative downstream development strategies for the planning and the development of the agricultural/rural/transport sector in the area commanded by the proposed mainstream infrastructure including Manantali and Diama Dams. These strategies shall focus on the agricultural/rural/transport sector.

The contractor shall address the goal of the respective Governments of Mali, Mauritania and Senegal, which are:

- (a) To provide and improve income for the maximum number of inhabitants in the Basin and neighboring regions;
- (b) To establish a more stable balance between man and his environment, not only as regards the Basin, but also over the widest area of the country, as far as the three Sahelian zone States are concerned;
- (c) To make the economies of the three States less vulnerable to climatic and external factors;
- (d) To accelerate the economic development of the three States and inter-state cooperation.

Existing alternative strategies, plans and programs now under consideration by the OMVS and the OMVS for the Senegal Basin shall be examined and shall serve as the departure point for the preparation of

conceptual alternatives to be developed and analyzed by the contractor.

The contractor shall present the information (assumptions, inputs, and expected outputs, constraints, etc.) for each strategy clearly with supporting narrative to facilitate the analysis for each strategy and for comparison among strategies for use by the decision-makers.

The strategies developed shall provide for operative mechanisms for data collection and assessment of possible economic and social impacts to be derived from water resources development. The information and necessary system will address: (1) the characteristics of the population in the basin area by location, ethnic type, number, income level, sources of income, means used for securing basic food and drinking water requirements and other traits; (2) commodities produced by all rural persons in the development area by type, amount, cost and alternate use (on-farm consumption, waste, barter, trade, etc.); (3) existing and potential markets for commodities produced, or that which will be produced in basin regions to be irrigated with markets categorized by customer type, locations (foreign and/or nearby and remote domestic), prices as these would influence commodity flows, returns to farmers and commodity processes and traders (with analyses of returns at various cost levels and related economic factors); and (4) food deficiencies (by crop type, e.g. grains, vegetables, poultry) of total rural population in basin area, and changes in diet.

2. With respect to (1) above, the contractor shall factor the perceived needs of the farmer into the alternative strategies. The contractor shall identify constraints on the water users, and in particular the farmers, to take advantage of the potential to be unleashed under the different alternative strategies.

3. In the formulation of the alternative downstream strategies, the

contractor shall evaluate the following in terms of their capacity to provide effective and timely support to integrated agricultural/rural planning and development of the Senegal River Basin. Deficiencies shall be identified, if they exist, and capital and technical assistance projects and project components prepared for:

(2) removing constraints to development within the agricultural/rural/transport sector as they may impede present and proposed increases in rural per capita and agricultural production. The analysis shall center on the farmer and on his needs to effect the transition from recession to irrigated farming practices in conjunction with the planned development of the mainstream water resources infrastructure. The analyses shall include but not be limited to:

- downstream irrigated agriculture infrastructure requirements;
- adaptive agricultural and sociological/anthropological research to define the needs and opportunities available to the farm community;
- the development of appropriate technology packages for both irrigated and rainfed farming;
- extension and training programs at the farm level for the application of improved water management and use technology;
- institutional development at the farm level, especially formation of water-user organizations at the system and sub-system levels;
- credit, storage, pest control, marketing, processing and distribution;
- removing transport as a constraint to present and likely to be achieved increases in agricultural production;
- transport development to serve the projected needs of the agricultural sector;

- preliminary road improvement designs;
- road maintenance programs in order to protect transport investments;

(b) meeting the agricultural/rural sectors demands for energy and power and, in particular, the demands for motive power for irrigation in the Senegal Basin.

4. The contractor shall analyze quantitatively to the extent possible at a reconnaissance level each of the alternative downstream strategies in terms of criteria for:

(a) economic efficiency based on the analyses of the flow of estimated direct and indirect costs of inputs and of generated income and benefits using acceptable economic analyses (e.g., internal rate of return, benefit/cost, etc.), at constant prices,

(b) the equitable distribution of benefits as determined both by who (member countries, regions, population groups, etc.) bears the cost and to whom the benefits will accrue,

(c) international trade expressed in monetary terms at constant prices;

(d) capital and recurrent costs to the Governments of Mali, Mauritania and Senegal expressed in monetary terms at constant prices.

5. The contractor shall also undertake an assessment of the impact of the alternative development strategies on:

(a) Environment - preliminary assessment of the net effects and potentially net adverse effects on the environment of the alternative and any proposed mitigative measures. The assessment shall be cognizant of the environmental assessment underway in the Senegal Basin financed by AID and being undertaken in compliance with the "Environmental Assessment Guidelines

Manual" published by AID.

(b) Health - preliminary assessment of the net beneficial and net adverse effects on the health standards on the immediate area and people in it as a result of the alternative and any proposed mitigative measures.

(c) Sociology - preliminary assessment of the socio-cultural feasibility of the alternative in terms of its appropriateness to the socio-cultural milieu (values, beliefs, social structures, organization, etc.) in which the alternative may be introduced.

(d) Institutions - from a description of the functions, capabilities, staffing and facilities of the national (e.g., OPI, SAED, SONADER), regional (e.g., OMVS) and project level institutions with direct and indirect responsibility for the planning and development of the mainstream infrastructure in the Senegal Basin and of the agricultural/rural sector and other sectors (e.g., transport, power and other relevant activities), assess in a preliminary way the impact of the alternative strategies on these institutions and/or suggested modifications and/or proposed new institutions required to successfully implement a given alternative development strategy.

6. The contractor shall conduct an analysis for each of the strategies on the sensitivity of the outcome of each of the strategies to changes in the most significant assumptions and factors governing each strategy.

7. The contractor shall undertake a comparative analysis of the ability of the alternative strategies to meet the criteria indicated in (4) and (5) above. The alternative strategies shall be compared against a base case as well as compared to each other.

C. Phase III - Preparation of a Five-Year AID Assistance Proposal and of Final Reports

After notification by AID to begin Phase III, or at the end of the seventh calendar month from the commencement of the contractor's work, whichever occurs first, and based on the draft Report for Phase II and on the results of the series of reviews by AID, OMVS and OMVS States, the contractor shall begin Phase III.

1. The contractor shall make a recommendation to AID as to which strategy for downstream development is more likely to meet the objectives of the study.

2. Based on the recommended strategy in (1) above and in collaboration with OMVS and OMVS states, the contractor shall formulate, at a general level, a framework plan for the development of the agricultural/rural/transport sector including supporting activities required to make the agricultural/rural/transport sector viable.

3. In collaboration with the OMVS and OMVS states, the contractor shall define a five-year program proposal of investigations, studies and technical and capital projects and their costs required to execute the recommended downstream development strategy. This program proposal should be presented in a sequential and time-phased manner. The contractor shall indicate what appear to be feasible initial capital projects whether at the mainstream, intermediate (i.e., spatially between the mainstream and the farm) or on the farm, which could be undertaken prior to the completion of the Manantali and Diama Dams. These would be complementary and consistent with the construction of Manantali and Diama Dams and could prepare water users to take advantage of the benefits to be derived from the placement of the mainstream infrastructure. The contractor shall indicate the general outline of a second five-year program.

(a) With respect to the first five-year program, the contractor shall design a basic and anticipatory data and information generation and management system or systems at the OMVS and possibly with the OMVS Documentation Center to serve as a dynamic data base for the analyses (technical, economic, financial, sociological/anthropological, environmental, health, institutional) and the planning necessary for the integrated development of the Senegal Basin and in anticipation of the data and informational needs for current, ongoing and future technical and capital projects. Special studies necessary for the development of the resources of the basin and not covered elsewhere in these terms of reference would be included also.

(b) The contractor shall also formulate programs for developing the institutional capability of the regional, national, and farm level institutions in the Senegal Basin in support of the development of the agricultural/rural sector for:

- planning and developing the agricultural/rural sector;
- factoring farmer needs into agricultural/rural planning and development, e.g., organizing social and economic surveys;
- adaptive research;
- the training from the farm level to the technical/managerial level in the OMVS member states and the OMVS itself;
- evaluating projects in the light of health/environmental and social considerations;
- planning and development of the transport sector and for the maintenance of the transport system; and
- factoring agricultural system power needs into overall power planning and development in the Senegal Basin.

4. Based on the recommended strategy and program from (1); to (3) above, and in collaboration with the OMVS states, OMVS and AID, the contractor shall formulate a five-year program proposal and process for AID technical and capital assistance projects and project components sequentially arranged with their costs and appropriately packaged in four sub-programs for bilateral assistance to Mali, Mauritania and Senegal and for assistance regionally through the OMVS mechanism. An indicative second five-year assistance program shall also be presented.

5. For the studies to be executed during the first five-year period, in compliance with standard feasibility criteria, the contractor shall include:

- an assessment of relevant previous studies and evaluation of the highest level of feasibility;
- terms of reference for the study;
- cost estimates for the study.

6. For capital projects whose execution would begin during the five-year period, the contractor shall include:

- an assessment of the current level of feasibility of the project (technical, economic, financial, sociological, environmental, health and institutional);
- a determination of pre-construction feasibility requirements;
- terms of reference for all component studies required to justify project implementation including feasibility criteria;
- requirements for architectural and engineering design;
- cost estimates to execute the projects.

7. With respect to proposed AID assistance the contractor shall prepare:

(a) project descriptions for all recommended technical and capital assistance projects and project components for AID assistance in the first five-year program, including priority follow-on terms of reference for studies required to advance the project/program to the investment stage;

(b) job descriptions for all recommended manpower requirements for institutional support recommended to be provided by AID assistance in the first five-year program; and

(c) other documentation required to meet AID project and program requirements.

8. Based on the proposed program for AID assistance, the contractor shall prepare a recommended conceptual policy framework over the next five- and ten-year periods for AID assistance to contribute to development of the land, water and human resources of the Senegal River Basin, both in terms of direct assistance to the OMVS states and assistance to the states through the OMVS mechanism.

#### IV. STUDY TEAM

A team of selected professionals shall be assigned to work over an eight month period with AID, OMVS staff and OMVS Member State officials to develop the components, projects and program requirements for fulfilling the objectives of this study including the preparation of documentation for meeting AID requirements. The contractor shall be required to mobilize the team and start work in Dakar within one month of contract signing. It is estimated that approximately 1,500 person/days of professional services will be required.

The team would be resident in Dakar, headquarters of the OMVS, under the direction of AID for the duration of the contract, but with formal and extensive consultation with the OMVS policy and technical level staff. Trips would be arranged as necessary to the OMVS Member States, Paris, New York and Washington for consultation and data/information acquisition.

The study team should include expertise in the following fields:

- Water Resources Planning
- Water Resources Infrastructure
- Water Resources Economics
- Agronomy
- Irrigation Planning and Engineering
- General and Agricultural Economics
- Irrigation Economics
- Transport Economics
- Transport Engineering
- On-Farm Water Management
- Sociology/Anthropology
- Environmental Science
- Public Health
- Institutional Management
- Data Management
- Writing/Interpreting

It is anticipated that the contractor may also have to evaluate aspects of geology, hydrology, hydraulic and structural design, soil science and power.

V. RELATIONSHIPS AND RESPONSIBILITIES

1. The contractor shall be responsible to AID for the conduct of the study for the fulfillment of these Terms of Reference. The study is to contribute to the continuing substantive dialogue between AID, OMVS and the OMVS Member States.

2. The AID/OMVS, Dakar office shall ensure that appropriate initial liaison and substantive interchanges are provided between the contractor and the relevant institutions and staff at OMVS, with the AID bilateral Missions in the Senegal Basin and with OMVS Member States for the orderly and effective execution of these Terms of Reference. It is crucial that the contractor develop close day to day working relationships with the OMVS and OMVS staff and technicians in order to ensure that there is a mutual and continual exchange of views on the tasks associated with the fulfillment of these Terms of Reference.

3. The AID/OMVS, Dakar Office, shall arrange the required meetings among the appropriate parties to effect the liaison and interchange described in (2) above and for the required presentations and reviews outlined in Attachment A.

4. The preparation of all AID documentary requirements (PIDs, etc.) shall be done under the direction of the responsible AID field offices (USAID, OAR and AID/OMVS).

VI. REPORTING REQUIREMENTS

1. An Inception Report outlining the work plan, schedule, methodology to be employed, initial observations and a critique of the data base shall be submitted to AID in 25 copies each in the English and French languages

before the conclusion of the first month from the start of work.

2. A draft report consisting of the recommendations and supporting data and analyses for Phase I as required in Section III above of these Terms of Reference shall be submitted to A/D in 25 copies each in the English and French languages before the conclusion of the third month from the start of work. A/D intends to review Phase I of the draft report and to transmit comments to the contractor within one month.

3. A draft report consisting of the recommendations and supporting analyses and data and information for Phase II as required above in (III) of these Terms of Reference shall be submitted to A/D in 25 copies each in the English and French languages before the conclusion of the fifth month from the start of work of this contract. A/D intends to review Phase II of the draft report and to transmit comments within two weeks.

4. Within one month of notification by A/D to prepare the final reports, or before the end of the seventh month from the start of work, whichever comes first, two separate final reports shall be prepared and submitted to A/D before the end of the contract.

(a) Based on the draft report for Phase I and on the agreed modifications as a result of the A/D reviews, the Final Report for Phase I shall be submitted in 50 copies each in the English and French languages.

(b) Based on the draft report for Phase II and on the agreed modifications as a result of the OMVS member States/OMVS/A/D reviews and the requirements for Phase III in these Terms of Reference, the Final Report for Phases II and III shall be submitted in 50 copies each in the English and French languages.

5. The contractor shall participate as required by A/D in the presen-

tation and review sessions of the work and reports associated with the execution of these Terms of Reference.

**VII. ILLUSTRATIVE WORK PLAN**

Signing of contract between contractor and AID.

Start of Work.

S + one month	-	Submission of Inception Report.
S + 3 months	-	Submission of draft Phase I Report.
S + 4 months	-	AID review of draft Phase I Report and transmission of comments to contractor.
S + 5 months	-	Submission of draft Phase II Report to AID.
S + 5½ months	-	AID review of draft Phase II Report and transmission of comments to contractor.
S + 6 months	-	Presentation to and review by meeting of OMVS member States, OMVS and AID of Phase II Report.
S + 7 months	-	Contractor notified to prepare final Phase I Report and Final Phase II Report.
S + 8 months	-	Final Reports submitted to AID.

**ATTACHMENT A**

**PROCESS FOR THE PREPARATION  
OF A PROGRAM FOR AID ASSISTANCE TO THE SENEGAL RIVER BASIN**

Assessment	Analyses & Recommendations	Presentation to and Review By			Preparation of five Year AID Program Proposal	Definition of U.S. Position	Detailed AID Program (collaboration OMVS States, OMVS, AID/OMVS, AID Missions)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
of the adequacy of the data and information base for the planning and development of the Senegal Basin	Critical review of the OMVS proposed mainstream and infrastructure recommendations for U.S. Policy with respect to the mainstream infrastructure	for alternative downstream strategies for the development of the agricultural/rural/transport sector and related activities	AID of a) Phase I b) Phase II	OMVS States and OMVS of Phase II	Jointly by OMVS States OMVS, AID/W AID/OMVS, AID/Mali, AID/Mauritania, AID/Senegal of Phase II.	Contractor prepares five year AID assistance program proposal and Final Reports for Phases I and II.	for U.S. assistance to the planning and development of the mainstream infrastructure and for the agricultural/rural/transport sectors.	Identification components for AID technical and capital assistance. Preparation of five year AID assistance programs for Mali, Mauritania, Senegal and the OMVS.	Preparation of AID program documentation.
P H A S E I		P H A S E II			P H A S E III		P H A S E IV		

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KEY REPORTS TO BE EVALUATED

This list does not include all reports which the contractor will need to review but only those considered most important.

Global Evaluation of OMVS Program, A. Gibb., 1978

Evaluation Study Diama Dam, 1977, Gersar

Final Report, execution Study of Dam and Hydroelectric Plant, Manantali Dam, Groupement Manantali, 1978.

Socio Economic Study of the Senegal River Basin, Provisional Report, OMVS, 1978

Execution Study for Development of the SRB for Navigation, Lackner-Electrowatt, 1978

Hydroagricultural Projects in the Senegal River Basin, Rates of Development and Flood Regulation, OMVS, April 1977

Sketch of the Master Plan for First Generation Perimeters, (Horixon 1990) M. Juton, OMVS, June 1978

Hydroagricultural Study of the Senegal River Basin, Synthesis Report of Studies and Works, FAO, 1977

The OMVS Program, Presentation, Methods, and Means of Implementation, OMVS, May 1976

NOTE: Some of the above reports are in the French language.