

OFFICE MEMORANDUM

DATE: September 27, 2001

TO: Mr. Ken King, Assistant CEO, GEF Secretariat
Att: GEF PROGRAM COORDINATION

FROM: Lars Vidaeus, GEF Executive Coordinator



EXTENSION: 3-4188

SUBJECT: **Regional: Senegal River Basin Water and Environmental Management Project
(Guinea, Mali, Mauritania, Senegal)
Submission for Work Program Inclusion**

Please find enclosed the electronic attachment of the above mentioned Project Brief for work program inclusion. I am pleased to make this submission on behalf of the UNDP and the World Bank. We would appreciate receiving any comments by October 9, 2001.

The proposal is consistent with the *Criteria for Review of GEF Projects* as presented in the following sections of the Project Brief:

- Country Drivenness:
 - GEF Project Brief section *B3 (Page 8): Government Strategy* describes the extent of cooperation that already exists in the Senegal River Basin and the commitment to, and ownership of, the process and the present project by the four Senegal River Basin countries and by the OMVS (*Organisation pour la mise en valeur du fleuve Senegal*) which is the river basin organization established by three of the four riparian states three decades ago.
 - GEF Project Brief section *D4 (Page 28): Indications of Recipient Commitment and Ownership* describes the indicators of riparian commitment.
 - GEF Project Brief section *C1.5 (Page 19): Public Participation and Awareness*, and *Annex 6: Stakeholder Involvement and Participation in Project Formulation* summarize the project's explicit emphasis on local and regional participation and describe the involvement of a wide range of stakeholders in project design.
- Endorsement:
 - *Annex 4 (Page 61)* includes GEF National Focal Point letters of endorsement from Guinea, Mali, Mauritania and Senegal and from the High Commissioner of OMVS.
- Program Designation & Conformity:
 - GEF Project Brief section *A (Page 1): Project Development Objective* outlines the project objective;

- GEF Project Brief section *D6 (Page 29): Global Benefits Catalyzed by GEF Support* describes the project's conformity with GEF Operational Program 9, the "Integrated Land and Water Multiple Focal Area Operational Program."
- Project Design:
 - GEF Project Brief section *B (Page 2): Strategic Context* outlines the process of project preparation that included an extensive Stakeholder Participation Program, a preliminary Transboundary Environmental Analysis and Action Plan, the Root Cause Analysis and Environmental Priority Action by Country (*Annexes 6, 9, 10 and 11*).
 - GEF Project Brief section *C (Page 15): Project Description Summary* provides a description of the project design.
 - *Annex 2 (Page 51): Logical Framework Matrix* presents the logical framework which provides the structure for the design of the project.
 - *Annex 8 (Annexes Page 15): Project Implementation Arrangements* describes the management of the project.
- Sustainability:
 - GEF Project Brief section *D3 (Page 27): Lessons Learned and Recognized in the Project Design* recognizes that project sustainability is based partly on the incorporation of the described lessons learned in the project design.
 - GEF Project Brief section *F (Page 34): Sustainability and Risks* describes issues affecting sustainability and addresses critical risks.
- Replicability:
 - GEF Project Brief section *C (Page 15): Project Description Summary* describes the project activities, which will guide and provide a framework for additional sub-basin investment actions in the future.
 - GEF Project Brief section *C2 (Page 19): Key Policy and Institutional Reforms supported by the Project* describes specific policy and institutional reforms which will help this process.
 - GEF Project Brief section *D (Page 24): Project Rationale* emphasizes the incremental transboundary nature of the project and describes how it will initiate a broader programmatic process emphasizing replicability and sustainability.
- Stakeholder Involvement:
 - GEF Project Brief section *C1.5 (Page 19) Public Participation and Awareness* describes the public involvement strategy for the project including public information and awareness, civil society participation and scientific community involvement.
 - GEF Project Brief section *C2 (Page 19): Stakeholder Participation* and *Annex 6 (Annexes Page 3): Stakeholder Involvement and Participation in Project Formulation* summarize the project's explicit emphasis on local and regional participation, and describe the involvement of a wide range of stakeholders in the project design. This was coordinated by IUCN and involved a series of local and national meetings in all four countries.

- Monitoring & Evaluation:
 - GEF Project Brief section *C7 (Page 23): Monitoring and Evaluation Arrangements* describes the elements of the M &E program in accordance with World Bank and UNDP supervision rules.
 - GEF Project Brief *Annex 2 (Page 51): Logical Framework Matrix* provides explicit description of indicators for project performance in the column headed “Means of Verification”.
 - GEF Project Brief *Annex 8 (Annexes Page 15): Project Implementation Arrangements* describes the monitoring and evaluation events.
- Financing Plan:
 - GEF Project Brief section *E2 (Page 31): Project Financing* includes a detailed table that summarizes the project budget by component and by Implementation Agency. This shows details of the GEF funding of \$7.25 million and the initial non-GEF co-financing of \$12.6 million for a total of \$19.8 million.
 - GEF Project Brief section *E 1 (Page 30): Incremental Costs* summarizes the baseline and incremental costs analysis. The analysis is in Annex 1.
 - *Annex 1 (Page 38): Incremental Cost Analysis* addresses the issues of co-financing and includes the Incremental Cost Matrix.
 - *Annex 1.1 (Page 50) Budget Overview* provides a breakdown of expenditures.
- Cost-effectiveness:
 - GEF Project Brief section *D1 (Page 25): Project Alternatives Considered* addresses issues of effectiveness.
 - *Annex 1 (Page 38) – Incremental Cost Analysis* describes the baseline and presents the Incremental Cost analysis and explains how the project has been designed in order to be cost-effective in its intervention.
- Core Commitments and Linkages.
 - GEF Project Brief sections *B3 (Page 8): Government Strategy*, and *D: Project Rationale* outline the regional goals of the Senegal River Basin riparians and their commitment to the project and to its goal to provide an environmental framework for sustainable development in the basin.
- Consultation, Coordination and Collaboration between IAs:
 - GEF Project Brief section *C4 (Page 21): Institutional and Implementation Arrangements* and section *C5 (Page 22) Project Coordination and Oversight* describe the role and active cooperation of the IAs during project preparation and implementation. These sections specify the coordination arrangements to be made with other specified projects in the basin and the region.
 - *Annex 8 (Annexes Page 15): Project Implementation Arrangements* outlines the roles of the IAs in supporting the project.
- Response to Reviews:
 - *Annexes 3 (Page 55) and 3.1 (Page 60)* contain the STAP technical review and response to the review.

Please let me know if you require any additional information to complete your review prior to inclusion in the work program. Many thanks.

Distribution:

Messrs.: R. Asenjo, UNDP
A. Djoghlaif, UNEP (Nairobi)
K. Elliott, UNEP (Washington, DC)
M. Gadgil, STAP
M. Griffith, STAP (Nairobi)
Y. Xiang, CBD Secretariat
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Y. Vyas, AfDB

cc: Messrs./Mmes. H. Binswanger, (AFTRS); P. Patel (AFTPI) A.Kiss, C. Crepin, Y. Prevost (AFTES); L. Obeng, F. Cardy, I. Andersen, O. Badiane (AFTU2) D. Grey (AFTU1); A. Duda, A. Merla (GEFSEC); H. Ibrekk, M. Hatzios, R. Khanna, D. Aryal (ENV); ENVGC ISC, Relevant Regional Files

AFRICA

SENEGAL RIVER BASIN

WATER AND ENVIRONMENTAL MANAGEMENT PROJECT

(Global Environment Facility)

PROJECT BRIEF

PROJECT BRIEF

1. IDENTIFIERS :

| | |
|---|---|
| PROJECT NUMBER: | P064573 |
| PROJECT NAME | Regional (Guinea, Mali, Mauritania, Senegal): Senegal River Basin Water and Environmental Management Project |
| DURATION: | 4 years |
| IMPLEMENTING AGENCIES : | World Bank and UNDP |
| EXECUTING AGENCY: | OMVS |
| REQUESTING COUNTRY OR COUNTRIES: | Guinea, Mali, Mauritania, Senegal |
| ELIGIBILITY: | Eligible under para 9 (b) of GEF Instrument |
| GEF FOCAL AREA: | International Waters, OP 9. |
| GEF PROGRAMMING FRAMEWORK: | |

2. SUMMARY:

The objective of this project is to provide a participatory strategic environmental framework for the environmentally sustainable development of the Senegal river basin and to launch a basin-wide cooperative program for transboundary land-water management. This objective will be accomplished by:

1. **Capacity building:** Strengthening environmental and water resource management capacity in national institutions and in OMVS (*Organisation pour la Mise en Valeur du Fleuve Sénégal*) and OMVS national cellules and support for the full involvement of Guinea and OMVS member states in a cooperative agreement for sustainable water resources management in the basin.
2. **Data and knowledge management:** Supporting the improvement of the data and knowledge base for water resources management in the basin and the establishment of necessary monitoring and analysis on a sustainable basis, in close coordination with the *Observatoire de l'Environnement de l'OMVS*.
3. **Transboundary Diagnostic Analysis and Strategic Action Program:** Completing the basin-wide Transboundary Diagnostic Analysis (TDA) and a Strategic Action Program (SAP)
4. **Priority actions:** Based on the preliminary transboundary diagnostic analysis, carrying out specific on-the-ground priority actions through pilot activities.
5. **Public participation and awareness:** Establishing a public participation and awareness program for broader community and civil society involvement in development actions in the Senegal river basin.

3. COSTS AND FINANCING (US\$ MILLION):

| | | |
|-------------|--------------------|---------------------------------|
| GEF: | Project | 7.250 |
| | <i>of which: .</i> | <i>5.620 World Bank managed</i> |
| | | <i>1.629 UNDP managed</i> |
| | PDF (A & B) | 0.375 |
| | GEF Total | 7.625 |

| | | | |
|----------------------|--------------|--------|---------------------|
| CO-FINANCING: | World Bank | 1.500 | – Mali (P041723) |
| | | 8.570 | – Senegal (P041528) |
| | | 0.500 | – Guinea |
| | UNDP | 1.300 | |
| | OMVS | 0.500 | |
| | Countries | 0.380 | |
| | PASIE | 8.375 | |
| | Other donors | 10.985 | |

Subtotal Co-Financing 39.730

| | | |
|--|-------------------------------------|---------|
| NON-GEF PROJECT PREPARATION COSTS | Bank budget | 0.030 |
| | WB Norwegian Trust Fund | 0.060 |
| | WB Netherlands Trust Fund | 0.020 |
| | WB Canadian GEF Trust Fund | 0.135 |
| | WB IUCN | 0.100 |
| | Sub-total non GEF project prep cost | 0.335 |
| | | 308.750 |

4. ASSOCIATED FINANCING (US\$ MILLION)

5. OMVS & OPERATIONAL FOCAL POINT ENDORSEMENT:

Cheikna Seydi Ahamadi Diawara, High Commissioner, Organisation pour la Mise en Valeur du Fleuve Sénégal (OMVS)
27 September 2001

Kadiatou N'Diaye, Manager, National Environment Directorate, Guinea,
20 September 2001

Abdoulaye Kone, Chef de la Division, Convention sur les Eaux Internationales, Normes et Reglementations D.N.H., Mali,
25 September 2001

Cheikh Ahmed Ould El Khalifa, Director, Environment and Rural Management, Ministry of Environment and Rural Development, Nouakchott, Mauritania,
20 September 2001

Fatimata Dia Toure , Director, Department of Environment and Classified Facilities, Ministry of Youth, Environment and Public Hygiene, Senegal,
24 September 2001

6. IA CONTACT:

Christophe Crepin
Tel. +1 202 473 9727
E-mail: ccrepin@worldbank.org

LIST OF ACRONYMS

| | |
|-----------|--|
| AfDB | African Development Bank |
| ALWMI | African Land and Water Management Initiative (a World Bank-GEF program) |
| AWRMI | African Water Resource Management Initiative (a World Bank initiative) |
| CAS | Country Assistance Strategy |
| CC | Consultative Committee (OMVS) |
| CILSS | Inter-ministerial Committee to Combat Drought in the Sahel. |
| CNED | <i>Conseil National pour l'Environnement et le Développement Durable (Mauritania)</i> |
| COM | Council of Ministers. |
| CONSERE | <i>Conseil Supérieur de l'Environnement et des Ressources Naturelles (Sénégal)</i> |
| DEEC | <i>Direction de l'Environnement et des Établissements Classés (Sénégal)</i> |
| DEFCCS | <i>Direction des Eaux, Forêts, Chasse et Conservation des Sols (Sénégal)</i> |
| DNEF | <i>Direction Nationale des Eaux et Forêts (Guinea)</i> |
| DNGRE | <i>Direction Nationale de la Gestion des Ressources en Eau (Guinea)</i> |
| DNM | <i>Direction Nationale de la Météorologie (Guinea)</i> |
| DPN | <i>Direction des Parcs Nationaux (Sénégal)</i> |
| ECOWAS | Economic Community of West African States |
| EU | European Union |
| FSP | Fond de solidarité Prioritaire. |
| GEF | Global Environment Facility |
| GTZ | German Technical Cooperation Agency. |
| IDA | International Development Agency |
| IUCN | World Conservation Union (previously the International Union for the Conservation of Nature) |
| IW | International Waters |
| MSA | Management Services Agreement |
| M&E | Monitoring and Evaluation |
| NEAP | National Environment Action Plan |
| NEPP | National Environmental Protection Policy |
| NGO | Non-Governmental Organization |
| NPPC | National Project Planning Committee |
| OAU | Organization of African Unity |
| OERS | <i>Organisation des États Riverains du Fleuve Sénégal</i> |
| OP | Operational Program (of the GEF) |
| OMVS | <i>Organisation pour la Mise en Valeur du Fleuve Sénégal</i> |
| PAD | Project Appraisal Document |
| PASIE | <i>Plan d'Atténuation et de Suivi des Impacts sur l'Environnement</i> |
| PCD | Project Concept Document |
| PDF-B | Project Development Fund –B |
| PDLG | Programme de développement local et de gestion (Guinea) |
| PDRG | Left Bank Development Program |
| PMU | Project Management Unit |
| PNIR | National Rural Infrastructure Project |
| POPs | Persistent Organic Pollutants |
| PRC | Planning Regional Committee (OMVS) |
| PPER | Project Performance and Evaluation Review |
| PSA | Project Services Agency |
| RBOS | River Basin Organizations |
| RPPC/CRPP | Regional Project Planning Committee |

| | |
|---------|--|
| SAP | Strategic Action Program |
| SOGED | <i>Société de gestion du barrage de Diama</i> |
| SOGEM | <i>Société de gestion du barrage de Manantali</i> |
| SONADER | <i>Société Nationale de Développement Rural (Mauritania)</i> |
| SRB | Senegal River Basin |
| SRBSC | Senegal River Basin Steering Committee |
| TDA | Transboundary Diagnostic Analysis |
| UNCCD | United Nations Convention to Combat Desertification |
| UNDAF | UN Development Assistance Framework |
| UNDESA | United Nations Department of Economic and Social Affairs |
| UNDP | United Nations Development Programme |
| UNEP | United Nations Environment Programme |
| WWF | World Wildlife Fund. |

A. PROJECT DEVELOPMENT OBJECTIVE

Project development objective

1. The objective of this project is to provide a participatory strategic environmental framework for the environmentally sustainable development of the Senegal river basin and to launch a basin-wide cooperative program for transboundary land-water management.
2. This objective will be accomplished by:
 - **Capacity building:** Strengthening environmental and water resource management capacity in national institutions and in OMVS (*Organisation pour la Mise en Valeur du Fleuve Sénégal*) and OMVS national cellules and by supporting the full involvement of Guinea and OMVS member states in a cooperative agreement for sustainable water resources management in the basin;
 - **Data and knowledge management:** Supporting the improvement of the data and knowledge base for water resources management in the basin and the establishment of necessary monitoring and analysis on a sustainable basis, in close coordination with the *Observatoire de l'Environnement de l'OMVS*;
 - **Transboundary Diagnostic Analysis and a Strategic Action Program:** Completing the basin-wide Transboundary Diagnostic Analysis (TDA) and the formulation of a Strategic Action Program;
 - **Priority Actions:** Based on the preliminary transboundary diagnostic analysis, carrying out specific on-the-ground priority actions through pilot activities; and
 - **Public participation and awareness:** Establishing a public participation and awareness program for broader community and civil society involvement in development actions in the Senegal river basin.

Key performance indicators

3. The achievement of the development objective will be closely monitored through the following performance indicators:

Outcome/Impact Indicators:

- Increased capacity at OMVS and in the riparian states to address international waters and environmental management issues
- A cooperative agreement for appropriate social, environmental and economic cooperation for improved water resources management in the basin;
- All riparian states, including Guinea, involved in cooperative decision-making for water resources management;
- Improved knowledge of, and management of, the flow of the Senegal river, and of its relation to ecological and social processes;
- Completion and adoption of the preliminary Transboundary Environmental Analysis and Action Program;
- Implementation of priority activities identified under the preliminary Transboundary Environmental Analysis and Action Program;
- Increased numbers of stakeholders involved and trained in local and transboundary water resource management issues and increase involvement of the public and stakeholders in the decision making processes;
- Sustainable transboundary monitoring and response mechanisms established – with regular reports and analysis of results.

B. STRATEGIC CONTEXT

Overview

4. The value of this project for the GEF is that it specifically complements and builds on activities and projects which are already under implementation at the national and sub-basin level. The present project adds a transboundary element to these actions, thereby expanding and capturing additional benefits to the people and their shared environment.

5. The project is complementary to these ongoing activities and will lead to the improved coordination of water and environmental management in the basin as a whole. It is designed to improve the capacity of the sub-basin organization OMVS and to strengthen the national capacities to address transboundary water and environment management issues. Importantly, the project provides a framework for including Guinea, the upstream riparian, as a full participant and beneficiary in the work of OMVS.

6. The economic, social, and environmental well-being of participating countries depends upon the vitality and productivity of the Senegal river basin. This jointly prepared project (prepared under OP #9) provides a sound technical basis for establishing a cooperative basin-wide framework for environmental management of a shared resource – the Senegal river.

7. The Senegal river basin already has a long history of donor support and many ongoing activities continue with involvement of more than a dozen international donors, including France, the Netherlands, Canada, Germany, UK, US, Norway, and others, including UNDP and the World Bank, recently joined by the African Development Bank. Recently, OMVS has put in place a program entitled *Plan d'Atténuation et de Suivi des Impacts sur l'Environnement* (PASIE) (see Section B2 for additional information). The present GEF project is designed specifically to complement and to serve as an increment to the PASIE. The PASIE addresses environmental mitigation and management in relation to the Manantali power project, while the GEF project will address the broader aspects of transboundary environmental management and capacity building of the shared water resource. In particular, OMVS has expressed the need to establish an overall framework for environmental management of the river basin and, therefore, requested GEF support for this endeavor.

8. Through a transboundary analysis carried out during the project preparation period, specific needs have been identified which require attention through the present project. In particular, the following were identified:

- Capacity enhancement to deal with transboundary issues at national and basin-wide levels;
- Improving the shared data and knowledge base;
- The need to ensure greater involvement of Guinea in the basin;
- Sound environmental management and the linkage to sustainable livelihoods;
- The need for a common and agreed analysis which can provide a firm basis for environmental management and monitoring; and
- Need for a stronger civil society participation in transboundary basin-wide activities and the associated need for greater awareness and outreach to communities and NGOs to tap their resources and ensure their involvement.

9. Through a root-cause analysis specific environmental threats were identified which hinder the sustainable management of the shared water resources in the Senegal river basin. The summary of this analysis is highlighted in Annex 10. Briefly, the priorities are identified as:

- Land degradation (including deforestation, soil erosion, overgrazing and desertification);

- Water resource management (including groundwater use, information and data collection, water quality, energy needs, food security, waterborne diseases and siltation);
- Biodiversity conservation (including loss of habitats, flora and fauna, wetlands degradation);
- Capacity building at all levels within the above categories, with special emphasis on transboundary aspects;
- Participatory approaches to project planning, implementation and monitoring; and
- Awareness and outreach.

10. The project is intended to address the above identified needs as well as the root causes which act to undermine the cooperative and sustainable management of the shared water resource. The project will complement baseline activities by facilitating an inclusive process for riparian cooperation which will include Guinea, by assisting OMVS to set in place an agreed environmental management framework addressing the transboundary issues; by enhancing national and basin-level capacities; by strengthening participatory processes and by encouraging civil society involvement in transboundary environmental activities and by supporting action on the ground which addresses priority environmental management actions thereby, increasing learning for subsequent up-scaling through broader investments.

11. The project is seen as the next step in the development of a basin-wide action program, and a more effective river basin management framework for this shared international river basin. This will build capacity and sustainability, and it is intended that the riparian countries' contributions would be supported as needed by a broad partnership of donors and NGOs and, to the extent possible, the private sector.

12. The project has been developed largely within the basin through a participatory process including consultants, national committees, a public participation program led by IUCN, and national fora leading to a regional forum of the Regional Project Preparation Committee led by the High Commissioner of OMVS. The project has been endorsed by all four riparian countries, and the World Bank and UNDP intend to complete a formal project appraisal and approval process following the approval by the GEF Executive Council scheduled for December 2001.

B1. GLOBAL OPERATIONAL STRATEGY/PROGRAM OBJECTIVE ADDRESSED BY THE PROJECT

13. **GEF Operational Program objective.** Achieve global environmental benefits through implementation of International Waters (IW) projects which integrate the use of sound land and water resource management strategies.

14. **Global project objective.** Achieve global environmental benefits through broad, basin-wide participation in the development and implementation of measures that lead to sustainable management of the Senegal river basin's land and water resources. The project will help enable the Senegal basin's four riparian countries to jointly develop a regional approach to the environmental management of the basin and the effective and equitable operation of the basin's water resource, that will be of benefit beyond the borders of the basin itself.

15. **Project development objective.** The objective of this project is to provide a participatory strategic environmental framework for the environmentally sustainable development of the Senegal river basin and to launch a basin-wide cooperative program for transboundary land-water management.

16. **Public involvement.** The project was developed through a process of extensive public involvement within the basin (Annex 6). National committees were established in each riparian country and they were responsible for coordinating the preparation of reports by national consultants. At the same time, IUCN coordinated a process of public stakeholder involvement designed to bring the perspectives of the public to

bear on the preparation of the project at national meetings in each country. The recommendations from the national meetings were brought to a regional meeting led by the Regional Project Planning Committee (RPCC). This committee includes the leaders of the national committees and representatives of civil society organizations, and is chaired by the High Commissioner of OMVS. The draft project brief has been reviewed by experts and the conclusions from this comprehensive process are reflected in the present project brief.

17. **Coordination with other GEF international waters projects.** This project will complement and work directly with, other GEF international waters projects in the Lake Chad basin and the Niger river basin (joint UNDP/World Bank implementation). It will coordinate closely at the steering committee level with the proposed project for the Fouta Djallon highlands and the GEF supported dry-lands project in the Senegal river valley, which are concerned with land degradation issues as part of the overall GEF supported effort to address land and water degradation in Africa. The project makes provision for co-implementation by the World Bank and UNDP to demonstrate the commitment to the Africa Land and Water Management Initiative (ALWMI), to ensure coordination with other GEF projects in the region and to ensure effective co-ordination of multilateral assistance to the Senegal river basin.

B2. MAIN SECTOR ISSUES

18. **The river basin.** The Senegal river is the second longest river of West Africa. About 1800 km long, it originates in Guinea, runs through western Mali and then flows west, forming the border between Mauritania and Senegal (see map). The basin covers around 300,000 km² and is shared by Guinea (11%), Mali (53%), Mauritania (26%) and Senegal (10%). The river's three principal tributaries – the Bafing, the Bakoye and the Faleme – all originate in the Fouta Djallon mountains in Guinea and together produce over 80% of its flow. The Bafing alone contributes about half of the river's flow at Bakel. The main tributaries above Bakel, namely the Gorgol and Oued Gharfa on the river's right bank, add as little as 3% to the water the Senegal river discharges into the Atlantic Ocean at Saint-Louis. The rains falling in the Fouta Djallon mountains from April through October produce a flood season beginning in July and ending in October.

19. The basin has three distinct parts: (i) the Upper Basin, a mountainous area between the Fouta Djallon and Bakel; (ii) the Valley, featuring a flood plain varying in width from 10 to 20 km between Bakel and Dagana; and (iii) the Delta between Dagana and the sea (see map).

20. **An international basin.** The international aspects of the Senegal river basin are key factors in its development and management. Shared by four countries, the river crosses the border from Guinea into Mali and then flows out of Mali to form the physical frontier between Senegal and Mauritania for much of its lower course.

21. **The people.** The basin is inhabited by approximately two million people, 85% of which live near the river. Population growth rate is high (some 3% per year), partly due to in-migration. The upper basin has remained largely an area of subsistence agriculture based on shifting cultivation. In the valley and the delta, traditional production systems (flood-recession cropping, livestock raising, fishing) and the practice of modern irrigation with water pumped from the river exist side by side. Important delta wetlands have been preserved at four Ramsar Convention sites including the Diawling (Mauritania) and Djoudj (Senegal) national parks.

22. **Data gaps.** In the Guinean part of the Senegal river basin, the knowledge required for adequate water and environmental management is limited to a few sub-basins that were the object of interventions under the Fouta Djallon Integrated Watershed Management project coordinated by the OAU. Elsewhere, existing knowledge is inadequate. Among urgent requirements are topographic maps at a sufficiently

large scale and an appropriate network of hydro-meteorological stations which are properly maintained. These elements would help Guinea with the judicious development of its water and land resources, and would also provide the information and data required to refine the computer model estimating the releases needed from the Manantali dam to produce optimal artificial floods and generate electricity.

23. **Power potential.** Guinea is very conscious of the hydropower potential of the Senegal river headwaters. In the Bafing river sub-basin, Guinea has identified four favorable dam sites with a combined power-generation potential of 770 MW. Of these, the Koukoutamba site, alone, has a potential of 290 MW. This compares with the 200 MW for which the Manantali dam was to have been equipped, which in itself is not enough to serve the needs of the three OMVS countries. The integration of Guinea in a regional power grid is an alternative that is of interest to all riparian countries. Guinea is also interested in the development of its micro-hydro potential. The need to consider and support Guinea's interests so as to seek its full involvement in the development of the basin's land and water resources is clearly indicated.

24. **Irrigation.** The delta and the valley flood plain have seen the development of both large-scale and community-based irrigation for several decades on the Mauritanian as well as on the Senegalese side. The irrigation schemes currently in place cover just over 100,000 ha, of which some 60,000 are cropped (mostly with rice) in the wet season and some 20,000 ha in the dry season. Currently irrigated land represents only one third of the overall potential estimated at 375,000 ha.

25. **Natural variability.** Before the Diama and Manantali dams were built the river had markedly different hydrological conditions that varied in time and space. Fluctuations occurred seasonally in water level and quality in addition to the annual or cyclic episodes of dry and wet conditions. These fluctuations, characterized by erratic flows and episodic inundation, prevented any single species from dominating the ecology and contributed to the real diversity of habitats and species. In turn, this resulted in a variety of natural resources and production systems. The Diama and Manantali dams, and their accompanying infrastructure, contributed substantially to making the ecosystem more uniform and provided the habitat for aquatic weeds and diseases vectors.

26. **Natural reserves.** The region is still important for migratory birds, notably water birds, which arrive in large numbers during the European winters to wetlands in the Senegal valley and delta. There are protected areas of international significance such as the Djoudj National Bird Sanctuary which is a World Heritage Site on the Senegalese side of the delta, and the Diawling Strict Nature Reserve on the Mauritanian side. The fish production capability of the lower reaches of the river could be considerably enhanced.

27. **Dam construction.** Diama dam, located approximately 23 km from the river's mouth, has functioned since 1986. Its purpose is to block seawater intrusion and to raise the level of the upstream water body (confined by dykes along both shores) to facilitate irrigation, navigation and the filling of *lac de Guiers* in Senegal and *lac Rqiz* in Mauritania. Manantali dam, built in Mali approximately 1,200 km from the river's mouth, has regulated the flow of the Bafing river since 1987. This dam's purpose is to attenuate extreme floods, generate electric power and store water in the wet season to augment dry-season flows for the benefit of irrigation and navigation. OMVS has entrusted two separate entities with the dams' operation and maintenance: the *Société de gestion du barrage de Diama* (SOGED) and the *Société de gestion du barrage de Manantali* (SOGEM).

28. **Power generation at Manantali.** A second investment program (co-financed by the World Bank under its Regional Hydropower project) is currently underway with the installation of hydro-electric generating equipment at Manantali and the construction of the corresponding transmission lines serving the three OMVS member countries. Power generation, transmission and distribution is expected to begin

in the second half of 2001 but is not likely to meet the original target output because of reduced river flows. The power produced is not expected to fully meet the power needs of the three countries.

29. **Impact of river flow changes.** The changes in river regime have had both positive and negative environmental and socioeconomic effects. On the whole the “artificial flood” has been managed fairly well until now, but issues related to flow regulation are becoming more prominent as the generating plant at the Manantali dam in Mali comes on line in the second half of 2001. The principal flows for the dam come from the Bafing river in Guinea. However, the flow information available from the head waters in Guinea is inadequate to allow for optimal management. An inclusive basin organization as well as improved data and knowledge management would greatly enhance the flow management.

30. **The PASIE.** Recognizing the social and environmental implications of the potential conflicts between power generation and the other uses of the Senegal river's water, the three governments through OMVS have embarked on the implementation of a program called *PASIE (Plan d'Atténuation et de Suivi des Impacts sur l'Environnement)*. The PASIE will cost US\$17.056 million, and is being financed by a number of multi- and bi-lateral donors including the World Bank, the African Development Bank and the French Global Environment Facility. The PASIE will also support the development of revised rule curves and operating procedures (through the development of a “Water Charter”) which will provide the opportunity for a fresh approach to river management. The PASIE is an environmental program specifically designed to address, monitor and mitigate the environmental issues raised by, and related to, the development and distribution of power from the Manantali generating station. Although quite specific and narrow in purpose it is broad in concept and approach, recognizing as it does the need for a comprehensive approach to environment management. The establishment of the downstream monitoring program illustrates this. As such it provides a firm foundation on which the GEF project can build its consistent but much more ambitious approach, addressing water and environment management issues throughout the basin, in all four riparian countries. In summary, the PASIE supports six programs:

- Mitigation of Hydropower Project Impacts;
- Acquisition of Right-of-Way for Transmission Lines;
- Reservoir Management Program;
- Environmental Health;
- Related Measures; and
- Coordination and Monitoring.

31. Each component of the PASIE includes a number of separate elements. It was originally planned that the implementation of the PASIE would be completed this fiscal year. However, for several reasons, delays have occurred. The current status of implementation of the PASIE can be summarized as follow:

- The mitigation of impacts from the hydropower project including monitoring of the transmission lines construction is underway. The Malian part of the process is already completed and efforts are now focused on the Senegal and Mauritanian side.
- The acquisition of right-of way for transmission lines is still underway in Senegal and in Mauritania. The energy distribution system has already reached Bamako and is almost completed for the Malian side;
- Under the reservoir management program, progress so far achieved includes the following: (i) phases I & II of the program are completed, including the modeling process for the flow and level forecasting, the downstream ecosystem and the reservoir ecosystem; (ii) the third phase is underway; this includes preparation of the management handbook of the Diama and Manantali

dams, the calibration and updating of the forecasting model and flood monitoring, and the required training for decision makers and stake-holders. (iii) In addition, the draft of the cost benefit analysis and the draft water charter have already been submitted, but not yet finalized and agreed. After a series of workshops on these documents the final version is expected to be submitted by the end of October. (iv) In the meantime, the bidding process is being launched for the warning and communication system that forms a component of the reservoir management program.

- Under Environmental Health the pilot project study has been completed including identification of a list of sites. The implementation phase, which is expected to start in early November, is now being prepared. After the African Development Bank's review, the elaboration and monitoring of the Regional Sanitary Action Plan that forms the basis of the Environmental Health program has been revised and the final document is now available.
- Within the Related Measures component, rural electrification promotion has not moved very far. The proposed list of villages has still to be approved by all countries. Studies on the second generation hydro sites, namely the Felou and Gouina sites are underway and the economic analysis will be submitted at the end of October 2001.
- The coordination and monitoring component is one of the most advanced of the PASIE. The Steering Committee is meeting regularly. At national level, the National Consultative Committee (NCC) as well as the Local Consultative Committee (LCC) are operational in the ground. The Consultative Group (CG) whose role is to monitor and advise the PASIE structure on various matters, is also active. In relation to this component, the OMVS is also continuing the preparation of the basin environmental code. The relevant laws have already been gathered from the member countries in and Guinea and these will provide a basis for the preparation of the basin environmental code. In line with these elements the OMVS has also set up the environment monitoring program (l'Observatoire) which will play a central role in knowledge and data management within the three member countries. The Coordination Bureau for the PASIE is still recruiting some staff.

32. As indicated above, despite a number of achievements, the PASIE will not be completed this year within the original schedule. Delays noted in several components such as the water management and the environmental health programs may further delay project completion. This will enable a close liaison to be maintained between ongoing PASIE activities and the start up of GEF project activities. The current GEF project is based on a one program approach, expanding the geographical scope of the PASIE to include the whole river basin; taking into account what has been achieved so far by the PASIE; complementing and reinforcing the remaining actions which are still to be completed. The project will closely mirror the PASIE objectives while addressing basin wide water and environmental management. As such, it may be seen as a GEF component complementing the PASIE, adding to and providing the cohesion for common understanding on specific issues such as the inclusiveness of Guinea in the basin wide management. The project supported by GEF will take advantage of the institutional arrangements already established for the PASIE. The project is entirely consistent with and complementary to the PASIE but is much broader in scope, in that it addresses the transboundary water and environmental management issues throughout the basin. It will create a basin-wide framework for cooperation on implementing a sustainable programmatic approach. This will provide a consistent coordinated framework for further participation by other donors interested in the establishment of sustainable water and environmental management in the whole of the Senegal River Basin.

33. **Coordination with French Global Environment Facility (FGEF).** The present project will establish complementarity and close cooperation with the FGEF through the coordination mechanism which will be established with the PASIE. The two funding mechanisms (GEF and FGEF) operate with the same overall funding criteria and aims for enhanced transboundary environmental management and close coordination will be ensured through the proposed Steering Committee and through the PASIE Consultative Committee (see C5 and Annex 8 for further information).

34. An important part of the PASIE is an environmental monitoring program *l'Observatoire*, funded in large part by the FGEF. The Observatoire has recently been established and will play an essential role in monitoring the impacts of the Manantali operations on the river and on the environment. The present GEF project will complement this effort by ensuring the inclusion of Guinea and by adding additional data and knowledge which address aspects as they relate to Guinea.

35. **Benefits from dams.** So far, the dams have primarily benefited irrigation, thereby playing a key role in preventing a massive exodus of the valley's population in the face of severe drought and desertification. Flow regulation from the Manantali dam has ensured a year-round supply of irrigation water, while Diama dam prevents this supply from mixing with intruding sea water and reduces pumping costs by raising the upstream water level. Additional benefits are: (i) the creation of a significant fisheries resource in the Manantali reservoir, that has led to the seasonal settlement of fishing communities, and (ii) the maintenance of the Diawling, Djoudj and Trois Marigots/Ndiael wetlands with controlled flows from the Diama reservoir.

36. **Impacts of dams.** The dams and associated dykes on the flood plain have brought about major ecological changes in the floodplain on both the Mauritanian and the Senegalese sides of the river. Filling of the reservoir behind the Manantali dam reduced the volume and duration of the annual floods. This, in turn, diminished the inundation of the floodplain and resulted in weakened eco-systems depending on prolonged seasonal submersion. It also resulted in a reduced area suitable for flood-recession cropping, and curtailed groundwater recharge. Diama dam has created a permanent and fairly stable freshwater body whose shores have been invaded by a dense growth of unwelcome aquatic plants (*Typha australis*, *Pistia striatules* and *Salvinia molesta*). These plants proliferate in the river's distributaries and in the irrigation canals reducing flow velocities, encouraging insects and disease, displacing other species, reducing fish production and impeding fishing.

37. **Health issues.** One of the invasive plants' most damaging effects is the habitat they offer for vectors of waterborne diseases. An explosion of mosquito and snail populations has brought malaria and bilharzia to epidemic proportions. Despite efforts by the international aid community and national public-health services, the re-infection process causes the prevalence of these diseases to remain at an unacceptably high level. The nuisance plants and their consequences for public health clearly call for corrective measures to be implemented in a concerted fashion on both sides of the river.

38. The practice of drawing water from the river is also becoming increasingly hazardous, particularly in the dry season, as the irrigated area expands and the use of agro-chemicals intensifies. The river's water quality is to be addressed through the Dakar Long Term Water Sector Project, but it has not been addressed in respect of the riverside population.

39. **Estuarine, coastal and marine issues.** The river discharges into the Atlantic Ocean through a somewhat deltaic estuary, the mouth protected by a long sand spit on which sits the ancient capital city of St Louis. The Diama dam has drawn a clear line between fresh and salt water where none previously existed. There was once a highly productive zone of intermingled flora and fauna and an important marine fish spawning ground. There are still some linkages between salt and fresh water zones and there is potential for much improved management of these zones to increase production of fish and bird life and to

enhance the ecology generally. There are clear linkages with other projects working in this area and with the offshore projects such as those of the Canary Current project. It is recognized that water management is a continuum from fresh water springs all the way downstream to the oceans where evaporated water is recycled as precipitation to replenish the sources.

40. **The Marine and Coastal biodiversity Management** project under preparation will strengthen the conservation and management of globally significant marine and coastal biodiversity in Senegal. To that end, the project will address priorities identified in the National Biodiversity Strategy (NBS) and the National Environmental Action Plan (NEAP). The project to be also partly supported by GEF will address among other issues the management of existing coastal and marine protected areas; development and implementation of participatory systems for sustainable biodiversity management; capacity improvement to protect and conserve marine biodiversity, taking into account stakeholders participation, technical and managerial skills and improving the regulatory framework for the coastal zone management. Along with the Senegal river basin project, the two projects must be seen as complementary in their approach towards mitigation of the environmental problems. These two projects will address the more urgent transboundary environmental issues on the coast and in the basin. The special needs of the delta, lying mostly in Senegal, require particular attention. It may be necessary to consider additional support through a specific program that could link the main problems in the delta with the key actions to be implemented by the two projects. Proposals being developed by UNEP under the Global Program for Land Based Sources of Marine Pollution may also help address these special needs.

41. **OMVS priorities.** At the start of the preparation for the present project a number of issues were identified by OMVS as priority concerns. These included: groundwater evaluation, especially including the internationally significant *maestrichtian* aquifer; cooperation with Guinea for flow and flood warnings; dealing with aquatic weeds; hydrologic studies of the tributaries and distributaries of the lower valley; studies for better management of the lower valley flows taking environmental considerations into account; allocation of water between the states and for the maintenance of the environment; land use and environmental management issues in the upper basin areas in Mali and Guinea where less work has been done than in the lower basin.

42. **National priorities.** The concerns of the riparian states were identified during the project preparation process and are reflected in the Preliminary Transboundary Environmental Analysis attached in Annex 9, 10 and 11. Priority concerns include land degradation and its related impacts (deforestation, erosion, overgrazing and desertification), water resource management associated with information and data collection, water pollution (from source and non-point source), food security through irrigation, hydropower for energy needs, biodiversity conservation, wetland management and conservation, the strengthening of institutional policy and capacity development as well as participatory development practices, public awareness and outreach.

43. **Civil society priorities.** During the project preparation process an inclusive consultative process was managed and coordinated by the World Conservation Union (IUCN) to ensure that civil society priorities and concerns were heard and reflected in project design. Issues raised through this consultative process include: safeguarding regionally important environmental sites (parks, mangroves etc.); planning and managing these sites sustainably; the need for an international strategy for the humid zones; the need to develop a comprehensive environmental management approach; the need to integrate environmental and social concerns; the importance of maintenance of wetlands areas for migrating birds; the need for adoption of a basin-wide and holistic action program for the environment; the need for improved coordination between the officials, NGOs and people's representatives; the need for institutional strengthening and capacity building in basin-wide management; the need to address the transboundary environmental health concerns; the need for coordinating committees at field level, at national level and at international level; and, the need for the proposed *Observatoire* to be a center of technical excellence.

B3. GOVERNMENT STRATEGY

44. **Regional importance.** The Senegal river's development potential and regional importance have long been recognized. In 1968, Guinea, Mali, Mauritania and Senegal created OERS (*Organisation des États Riverains du Fleuve Sénégal*) with a view to realizing the potential offered by the basin's land and water resources in a framework of regional economic integration. In view of internal political changes, Guinea withdrew from OERS in 1971, which led Mali, Mauritania and Senegal to form OMVS (*Organisation pour la Mise en Valeur du Fleuve Sénégal*) the following year.

45. **Establishment of OMVS.** OMVS is governed by three principal legal texts: *Convention relative au statut du fleuve Sénégal (1972)*; *Convention portant création de l'OMVS (1972)*; and *Convention relative au statut juridique des ouvrages communs (1978)*. (See Annex 7 for additional background information on OMVS). In 1992, Guinea and OMVS signed the *Protocole d'accord-cadre de coopération entre la République de Guinée et l'OMVS* with a view to creating a framework for cooperation in actions of mutual interest concerning the Senegal river and its basin, including a provision allowing Guinea to attend OMVS meetings as an observer.

46. **OMVS scope and challenges.** OMVS is mandated with the authority to carry out and manage “works” on the river, on behalf of the three member states. OMVS organigram includes national “cellules” in each member country, which are directly linked to the Experts Committee of each state established by the Council of Ministers to advise the Council. Although established on a firm legal basis, OMVS continues to face challenges in obtaining and managing its resources, in recruiting staff and in carrying out its functions as a fully functioning river basin organization. One major challenge is the need to encourage the upstream riparian Guinea to join the organization.

47. **Management Bodies.** The supreme body of OMVS is the Conference of Heads of State and Government. There are also three permanent organs: the Council of Ministers (COM), the High Commission (HC) and the Permanent Water Commission (PWC). Others may be created as needed. In addition there is an Advisory Committee. The Regional Planning and Monitoring Committee advises on whether projects and measures planned in member states are consistent with the organization’s objectives and whether the available resources in the basin can meet the development plans (see also organizational chart overleaf).

48. **National Offices.** The National Cellules in the three countries are directly linked to the Committee of Experts of member states, established by the Council of Ministers to advise the Council. For example, the Coordinator of the OMVS National Cellule for Senegal is also a member of the COM’s Committee of Experts. The National Cellule assists in the implementation of OMVS projects and the Cellule is a permanent member of the advisory body of OMVS. In addition, local committees at district level are needed to allow grass root participation.

49. **Previous work.** In the late 1980s, a number of meetings were held in the basin, groups were formed and surveys carried out. National bodies were created including in Senegal, the “*Cellule Après Barrage*”. A “Management Plan for the Development of the Left Bank” (PDRG) was produced. This plan supported the rehabilitation of the natural environment; management of natural and human resources; optimization of traditional systems of production, both in the floodplains and the rain-fed zones; rehabilitation where feasible; extension of irrigation by promoting investments by farmers and the private sector and adoption of necessary policy measures to facilitate the plan’s objective.

50. **The Left Bank Management Plan.** Approved by the Senegalese authorities, the *Plan Directeur Rive Gauche* (PDRG) became a plan for integrated development over 25 years (1992-2017). The plan covered four administrative districts (Dagana, Podor, Matam and Bakel). However, it soon became clear that the plan would only succeed if similar plans were implemented on the right bank in Mali and Mauritania.

51. **UN Assessment of Human Development.** In 1997, the United Nations Department for Economic and Social Affairs (UN-DESA) executed a UNDP regional project: "Management of International Waters in Sub-Saharan Africa: Senegal river basin". Within the river basin, in Mali, Mauritania and Senegal, five consultants conducted interviews and research in the capitals and in the field along the river, to assess the current situation in terms of sustainable human development. This project has provided a recent and documented diagnostic on the current management of water for various users, the participative dimension in the development of the basin, and the environmental dimension in the Senegal valley.

52. **Cooperative track record.** The Governments of Mali, Mauritania and Senegal have thus developed a fairly strong track record of cooperation for development. The agreement establishing OMVS's authority over common "works" is very unusual in that the Manantali dam, for instance, located in Mali, legally "belongs" to all three member states of OMVS. Burden-sharing of the investments on the shared water resource has encouraged such cooperation. When disputes arose, as in the 1980s between Senegal and Mauritania, the governments recognized the importance of resolving them amicably as soon as possible to avoid jeopardizing their jointly owned infrastructure. The governments jointly support OMVS and the staff is drawn from each member state.

53. **Riparian interests.** The four riparians have common as well as different interests that they pursue. Guinea's principal interest is in investment for development and environmental management. The principal interest of Mali continues to be the maintenance of river levels so as to provide navigable access to the sea from landlocked Mali. The Manantali dam and generating station are on Mali territory and the country is clearly also interested in output of power from the plant. The Mauritanian and Senegalese interests include power production, particularly for Senegal, but a dominant preoccupation has been the livelihoods of the population of the valley and the delta. The desire to increase irrigated crop production has driven many of the decisions. The challenge for the riparians is to develop a cooperative platform which seeks to support win-win actions and closer integration so that the various interests can be addressed to the maximum extent possible.

54. **Flow allocation.** The operation of Manantali dam for hydropower generation requires careful management to minimize negative environmental impacts. The fundamental problem lies with the limited volume of water available to satisfy the competing requirements of the planned objectives (irrigation, navigation, hydropower), of critical ecological processes (groundwater recharge, maintenance of flood-plain ecosystems) and of traditional societies (flood-recession cropping, livestock, fishing). The available annual volume is currently considerably less than assumed in the 1960s on the basis of the flows observed up to that time. The proposed management scheme is not based on a reliable rainfall-runoff model because of a lack of data from the upper reaches. Not only are such data currently unavailable to OMVS, but the existing network of stations is inadequate. Best management practice requires a reliable model using real-time rainfall and stream-flow data from stations located in Guinea and Mali.

55. **Public awareness and participation.** A priority issue is the need for an improvement in the relationship, and an increase of understanding between the OMVS and the public in the basin. There is a need for improved flow of information from OMVS to the public as well as improved methods of assessing and addressing the concerns of the affected populations in the basin. IUCN and its national members have been supporting a number of participatory programs within countries in the basin. However, there is agreement that a substantial, regional complementary effort aimed at improving

participation and communication would greatly enhance impact, and would ensure that the concerns of civil society were heard, and options assessed, as development programs and actions are discussed and designed.

56. **Environment Management in Guinea.** Guinea developed a National Environmental Action Plan (NEAP) in 1994. The plan defines a set of integrated sectoral initiatives, some of which are currently being implemented. The NEAP also proposed the creation of a *Conseil National de l'Environnement* representing 13 ministries and several civil-society entities concerned with environmental management. The Conseil was formed and is operational. Guinea has been preparing a *Code de l'Eau* and related regulations. These are expected to be approved shortly and include a proposed Water Fund which will contribute to the long term aim of making water management sustainable in Guinea. Guinea has for some years been attending OMVS meetings as an "Observer" but is awaiting developments before committing itself as a Member State. Within Guinea, development of environmental policy and enforcement of the corresponding laws are the responsibility of the *Ministère de l'Équipement* through its *Direction de l'Environnement*. The principal government services that are directly involved with the preparation of the project and its implementation are: (i) *the Direction Nationale de la Gestion des Ressources en Eau* (DNGRE) and the *Direction Nationale de la Météorologie* (DNM), both of the *Ministère des Ressources Naturelles et de l'Energie*; and (ii) the *Direction Nationale des Eaux et Forêts* (DNEF) of the *Ministère de l'Agriculture, des Eaux et des Forêts*.

57. **Environmental management in Mali.** Mali's NEAP, which integrates actions responding to the UN Convention to Combat Desertification, is the result of wide-ranging consultations at the national, regional and local levels. Work on the synthesis of the NEAP started in 1994 and the document was endorsed in May 1998. The NEAP defines a National Environmental Protection Policy (NEPP) and proposes national, regional and local action programs to achieve the objectives outlined in the NEAP. The NEAP's nine cross-sectoral national programs include the National Program on Water Resources Management, which has as one of its operational objectives "to protect and ensure a sustainable management of rivers and their catchment areas, including with neighboring countries (shared resources)". One of its eight regional programs concerns the Kayes Region, essentially covering Mali's portion of the Senegal river basin. Mali has created an Environment Ministry with three departments: (i) *Direction de la Conservation de la Nature*; (ii) *Direction du Contrôle des Pollutions et des Nuisances*, and (iii) *Secrétariat Technique Permanent*. The two directorates operate in a decentralized fashion at the level of local administrative units. The Secretariat is responsible for policy formulation and strategy development. The principal sectoral entities concerned with the management of the Senegal basin's water resources and environment are *the Direction Nationale de l'Aménagement et de l'Équipement Rural* under the Ministry of Agriculture; and the *Direction Nationale de l'Hydraulique et de l'Energie* under the Ministry of Water, Mines and Energy. A water resources component is included in the World Bank funded program entitled Programme National d'Infrastructures Rurales (PNIR). Activities under this component is supporting the preparation of tender documents for the implementation of project activities. The activities will provide national underpinning and complementarity to the activities proposed in the present project.

58. **Environment Management in Mauritania.** In Mauritania, an environmental strategy paper prepared by the World Bank, in 1994, recognized the need to integrate all economic, technical, ecological and social aspects in the development of the Senegal River. A study supported by UNDP, in 1997, as a contribution to the formulation of an environmental management and protection program reiterated this concern and stressed the urgency of developing a NEAP. In 1995, Mauritania established the *Conseil National pour l'Environnement et le Développement Durable* (CNED) comprising an advisor to the President and an advisor to the Prime Minister, in addition to representatives from 13 relevant ministries. This council is mandated as the entity responsible for supervising the development of an environmental strategy. The principal operational entities concerned with environmental issues in the Senegal river basin are the *Direction de la Planification et la Coopération Sanitaire* of the *Ministère de la Santé*, the

Direction de l'Environnement et de l'Aménagement Rural, of the *Ministère du Développement Rural*, and SONADER (*Société Nationale de Développement Rural*).

59. **Environment Management in Senegal.** In Senegal, the NEAP was completed in 1997 and is the result of the consolidation of a series of regional environmental action plans developed in a decentralized and participatory manner. It integrates the national action program to combat desertification in the framework of the UN Convention to Combat Desertification. The regional action plan for the Senegal river valley (*Région de Saint-Louis*) essentially represents the environmental management measures provided by the *Plan Directeur Rive Gauche* (PDRG). The Ministry responsible for elaborating and implementing Senegal's environmental policies was established in 1993. Called the *Ministère de l'Environnement*, it comprises three directorates: (i) *Direction de l'Environnement et des Établissements Classés* (DEEC); (ii) *Direction des Eaux, Forêts, Chasse et Conservation des Sols* (DEFCCS); and (iii) *Direction des Parcs Nationaux* (DPN). Recognizing the dependence of sustainable development on sound environmental management as well as the cross-cutting nature of environmental concerns, Senegal has created two supervisory and coordinating bodies: (i) the *Commission Nationale pour le Développement Durable*; and (ii) the *Conseil Supérieur de l'Environnement et des Ressources Naturelles* (CONSERE). It is these two bodies that oversaw the elaboration of the country's NEAP. The Ministry was recently working on an environmental policy statement as a guiding document for the period 2001 to 2005.

B4. SECTOR RELATED COUNTRY ASSISTANCE STRATEGY GOAL SUPPORTED BY THE PROJECT

60. The present project includes four countries and thus, four sector-related World Bank Country Assistance Strategy (CAS) linkages. All four CASs are several years old (1997 & 1998) and are currently under revision. Priority areas of particular relevance to the present project are highlighted below.

61. **Guinea's CAS** (11/21/1997) notes that "the Bank fully supports the Government's development strategy through both lending and non-lending services directed at selective activities in rural development, governance and improved service delivery". The proposed Bank strategy includes "increased emphasis on building broad-based support for reforms through participation" and "more emphasis on improving governance and capacity building".

62. **Mali's CAS** (04/24/1998) supports the government's development strategy to reduce poverty through sustained, rapid and broad-based economic growth. This includes efforts to reduce the state's role and encourage the private sector and support from IDA for broad-based growth of the rural sector. The Manantali generating station in Mali is the most significant project underway in the basin and is receiving close attention. Mali is one of two pilot countries for enhanced coordination between the World Bank and the United Nations. The CAS and the UN Development Assistance Framework (UNDAF) were developed through close consultation with the UN and Bank teams in Mali.

63. **Mauritania's CAS** (05/21/1997) states: "Development of irrigation in the Senegal River Valley ... must balance economic, ecological and social concerns and guarantee the long term provision of an artificial flood for traditional flood recession agriculture. Improved resource management including better surveillance is critical for safe-guarding the rich fishing grounds against over-exploitation". It further states under a section headed "Regional Integration" that the government "is aware that the success of its reform program depends in part on effective cooperation with other countries in the region". As part of these efforts Mauritania is working closely with Senegal and Mali, within the framework of the OMVS on the development of the Senegal river basin. The government's Country Environmental Strategy Paper identified three major environmental challenges of which the first was natural resources development particularly in the Senegal river valley. A number of natural resources management efforts being planned or underway are also mentioned in the CAS.

64. **Senegal's CAS** (12/29/1997) describes the NEAP that had just been completed and the government's desire to seek support for its implementation. Among the issues identified are: reduction in water resources and inadequate access to water; degradation of soils through erosion, desertification and salinization; loss of forest and vegetal cover; loss of faunal bio-diversity due to habitat destruction; as well as coastal zone management problems, with which this project may interact. The government intended for the NEAP implementation to be done in a way that will support the decentralization program.

B5. SECTOR ISSUES TO BE ADDRESSED BY THE PROJECT AND STRATEGIC CHOICES

1.1 Preliminary Transboundary Environmental Analysis

65. The Senegal river crosses four countries and has been the focus of national and international attention for more than six decades. There have been, and there continue to be, numerous interventions that relate to water resource management. National priorities sometimes supercede regional priorities and may conflict with each other. Countries naturally tend to pursue their own interests first. These interests are seldom evaluated for the long term, but receive responses for the immediate need. The availability of information is poor, data-sharing is limited, communication remains poor within the basin, there are diminished flows in the river since the 1960s and there are increasingly complex and conflicting demands from the increasing population. A large generating station is about to come on line and the operating rule curves still have to be decided and properly adhered to so as to ensure equitable and economic allocation of the river flow among the competing users. What is required to improve the response to these transboundary issues is basin-wide cooperation; improved management and response capacity; improved data and information flow; in-depth analysis and design of appropriate actions; some immediate action on the ground; improved public participation and establishment of a sustainable long term program for improved water and environment management in the basin.

66. Through the transboundary analysis a number of key issues have been identified as a priority for intervention and assistance in order to ensure the long-term sustainable management of the Senegal river basin. These are highlighted below:

a. Management capacity and institutional strengthening

67. A major need is to improve the capacity of OMVS and the riparian states to address transboundary environmental issues. OMVS was established to address the management of specific water management works, but as such is not well equipped to deal with broader basin management and environment and social issues that were not previously recognized as an essential part of river management. Equally the national governments are still weak in the areas of water resource and environment management and their efforts naturally tend to be focused on immediate national concerns. There is a need to enhance their capacity to deal with transboundary and international issues that are inherent in the management of the basin.

b. An inclusive framework

68. To ensure optimum management of the river basin, it is imperative to build an inclusive framework of cooperation which sees the participation of all the riparian states. The involvement of Guinea in the preparation of the present project proposal has been an important first step towards that eventual goal. Each riparian, including Guinea, needs to clearly see benefits derived from the riparian cooperation. The present project facilitates the establishment of a common, inclusive platform for dialogue and exchange between the riparian countries through which cooperative development paths and win-win options can be identified and discussed. The opportunity to include Guinea in joint planning of shared benefits is much to be preferred to the possible alternative of competition for limited resources.

c. Data and information flow – the knowledge base

69. Although much has been done in the lower basin in the past to collect data on water and environmental matters, there is a critical need for complementary efforts. Data has been collected for many projects – but the resulting databases are incompatible or have simply been lost or abandoned on completion of the project. This is a particular need in the upper basin, including Guinea, where the lack of data is a concern not only for the Government of Guinea but for the whole basin. In order to optimize management of the river flows, not only for generation but also for the maintenance of livelihoods in the headwaters as well as downstream, it is essential to have much improved baseline data. The need for improved hydrometric, climatological, land resource and land use data is clear. Capacity building, agreement on data parameters and platforms for data management and exchange need to be supported.

d. Transboundary Diagnostic Analysis

70. Initial work on the Transboundary Diagnostic Analysis by national consultants has identified specific issues that can be addressed rapidly and are clearly priority issues with transboundary implications. What remains is the consolidated and more in-depth analysis of opportunities and priorities from a basin-wide perspective. Identification of transboundary issues with detailed analysis of their root causes is needed to identify the significant interventions that can contribute most effectively to improved benefits across the basin. The detailed basin-wide Transboundary Diagnostic Analysis (TDA) will extend the work already done and will propose priorities actions for further investments. The priorities for early action on the ground which were identified in the Preliminary Transboundary Environmental Analysis (see also Annex 9) are as follows:

i. Land degradation and desertification

Land degradation and desertification issues of high concern in the basin and cause much negative impact. Inappropriate land use in sloping, hilly and mountainous areas of the Fouta Djallon, and the Manding plateau have caused soil erosion, land degradation and loss of soil fertility leading to the creation of vast denuded areas. The spread of deforestation throughout the basin in combination with the overexploitation of natural resources is affecting the basin dynamic in terms of human settlement patterns and resource conflicts. In addition, phenomena such as a decrease in rainfall, increase in the frequency of severe droughts, the occurrence of the harmattan dust-bowl, sand dune movement and the associated loss of arable land as well as livestock death are indicators of an increase in land degradation and desertification progression toward the south of the basin. All basin countries have signed the Convention to Combat Desertification (CCD) and have CCD National Action Programs in place, however, jointly planned transboundary coordination will need to be increased if the degradation processes are to be halted.

ii. Siltation and erosion

Siltation and erosion are cross borders issues and must be addressed through cooperative action. These processes are tied to overgrazing and poor agricultural practices. The Fouta Djallon region provides 13 tons/km² of eroded and siltated material per year of which 30% is derived in the Bafing basin. The increase in siltation and erosion in many areas of the basin represents a serious threat for water resource availability. Aside from the loss in land productivity, increased siltation also increases the dangers of floods and interferes with infrastructure. A number of national programs are underway to enhance soil protection and conservation; and these important initiatives are making impact at the local levels. However, there is an urgent need to support transboundary cooperation targeting specific areas such as the Fouta Djallon and fertile soil of the “walo” or flood plains, where this continuing trend will cause severe damage to the basin water resource and food production.

iii. Point and non-point source pollution

Both point and non-point sources of pollution are basin-wide and of a transboundary character. Growing urbanization combined with lack of sanitation facilities has increased water pollution. Increased use of pesticides and fertilizers in irrigation schemes in the valley have led to high levels of pollution. These impacts have the potential to affect the regional basin economy and could jeopardize development progress achieved thus far. Data and information as well as awareness related to national and transboundary impacts of this pollution are scarce. To date, only limited transboundary action is underway to address these issues and the need for a holistic and basin-wide approach is of high priority.

iv. Water weeds infestation

The infestation by water weeds has increased tremendously throughout the basin, leading to a decline in fisheries and a threat to the available water supply sources for big cities such as Dakar. Moreover, the infestation contributes to the spread of waterborne diseases. The *Typha* and *Salvinia molesta* weed infestations have recently been recorded among the main environmental impacts within the Senegal valley. Although some pilot initiatives are underway to mitigate this infestation, there is an urgent need for a transboundary approach so that the basin-wide dimensions can be tackled.

v. Public participation, awareness and stakeholder capacity

A fundamental issue identified in the basin has been the need for greater participation by the public in the decisions that are made that significantly affect their livelihoods. During the preparation of the present project, a significant effort has been made to involve as wide a segment of the public as possible. There is a clear need to ensure that the voice of civil society is heard as developments are discussed and options assessed. Moreover, a greater awareness of interlinkages, of transboundary impacts and of the priorities of neighboring states and communities, will greatly enhance and strengthen the spirit of cooperation between the four countries. Communities need access to information and assistance to build their capacities so that they can more effectively participate in decision-making processes. Support is needed for the poorest and least educated among the communities and the special needs of the largest segment of the population, women and children, are particularly important in this respect.

vi. Sustainable management of wetlands

There is an urgent need to increase the knowledge and awareness of the important economic and ecological functions which the wetlands in the basin play. These fragile environments are being degraded due to draining, expansion of agriculture, and unplanned developments. Although specific regulation has been prepared for the protection of these areas and although protected areas have been created and/or extended, more effective enforcement is needed combined with awareness and capacity building. Examples of important wetlands in the Senegal delta include the Djoudji and the Diawling which are important reserves for *paleoarctic* migratory species, and the Gonakie forest along the valley which plays a crucial role as a filter and nursery for fish species. Other important wetlands include the Kemeba-Ko in Mali and the Baoule Game Reserve in Mali, both of which form important habitats as well as nesting areas for migratory birds.

vii. Waterborne diseases

Waterborne diseases such as bilharzia, Guinea worm, diarrhea and malaria are prevalent in the basin and remain a major concern. The construction of dams and the increase in the water level have contributed to increasing the spread of water borne diseases, including urinary bilharzia which has especially stricken the population of the Senegal valley. National health projects have been launched in Mauritania and Senegal to address water-borne diseases. Both of these projects seek to put in place coordinated actions to reverse the present situation. In addition, a

WHO/UNICEF/UNDP regional program combating the Guinea worm is also in place supporting the two countries.

C. PROJECT DESCRIPTION SUMMARY

71. The Preliminary Transboundary Environmental Analysis (see also Section B5, and Annexes 9 and 10) identified the root causes of environmental degradation in a transboundary context. The Analysis further identified priority areas for action, which could help alleviate and remove some of these root causes.

72. The project components outlined below are specifically designed to meet the priorities which are of a transboundary and incremental nature.

C1. PROJECT COMPONENTS

| | |
|---|---|
| 1. Capacity Building: | Environmental and water resource management capacity in national institutions and in OMVS and national cellules and support the development of an inclusive framework for cooperation. |
| 2. Data and knowledge management: | Improvement of data and knowledge base for water resources management; and establishment of monitoring and analysis, in close coordination with the <i>Observatoire de l'Environnement de l'OMVS</i> . |
| 3. Transboundary Diagnostic Analysis : | Completing the basin-wide Transboundary Diagnostic Analysis |
| 4. Priority Actions: | <p>Based on the preliminary transboundary diagnostic analysis, implementation of priority actions through pilot activities. Agreed priority actions are:</p> <ul style="list-style-type: none"> • Land degradation & desertification <ul style="list-style-type: none"> ○ Soil erosion & siltation ○ Transhumance management ○ River bank protection • Water quality <ul style="list-style-type: none"> ○ Water weeds ○ Point and non-point pollution • Wetland management <ul style="list-style-type: none"> ○ Flood plain rehabilitation ○ Sustainable traditional fisheries ○ Biodiversity management ○ Land use planning • Evaluation of micro-hydropower potential <ul style="list-style-type: none"> ○ Studies ○ Consultants |
| 5. Public participation and awareness: | Public participation and awareness program for broader community and civil society involvement in development actions in the Senegal river basin. |

1.1. Environmental Management Capacity Building

73. This component seeks to reinforce the institutional capacity for the coherent management of the Senegal river basin's water resources and environment. The intention is to build a core group of transboundary environmental management expertise in each national institution linked to a core group in OMVS. The component will be complemented by the World Bank funded non-GEF increment (projects Long Term Water Sector Project, Senegal - P041528 and Programme Nationale des Infrastructures Rurales, Niger - P041723), which addresses issues pertaining to national water policy, including institutional reforms, capacity building, pricing and water legislation in Mali and Senegal. The GEF funded component entails:

- a. Completion of the analysis of the capacity and needs of each riparian country's relevant institutions and of OMVS with regard to transboundary issues ,
- b. Strengthening institutional structures at the national as well as at the regional level.
 - University courses and other technical training (modules etc.); and
 - Workshops and seminars.
- c. **Guinea specific.** Preparation of recommendations for harmonization of environmental management and environment legislation in OMVS member states is already planned under the PASIE; the present GEF project will extend this to include Guinea. Activities to be supported in Guinea are include:
 - Review of existing legislation;
 - Establishment of national working groups to review water and land policy and legislation;
 - Assessment of biodiversity, habitats and unique eco-systems; recommendation of protected areas and eco-zones in Faleme, Bakoye and Bafing river basins;
 - Consolidation of findings and recommendations;
 - National workshop; review and validation of proposals; and
 - Preparation of suggested new water and land management policy and reforms.
- d. Capacity building and strengthening of the relevant institutions and affected stakeholders involved with, and affected by, the research, planning, and management of transboundary waters and of OMVS's environmental management capability. Capacity building activities must and will include provisions for applying a fully integrated approach to water, environment, land use, agricultural practices, energy management and other sectors and ministries involved in or affected by project activities.
 - Training and strengthening of transboundary **environment** management capacities at national level (with national environmental departments and all other agencies and ministries involved in or affected by project activities, the functional equivalent of inter-ministerial committees.);
 - Training and strengthening of transboundary **water** management capacities at national level (with national OMVS cellules, regional water bodies etc.);
 - Capacity building at OMVS for transboundary environment and water management;
 - Linkages between regional institutions (e.g. Institute du Sahel, Centre Ecologique de Suivi (CSE), relevant university departments, and others);
 - Incorporation of transboundary concerns and issues into project activities associated with affected stakeholders at all levels; and
 - Design of a set of appropriate regional coordinating procedures for transboundary environment and water management issues.

- e. Development of an inclusive institution – Guinea and OMVS
 - Provision of appropriate technical, legal and institutional support that may be needed to support the process of negotiating closer cooperation between OMVS, its member states and Guinea. A Protocol for OMVS-Guinea cooperation has already been signed between the two. Moreover, active dialogue is in place on the details of the present project. The project will support greater involvement, inclusion and search for cooperative actions which can yield a cooperation arrangement to be agreed during the project period.
 - Although formalization of joint membership is clearly a goal of this project, the project also aims to establish a program of cooperative basin management that may proceed at the working level. The project is designed as an initial step in the establishment of a long term ongoing program of basin-wide cooperation.

- f. Establishment of the OMVS Project Management Unit.
 - The project will be executed by OMVS and managed through a Project Management Unit located at OMVS. The PMU will consist of a project manager, and technical staff in addition to finance, procurement and admin staff. The full details of project implementation will be finalized during project appraisal. (See also Annex 8 for further information on the project implementation arrangements).

- g. Establishment of the first GEF consultative forum

In relation with other on-going GEF activities, the project will promote coordination and exchange of best practices between projects in Sub Sahara Africa. The OMVS will take the lead in organizing a first Consultative forum to bring together representatives from other related GEF projects such as the Niger river basin, the Lake Chad Basin, Fouta Djallon, Niger-Nigeria shared watershed, Senegal-Mauritania and Nile projects, for broad exchanges and experience sharing. While OMVS will leverage additional non-GEF resources to complement the amount set for this event, it is expected that other projects will also set aside resources for such events so as to establish a continuing process. The use of IW:LEARN as a tool to facilitate virtual exchange of lessons learned among West Africa family of GEF IW projects will also be pursued.

1.2. Data and knowledge management

74. This component will be complemented by the non-GEF funded alternative (projects P041528 and P041723), which is supported by the World Bank. World Bank activities include national assessments of water availability; national data collection and management; water allocation between different users as well as data and information on water quality (point and non point source). The present GEF project will build on this and fund the following:

- a. **Guinea specific.** This project component will fund the cost of including Guinea in the *l'Observatoire de l'OMVS*. The Observatoire is funded through the PASIE program. The activities will focus on ensuring the inclusion of Guinea in the emerging planning environmental and socio-economic data and knowledge framework which the PASIE is developing. The Guinea specific activities will mirror those of the PASIE which will be supported in the OMVS member countries and will therefore focus on socio-economic, environmental and water related data gathering, analysis, assessment and management as well as capacity building to ensure the long term sustainability of the system to be set in place.

Guinea specific activities are also envisaged include:

- Mapping of Senegal river basin in Guinea, including preparation of a Master Plan for the Bafing;
- Hydro-meteorological studies;
- Study on impact of bush fire.

- b. **Regional activities.** At the level of the basin, the GEF project will also provide training and capacity building so that the monitoring program can be owned and sustained by the riparian parties during and after the end of the present project support. It is expected that there will be close cooperation on this task with the operator of the generating plant who will benefit from improved data availability. The potential for private sector participation will therefore be strongly pursued during the implementation of this component.

1.3. A Transboundary Diagnostic Analysis and a Strategic Action Program

75. During the Project Development Fund –B (PDF-B) phase of the project, national reports and consultations were undertaken which highlighted the national priorities pertaining to the management of the shared water resource. Additional work will be required to complete the basin-wide picture. A **Transboundary Diagnostic Analysis (TDA)** will therefore be completed under this component, aided by resources from the pilot budget. The scientific community of the region assisted as appropriate by international scientists will be key to the completion of the TDA. The TDA work will address a variety of aspects, including: flow regime changes and implication of these on floodplains, biodiversity, fisheries; socio-economic impacts of flow regimes; possible future flow regimes in view of planned structures; impacts of infrastructure on environmental health and links to coastal and delta interactions below Diama.

Strategic Action Program

Following completion of the TDA, a Strategic Action Program will be formulated. The SAP will focus on the following:

- a. An in-depth consolidation of the identified national priorities;
- b. Narrative presentation of the root cause analysis and threats identified;
- c. Description of public perceptions towards proposed development actions in the basin and perceptions on transboundary environmental management issues;
- d. Prioritization of transboundary and national actions as reflected in the diagnostic analysis;
- e. Identification and definition of priority interventions;
- f. Identification of necessary additional policy and institutional reforms to facilitate enhanced transboundary management actions.

76. The existing national interministerial committees have been and will continue to function during project implementation and will play an important coordinating role in the finalization of the TDA and significantly in the agreement on the SAP. Further reference is made to the use of the functional equivalent of interministerial committees in component 1 above.

77. It is expected that the report will be completed within the first six project months. The report will serve as a basis for OMVS and the GEF implementing agencies to solicit further donor support to the sustainable management of the transboundary environmental resource in the Senegal river basin.

1.4. Priority Actions

78. Based on the preliminary transboundary diagnostic analysis, priority actions have been identified for early implementation through pilot activities. The pilots specifically target improvements of transboundary water resource and environmental management which have a transboundary impact. The pilots are intended to assist the four countries in establishing best practice, in testing transboundary management approaches and in establishing networks across boundaries thereby, strengthening riparian cooperation and integration.

a. Micro grant committees

The pilots will be implemented through micro-grant activities. As part of the preparation process for the World Bank project appraisal document, OMVS is establishing a micro-grant committee with participation of the national OMVS cellules, NGOs and civil society representatives and community organizations. Community organizations and civil society societies and other national actors will be invited to submit proposals addressing the transboundary actions within the areas listed below. The micro-grant allocations will have a ceiling of \$50,000 per micro-grant, but it is anticipated that many of the grants will be well below this ceiling. The recommendations of the micro-grant committee will be reviewed by the CRPP in December/January and incorporated as appropriate in the Action Plan being prepared for the Project Appraisal Document. During appraisal, anticipated in February/March 2002, additional funding commitments will be sought for these activities from other donors. Appropriate financial and other management arrangements specific to each activity will be designed as needed, consistent with the overall arrangements described in this document and in full compliance with GEF, World Bank, UNDP, OMVS and national criteria. Full details of the selected micro-grant projects will be incorporated in the Action Plan in the Project Appraisal Document.

The specific criteria for eligibility of proposals will be determined during the appraisal process, however, it is expected that the criteria will include the following aspects:

- Activities will fall within the priority areas emerging from the preliminary results of the Transboundary Diagnostic Analysis.
- Activities will be representative of the priority areas outlined below and will provide a learning tool providing further input to the Strategic Action Plan.
- As these are pilot actions, emphasis will be placed on collecting representative lessons learned from the various areas of intervention so that these can be used for subsequent upscaling of actions through investment.
- Activities which will test new approaches and indigenous knowledge will be encouraged
- Activities which address the integrated nature of the land/water management will be encouraged
- Activities which address a combination of community action with policy aspects will be encouraged.

Agreed priority actions areas for which micro-grant proposals will be invited are:

- b. Land degradation & desertification
 - Soil erosion & siltation
 - Transhumance management
 - River bank protection
- c. Water quality
 - Water weeds
 - Point and non-point pollution
- d. Wetland management
 - Flood plain rehabilitation
 - Sustainable traditional fisheries
 - Biodiversity management
 - Land use planning
- e. Evaluation of micro-hydropower potential
 - Studies
 - Consultants

1.5. Public participation and awareness

79. This component will expand on the participatory activities already initiated during the PDF-B process (for further detail on the public participation process implemented during the PDF B phase, see Annex 6). The project will continue to look to IUCN for support in the implementation of this component. The component is designed to support the effective involvement of local community leaders, the broader public, especially women, as well as the scientific community in the planning and management of environment and water resources in the basin. The project will build on the World Bank funded portion of the increment, projects P041528 and P041723. Activities under these two projects include stakeholder involvement in introducing decentralized water management; awareness and outreach activities in the context of the creation of national water agencies as well as awareness and public information activities on the management and protection of water resources. The present GEF project will have three core focus areas:

a. Public information and awareness

- Through a variety of delivery mechanisms, (nature clubs, schools, scout movement, youth movement, university modules etc) launch environmental education and awareness programs in the four countries, emphasizing transboundary linkages and interdependencies.
- Form basin-wide teams to design and develop common environmental education and awareness programs and materials aimed at public and school audiences, emphasizing transboundary links and connections which the Senegal river forms, using TV, radio and web pages in addition to traditional media to complement existing initiatives.

b. Civil society participation

- Through NGOs and other civil society networks, provide training and facilitation to support civil society participation in the discourse on the sustainable development of the Senegal river basin.
- Strengthen the community organizations and pay special attention to the integration of women's groups and vulnerable or marginalized groups in the process.
- Promote public participation in the development of new legislation (see also activity 1.3) that is understandable to the public, favorable to public participation and prepared or amended following public consultations and hearings. Promote the distribution of new or harmonized legislation in a readily comprehensible form and in local languages to allow for greater access to and awareness of rights and obligations.

c. Scientific community involvement

- Establish a basin-wide working group with representatives from principal universities and research institutions to facilitate exchange and to coordinate university programs in environmental science, engineering, and policy studies.

C2. KEY POLICY AND INSTITUTIONAL REFORMS SUPPORTED BY THE PROJECT

80. **An inclusive cooperation framework.** A major objective of the present project is to support and encourage the full involvement of Guinea in the environmental management framework for the basin. It is recognized that Guinea's priorities for support in the environment and water resource management fields are urgent and the project includes measures to address some of these priorities. As unilateral actions in the basin will inevitably place further strain on the limited water resources, all the riparians recognize that an inclusive framework within which planning is undertaken is the optimal solution. However, concerns with equity on the one hand and downstream impacts on the other are important factors which need to be considered to the satisfaction of all. The goal is to move towards realizing sustainable development benefits for all riparian countries drawing on the development potential which the river offers. It is important not only that Guinea participates fully in the targeted cooperative agreement for

environmentally and socially sustainable management of the basin, but that the special needs of Guinea are recognized and addressed in the cooperation framework.

81. **Improved policy and institutional effectiveness.** The need for policy and institutional reforms is addressed directly by the project, but for many policies this will entail a refinement of existing policies and structures rather than a radical change. A comparison of national environmental legislation between the three OMVS countries is already being carried out under the PASIE. This project will extend the analysis to include Guinea and will further propose modifications to enable a coherent approach to water and environment management issues across the whole basin.

82. **Improved transboundary waters management capacity at national level.** A key policy and institutional priority is the strengthening of institutions that relate to transboundary waters in each of the riparian states, with a view to improved planning and management of national water resources within the transboundary context. This is expected to involve the ministries of both water and environment (which are often separate) as well as related agencies such as SOGED. The World Bank is already actively involved at the national level with various forms of support for water resource management through existing and planned projects, and through the Bank's African Water Resource Management Initiative (AWRMI) the Bank will further strengthen its national level water resource management program in all four countries. This project will provide linkage between relevant national policies and activities and basin-wide considerations. By strengthening OMVS, the project will also reinforce national institutional linkages with OMVS and between the countries themselves.

83. **Strengthened environment management at basin level.** At the basin level, the strengthening of OMVS' capacity with regard to environmental management is seen as crucial to improved coordination in the basin. A reinforced OMVS will be able to monitor and fulfill its sustainable management mandate more effectively. Through this project, OMVS will also be able to respond to client country requests to help prevent and/or resolve transboundary land and water conflicts. OMVS will also be in a position to lead the basin-wide long-term planning for effective use of transboundary surface and groundwater resources.

84. **Stakeholder participation.** The project also expects to maintain and build upon the ongoing public participation process developed during project preparation. It is intended that this will become established as an on-going part of the decision-making process in the basin, running in parallel to, and feeding into, the completion of the Transboundary Environmental Analysis and Action Program. The present project has been prepared in a highly participatory manner and is designed to establish an ongoing process of public involvement in the environment management of the basin. The project will build on the excellent participation experiences from the PDF B phase and will ensure that civil society will be involved not only with the pilot projects on the ground but also with the process of defining longer term objectives within the Transboundary Environmental Analysis and Action Program.

C3. BENEFITS AND TARGET POPULATION

85. The benefits that will be derived from the establishment of this long term programmatic approach are analyzed in more detail in Annex 1 on incremental benefits and costs.

86. **Bene ficiaries.** Benefits for the population are expected to accrue to communities living on or near the River Senegal, through the establishment of a comprehensive basin-wide plan for long-term environment management of land and water resources associated with the river and its shorelines. Direct benefits will accrue to communities involved in the pilot activities which explicitly include poverty alleviation measures or improve income potential. Indirect benefits will accrue to communities who may benefit from improved land and water resource management actions which OMVS and the riparian

countries will be undertaking. Direct benefits will also accrue to the regional institutions involved, notably OMVS, and to those institutions working on transboundary water and environmental issues including the national ministries, universities, research institutes, NGOs and the private sector.

87. **Improved livelihoods.** The project is intended to help maintain and improve the livelihoods of populations and communities living close to the river and dependent upon it. The project will provide a strategic framework and a programmatic approach within which the transboundary resource can be managed with greater efficiency and coordination for greater impact on poverty alleviation. The project also includes pilot activities which will contribute directly to the reduction of poverty.

88. **Sustainable WRM.** The project will help achieve improved and sustainable management of the water resource. Benefits are expected to accrue to the global and regional environments through improved management of the river, its flows and related natural resources, through availability of improved data, and through specific interventions under the Transboundary Environmental Analysis and Action Program. The extensive wetlands in the basin are of global and regional importance and are themselves transboundary. The Fouta Djallon headwaters are the highest in west Africa and the source of most major West African rivers. The closeness of the sources of these international rivers emphasizes the regional scale of the impacts and benefits of water management in the Senegal river basin. Improvements in water quality, reduction of sediment loads, regulation of flows in this area can bring benefits throughout West Africa.

C4. INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS

89. **Implementation period.** The project is expected to be implemented over a period of four years starting in 2002.

90. **Co-implementation.** The project will be co-implemented by UNDP and the World Bank to ensure effective co-ordination of multi-lateral assistance to the Senegal river basin. Each of the two organizations have a number of ongoing programs and projects underway which are an important base-line for the present GEF project. Moreover, the two agencies have found that cooperative implementation for international waters projects greatly enhances project impact, since each agency draws on its comparative advantage in serving the client river basin organization.

91. **Executing agency.** The project will be executed by OMVS. To handle the project implementation, a Project Management Unit (PMU) will be established as an integral part of OMVS' head office in Dakar. To facilitate smooth implementation on the ground, OMVS will sign a management services agreement with a project services agency. However, an integral part of the terms of reference of the project services agency will be to further strengthen OMVS capacities in procurement and administration so that OMVS can take on the direct responsibilities of implementing any follow-on activities. The PMU, working in close collaboration with World Bank and UNDP country offices, will be responsible for supporting OMVS in ensuring that the national and regional priorities agreed by the riparian states are substantively and coherently accommodated within the Transboundary Environmental Analysis and Action Program. (See Annex 8 for further details on proposed institutional arrangements and Annex 7 for information on OMVS structure and mandate).

92. **Co-financing.** A large number of donors are actively supporting the PASIE and a number of these have expressed clear interest in the further expansion and consolidation of the environmental management actions which are supported in the basin. During the preparation of this project, the World Bank have had fruitful discussions with donors to the region and several have contributed significantly to the preparation process. While the World Bank is providing considerable co-financing at the national level and while this

will be expanded during 2002 to include national water resource management support to Guinea, it is expected that discussions with donors will firm up during the appraisal period and that an additional \$10 million will be mobilized from co-financed resources. It is expected that these resources will be confirmed by the time the project appraisal document will be sent for GEF endorsement.

93. **Coordination.** The Project will be closely coordinated with other projects in the basin and with other GEF projects in West Africa. The “Integrated Management of the Fouta Djallon Highlands” (UNEP/GEF) for which the drafting of the PDF B request is nearing completion, is closely inter-related and a special effort will be made to ensure the closest possible coordination. The sources of the Gambia, Senegal and Niger Rivers occur in the Fouta Djallon and the need for a coordinated approach to the management of the highland areas is clear. The Fouta Djallon project comes under the GEF OP12 category but it is essential that the Senegal project management work closely with that of the Fouta Djallon project to ensure compatibility of effort. The Implementing Agencies are already working closely during the preparation of these two projects and on the Niger River Basin project. Land management issues are seen as crucial to the improved management of water resources. Among other relevant and important projects are: the project for “Biological Diversity Conservation through Participatory Rehabilitation of the Degraded Lands of the Arid and Semi-Arid Transboundary Areas of Mauritania and Senegal” (GEF, UNEP/UNDP); the “Coastal and Marine Biodiversity “ project (WB/GEF); the Canary Current project offshore (UNEP/UNDP/GEF); the “Integrated Coastal and River Basin Management Project” (UNEP/Norway); the “Transboundary Protected Area Bafing/Faleme Project” (EU) and “PARS” and “PROWALO” which are agroforestry, irrigation and drainage projects supported by the German KfW. Other closely related projects in west Africa which are also concerned with international waters and land degradation issues include the Volta River, Lake Chad Basin and Niger River Basin GEF projects now under preparation. Coordination will be achieved through the respective implementation agencies as well as by establishing links to the other basin organizations and project management units involved. Coordination with the Bank’s activities under the Africa Land and Water Management Initiative, as well as exchange and networking with the Nile Basin Initiative and the Okavango project will also be supported.

94. **Integration with regional initiatives.** All the four countries are signatories to the CCD. Moreover, all four countries have completed their National Action Program exercises and filed these with the CCD Secretariat in Bonn. A Regional Action Program (RAP) has also been completed and within this, a Sub-Regional Action Plan has been formulated. Moreover, in the context of the Global Waters Partnership, OMVS is the sub-regional lead agency for the Initiative on the Sustainable Management of Shared Water Resources.

C5. PROJECT COORDINATION AND OVERSIGHT

95. A **Senegal River Basin Steering Committee (SRBSC)** will be created. The SRBSC will oversee project implementation activities. Its membership will include representatives from the participating countries, OMVS (including relevant project managers from projects such as the PASIE, the Observatoire and others), participating GEF implementing agencies, donors to the present project, and participating NGOs. In addition, to the above, and in an effort to ensure transfer of lessons and best practice, UNEP will also be invited to participate in all Steering Committee meetings. Moreover, in an effort to ensure coordination with ongoing GEF and agency projects listed above, the Project Managers/Coordinators of these will also be invited to participate as observers in all Steering Committee meetings.

96. The Project Manager will act as Secretary of the SRBSC. Thematic and geographic committees will be created as necessary. Close links will be maintained with existing OMVS committees, especially the Water Commission. The High Commissioner of OMVS will chair the first meeting of the SRBSC.

The SRBSC will:

- Have oversight of the project and will provide policy advice and guidance;
- Review project implementation and provide technical advice and guidance to the OMVS PMU;
- Receive and review annual substantive and financial reports on project activities; and
- Review and approve annual work plans.

97. The Steering Committee will report through the High Commissioner of OMVS to the Ministers' Council which is an Inter-Ministerial Council already established as part of the structure of the OMVS (See Annex 7 for details). Decisions that cannot be reached by the Steering Committee will be referred as necessary to the Council of Ministers. As discussed during the recent OMVS mission to Guinea, Guinea will be invited to participate fully in the Ministers' Council and the other relevant decision making bodies. National, inter-ministerial (environment, water, energy, etc.) committees in each country, to coordinate intersectoral participation, coordination and commitment to SAP preparation and implementation will also be created building on the outputs of the PDF B implementation process.

98. Direct and ongoing management of project activities will be the responsibility of OMVS through the PMU. The PMU will comprise a manager, technical experts for each of the project components, including public participation and communications expertise, as well as the requisite administrative and secretarial staff. In so far as possible, consistent with their regular duties, OMVS staff will be incorporated within the PMU. Consultants will be retained when necessary and priority will be given to the recruitment of national/regional consultants as available. The OMVS will play a key and ongoing oversight and coordination role with and on behalf of the participating countries. The respective UNDP and World Bank task team leaders will be in direct and ongoing contact to facilitate the work of the project and to ensure maximum levels of co-operation to bring about project success. In implementing this project, OMVS will ensure close coordination and harmonization with the ongoing PASIE project, especially ensuring information exchange and coordination within the context of the PASIE Consultative Committee.

C6. ACCOUNTING, FINANCIAL AND AUDITING ARRANGEMENTS

99. Accounting, financial and auditing arrangements are outlined in Annex 8. Outstanding details will be finalized during pre-appraisal. This will include:

- Assessment of the **financial management system** with timetable for any improvements required;
- Agreement with project on **financial and accounting standards**;
- **Audit arrangements:** Independent audits will be undertaken on an annual basis; and
- **Disbursement arrangements:** To be determined in accordance with best practice.

C7. MONITORING AND EVALUATION ARRANGEMENTS

100. **Project Supervision:** The project will be supervised in accordance with the OMVS/UNDP/World Bank's supervision rules adapted to the multi-country nature of the project. The following elements make up the monitoring and evaluation program:

- A **substantive progress report** will be issued by the project on an annual basis. This report will be drafted by the PMU. The report will be submitted to the SRBSC members, the relevant four Ministers (OMVS Ministers plus Guinea), the World Bank and UNDP and will be reviewed and

approved by the annual Steering Committee meeting (see below). Extracts of the reports will also be posted on the worldwide web for public access if feasible.

- **Annual supervision missions:** An annual supervision mission will be fielded to review project progress. This supervision mission will be a joint undertaking of the World Bank, UNDP and other donors to the project and OMVS.
- **Annual Steering Committee meetings:** In conjunction with the annual supervision mission, an annual Senegal River Basin Steering Committee meeting will be held. This meeting will be attended by the Steering Committee members as well as by the supervision mission members. The Steering Committee will have received and reviewed the Annual Progress Report prior to the meeting.
- **Mid-term evaluation:** An independent mid-term evaluation will be carried out to assess progress and to make suggestions for adjustments in project design and implementation. The terms of reference, composition and timing of the mission will be agreed by the Steering Committee. The evaluators to be selected will have had no previous involvement in the design or monitoring of the project.
- **Use of IW indicators:** The project will employ established International Waters indicators during the M&E process. The use of *Process Indicators* will be essential to measure progress of the many elements of the project that will require complex inter-ministerial and multi-country interactions necessary to the completion of the basin-wide transboundary environmental analysis and action program and measures to build capacity both at national and regional levels, and most particularly for the OMVS. *Stress Reduction Indicators* will also be used to measure project progress. These indicators will be useful, *inter alia*, to measure progress in implementation of the priority actions and in follow-on efforts to adapt existing legislation and regional approaches to more effectively address issues related to land degradation and desertification, water quality, wetland management, and the evaluation of micro-hydropower potential. Last, *Environmental Status Indicators* will be identified as part of the ongoing process of M&E. While actual changes in the water column and the effects of altered land use practices may not be evident during the four year life of the project, the identification of such measures is expected to be a project activity.

D. PROJECT RATIONALE

101. **Adding a transboundary increment.** The present project complements ongoing and planned water resource and environmental management initiatives in the Senegal river basin. The project adds a transboundary increment to ongoing national and regional efforts. The project promotes an inclusive cooperation environment, by bringing Guinea into the Senegal river cooperation through on-the-ground regional and transboundary actions in the four riparian countries.

102. **Capacity building.** The project supports substantial capacity building at national and OMVS levels, improving the knowledge base, identifying the opportunities and priorities and supporting concrete actions on the ground. Additionally, the project brings the important aspect of civil society involvement and public participation to ongoing regional OMVS activities. By bringing together social groups and the regional organization each side will have the opportunity to experience the benefits of this kind of interaction thereby, ensuring that long term sustainability as well as consultative practices are incorporated into future and ongoing Senegal river basin management actions.

103. The project is seen as the first step in the development of a program for establishing an increasingly effective river basin management framework. The project, therefore, builds capacity and sustainability among the riparian countries.

104. **Land and water issues.** The principal focus of the project is on the water resources of the Senegal river basin, but the project recognizes that attempting to improve the management of a river without paying attention to the management of the land it drains is ultimately a fruitless task. Fundamental land and water management issues arise throughout the valley and there is a need for an integrated approach recognizing such interactions as between land tenure issues and soil degradation and erosion and changes of flow regime and increased sedimentation, to name just one chain of events. The GEF approach provides scope for adequately addressing such inter-relationships, while not attempting to address all issues at once. Land use practices (whether agriculture, forestry or mining) in the upper basin may have major impacts on the operation of the generating plant and on the livelihoods of people downstream. Equally, decisions made for agriculture development or for wildlife conservation or for fishery production, all have inter-related impacts on the livelihoods of the inhabitants that need to be fully taken into account in the context of the basin as a whole.

105. **Building on the PASIE.** The major project in the basin at present is the Manantali scheme (US\$126 million) and the imminent start up of electricity generation. The impacts of this project are being directly addressed through a US\$17.056 million project which is already under way – the PASIE, described above, that is directly related to minimizing the impacts from the power generation. Although broad in scope, this project is limited to the specific impacts among the downstream riparians. The project does not address the broader water resource and environment management needs of the basin as whole and does not include Guinea. The opportunities thus presented for obtaining incremental benefits at modest additional cost are considerable. The project will complement and reinforce, but not duplicate, the PASIE.

106. **The start of a programmatic process.** This project is thus seen as a first step in a programmatic process. The project itself will prepare the framework by strengthening capacity and improving the knowledge base; by initiating some urgent and achievable actions on the ground, by completing in-depth analysis of the problems and root causes and of their solutions; by continuing to seek the views, perspectives and advice of the stakeholders at all levels and by using all this to produce a coherent, implementable Transboundary Environmental Analysis and Action Program that can be supported by all the riparians, by OMVS, by a consortium of donors and by the GEF, as appropriate.

D1. PROJECT ALTERNATIVES CONSIDERED

107. **A transboundary increment.** The limitations of a national level approach to the basin development were recognized and rejected. Consideration was also given to a sectoral approach which might have built on the Manantali Power Project and the associated PASIE. This approach presented opportunities and difficulties. The difficulty was principally that the project was already well underway and agreed between the three downstream riparians. Trying to introduce additional elements and an additional upstream partner would have needlessly complicated and delayed the project. On the other hand, the fact that the project was underway and that clearly defined incremental benefits could be secured by supporting an inclusive transboundary initiative offered a very attractive and relatively low cost opportunity for the GEF.

108. **Co-implementation considerations.** A basic consideration for the World Bank in helping to prepare this project is whether or not to join with UNDP as co-implementing agencies on the project. The following factors contributed to the decision to co-implement the project:

- The World Bank is supporting active portfolios in the water resource management /environment /water supply sectors in all four countries;
- UNDP supports land management projects and institutional capacity building in each country and has a substantial office in each capital city; and
- The two agencies are co-implementing other African international waters projects such as the Lake Chad project, the Niger river project and the Nile Basin Initiative. The two agencies have found that working together with each agency drawing on its comparative advantage, considerably increases the chances of success.

109. Accordingly, during the implementation of the project, emphasis will be placed on the priority actions on the ground in accordance with the Preliminary Transboundary Environmental Analysis. The Transboundary Environmental Analysis and Action Program will be completed early in the project, and will serve as a useful tool for OMVS to further sharpen its activities in the land/water management field.

D2. MAJOR RELATED PROJECTS FINANCED BY THE BANK AND/OR OTHER DEVELOPMENT AGENCIES (COMPLETED, ONGOING AND PLANNED)

110. The accompanying table provides an overview of the most significant interventions which are underway in the basin related to water resources and environment management.

111. **PASIE.** As mentioned earlier the PASIE program, funded by a variety of donors, addresses environmental issues related to the hydropower project, but the PASIE also addresses optimization of benefits for the various users of the water. The decisions that will be reached, and the manner in which they are actually applied, will be fundamental to the future livelihoods of many of the two million residents of the basin. Underlying both the acceptance of a Water Charter and operation rules for the river is the need for reliable baseline information. The paucity of such information in the past has undermined the original design assumptions for the power project and emphasizes the importance of greatly improving the data base especially in the headwaters in Guinea.

112. **In Guinea,** the World Bank has supported Guinea's Third Water Supply with a total of \$31.5 million and is now in the process of processing a supplemental credit to that project amounting a total of \$27.5 million. This project supported an initial workshop on water resource management; and the Bank's African Water Resource Management Initiative (AWRMI) secured additional Dutch funding for studies on groundwater opportunities in Guinea. At this point, the Bank is about to engage in further discussions with Guinean authorities on next steps to carry this work further.

113. **In Mali,** the World Bank and UNDP are involved in several projects which deal with natural resources management such as the GEF Arid Rangeland Biodiversity Conservation Project and the Bank funded National Rural Infrastructure Program (PNIR). Components of relevance include strengthening of community participation and development of an adequate water resource management framework at the national level.

114. **In Mauritania,** pressure is mounting for an increased water supply for Nouakchott. The Bank is currently preparing a water supply project which will address Nouakchott's water needs through groundwater development. At the same time, the National Health Program addresses the spread of water borne diseases in the valley. Although this project does not have a specific water resource component, the project will, nevertheless, address key water resource management issues.

115. **In Senegal,** the Bank is involved with major water projects to supply Dakar including the newly approved Bank project, the Long Term Water Sector project which will draw additional water from *Lac de*

Guiers. The Bank is also supporting a national program for development of rural infrastructure in Senegal. The Long Term Water Supply project has links to the PASIE's call for a Water Charter which will determine the basis for allocation of water from the River. The Bank is also involved with a project for endemic diseases control which also has strong links to the environmental health issues raised by the operation of the Diama and Manantali Dams. The impacts from the construction of these dams led to increases and changes in the disease patterns downstream. New strains of malaria developed and schistosomiasis increased. The invasion of aquatic weeds has increased the breeding grounds for disease vectors and measures proposed under the present will begin to address these concerns.

116. **Active Donors.** There are approximately a dozen major donors supporting water and environment related activities in the basin, notably Canada, France, Germany, Netherlands, Norway, Saudi Arabia, China, USA, the African Development Bank as well as IDA, UNDP, GEF and IUCN. There are also numerous national and local NGOs and local community groups working on water related projects. An example is the work which Germany is supporting in a number of projects in the Senegalese part of the basin. The projects most closely related to and allied with the present project are the Manantali Power Project and the associated PASIE, which this project is partially designed to complement.

117. **Adjacent GEF projects.** There are several other GEF projects that are under way or under preparation. The most significant of these is the one being developed for the Fouta Djallon watersheds (including the headwaters of the Senegal, Gambia and Niger rivers). This is expected to help address some of the land and small watershed management issues in the highlands and will have to be closely integrated with this project for the Senegal river basin and with another being developed for the Niger river basin. Other GEF projects in the basin include a project to preserve biodiversity around the Manantali reservoir and a land rehabilitation project in the lower valley. There is also a GEF project under preparation off-shore dealing with the Canary current. The physical barrier of the Diama Dam presents a convenient division between these, but in fact there are important physical interactions between the Senegal river and the Atlantic ocean which need to be taken into account. The lower valley and the delta also include significant wildlife areas and reserves of global importance including two RAMSAR sites.

118. **Other relevant GEF projects.** Linkages with the UNDP/GEF initiative IW:LEARN will provide for sharing of project results and replication of successful practices in other regions of the world and specifically among other groups of countries confronting similar issues, especially in Africa. In addition, while country specific activities are not yet determined, the present project will establish linkages to the African Stockpile Program which is under preparation in the framework of the Stockholm Convention on Persistent Organic Pollutants (POPs). As referenced in an earlier section, the Senegal project will draw on and network with other ongoing international waters projects, particularly the Niger and Lake Chad projects, but linkages will also be established with the Nile Initiative and Okavango project.

D3. LESSONS LEARNED AND REFLECTED IN THE PROJECT DESIGN

119. Lessons learned from the other GEF and non-GEF international waters projects to date are reflected in the project design. The lessons that are of the greatest relevance to the project are listed below:

- (a) *Project design lessons:* Many of the lessons learned from activities in the Senegal basin itself relate to project design and deal with unrealistic project planning, schedules and assumptions. Top down planning has occurred without relationship to the local needs of the beneficiaries. Large schemes for groundnuts, cotton, irrigation, have been less than successful due to application of inappropriate technologies, lack of markets or access to markets, competition from abroad (including dumping of products from northern countries), lack of local capacity, lack of capacity and training in necessary techniques etc. Supervision, monitoring and evaluation have at times

been inadequate. National activities have not always taken into account the potential impacts on the neighbors. International activities such as the establishment of wildlife reserves of global significance have not always involved or been adequately understood by the local residents; more effort is needed to ensure there are local benefits as well as global benefits from any further developments.

- (b) *Sustainability and participation:* Lessons learned, however, do include the positive, if sometimes difficult to achieve and time consuming successes of community based developments, of micro-enterprise, of access to credit, of local ownership: cost recovery and retention for sustainability; in short, of involvement of the beneficiaries in design, implementation and evaluation of projects on the ground.
- (c) *Land management:* It has become increasingly clear in recent years that successful management of water resources cannot be done if management of the riparian lands is not also attended to. Optimal water resources management depends on good land management practices. All the elements of the watershed are inter-related and need to be seen as a whole, as a single integrated but multi-faceted system. Ultimately this will only be fully optimized through effective management of the environment of the whole basin, in concert with the skills and culture of the different peoples living in the different parts of the basin.
- (d) *Institutional capacity:* The challenge is to bring about effective implementation, to ensure sustainability and to achieve benefits for the most needy. This is particularly difficult and important when dealing with regional-scale issues and a regional organization. It is for this reason that the first focus of this project is on capacity building. Without improved capacity for management, additional interventions are at risk and are unlikely to achieve the desired benefits.
- (e) *Monitoring and evaluation:* At a recent GEF International Waters conference, attended by team members, several important lessons were highlighted including the importance of ensuring a stronger and more participatory monitoring and evaluation component, including the collection of baseline data within that monitoring and collection component; and the inclusion of the local scientific academic and research community into the project so as to close the 'loop' on scientific data underpinning of environmental and hydrological decision-making.
- (f) *Partnership:* Building broad partnerships among and within the riparian countries and with NGOs, international agencies and donors is essential for a coordinated process.
- (g) *Inclusivity:* In order to support long term sustainability and cooperative management of a shared river, the participation of all riparian countries is of paramount importance. There are often historical legacies which have led to the absence of one or more riparians from a cooperative instrument. However, with increasing pressures and demands on the resource, cooperation is the only alternative. The challenge, therefore, becomes to help foster an environment of trust, equity and dialogue within which all riparians can together pursue their common and cooperative development aspirations.

D4. INDICATIONS OF RECIPIENT COMMITMENT AND OWNERSHIP

120. **OMVS request.** The origin of this project was a request to the World Bank from OMVS to help prepare a project for the Senegal river basin. OMVS staff have been active throughout the preparation of the present project. The High Commissioner of OMVS has played a key role in leading the meetings of the Regional Project Preparation Committee which has endorsed this brief and the request to GEF.

121. **Inclusivity and national commitment.** Each riparian country, including Guinea, has been contributing to the preparation of the project under the guidance of its National Project Planning Committee (NPPC). Four parallel committees have been established in each of the basin countries and committee members include senior officials from both the water and environment ministries. The countries have demonstrated commitment and enthusiasm to complete the preparatory work. National

reports have been prepared by national pools of consultants under the supervision and in collaboration with the National Project Planning Committees. The GEF focal points for the countries in the basin have shown individual commitment in the preparation of this project. Everyone has acknowledged the need for thorough preparation and are ready to begin implementation

122. **Active Public Participation Program.** The concept of involving the public so extensively in the preparation of the project (see Annex 6) was relatively new in the Senegal basin context. This time-consuming, but important, process has been fully supported at the technical and political levels by OMVS and the member states. The commitment to a broad participatory process was emphasized by the OMVS High Commissioner's note to the Bamako workshop on the World Bank's Regional Strategy in West Africa in March 2001. This note made a clear commitment to enhance participatory approaches in project design and implementation so that successful projects which target poverty alleviation can be implemented at the basin level.

123. **Riparian commitment to cooperation.** The commitment to regional cooperation is already evident in the establishment and maintenance of OMVS by the three member states and by Guinea's interest as a participating observer. The major regional projects developed by OMVS have cemented this collaboration as is shown by the objectives of the Regional Hydropower Development Project. Within the context of this project, the three participating states have committed to a number of obligations and joint actions. These include:

- To contribute to meeting debt service associated with the building of the Manantali dam;
- To contribute to increasing the efficiency and reliability of power systems in the three countries;
- To establish an effective organization to construct and operate the project facilities and to mitigate environment and health impacts of the project and the Manantali dam;
- To promote competitive private sector participation in project as well as in financing of future generation projects on the valley; and
- To support the traditional agricultural sector downstream through the rational management of the Manantali reservoir.

D5. VALUE ADDED BY THE WORLD BANK AND UNDP

124. **OMVS request.** The involvement of the World Bank in this project is as a result of the direct request of OMVS to assist with the preparation of a GEF project. This recognizes that the Bank's ability to contribute a variety of technical strengths, combined with the Bank's ready access to the highest representatives of the member states and its influence and convening power make it a strong ally in the effort to strengthen OMVS, to encourage the involvement of Guinea and to improve the management of the Senegal river basin. In pooling its resources with UNDP, which has a strong on-the-ground presence and long term experience in capacity building, the support and expertise of both institutions are put at the disposal of the project thereby, offering it a greater chance of success.

125. **World Bank support and links to related projects.** The World Bank's involvement in developing the Senegal river basin dates back to the 1960s. In 1979, based on different interpretations of the rationale and different views on impact, the Bank withdrew its support for the construction of the Diama and Manantali dams. Since the mid-1990s, the Bank has re-engaged with OMVS and is now supporting a number of related activities in the basin. These include the installation of power generation facilities at Manantali; the PASIE which is designed to monitor environmental aspects of the project; and the Long Term Water Supply project in Senegal. The Bank has also been working with the national governments on the implementation of integrated water resources policies. Through its Water Resources Policy and its work of the African Water Resources Management Initiative, the Bank is committed to a policy of supporting governments in the preparation of water resource policies and strategies. These range

from a major effort for all the countries in the Nile Basin to support for water resource management objectives in the Rural Infrastructure Project in Mali and support for follow-up to the National Water Resources Management Conference in Guinea.

D6. GLOBAL BENEFITS CATALYZED BY GEF SUPPORT

126. The value of this project for the GEF is that it specifically complements and builds on much of the work that has been and is being done, at the national and sub-basin level, so as to expand the potential benefits to the wider transboundary and global environment.

127. This largely complementary project is to be part of an evolutionary process, based on a programmatic approach, that will lead to the coordination of water and environmental management in the basin as a whole. The benefits will come from improved land and water conservation and management in the headwaters through improved flow management in the low reaches. Transboundary impacts will be minimized; sedimentation and pollution reduced; water rights for users more clearly allocated and fairly distributed; causes of tension among land holders in border areas reduced with the help of improved science, knowledge and management. Capacity building at all levels will improve management skills and enable improved management of the basin for all its users. The project will largely complement baseline activities by addressing the transboundary issues and, thus, achieve incremental benefits.

128. The economic, social, and environmental well-being of the participating countries depends upon the vitality and productivity of the Senegal river basin. This co-operatively prepared project provides a sound technical basis for, and country commitment to, participation in OP #9 generally and especially the international waters component of that OP. The objective of OP #9 is to support “better use of land and water resource management practices on an area-wide basis”. Under this OP, activities supported are those that have “an area wide focus” and are to include measures that are “more proactive interventions aimed at protecting international waters”. A major focus is to support measures for “prevention of damage to threatened waters” and the OP’s long-term objective “is to achieve global environmental benefits through implementation of IW projects which integrate the use of sound land and water resource management strategies as a result of changes in sectoral policies and activities that promote sustainable development”.

129. The project is consistent with this GEF guidance and include the formulation of a Transboundary Diagnostic Analysis (TDA) and a Strategic Action Program (SAP), as prescribed as part of the International Waters Portfolio. Of particular significance for the project is GEF commitment to “support for preparation of water resources management strategies by riparian countries for a transboundary dryland basin...to allow harmonizing of sectoral water uses among basin countries in an environmentally sustainable manner”. This proposal contains explicit provision for addressing these GEF defined activities. In efforts related to the PDF-B, the four Senegal river basin countries co-operating in this project have worked to meet the objectives of OP #9 generally as well as the Land Degradation Component of that OP.

130. GEF support will serve a catalytic role in the project and the continuing participation of existing donors will contribute to this multi-country, regional organization, and multi-stakeholder effort. Through co-implementation with UNDP, additional synergies will be achieved. Moreover, through the completion of the Transboundary Environmental Analysis and Action Plan, OMVS and riparian countries will be able to approach donors for additional assistance in the field of transboundary environmental management activities.

E. ISSUES REQUIRING SPECIAL ATTENTION

E1. Economic

131. **Incremental Costs.** The total baseline of the project is estimated at US\$ 308.75 million and the alternative scenario is estimated at US\$ 354.8 million. The incremental cost is estimated at US\$39.730 million of which US\$32.480 million comes from non-GEF sources and 7.25 million is the GEF contribution. GEF finance totals for this project amount to US\$7.25 million. In addition, GEF preparation funding (PDF Blocks A and B) amounted to US\$375,000, thus comprising a total of GEF finance of US\$ 7,625,000.

132. The costs of monitoring and evaluation, supervision and quality control, contingencies as well as execution costs are included in these amounts. A full analysis of the incremental cost is found in Annex 1.

| COMPONENT | GEF IMPLEMENTING AGENCY | GEF FUNDING | WORLD BANK & UNDP FUNDING | PASIE FUNDING | OTHER DONORS | NON-GEF AND GEF PROJECT TOTALS | UNDP GEF | WORLD BANK GEF |
|--|-------------------------|------------------|---------------------------|------------------|----------------|--------------------------------|----------------|------------------|
| 1. Capacity Building | | | 870,000* | | | 870,000 | | |
| 1.1 Transboundary institutional analysis | World Bank | 17,000 | | | 20,000 | 37,000 | | 17,000 |
| 1.2 Strengthening institutional structures | World Bank | 470,000 | 1,900,000 | 1,200,000 | 250,000 | 3,420,000 | | 470,000 |
| 1.3 Harmonization of legislation – Guinea | World Bank | 150,000 | 1,400,000 | 500,000 | 15,000 | 2,065,000 | | 150,000 |
| 1.4 Capacity building in regional institutions | UNDP | 410,000 | | 150,000 | 150,000 | 710,000 | 410,000 | 0 |
| 1.5 Development of an inclusive institution | World Bank | 120,000 | 720,000 | | 50,000 | 890,000 | | 120,000 |
| 1.6 Strengthening of OMVS | World Bank | 2,078,800 | | 1,200,000 | 25,000 | 3,103,800 | | 2,078,800 |
| 1.7 Africa regional forum | World Bank | 100,000 | | | 25,000 | 125,000 | | 100,000 |
| Sub-total | | 3,345,800 | 4,890,000 | 3,050,000 | 535,000 | 11,820,800 | 410,000 | 2,935,800 |
| 2. Data and Knowledge management | | | 470,000* | | | 470,000 | | |
| 2.1 Guinea program | World Bank | 250,000 | 100,000 | | 50,000 | 400,000 | | 250,000 |
| 2.2 Transboundary data and knowledge mgt | World Bank | 1,020,000 | 300,000 | 1,075,000 | 150,000 | 2,545,000 | | 1,020,000 |
| Sub-total | | 1,270,000 | 870,000 | 1,075,000 | 200,000 | 3,415,000 | | 1,270,000 |
| 3. Transboundary Action Program | | | 395,000* | | | 395,000 | | |
| 3.1 Transbdry Env. Analysis & Action Plan | World Bank | 40,000 | | | | 40,000 | | 40,000 |
| Sub-total | | 40,000 | 395,000 | | | 435,000 | | 40,000 |
| 4. Priority Actions | | | 170,000* | | | 170,000 | | |
| 4.1 Land degradation and desertification | UNDP | 1,000,000 | | | 1,500,000 | 2,500,000 | 1,000,000 | |
| 4.2 Water quality | UNDP | 289,200 | 2,000,000 | | 400,000 | 2,689,200 | 289,200 | |
| 4.3 Wetlands management | World Bank | 900,000 | 300,000 | | 3,850,000 | 5,050,000 | | 900,000 |
| 4.4 Evaluation of micro-hydro potential | World Bank | 75,000 | | 1,300,000 | 150,000 | 1,375,000 | | 75,000 |

| COMPONENT | GEF IMPLEMENTING AGENCY | GEF FUNDING | WORLD BANK & UNDP FUNDING | PASIE FUNDING | OTHER DONORS | NON-GEF AND GEF PROJECT TOTALS | UNDP GEF | WORLD BANK GEF |
|--|-------------------------|------------------|---------------------------|------------------|-------------------|--------------------------------|------------------|------------------|
| Sub-total | | 2,264,200 | 2,470,000 | 1,300,000 | 5,900,000 | 11,934,200 | 1,289,200 | 975,000 |
| 5. Public Participation and Awareness | | | 645,000* | | | 645,000 | | |
| 5.1 Public information and awareness | UNDP | 160,000 | 2,100,000 | 1,400,000 | 1,350,000 | 5,010,000 | 160,000 | |
| 5.2 Civil society participation | UNDP | 120,000 | 1,500,000 | 1,550,000 | 2,500,000 | 5,670,000 | 120,000 | |
| 5.3 Scientific community involvement | UNDP | 50000 | 250,000 | | 500,000 | 800,000 | 50000 | |
| Sub-total | | 330,000 | 4,495,000 | 2,950,000 | 4,350,000 | 12,125,000 | 330,000 | |
| TOTAL | | 7,250,000 | 13,120,000 | 8,375,000 | 10,985,000 | 39,730,000 | 2,029,200 | 5,220,800 |

*The figures marked with an asterisk are a combination of UNDP/OMVS/participation country contribution

E2. Financial

130. **Project Financing.** The project will finance project activities in the four participating countries. As described above, the project builds on national activities which the UNDP and World Bank are supporting in the riparian countries and serves as a transboundary increment to those national actions. The project will not fund any of the OMVS operations and recurrent cost. These continue to be funded by the countries themselves through their annual contributions to their organization (see also Annex 7). The summary budget, including responsibilities between the two agencies, are outlined overleaf:

133. The project is designed to complement, reinforce and expand the PASIE; to provide a basin -wide framework within which the further activities envisaged under the Action Plan will be carried out. Additional financing for these activities is being secured from donors and other partners, as the specifics become clearly defined during further project (see para. 80) . The GEF financing will thus act as a ‘bridge’ and as a catalyst to encourage further investment in the basin within the overall programmatic approach. Several donors(see para. 7) have been participating in, and contributing to, the process to date and it is confidently expected that the interest of these donors in the programmatic approach will be confirmed with financial commitment in due course.

134. **Fiscal Impact.** The size of the OMVS contribution to the operations of the project is still under discussion and will be finally determined during appraisal, but an indicative figure of US\$175,000 per year over the four year period is being discussed. The indicative figure would involve new and additional finance and/or the reallocation of already committed resources to project related activities. Such matters are determined by the OMVS Heads of State summit and will be agreed upon careful consideration of the overall financial situation of the institution.

E3. Transboundary complementarity.

- 133. The present project will complement already ongoing regional actions (the PASIE) and will through World Bank and UNDP co-financing at the national level build on those national actions in the field of water resource management, by adding the transboundary dimension to the assistance.

E4. Institutional

134. Institutional issues requiring special attention include predominantly:

- The objective of involving Guinea, supporting inclusivity in the participatory cooperative management of the Senegal river basin;
- The reinforcement of OMVS, in particular with regard to its capacity in transboundary water resource management and its sensitivity to participatory approaches; and
- The reinforcement of the riparian water resource and environmental agencies with respect to their capacity to deal with transboundary water resource and environmental issues.

4.1 Executing agencies

135. OMVS will be the executing agency of this project. OMVS will contract the services of a project services agency to support it in implementation, financial management and procurement actions. A Project Management Unit will be established within OMVS to handle the implementation of the project.

4.2 Project management

136. **GEF Project Implementing Agencies.** The project will be co-implemented by the World Bank and the United Nations Development Programme, which are both implementing agencies of the Global Environment Facility.

137. The project will draw on the respective strengths of the two GEF implementing agencies for the implementation of the present project. UNDP will support the implementation of the component addressing capacity building in regional institutions, drawing on UNDP's long experience from other regional programs and institutions in West and Central Africa. UNDP will also take responsibility for supporting the implementation of two of the priority actions, namely that pertaining to land degradation and that addressing water quality issues. UNDP has a long history of support to land degradation and desertification, especially in the Sudano-Sahelian region, where UNDP has been active since the early 1970s through its Office for Drought and Desertification (UNSO). On the water quality side, UNDP will work with local institutions, drawing on its extended network of country offices to support transboundary water quality measures. Finally, UNDP will also support the public participation and awareness component. UNDP will continue to look to IUCN for support in the implementation of this component of the project.

138. The World Bank is supporting a large investment portfolio in all four of the countries. Much of this portfolio has direct linkages, at the national level, to the activities which the present project will support at the transboundary level. The World Bank will, therefore, be responsible for supporting the implementation of project components which deal with facilitating the inclusion of Guinea in the broader riparian cooperation, transboundary analysis and institutional strengthening, data and knowledge management as well as two of the priority actions dealing with wetland management and evaluation of sustainable micro-hydro potential options.

139. **Project implementation at the national level.** At the national level, each country will have a **National Project Coordinator** who is the lead for the project in that country. The National Project Coordinator will work with other specialists from the same country, who are involved in implementing the project. The cost of the National Project Coordinators will be a government contribution and will, in the case of the three OMVS countries be working at the OMVS cellule. The national project office will be located in the following ministries:

- Guinea: Ministère des Mines et de la Géologie et de l'Environnement
- Mali: Ministère des Mines de l'Energie et de l'Eau
- Mauritania: Ministère de l'Environnement et du Développement Rural;
- Senegal: Ministère des Mines, de l'Energie et de Hydraulique;

Further details on project implementation are provided in Annex 8.

4.3 Procurement issues

140. The PMU will prepare the procurement plan which will be reviewed and approved by OMVS. Upon the approval of the World Bank and UNDP of the plan, the project services agency will be requested to implement the procurement plan. For procurements of goods and services, the project services agency will establish contracts with contractors to supply goods and services in accordance with the procurement plan. (See Annex 8 for further details).

4.4 Financial management issues

141. The services of a financial management specialist will be engaged through to appraisal, to address the relevant issues. However, it is anticipated that payments will be made directly from the UNDP/World Bank to the project services agency. The World Bank/UNDP will release resources in *tranches* to the project service agency. Such releases would be subject to the approval of OMVS. The OMVS PMU would issue its authorization based on the satisfactory performance of the project service agency in accordance with agreed deliverables.

142. OMVS (or its contracted agent on its behalf) will prepare financial reports on an annual basis for review by the SRBSC; the World Bank and UNDP, in accordance with World Bank and UNDP guidelines on monitoring and reporting on the use of GEF funds.

143. Ministerial meetings of OMVS will receive consolidated financial reports on a regular basis. A schematic on the proposed flow of funds can be found in Annex 8

E5. Social

6.1 Summarize key social issues relevant to the project objectives, and specify the project's social development outcomes

144. The project will address numerous social issues. Through the implementation of improved land and water management practices through the various project capacity building, outreach, and enabling activities, the project will create enhanced transboundary planning, cooperation and development impacts. This will benefit the land and water users of the region. Through the priority actions, the project will work with and support communities in the Senegal river basin with priority action on the ground, addressing anti-desertification and soil erosion measures water weeds infestation, improved traditional fisheries etc. The social and economic welfare of the region is affected by highly variable and unpredictable rainfall patterns. It is essential for the welfare of the people of the basin, that a sincere effort be made to find an optimal approach to the management of the flow regime below the dam. Much of this work is being done under the PASIE project, but the present project adds an incremental dimension in that it supports the further involvement of Guinea, as well as supports the transboundary aspects and implication of the land and water management issues.

6.2 Participatory Approach: How are key stakeholders participating in the project?

145. Stakeholder participation (see Annex 6) has been a key and successful ingredient of work being undertaken during the execution of PDF-B activities. The project will build on and add to the level of public involvement that began in the PDF-B phase. The project includes a specific project component which addresses participation, involvement and public awareness. Moreover, the priority actions will be carried out at the community level and will directly involve the various stakeholders and communities. Throughout the preparation of this project it has become clear that a genuine commitment to stakeholder

involvement is imperative as the only way of ensuring co-operation at all significant levels, promoting sustainable and productive engagement with local environments and involving the private sector and locally elected organizations in seeking negotiated solutions to environmental degradation.

6.3 How does the project involve consultations or collaboration with NGOs or other civil society organizations?

146. IUCN has been a key partner in the preparation of the project. The international NGOs and secretariats with whom there is ongoing discussion include national and regional NGOs, and IUCN (see Annex 6 for the list of institutions consulted during project preparation). The project will continue to look to IUCN for support in the implementation of the public participation and awareness component of the project thereby. It is expected, however, that a large range of national organizations, including, but not limited to IUCN's membership organizations will be participating in the implementation of the component. This includes reaching NGO umbrella organizations active in the region as well as development NGOs which may not be IUCN members.

6.4 What institutional arrangements have been provided to ensure the project achieves its social development outcomes?

147. OMVS, the executing agency, operating through the PMU, and the riparian states will be responsible for ensuring the project achieves its social development outcomes. The Steering Committee will monitor and provide advice, guidance and direction to the project. Clearly this is not easy to guarantee but the project is being designed to facilitate effective, monitored and responsive management (see section C4 and Annex 8). Appropriate monitoring and evaluation indicators will be developed to measure this outcome and checks and balances introduced to ensure that attention is given to all project outcomes, including the social development outcomes.

6.5 How will the project monitor performance in terms of social development outcomes?

148. In so far as the project addresses the need for establishing a framework and capacity for improved management of the basin, the social development outcomes will be mostly indirect and long range. The immediate action elements of the priority actions, however, will have specific monitoring and evaluation measures incorporated in their design. The public participation program, which will continue throughout the project, will act as a valuable and, no doubt, very critical gauge of the public's perception of the performance of the project.

149. Project objectives, outputs and emerging issues will be regularly reviewed and evaluated annually in the annual report, by the supervision mission, and by the Steering Committee. The project will be subject to the various evaluation and review mechanisms of the World Bank and UNDP. It is anticipated that the scientific advisory panel will be instrumental in assuring the scientific quality and standard of project implementation and reporting.

F. SUSTAINABILITY AND RISKS

F1. Sustainability

150. **OMVS.** OMVS is a well established and supported legal entity with specific transboundary responsibilities. However, it faces significant management challenges. The objective of this project is to reinforce its capabilities and to encourage the involvement of Guinea as a full member state. With its

capital assets and its expanding support, OMVS has the necessary elements in place to ensure sustainability of this project.

151. **Government Commitment.** As previously mentioned, the participating countries have worked together well during preparation of this project. All four riparian countries have established a National Project Planning Committee and each has participated as a member of the Regional Project Planning Committee (RPPC). Country official assistance in preparation of and participation in national and regional workshops, workgroups, and steering committees has been consistent and committed. The enthusiastic participation of Guinea in the process encourages confidence that it will continue its path towards greater involvement and eventual membership of OMVS once it is clear that there are direct benefits to Guinea from such membership.

152. **Financial Sustainability.** The financial commitment of the governments is largely reflected through their OMVS contributions (See Annex 7 for further detail on the level of contributions). UNDP's and the World Bank's ongoing work in projects which form the baseline for this intervention, in addition to the national water policy reform work which the Bank is supporting and which adds to the increment, will further consolidate and strengthen the long term financial sustainability of the present intervention. In addition, many other donors are active in their support to OMVS, to OMVS member countries and to Guinea. These include France, the African Development Bank, the EU and others. In general, OMVS member countries contribute 10% or more to each project that has been the subject of donor assistance.

F2. CRITICAL RISKS (REFLECTING THE FAILURE OF CRITICAL ASSUMPTIONS FOUND IN THE FOURTH COLUMN OF ANNEX 2)

153. **Political considerations.** The long term success of regional scale, multi-country management programs, such as the one proposed in this project, depends, *inter alia*, on the political willingness of the participating countries to co-operate, their willingness to continue project programs and approaches after the life of the GEF intervention, and the extent to which activities successfully engage end-users at the community level. In this case, the long standing commitment to the OMVS by three of the riparians, and the support of this project for the full involvement of Guinea, lend credence to a hope for successful and sustainable implementation.

154. The four countries have witnessed tension in the past. Some of this tension concerned water rights. The potential for future tension still exists, however, as the three OMVS countries are bound together by common investments, there is also an acute appreciation that this tension must not, at any cost, erupt into full scale conflict, as the consequences are unthinkable, not only in social and human terms, but also in economic terms.

155. **Guinea's participation.** The willingness of Guinea to join OMVS officially is likely to depend on what advantages Guinea perceives to such membership. This project is intended to explore aspects of cooperative planning, inclusiveness and equity within the international basin context, and it is hoped that this project will help create the framework and the enabling environment which will enable Guinea's participation.

156. Should Guinea decide not to formally join OMVS as a state member during the life of the project, the project will, nevertheless, have contributed to building greater confidence and broader cooperation between the four riparian states. Moreover, none of the project objectives are dependent on the full membership of Guinea, though this would certainly greatly facilitate, not only the objectives of the project, but also the broader goal of riparian integration and cooperation.

157. **Incompatible legislation.** A study is currently under way funded by the PASIE to review environmental legislation in the three OMVS member countries and recommend ways to harmonize them. The present project will extend this study to include Guinea. As the findings and recommendations from these studies emerge, the next step will be to move towards harmonization of legislation dealing with the shared water resource. Experiences from elsewhere on harmonization efforts show that this is a difficult process which inevitably has its supporters and its opponents. There is a risk that lobbies would form opposed to such harmonization, based on narrow local or national interests. However, the riparian countries are persuaded of the potential benefits which can be derived from taking the path of cooperation. The risk will be further mitigated by developing regional approaches that minimize the extent to which existing country wide legislation needs to be altered.

158. **Sustainability – the launch of a programmatic approach.** The risk of launching a project which would be unsustainable is seen as moderate. The purpose of the project is to lay the foundation for future sustainable coordinated development in the basin by: (i) building on national water resource projects and initiatives already supported by the World Bank and the UNDP; (ii) creating capacity for transboundary environmental management at the community, national and OMVS levels; (iii) creating the conditions which will facilitate an inclusive cooperative framework encouraging Guinea to join the riparian cooperation through joint project implementation; (iv) setting in place strong participatory process, which will involve communities, scientific institutions and NGOs in the management of the common transboundary resources; and (iv) designing a common Transboundary Environmental Analysis and Action Program which will lay the analytical and technical foundation for future cooperative projects and programs.

F3. Possible Controversial Aspects

159. **Tensions and differences.** As with many rivers in Africa, the Senegal river basin has in times past seen water rights disputes. As mentioned above, the existence of the jointly owned installations, on which the three OMVS countries all service debts, have meant that governments have reacted swiftly to overcome any emerging tension. It is possible that the modified flow regime controlled by the Manantali dam and generating station will be a cause of contention, not necessarily between states, but more likely between different user groups of the water resources. While the present project is not involved with the design of the flow regime or the dam operations, it is recognized that it may be difficult to design an operating plan that will satisfy all the inhabitants of the basin.

160. **Guinea's participation.** The involvement of Guinea as a full participant is not anticipated to be a major difficulty at the operational level, since Guinea has played an active and enthusiastic role in the preparation process. At the formal, political, legal and financial level, however, it can be expected that Guinea will wish to clearly identify the advantages it would gain in undertaking to join OMVS and participating in the benefits of river basin management. This may generate some discussion, but it is considered that an inclusive discussion which serves to highlight the different aspirations of all four riparians is to be preferred by far, from a possible scenario of future unilateral or non-inclusive development actions, which will not serve optimal and efficient use of the shared water resource.

LIST OF ANNEXES

REQUIRED ANNEXES

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TRANSBOUNDARY ENVIRONMENTAL ANALYSIS FOR THE SENEGAL RIVER BASIN (IBRD 31612)

ANNEX 1 INCREMENTAL COST ANALYSIS

1. Regional Context and Broad Development Goals

1.1 General poverty characterises the development situation in the Senegal river basin. The four countries that are the subject of this project brief are among the last twenty-six countries ranked in the Human Development Index. One of the participating countries ranks in the last ten. The issue of poverty is a key factor in all of the environmental threats facing the basin. Food production per capita and daily per capita supply of calories are key concerns for the countries sharing the basin. Human health is also a priority for populations living along the river. There is currently an explosion of mosquito and snail populations that have brought malaria and both urinary and intestinal bilharzia to epidemic proportions. This explosion has resulted in substantial part from the habitat offered by invasive plants for vectors of waterborne diseases.

1.2 The socio-economic pressures on the region's water resource base have driven significant levels of investment in water infrastructure, particularly in Senegal and Mali. To date, two dams have been constructed in an attempt to generate economic benefits for three of the riparian states (Senegal, Mali, and Mauritania). The Diama dam, twenty-three miles from the river mouth in Senegal, is intended to block salt-water intrusion and to raise the level of the upstream body to facilitate irrigation, navigation, and two upstream lakes in Senegal and Mauritania. The Manantali dam in Mali regulates the flows of the Bafing River, a tributary of the Senegal, and is intended to attenuate extreme floods, generate hydro electric power, and store water during the dry season to augment dry season flows for the benefit of irrigation and navigation.

1.3 The World Bank and the UNDP are already funding water resource management programmes in the participating countries. These initiatives are identified elsewhere in this document. Three of the four countries participating in the project (Mali, Mauritania, and Senegal) have provided and continue to provide funds to OMVS for issues related to the management of the basin's water resources. However, little attention has been given to the identification and assessment of environmental issues. Guinea has been active as an observer within the OMVS and an objective of this project is to further integrate Guinea into an overall basin-wide approach to the management of the basin's water resources.

2. Global Environmental Objective and Incremental Cost Analysis

2.1 The global environmental objective of the project is to establish a participatory basin-wide framework for the integration of transboundary water resource activities and launch a basin-wide action program for the global environment.

2.2 The significance of the basin has been highlighted by the international interest in the hydro-ecological state of the basin. Donors have included, *inter alia*, France, the Netherlands, Canada, Germany, UK, Norway, the World Bank, and the UNDP. An assumption of the project is that continuing inattention, in the baseline condition, to development of an over-arching environmental framework, with special attention to transboundary issues, will undermine attempts to achieve sustainable use of the basin's water resources and associated values.

2.3 If the transboundary issues are not addressed, the direct and indirect impacts will result in the progressive breakdown of the hydrological and ecological integrity of the Senegal river basin ecosystem, a deterioration in riparian populations in their ability to achieve food security, a resultant diminution of environmental values due to an acceleration of unsustainable agricultural and forestry practices, and a

likely trend in migration to already overcrowded urban areas. All of these likely trends would make it increasingly difficult to address poverty in the participating countries.

3. Baseline

3.1 The scope of the baseline is set spatially by the natural limits of the Senegal river basin and the locus of external demands upon the basin's resources. Thematically, the project outputs (Capacity Building, Data and Knowledge Management, Transboundary Diagnostic Analysis, Strategic Action Program, and Public Participation and Awareness) establish the parameters for the baseline. Temporally, the baseline is defined by the life of the project (4 years). The sectoral activities in the basin that involve mitigation measures resulting from dam construction and management and investments in infrastructure are distinguished clearly from activities that relate to mechanisms for effective transboundary environmental management, water resource analysis for the OMVS, and the programming and planning of water related investments in the OMVS. A proportion of these non-operational activities carried out by each country, and the OMVS itself, will be diverted into the alternative. In the table below, a summary of the baseline is presented.

3.2 The Baseline calculations for the UNDP are largely based on analysis of the TRAC programs of the four countries. It should be noted that several they are in the final stages of their current five-year TRAC programs. As the new five year TRAC programs are not yet finalized or approved, the exact amount of UNDP baseline and co-finance over the life of the project cannot be accurately assessed. The four UNDP Country Offices do have in common, however, an established priority of addressing issues of poverty, environment (which is often subsumed in poverty alleviation programs), governance, decentralization, and generalized country program support. UNDP will engage with the four governments as the priorities in the next cycle are discussed, emphasizing the importance of the present initiative and seeking to ensure additional UNDP funding for the initiative.

3.3 The baseline contributions of the World Bank are listed in Baseline Table 1 in this section. Baseline contributions of the UNDP are listed in Table 2. Baseline Table 3 lists other donors active in the region and also includes the baseline contribution of OMVS, which is in significant part comprise of contributions from the three member countries.

3.4 Accordingly, UNDP baseline has been calculated using indicative assessments of future TRAC programs in the four participating countries. The four countries are now in the last year of the present country programming framework.

The Baseline total for this project is US\$ 308,750,000.

BASELINE SUMMARY TABLES
BASELINE TABLE 1

| WORLD BANK | | | |
|---|------------------------|---|---------------------------|
| Project | Amount (US\$ m) | Corresponding Project component or sub-component | Relevant component |
| • Third Water Supply and Sanitation Project | 1 | Water Resources management | 1 |
| • Rural Energy | 7 | Community based development | 5 |
| • Second national rural Infrastructure | 3.2 | Institutional Strengthening | 1 |
| • Agriculture Services and producer organizations | 15.8 | Capacity building Disaster prevention Institutional strengthening and Decentralization Knowledge based | 1 3 1 2 |
| • Arid rangeland biodiversity conservation | 11 | Capacity building Inter-communal management areas Community based initiatives | 1 4 5 |
| • Pilot private irrigation promotion project | 0.8 | Capacity building Environment monitoring and impact mitigation | 1 2 |
| • PGRNP | 1.6 | Capacity building | 1 |
| • PDIAM | 3.4 | Environment assessment, standards and mitigation impacts Land uses plans | 2 4 |
| • Social Investment Fund | 20.1 | Micro-finance Capacity building for the poor and Basic infrastructure | 4 1 |
| • National Infrastructure project | 24 | Support for decentralized rural development Local investment fund | 1 4 |
| Total | 87.9 | | |

Baseline Table 2

| UNDP | | | |
|--|------------------------|---|---------------------------|
| Project | Amount (US\$ m) | Corresponding Project Output | Relevant component |
| • PDLG | 7.761 | Community based development | 1 4 5 |
| • Women promotion project | 0.95 | Community development: Gender development integration | 1 |
| • Audiovisual production center | 1.4 | Community based development | 1 5 |
| • Participation on Decentralized development | 4.9 | Decentralized community based development | 1 5 |
| • Audiovisual production center | 1.4 | Community based development | 1 5 |
| • Senegal basin development monitoring cellule | 0.6 | Community based development | 1 5 |
| • Argt scheme sustainability system | 3.3 | Development & environment protection | 1 2 |
| • Kita forestry management | 0.5 | Development & environment protection | 4 |
| • Koutiala water supply | 3.8 | Rural development Environment | 1 |
| • Gender & renewable energy | 0.669 | Rural development Environment | 4 |
| • Baoule parc biodiversity management | 1.260 | Rural development Environment | 4 5 |
| • Kayes <i>Acacia</i> reforestation | 1.8 | Rural development Environment | 4 |
| • Hydrometeo & hydrology support program | 0.67 | Rural development Environment | 2 |
| • Private sector promotion | 3.428 | Development management Governance | 1 |

| | | | |
|--|--------------|---|--------|
| • Capacity building & decentralized management development | 0.975 | Development management Governance | 1 |
| • Enabling sustainable human development (Senegal) | 0.25 | Capacity building Public sector promotion | 1 2 |
| • Poverty reduction (Senegal) | 4 | Promote targeted actions against poverty Community based development | 1 4 |
| • Environment protection (Senegal) | 3 | Integrated environment policy and programs Natural resource management | 1 4 |
| • Gender promotion | 0.5 | Promote Gender participation on decision making and resource management | 1 5 |
| Total | 40.21 | | |

Baseline Table 3

| OTHER CONTRIBUTIONS (OMVS/COUNTRIES) AND DONORS | | | | |
|--|---------------|------------------------|---|---------------------------|
| Project | Donors | Amount (US\$ m) | Corresponding Project Output | Relevant component |
| • Project related ongoing and planned country activities | countries | 5.0 | All components | 1 - 5 |
| • Water management project | GTZ | 0.750 | Water Resources management | 1 2 |
| • Transboundary protected areas Bafing-Faleme | E.U | 1.7 | Water Resource management | 1 |
| • Fouta Djallon Integrated Management | IFAD A.U | 53 | Intercommunal management areas | 1 4 5 |
| • Assistance to Diawling National Park | GTZ | 0.25 | Institutional strengthening Sustainable resource management Research action | 1 3 5 |

| | | | | |
|--|-----|---------------|--|-------------|
| • Assistance to Dioudj National Park | GTZ | 0.6 | Institutional strengthening Sustainable resources management Research for action Community development Environment awareness and education | 1 3 5 |
| • Integrated Coastal and River basin | GTZ | 0.042 | Institutional strengthening Capacity building | 1 |
| • Water Supply for the 6 Senegal River towns | GTZ | 15.4 | Water resource management | 1 5 |
| • Delta Drainage tributaries | GTZ | 24 | Water resource management | 1 2 5 |
| • Boundoum Irrigation | GTZ | 55.5 | Water resource management | 1 5 |
| • Nianga Irrigation | GTZ | 15.9 | Water resource management | 1 5 |
| • PARS • Prowalo | E.U | 9.3 | Reforestation in pastoral land Gonakiers forest restoration | 1 5 |
| Total | | 180.64 | | |

4. The GEF Alternative

4.1 The GEF intervention would provide incremental support costs to:

- *Develop an inclusive cooperation framework for the shared water resource and its environment.* A major objective of the proposal is to support and encourage the full involvement of Guinea in the effort to develop a comprehensive environmental framework for the basin.
- *Improve policy and institutional effectiveness.* The need for policy and institutional reforms will be addressed directly by the project.
- *Improve transboundary water management capacity at the national level.* A key policy and institutional priority is the strengthening of institutions that relate to transboundary waters in each of the riparian states, thus benefiting efforts to take an integrated and basin wide management approach.
- *Strengthen environmental management at the basin Level.* The strengthening of OMVS's capacity with regard to environmental management is crucial to improved communication and cooperation among the four riparian states.
- *Create a strong, ongoing, basin-wide participation program.* Effective basin-wide management will require effective basin-wide stakeholder participation. The GEF intervention will focus considerable resources on this effort.

4.2 The project is designed to be cost effective. Further, it is designed consistent with the need to analyse the ongoing and planned future activities of the countries, the OMVS, Implementing Agencies, and other donors active in the region. This makes it possible to avoid duplication, isolate the incremental activities necessary to project execution, and to request funding only for the incremental costs associated with project components.

4.3 In addition to the GEF contribution the increment will include a significant amount of co-financing from the World Bank. The World Bank contribution of funds is an important part of the increment since it is designed in such a way that it directly relates to components 1, 2 and 5 of the project. The non-GEF funded World Bank increment includes the following: (i) *national capacity building and institutional strengthening* in water resource management; (ii) *data and knowledge management* activities, such as studies on water availability, demand, pricing, projections etc.; and (iii) *public participation and awareness* at the national level supporting awareness campaigns, outreach and public communication and dialogue providing a basis for broad popular involvement. The non-GEF funded UNDP increment includes the following: (i) *national capacity building and institutional strengthening* in water resource management; (ii) *data and knowledge management*, and (v) *Public participation and awareness*.

4.4 Under the regional hydropower program, a program to address the impacts of the program (the PASIE) has been funded in the amount of US \$ 17.056 million. The World Bank contribution to the PASIE amounts to US \$ 3.050 million, that represents a part of the project increment. In addition to that, other funds from the PASIE related to the knowledge and data management component, the evaluation of second generation hydropower and the public participation and awareness component are included in the incremental cost. The overall incremental cost from the PASIE amounts to US\$ 8,375 million.

4.5 In **Mali**, the World Bank has just approved the Programme National des Infrastructures Rurales (PNIR) which comprises a total Bank funded project package of US\$115.1 million. The water resources component of the Bank funded project amounts to a total of US\$1.5 million. The latter amount forms part of the non-GEF funded increment. In **Senegal**, the Bank is supporting a large water supply and sanitation project, entitled Long Term Water Sector Project. The total cost of the Bank project is US\$125 million of which the water resource component amounts to US\$8.57 million. The Senegal project will reach effectiveness late 2001, while the Mali project reached effectiveness in May 2001. The Bank funded national water resource activities are not yet operational in **Guinea**. However, the World Bank funded Third Water Supply Project is being supplemented by an additional \$27.5 million. In addition, a dialogue will be initiated with the Guinean authorities on broader water resource management activities with a planned funding amounting to US\$0.5. It is expected that this dialogue will begin in the latter part of 2001. The Bank does not yet have water resource operations in **Mauritania**. However, through the World Bank funded Energy Project, the Bank is working with the government on water related studies. The Bank will also continue its engagement with the Mauritanian government in the context of the present GEF project. The World Bank total of non-GEF funded increment, therefore, as summarized in the table below, amounts to US\$13.12 million. It should be emphasized that the applicable portion of Guinean World Bank program is not included and, when this project is costed, the result will be an even greater amount of World Bank co-financing.

4.6 The activities listed above will build upon the outputs as described in this GEF project brief and thus constitute one element of the transboundary increment.

Other Non-GEF Sources of the Funded Alternative

5. Scope of Analysis

5.1 The physical scope of analysis will include the entire length of the Senegal river, which is approximately 1,800 km long. It will include the entire Senegal river drainage basin, an area of approximately 300,000 square km. The basin is shared by Guinea (which controls 11% of the basin area), Mali (53%), Mauritania (26%), and Senegal (10%). The physical scope of the project includes a variety of biomes, as the project addresses semi-arid areas in the highlands of the Fouta Djallon in Guinea, to arid and semi-arid areas at lower elevations in Mali, Mauritania, and Senegal, and estuarine areas at the mouth of the river at St. Louis. The scope of analysis also encompasses both rural and urban populations.

5.2 The thematic limits of the project are set by the project outputs. The project outputs include:

- Capacity Building
- Data and Knowledge Management
- A Transboundary Diagnostic Analysis
- Strategic Action Program
- A Public Participation and Awareness Program

5.3 Requisite institutional strengthening across related sectors, and particularly for the OMVS, is of the essence. The design of the project has taken into full account its complementarity with other existing projects in the region, such as ongoing projects at country level, projects of the OMVS, projects of the Implementing Agencies including associated GEF projects, and, most particularly, the *Plan d'Attenuation et de Suivi des Impacts sur l'Environnement* (PASIE).

5.4 The temporal boundary for the project is set by the anticipated time of implementation that is four years. Project benefits will clearly continue to accrue beyond the four year intervention. Strengthening of the OMVS, increased capacity for transboundary and a greater sensitivity at the national level to basin wide issues, and the commitment to act on the results of the transboundary diagnostic and action program will require an indefinite commitment of country and donor resources well beyond the initial scope of this GEF intervention.

5.5 UNDP co-finance is limited to those increments of country TRAC funding that remain in the current program cycle. The new five year cycles will be beginning during year one of project execution. A draft Project Brief has been forwarded to the respective Country Offices to assist their TRAC planning efforts and as a means of encouraging future TRAC co-finance for the components and activities of the project.

5.6 Additional financing for these activities is being secured from donors and other partners, as the specifics become clearly defined during further the project preparation process(para. 80). The GEF financing is intended to act as a 'bridge' and as a catalyst to encourage further investment in the basin within the overall programmatic approach. Details of the specific proposals are being refined by the countries as part of the ongoing project preparation, for review and incorporation as appropriate within the World Bank project document before appraisal. Several donors, including France, the Netherlands, Canada, Germany, Norway and others have been participating in, and contributing to, the process to date and have shown their commitment to the development of the basin wide programmatic approach based on stakeholder involvement. It is confidently expected that the interest of these donors will be further confirmed with financial commitment as soon as the details are finalized. The full extent of the commitment required has to still to be established, but the work being completed by the national

committees and OMVS to identify appropriate activities, suggests that additional co-financing in the order of \$10.985 million could be anticipated.

5.7 Total project co-finance is in the amount of US\$ 39.730 million

Project Baseline Summary

| Component | | Total Baseline (US\$) |
|------------------|------------------------------------|------------------------------|
| 1 | Capacity Building | 144,520,000 |
| 2 | Data and Knowledge management | 27,142,000 |
| 3 | Transboundary Diagnostic Analysis | 3,583,000 |
| 4 | Strategic Action Program | 60,881,000 |
| 5 | Public Participation and Awareness | 72,624,000 |
| Total | | 308,750,000 |

Incremental Cost Matrix (US\$)

| COMPONENT/ OTHER COSTS | CATEGORY | AMOUNT | DOMESTIC BENEFITS | GLOBAL BENEFITS |
|--|-------------|--------------------|---|---|
| 1. Capacity Building at National and Regional Levels | Baseline | 144,520,000 | Current capacity at national and regional levels suited to reactive management for local and country specific impacts. National legislation, environmental plans and projects geared to national concerns with little attention paid to transboundary issues. | |
| | Alternative | 162,890,800 | Some gains in national and local institutional and human capacity through training and involvement of national and local experts in the project. Improvement of national level inter-ministerial and inter-agency cooperation. | Generally, improvements in participating states' ability to address transboundary environmental and socio-economic issues. More specifically, a strengthened regional entity (OMVS) with increased capacity and institutional legitimacy to act at the regional level to secure an integrated, multi-sectoral approach to water management issues. An accelerated timetable for the full integration of Guinea into a regional approach to issues of the Senegal river basin. |
| | Increment | 8,475,000 | | |
| 2. Enhanced Data and Knowledge Management | Baseline | 27,142,000 | Emphasis has often been on the collection of data on an ad-hoc basis. Even when data has been collected and synthesized it has been used on a "one off" basis and has been allowed to become dated (abandoned) or lost altogether. Data and information for the critical Guinean part of the basin is largely absent. | |
| | Alternative | 34,835,000 | Some incidental benefits to the participating countries by enabling more systematic and better maintained data sets at national level. | Data sets will be shared by all of the participating countries, will be maintained centrally (in the offices of the OMVS), will include socio-economic and bio-physical assessments, characterize cross- |

| COMPONENT/ OTHER COSTS | CATEGORY | AMOUNT | DOMESTIC BENEFITS | GLOBAL BENEFITS |
|--|-------------|-------------------|---|---|
| | | | | country (transboundary) linkages among water, ecosystems and livelihoods. This will enable development of a regional and ecosystem approach and generate benefits to the basin's ecological resources. |
| | Increment | 2,145,000 | | |
| 3. Completion of a Transboundary Diagnostic and a Strategic Action Program | Baseline | 3,583,000 | Primary emphasis has been and continues to be on national issues with transboundary issues addressed in a limited way, limited national and OMVS resources make it difficult and often impossible to define transboundary issues systematically or address these issues as priority concerns. | |
| | Alternative | 5,018,000 | There will be incidental domestic benefits which would include limited additional human and financial resources being committed at national level to more rigorously identify and address project related issues of national concern. | Transboundary issues identified during the project would enable prioritization of interventions based on the most urgent transboundary environmental issues requiring attention, thus ensuring benefits to the basin's natural resources and helping ensure their long-term sustainable use. The identification of prioritized transboundary issues and the identification of approaches to address these issues will facilitate the identification of additional policy and institutional reforms necessary to enhance transboundary management. |
| | Increment | 395,000 | | |
| 4. Program to undertake Identified Priority Actions | Baseline | 60,881,000 | Actions taken to date have been largely at national and local levels, uncoordinated, poorly communicated to stakeholders up and downstream of the activity, and with limited public input. | |
| | Alternative | 71,615,200 | There will be some incidental and limited domestic benefits. Some pilot activities will directly benefit | Pilots will be selected for their transboundary relevance and will also meet the test of replicability in other parts of the basin and globally. Transboundary hotspots |

| COMPONENT/ OTHER COSTS | CATEGORY | AMOUNT | DOMESTIC BENEFITS | GLOBAL BENEFITS |
|--|--------------------|--|--|---|
| | | | stakeholders in certain national localities. | and urgent issues (such as environmental actions that yield a human health benefit) will also yield regional as well as global benefits. |
| | Increment | 9,670,000 | | |
| 5. Initiate a Public Participation and Awareness Program | Baseline | 72,624,000 | Low level of environmental awareness, public participation, and public education on the issue of shared water resources (issues related to transboundary use and considerations) among all stakeholders. | |
| | Alternative | 80,449,000 | Some incidental domestic benefits by virtue of expanded knowledge leading to better informed judgments regarding water use at local and national levels. | Expanded information concerning the transboundary issues related to an integrated approach to the management of basin resources. Specific improvements in information to the OMVS and senior levels of government to facilitate a basin-wide approach to integrated management of shared resources. Expanded provision for community level input into regional management approaches. |
| | Increment | 11,79,000 | | |
| Totals | Baseline | Total 308,750,000 | | |
| | Alternative | Total 354,808,000 | | |
| | Increment | Non-GEF: 32,480,000 GEF: 7,250,000: Total: 39,730,000 | | |

ANNEX 1.1 - BUDGET OVERVIEW

| Components | Personnel | Sub- contracts | Training & work- shops | Equip- ment | Misc. & Sundry | GEF |
|---|-----------|-------------------|------------------------------|----------------|-------------------|-----------|
| <u>1. Capacity building</u> | | | | | | |
| 1.1 Transboundary institutional analysis | 17,000 | | | | | 17,000 |
| 1.2 Strengthening institutional structures | | | 270,000 | | | 470,000 |
| 1.3 Harmonization of legislation – Guinea | | 150,000 | | | | 150,000 |
| 1.4 Capacity building in regional institutions | 20,000 | 350,000 | 40,000 | | | 410,000 |
| 1.5 Development of an inclusive institution | 40,000 | 40,000 | 40,000 | | | 120,000 |
| 1.6 Capacity building/OMVS | 1,857,600 | | | 138,000 | 83,200 | 2,078,800 |
| 1.7 Africa Regional Forum | | | 100,000 | | | |
| Sub-total | 1,934,600 | 540,000 | 450,000 | 138,000 | 83,200 | 3,345,800 |
| <u>2. Data and Knowledge management</u> | | | | | | |
| 2.1 Guinea program | | 50,000 | 100,000 | 100,000 | | 250,000 |
| 2.2 Transboundary data and knowledge mgt | 250,000 | 300,000 | 100,000 | 320,000 | 50,000 | 1,020,000 |
| Sub-total | 250,000 | 450,000 | 150,000 | 370,000 | 50,000 | 1,270,000 |
| <u>3. Transboundary Action Program</u> | | | | | | |
| 3.1 Transbdry Env. Analysis & Action Plan | | 40,000 | | | | 40,000 |
| Sub-total | | 40,000 | | | | 40,000 |
| <u>4. Priority Actions</u> | | | | | | |
| 4.1 Land degradation and desertification | | 1,000,000 | | | | 1,000,000 |
| 4.2 Water quality | | 289,200 | | | | 289,200 |
| 4.3 Wetlands management | | 900,000 | | | | 900,000 |
| 4.4 Evaluation of micro-hydro potential | | 75,000 | | | | 75,000 |
| Sub-total | | 2,264,200 | | | | 2,264,200 |
| <u>5. Public Participation and Awareness</u> | | | | | | |
| 5.1 Public information and awareness | | 160,000 | | | | 160,000 |
| 5.2 Civil society participation | | 120,000 | | | | 120,000 |
| 5.3 Scientific community involvement | | 50,000 | | | | 50,000 |
| Sub-total | | 330,000 | | | | 330,000 |
| Grand total (US\$) | 2,284,600 | 3,624,200 | 600,000 | 508,000 | 133,200 | 7,250,000 |

ANNEX 2
LOGICAL FRAMEWORK MATRIX

| Intervention | Indicators of performance | Means of verification | Risks and Assumptions |
|---|--|---|--|
| <p>Overall Goal: Achieve global environmental benefits through broad, basin wide participation in the development and implementation of measures that lead to sustainable management of the Senegal river basin's land and water resources. The project will enable riparian countries to jointly develop a regional approach to the environmental management of the basin.</p> | | | |
| <p>Project Objectives: The project aims to provide a participatory strategic environmental framework in relation with basin-wide cooperative program for transboundary land water management.</p> | <ul style="list-style-type: none"> • Riparian agreement on water resources management decision making • Examples of effective basin wide participatory framework on transboundary issues defined • Improved environmental monitoring and enhanced applied research capabilities | <ul style="list-style-type: none"> • Project monitoring and evaluation • Sustainable transboundary and monitoring response mechanisms established • Completion and adoption of TDA and the SAP • Senegal river basin project reports documenting basin-wide cooperation on environmental action | |
| <p>Component 1: Environmental Management Capacity building</p> <ol style="list-style-type: none"> 1. Establishment of operational PMU 2. Institutional assessment (national institutions and OMVS) with special emphasis on transboundary environmental management capacity; 3. Regional and national institution strengthening | <ul style="list-style-type: none"> • PMU fully established and operational • Increased capacity building and training at OMVS and in riparian countries • Studies on national institutions & OMVS capacities and needs • Modules, courses and technical training provided by national universities • Organization of 6 regional workshops and seminars • Organization of 15 national workshops • Guinea's existing water legislation reviewed • Guinea water and land new/modified | <ul style="list-style-type: none"> • Annual progress reports • National and basin assessments reports • University activities report and program courses/modules document • Workshops and seminar reports • Land and water legislation text prepared • Water and land tenure decrees prepared and adopted • Basin workshop report on legislation harmonization • Project progress report • Effective dialogue, cooperation and | <ul style="list-style-type: none"> • Operational PMU at OMVS active through national cellules • Efficient coordination between university departments to produce common modules and courses • Political commitment and concrete action from Guinea to move forward with legal reform • Slow and sensitive process for setting in place inclusive |

| Intervention | Indicators of performance | Means of verification | Risks and Assumptions |
|--|---|---|---|
| <ol style="list-style-type: none"> 4. Guinea legislation harmonized with OMVS countries 5. Relevant institutions capacity building 6. Development of an inclusive institution 7. Organization of regional forum | <p>legislation proposed</p> <ul style="list-style-type: none"> • Training and courses at national level on transboundary environmental management provided • Training and courses at national level on water resources management provided • Training and courses on water and environment to OMVS staff provided • Networking group between regional institutions established • Regional procedures and mechanisms on transboundary issues established • Riparian dialogue strengthened and framework facilitation • Basin-wide cooperation framework defined and adopted • Exchange of best practices and coordination among GEF projects | <p>confidence building increased among riparian countries</p> <ul style="list-style-type: none"> • Guinea actively engaged with OMVS through active program implementation • Transboundary concerns addressed in inclusive riparian framework • Holistic approach developed as basis for riparian cooperation • Effective organization of the forum with attendance of other related projects | <p>instrument for benefit sharing</p> <ul style="list-style-type: none"> • Willingness by all four riparians to identify cooperation benefits • Cooperation dividends accruing to all countries |
| <p>Component 2: Data and Knowledge management</p> <ol style="list-style-type: none"> 1. Data gathering and information exchanges 2. Decision support system 3. Capacity building | <ul style="list-style-type: none"> • Database system for water and environment established • DSS information system with environment developed • Training courses on water flow modeling provided • Information and data exchanges mechanism established | <ul style="list-style-type: none"> • Project progress report • Project monitoring and evaluation report • User manual and guidelines document of river flow modeling developed • Newsletter publication, data information standardization, regional database connected to four countries | <ul style="list-style-type: none"> • Reliable and standardized database with agreed, standardized data parameters • Agreed protocols for data sharing |
| <p>Component 3: Transboundary Diagnostic Diagnostic and Strategic Action Program</p> <ol style="list-style-type: none"> 1. Completion of basin wide transboundary diagnostic 2. Completion of Strategic Action Program | <ul style="list-style-type: none"> • Scientific analysis and study for TDA • Transboundary and national priorities mapped and identified • Priority interventions identified and agreed; • Additional required policy and institutional reforms identified | <ul style="list-style-type: none"> • Consolidation of national reports and studies into agreed analysis and prioritization • Basin-wide priority actions identified | <ul style="list-style-type: none"> • National priorities matched and harmonized in regional framework |
| <p>Component 4: Priority Actions</p> <ol style="list-style-type: none"> 1. Land degradation & desertification | <ul style="list-style-type: none"> • Targeted pilot projects with transboundary impacts on land management, soil erosion, siltation and river bank protection defined and implemented | <ul style="list-style-type: none"> • Project progress report • Report on status of marginal and fragile | <ul style="list-style-type: none"> • Adverse climatic impacts (e.g. drought) and slow behavioral changes |

| Intervention | Indicators of performance | Means of verification | Risks and Assumptions |
|--|---|--|--|
| <p>2. Enhance water quality</p> | <ul style="list-style-type: none"> • Transboundary studies on soil erosion and siltation conducted on main fragile areas with the full participation of stakeholders • National & international NGOs strengthened to support local action on land management, soil erosion and watershed management for siltation reduction • Local best practices on soil erosion, siltation and river bank protection documented and encouraged • Participatory approaches for promotion of sustainable transhumance & livestock management practices <ul style="list-style-type: none"> • Existing capacities assessed including mapping of water sources pollution • Capacity enhancement, training and workshops on pollution prevention and monitoring needs <ul style="list-style-type: none"> • Appropriate methods agreed to address water weeds infestation • Transboundary water weeds pilot projects identified and implemented • Replicable best practices developed on combating water weeds infestation | <p>land areas in the basin</p> <ul style="list-style-type: none"> • NGOs active in implementation of pilot activities • Toolkits document on best practices • Progressive awareness among stakeholders for livestock transhumance inclusion in environmental management <ul style="list-style-type: none"> • Report on water quality degradation and maps • Basin guidelines on water quality and norms <ul style="list-style-type: none"> • Agree on common basin-wide guidelines and methods to address water weeds infestation • Progress report on water weeds pilot projects • Toolkits document on water weeds removal | <ul style="list-style-type: none"> • NGOs with adequate capacity for pilot project implementation • Lack of appreciation of significant land management role of pastoral societies & economies <ul style="list-style-type: none"> • Capacity challenges in technical institutions dealing with water pollution <ul style="list-style-type: none"> • Scientists, stakeholders and technical community agree on common methods for water weeds removal |
| <p>3. Support wetland management initiatives</p> | <ul style="list-style-type: none"> • Management plans developed and implemented in significant transboundary wetlands • Sustainable traditional fisheries aspects incorporated into pilot activities | <ul style="list-style-type: none"> • Reports on wetland rehabilitation requirement and impacts • Development of agreed management plans • Project progress report | <ul style="list-style-type: none"> • Willingness of stakeholders and decision-makers to address wetland management & rehabilitation • Planners and stakeholders agreeing on water allocation |

| Intervention | Indicators of performance | Means of verification | Risks and Assumptions |
|---|---|--|---|
| <p>4. Assess micro-hydro potential</p> | <ul style="list-style-type: none"> • Ecological, social and economic studies on wetland management and rehabilitation completed • Wetland education and training and awareness programs developed and disseminated in national languages • Important ecosystems and habitats in transboundary setting identified for pilot activity for biodiversity conservation actions • Studies on sustainable micro-hydropower options on the upper Bafing Basin completed | <ul style="list-style-type: none"> • Wetland education, training and awareness programs materials • Report on selected areas for biodiversity management • Reports on sustainable micro-hydro potential prepared | <p>for sector uses</p> <ul style="list-style-type: none"> • Rational and pertinence of transboundary selected areas • High expectation on shifting issues to micro-hydro development |
| <p>Component 5: Public participation and awareness</p> <p>1. Promote and enforce public participation, information and awareness</p> <p>2. Encourage civil society participation</p> <p>3. Scientific community involvement</p> | <ul style="list-style-type: none"> • Common environmental education and awareness campaign developed emphasizing transboundary aspects and inter-dependence and integration • Regional training provided to national and OMVS staff • Innovative learning mechanisms and tools developed for public participation and awareness • Support to NGO networks working across boundaries for civil society engagement and participation • Selected riparian universities and research institution brought together in a network to coordinate national and transboundary programs in environmental and social science, engineering and policy studies | <ul style="list-style-type: none"> • Project progress report • Gender-sensitive guidelines and illustrated manuals on public participation and information sharing • Effective outreach program (TV, radio, theater, mass broadcast etc.) on transboundary resource and the importance of environmental management • Project progress report • Evaluation reports on universities and research institutions activities impact on overall water and environment management | <ul style="list-style-type: none"> • Willingness of governments to allow local communities to work cooperatively across the borders • Willingness of local communities on border areas to try to resolve issues at local level rather than at national level • Politicization of awareness campaign emphasizing national priorities, as opposed to transboundary interconnections and linkages • Education and health institutions in four countries strongly engaged in project component with keen sense of ownership of activities for ensure long term sustainability |

ANNEX 3 STAP ROSTER EXPERT REVIEW

Dr Gunilla Björklund
Member of STAP Roster of Experts

1. Overall impression

The Senegal River is a shared water system and basin where the riparians are Guinea, Mali, Mauritania and Senegal. A sub-basin organisation, OMVS, exists and shall create a framework for cooperation in actions of mutual interest concerning the Senegal River and its basin. Mali, Mauritania and Senegal are members and active partners to the OMVS, and Guinea, the upstream riparian has official status as an observer.

Several manageable as well as environmental threats, which hinder sustainable development of the shared waters of the Senegal River, have been identified. The fully involvement of Guinea is seen as a key issue. This is crucial, from an Integrated Water Management perspective as well as from the perspective of different sub-issues within such management for which the collection and dissemination of compatible data is an important pre-requisite. It would not be possible to take proper actions against several of the identified environmental threats unless the issue of full involvement of Guinea is solved.

The environmental threats are land degradation and its related impacts, water pollution and a water resources management (including groundwater use, water for energy, water for food security, water and health etc.) which is not integrated and not properly balanced, and threats to biodiversity and its sustainable use. To take proper actions towards those threats, at national as well as transboundary level there is a need to strengthen institutional as well as human capacity and to support the involvement of civil society in transboundary basin-wide activities.

The GEF Senegal River Basin Project is concentrating around five activities: Environmental and water management capacity building in national institutions and in OMVS; Supporting improvement of data and knowledge management; Completing the basin-wide Transboundary Environmental Analysis and Action Program; Carry out on-the-ground Priority Actions as identified in the preliminary TDA; and Establish a Public participation and Awareness program.

The overall impression of the project idea is very good. There is a clear emphasis on including all riparians in the Senegal River Basin water and environment management program, which is a pre-requisite for a successful outcome. The project provides a framework for including Guinea as a full participant in the work of OMVS. The need for a project as outlined in the project brief is very clear and many of the perceived national or local problems would also have to be solved in this transboundary context. A clear benefit is that the project complements and builds on on-going activities. The program would, thus, result in improved co-ordination of water and environmental management in the whole Senegal River Basin.

2. Relevance and priority

The project will operate together with other GEF projects in the region, as described in the project brief. This includes both projects linked to the Senegal River Valley such as the proposed Fouta Djallon highlands project and the dry-lands project in the Senegal River Valley, and other GEF International Waters projects in the region. The project, being an "Integrated Land and Water Multiple Focal Area Operational Program" with a strong transboundary interest would be a very important project in the context of the whole region, not just for the Senegal River Basin.

3. Approach

As the success of the project is depending on full participation of all riparian countries and all stakeholders, the approach needs to be directed towards achieving full involvement of Guinea as well as providing for public participation. This is clearly prioritised in the project approach. Only by a full involvement of Guinea and a public participation would it be possible to set up networks for and undertake data collection and dissemination. Compatible data are needed, not only for improved knowledge but also for a sustainable management of the water and land resources of the basin, a management that should include ecological and social aspects. Such approach to river basin management is emphasised in the project approach.

The capacity building component of the project is defined as capacity for "environmental and water resources management". However, such improved capacity that would facilitate cooperation between water ministries and environment ministries is not sufficient. The project brief does also define food security and agriculture as key issues. Energy production is another water dependent sector in the river basin. There is a need to clearly express that the capacity building component should ensure provisions for applying a fully integrated approach to water -, environment-, land-, energy- management, in which all related sectors and ministries need to be involved. This is not clearly stated in the project brief. Although the different sectors are discussed and thus implicitly the integrated aspect can be found, its importance should be ensured.

4. Objectives

The GEF International Waters' objective to achieve global environmental benefits is for this project specified as the "broad basin-wide participation in the development and implementation of measures that lead to sustainable management of the Senegal river basin's land and water resources". The project will provide a participatory strategic framework and launch a basin-wide cooperative program for transboundary land-water management. These objectives are clear and focused and should be able to achieve given the activities outlined.

5. Background and Justification

Sufficient background information and justification for the project has been provided. The background documentation clearly identifies both where there is available information and where adequate information is lacking, thus identifying gaps that need to be filled. The background information describes national priorities and commitments, which should be met when the project is implemented. The presentation of the existing institutions, in particularly the OMVS, and how it should be strengthened to set in place an agreed environmental management framework to address the transboundary issues is an important aspect justifying the project. The outcome of the project, a sustainable (integrated) water and environmental management, would target the root causes through the different components to reach that outcome.

6. Government Commitment and Sustainability

All four governments have endorsed the project. National committees have been established in each riparian country and these committees have been responsible for co-ordinating reports including such by national consultants. A regional project preparation committee lead by the High Commissioner of OMVS is a guarantee that the project will be not only country owned but owned by a coordinated effort in the region, in particular as the involvement of Guinea is to be ensured.

Public stakeholder participation has also been addressed through an IUCN-coordinated process, including national meetings in each country a process, which aims at ensure sustainability at grass-root level, through out the project implementation and beyond.

7. Activities

The different activities as defined in the project brief should not all be seen as a step-by-step process but should, at least for some of them be undertaken simultaneously. It is important to get the full involvement of Guinea to get a full data acquisition programme in place, including network for collection, equipment and capacity for analysing and dissemination of data. All this is a part of the process towards an integrated approach to water and environmental management but such management may, of course, not await the result of the capacity building and data management process. Priority actions should neither await the conclusion of the Transboundary Environmental Analysis and Action Program but should, as is stated in the project brief, start based on the preliminary analysis. Public participation is a key activity that needs to be ensured during the whole project process.

8. Project funding

As a result of the attacks on the World Trade Center, data for the UNDP funding has not been possible to obtain. However, the estimated level of costs, the World Bank financing and the co-financing, including from the participating countries should for the non-UNDP parts be adequate. The UNDP-supported parts a clearly defined and they should therefore be carefully costed as well.

9. Replicability

The countries concerned by the project are all poor countries, the economic effort of which are to a large extent directed towards short term goals such as short term food security for the people of their own country. The project would result in increased regional cooperation aiming at long-term food-security as well as transboundary water and environmental sustainability. This would, coupled with an increased political stability in the region imply a distinct benefit for the global environment.

10. Time frame

The clear commitments by the governments included as well as the ensured public participation should guarantee an impetus towards a swift implementation of the project. Given that and the institutional framework already in place, the OMVS, the objectives should be possible to reach within the given time frame. The Monitoring and Evaluation system as described in the project brief would ensure such time strategy.

11. Global environmental benefits and Goals of the GEF

As already noted, the project is clearly addressing issues resulting in global environmental benefits in terms of International Waters as it is addressing issues of integrated transboundary water resources management and activities. Within the floodplain and delta areas there are also wetlands, which are habitats for ecosystems including several rare or endangered species. Protection is needed for these as well as for areas around Manatali reservoir in the upper basin in Mali. A successful project outcome will result in a sustainable use of those areas, thus contribute to biodiversity conservation of the global environment.

A careful integrated approach taken within the project would ensure avoidance of negative environmental effects, which might otherwise be the case of an emphasis on increased hydropower installations or on production of water intensive commercial crops. Causes of tension among landholders in border areas would, thus, be reduced, which will increase the benefits of the project.

12. Rationale for GEF Support

The project will serve to support "better use of land and water resource management practices on an area-wide basin", which is the objective of the GEF OP 9. The activities are having an area wide focus and are supporting measures for prevention of threatened waters. Thus, the project fit well into the overall strategic thrust of the GEF-funded International Waters project. The project is assisting the countries of the region to better understand the environmental concerns of the shared Senegal River system and is to assist the countries to work collaborative to address these concerns. It will contribute to the building of capacity in existing institutions and implement measures that address transboundary environmental concerns.

13. Linkages to other focal areas, other beneficial/damaging effects, degree of stakeholder involvement, capacity building aspects, innovativeness of the project

The project will, as described under item 11, have global benefits from a Biodiversity aspect as well as from an International Waters perspective, in particularly through a conservation of wetland areas and a sustainable use of their resources. Mali, Mauritania and Senegal being parties to the UN Convention to Combat Desertification are all having Action Plans in place. Activities within this project will be closely linked to parts of those action plans and would, thus, contribute to the objectives of the UN/CCD as well.

The improved integrated land and water management system resulting from the project should include less pesticide dependent agricultural systems, which together with reduction in discharges of wastewater would result in increased water quality. Better land-use practices would also result in decreased land degradation. Increased information and knowledge of groundwater resources would result in a decreased pressure on surface water. All these different activities, undertaken within the framework of or linked to the project would have beneficial environmental effects.

The project has a clear component of stakeholder involvement, the priority actions will be carried out at community level and will directly involve stakeholders and communities. Stakeholders will also be able to be part of the decision making process through the IUCN-led component of public participation and awareness raising. This component also includes capacity building aspects.

The main capacity building component of the project is including building of a core group of transboundary environmental management expertise in each institution linked to a core group of OMVS. It is important to build capacity to address institutional reforms, pricing and water legislation, not the least to make the national legislation compatible, which is addressed in a study that will be linked to the project.

14. Conclusions

The project complements and builds on activities and projects, which are already under implementation at the national and sub-basin level. It is innovative as it has strong components of cooperation and coordination at regional, basin, national and sub-basin level that would result in increased sustainable development at all levels not only from an International Waters perspective but from an environmental, economic and social perspective and would also contribute to a more stable political balance in the region. It is therefore recommended that the project be approved.

ANNEX 3.1 RESPONSE TO STAP REVIEW

The project preparation team is pleased with the STAP reviewer's strong endorsement of the project. It is anticipated that the reviewer will remain involved in an advisory capacity during the implementation phase of the project through the Quality Assurance process.

In **section 3** of the review, the reviewer correctly observes that the required capacity building must reach well beyond the respective ministries of water and environment. In supporting the countries in establishing integrated water resource management, it is indeed key to ensure that all relevant sectors, as well as all relevant layers in the countries are reached. The text of the project brief has been further strengthened to better reflect the inclusive requirements and dimensions of integrated water resource management.

In **section 8** of the review, the reviewer mentions that the incremental cost analysis was incomplete in her review copy, in view of the fact that UNDP's communication facilities were linked through the World Trade Center. The UNDP figures have since been obtained from the country offices in the meantime and the incremental cost analysis is now complete.

ANNEX 4
LETTERS OF ENDORSEMENT

LIST OF ANNEXES

OPTIONAL ANNEXES

5. QUALITY ASSURANCE TEAM
6. STAKEHOLDER INVOLVEMENT AND PARTICIPATION IN PROJECT FORMULATION
7. OMVS – MANDATE, ORGANIZATION AND PROGRAM
8. PROJECT IMPLEMENTATION ARRANGEMENTS
9. PRELIMINARY FINDINGS –TRANSBOUNDARY DIAGNOSTIC ANALYSIS AND STRATEGIC ACTION PROGRAM (SAP)
10. TRANSBOUNDARY ENVIRONMENTAL ANALYSIS - ROOT CAUSE ANALYSIS
11. ENVIRONMENTAL PRIORITY ACTION BY COUNTRY
12. PASIE – A SUMMARY OF THE PROGRAM
13. BIBLIOGRAPHY AND REFERENCES

MAP

TRANSBOUNDARY ENVIRONMENTAL ANALYSIS FOR THE SENEGAL RIVER BASIN (IBRD 31612)

ANNEX 5
QUALITY ASSURANCE TEAM

STAP REVIEWER

Gunilla Bjorklund, STAP Roster of Experts member,

WORLD BANK

Willem Floor, Senior Energy Planner, World Bank

David R. C. Grey, Senior Water Resources Advisor, World Bank

Tracy Hart, Senior Water Resources Specialist, World Bank

Astrid Hillers, Water Resources Specialist, World Bank

Hans-Olaf Ibrekk, Senior Water Resources Specialist, World Bank

Yves Prevost, Senior Environment Specialist, World Bank

Robert Robelus, Senior Environmental Assessment Specialist, World Bank

Claudia Sadoff, Senior Economist, World Bank

ANNEX 6

STAKEHOLDER INVOLVEMENT AND PARTICIPATION IN PROJECT FORMULATION

The GEF project formulation process is intended to give due attention to ensuring that views, interests, needs and choices of local stakeholders constitute the basis for decision-making in water and environmental management, as well as providing mechanisms and requisites for strengthening the voices of the people.

The preparation of the present project brief included an extensive consultative process involving local and national workshops, consultations and national field studies contributing to the design of the project. All these activities involved broad participation from civil society and more than a thousand individuals.

This process provided an opportunity for OMVS and its specialized services to actively involve the public in all four riparian countries in the design of the program for the Senegal River basin. IUCN was selected to implement this self-standing program in view of its long-standing involvement in the region, and extensive local knowledge and insights into realities in the basin, as well as its willingness to contribute to the participatory involvement in basin activities. The public participation program was funded over and above the PDF B grant resources through contributions from IUCN as well as support from the Norwegian Trust Fund managed by the World Bank.

Agreed program plan. The launching workshop for the preparation process was held in St Louis in May 2000. Shortly after the launch of the preparation process, IUCN initiated the preparation of a broad consultative process involving all four countries. The development of the program plan took some time so as to ensure that all concerned were consulted and involved in the process. The formulation of the program was discussed in detail between OMVS, IUCN and agreed with the World Bank.

Objectives. The objectives of the public participation program were defined as follows:

- Provide a framework for consultation and dialogue at the local level, enabling reconciliation of the concerns, perceptions, advice and points of view of the public stakeholders with regard to the management of the natural resources of the basin;
- Enable the integration of local knowledge and strategies into the process of planning the program for water and environmental management;
- Use a variety of communication means to ensure equal access and equity not only in planning the program but also in any implementation that follows on from the preparation; and
- Promote the integration of such factors as health, education and food self-sufficiency as perceived by the riverside communities affected by the operational objectives and management of the water resource and the environment.

Commenced in February 2001. The program commenced formally in February 2001 upon securing of adequate funding resources and upon the completion of the formulation of the program and agreement by all concerned parties.

Local Coordinating Committees. Local committees that are already established in the OMVS member countries (*Comités locaux de coordination (CLC)*) were intensively consulted during the project preparation. In Guinea where these committees do not exist, this work was carried out by a local Guinean NGO. The CLCs, which were set up to secure wide public consultation during the PASIE preparation and implementation process, are intended to represent the voices of the riparian populations. They were chosen from among the grassroots organizations in the basin.

The steps involved included:

- **Participatory Analysis and Rapid Rural Appraisal**

The above analysis and appraisal was carried out by national consultants in order to assemble the views, perceptions, requests and knowledge of the people in the basin. Documentation and review of the resulting material followed.

- **Review of information collected and preparation of consultative meetings**

Based on the reports which were prepared, representing the views of the people in the basin, local fora were prepared to solicit further exchange and discussion on the project and on the participatory process which was being designed.

- **Local level meetings**

Local level meetings were held in 12 different districts (three in each riparian country) between mid-June and mid-August 2001. These were attended by villagers, women's groups, farmers groups, economic interest groups, local technical agencies and local government representatives. The purpose of these meetings was again to discuss the priority concerns of people in the region and to enable a public exchange on options for a participatory project process.

- **National level meetings**

The results of the local level meetings were consolidated and reviewed at national level meetings held between mid August and early September 2001. The conclusions from these meetings formed the basis for the planning of a regional public participation meeting and provided significant input to the preparation of the project brief and the design of the component of the project which addresses public participation

- **Regional fora**

The regional participation forum will provide consolidated input into a broad regional forum that will be held later in the year, and will bring together a broad base of technical and public and private citizens. This will help elaborate the additional details required for the post-GEF Executive Council elaboration of the Project Appraisal Document.

The process continues. The process of public involvement has yielded important results. Through the preparation process, consultation mechanisms were established which will continue to serve as vehicles for participation in the implementation of the project. Moreover, the upper basin, especially the Fouta Djallon highlands in Guinea, which were not covered by the PASIE, are being covered through the present project.

The consultation meetings held to date are summarized overleaf.

MEETINGS ARRANGED UNDER THE PUBLIC PARTICIPATION PROGRAM

| Country | Date and place | Participants |
|---|--|---|
| Mali local meetings | 2 to 22 July 2001 Three meetings in each district of Bafoulabe, de Kita and Kati. | Villagers Women's groups Farmers' groups Economic Interest groups Local technical agencies Local governments |
| Senegal local meetings | 5 to 26 July 2001 Three meetings in each district of Dagana, Matam and Podor | |
| Mauritania local meetings | 24 June to 15 July 2001 Three meetings per wilaya in Trarza, Gorgol, Brakna de Guidimakha | |
| Guinea local meetings | 23 July to 12 Aug 2001 Three meetings in each region of Labe, Mamou, Kankan and Faranah | |
| (For a more complete list of participants see the last pages of this annex) | | |

| Country | Date and place | Participants |
|-----------------------------|---------------------------------------|--|
| Mali National Meeting | 13, 14, 15 August 2001 in Bamako | 42 participants 7 community organizations 10 village representatives 8 technical services 7 NGOs 4 private sector people 7 Local governments |
| Senegal National Meeting | 17, 18, 19 August 2001 in Saint-Louis | 47 participants 9 community organizations 12 village representatives 8 technical services 7 NGOs 4 private sector people 7 Local governments |
| Mauritania National Meeting | 21, 22, 23 August 2001, Nouakchott | 48 participants 8 community organizations 14 village representatives 9 technical services 6 NGOs 4 private sector people 7 Local governments |
| Guinea National Meeting | 6, 7, 8 September 2001, Conakry | 45 participants 7 community organizations 13 village representatives 9 technical services 7 NGOs 2 private sector people 7 Local governments |

Commitment. The involvement of national water and environment authorities in project preparation coupled with stakeholder consultation at local, national and regional levels have brought high levels of commitment to the project and the proposed project objectives. Furthermore, OMVS has demonstrated a high interest in applying a participatory approach to the project design. Guinea, which is not a member of the river basin organization, has been active throughout this process. Moreover, Guinea continues to maintain close coordination with OMVS and project preparation staff.

National ownership. National specialists have produced the project preparation activities such as national studies, coordination of preparation, public consultation and regional syntheses. The involvement of local expertise has contributed to disseminating information and increasing awareness of the importance of the initiative and its potential positive impacts on the transboundary, local environment and livelihoods.

Coordination with environmental planning initiatives. Close coordination with PASIE has been provided by OMVS. OMVS staff responsible for environmental management have been actively involved in the project preparation activities.

Consolidation of findings. National reports have been discussed through a series of national workshops. Participants from the other riparian countries were invited and participated actively in the national workshops, thereby extending the learning and exchange processes. The results of the consultation process have been reflected in the definition and design of the project.

The principal recommendations which have emerged from the participatory process are summarized below:

- The promotion of inclusive partnerships between all affected parties (OMVS, governmental, communities, NGOs, etc.) to strengthen communication and information sharing on water resource management. Such partnerships can include information and awareness of upstream-downstream linkages, e.g. impact of upstream land degradation on downstream water availability;
- Information and awareness at the grassroots level needs to be improved, to give communities the opportunity to enhance their vision for water resource management in the basin;
- Stakeholders' knowledge and capacities should be further strengthened through participatory processes and community involvement.
- The suggestion to expand the membership of the OMVS Permanent Water Commission to include within its membership community based representatives and selected, representative NGO's. Such broadening of membership would facilitate enhanced understanding and improved information sharing between all stakeholders;

Some additional issues raised. Among the many issues raised by the public were some that are heard less often and, and while not necessarily included although not necessarily eligible for inclusion in this project, are worthy of increased emphasis. They include:

- The significance of migration and the transhumance in the transboundary river basin setting;
- The importance of indigenous knowledge;
- The necessity of ensuring dissemination in local languages;
- Inclusion of participatory options analysis in investment project design;
- The need not only for coordination and public debate, but for reaching convergence and/or consensus.

Stakeholders Consulted During the Process

Below follows a list of institutions, agencies and organizations that were consulted during the project preparation process. Overall some 1250 people have been involved to date.

STAKEHOLDERS CONSULTED DURING NATIONAL PROCESS

| Country | Stakeholders |
|---------|---|
| SENEGAL | Association de développement de Cascas (ADC) Communauté rurale de Ross Bethio Commissariat de l'après barrage Commission Permanente des Eaux (CPE) Comité National de Coordination (CNC) Comités Locaux de Coordination (CLC) Comité National Projet Préparatoire du Projet (CNPP) Division régionale de l'hydraulique (DRH) Direction régionale du développement rural (DRDR) Fédération des Paysans Organisés du Département de Bakel (FPODB) Fédération des femmes productrices de St-Louis Mouvement des acteurs de la Vallée (MAV) Ministère de l'Agriculture et de l'Élevage (MAE) Ministère de la Jeunesse et de l'Environnement et de l'Hygiène Publique (MJE) Ministère des Mines de l'Énergie et de l'Hydraulique (MMEH) Plan d'Atténuation et de Suivi des Impacts sur l'Environnement (PASIE) Société de Gestion et d'Exploitation de DIAMA (SOGED) Société de gestion de Manantali (SOGEM) Société d'Aménagement et d'Exploitation du Delta (SAED) Organisation pour la mise en valeur du fleuve Senegal (OMVS) Ong Diapanté ONG OXFAM Société Nationale des Eaux du Sénégal (SONES) Société des eaux (SDE) Union des groupements des femmes des villages voisins du parc de la langue de Barbarie (UGFVPLB) |
| GUINEA | Centre de Promotion et de Développement Minier (CPDM) Direction Nationale de l'Hydraulique (DNH) Direction Nationale de la Météorologie (DNM) Direction Nationale de l'Environnement (DNE) Direction Générale des Bauxites de Tougué – Dabola (DGBT/D) Direction Nationale de l'Énergie (DNE) Centre de Promotion du Développement Minier (CPDM) Direction Nationale de l'Agriculture (DNA) Direction Nationale des Eaux et Forêts (DNEF) Direction Nationale des Forêts et Faune (DNFF) Direction Nationale des Mines (DNM) Direction Nationale du Génie Rural (DGR) Institut de Recherche Agronomique de Guinée (IRAG) Inspection régionale des Mines (IRM) Fond pour l'Environnement Mondial (FEM) ONG Ballal Guinée ONG Vita |

Préfecture de Manou
Préfecture de Dalaba
Préfecture de Tougué
Préfecture de Labé
Programme de Réhabilitation Agricole et d'Appui au Développement local
(PRAADEL)
Projet de Gestion des Ressources Naturelles (PGRN)

MALI

Action d'Appui aux Initiatives de Développement (AIDEB)
Aménagement Forêts (AF)
Association d'Appui aux Actions de Développement Rural
(ONG / ADR)
Agence Nationale d'Investissement des Collectivités Territoriales (ANICET)
Agence Malienne de Presse et de Publicité (AMCFE)
Assemblée Régionale
Association des Chasseurs
Association des éleveurs transhumant de Mahina
Association Coopératives pêcheurs de Kayes
Association des exploitants forestiers de Kayes
Association des orpailleurs de Kéniéba
Association des transporteurs routiers
Association Djama Djigui Marena
Association des Exploitants Forestiers (AEF)
Cabinet d'Assistance pour le Développement Intégré du Sahel (CADIS Chambre
d'Agriculture)
Collectif des Ingénieurs pour le Développement du Sahel (CIDS)
Comité Nationale de Coordination (CNC)
Comité nationale de suivi des recommandations de la table ronde de Kayes
Comités locaux de coordination (CLC)
Compagnie Malienne de Développement du Textile (CMDT)
Conseil de Cercle
Conseil Communaux
Conseil de village
Consortium Koyne et Bellier
Coordination régionale des femmes de Kayes (CRFK)
Coordination des Associations féminines et ONG (CAFO)
Coopérative Agricole Multifonctionnelle de Somakidi (CAMS)
Coopérative Multifonctionnelle de Kamankolé (CMK)
Direction Régionale de l'Hydraulique et de l'Energie (DRHE)
Direction Régionale de la Santé Publique (DRSP)
Direction Nationale de la Conservation de la Nature (DNCN)
Direction Nationale de l'Hydraulique et de l'Energie (DNHE)
Direction Régionale de la Conservation de la Nature (DRCN)
Direction Régionale de l'Agriculture et de l'Equipement (DRAE)
Direction Régional de l'Aménagement Rural (DRAMR)
Groupe de Recherche et de Réalisation pour le Développement Rural dans le
Tiers Monde (GRDR)
Haut Commissariat Kayes
Ministère de la Sécurité
Ministère des forces armées
Ministère de Développement Rural (MDR)

Office Malien du Tourisme et de l'Hôtellerie (OMATHO)
Opération Parc National de la Boucle du Baoulé Projet Petite Irrigation (PPI)
Projet National d'Infrastructure (PNIR)
Programme de Gestion des Ressources Naturelles (PGRN)
Projet de Développement Intégré de l'Agriculture
Irriguée de Manantali (PDIAM)
Sous commission Economie Rurale Kayes
Service Local d'Appui-Conseil-Amenagement-Equipement Rural
(SLACAER)
Service Locale de la Réglementation et du Contrôle (SLRC)
Union Générale des Associations pour le développement (UGAP)

MAURITANIA

Association pour la promotion de Touguène
Association Mauritanienne de Ingénieurs Agronomes et filières Associées
(AMIFA)
Association Mauritanienne de lutte contre la désertification (AMLCD)
Centre Nationale de Recherche Agronomique et de Développement Agricole
(CNRADA)
Bureau foncier du Brakna
Centre National d'Hygiène (CNH)
Centre National d'Elevage et de Recherche Vétérinaire
(CNERV)
Comité National Préparatoire du Projet (CNPP)
Comité Consultatif Local (CCL)
Commune Ndiago
Condition féminine de Boghé
Coopérative des artisans de Taiba
Coopérative Rindao Silla
Coopérative Périmètre Pilote du Gorgol I (PPG)
Coopérative Périmètre Pilote du Gorgol II (PPG)
Coopérative Agricole Maghama
Coopérative des artisans de Taiba
Coopérative de Rindao Silla
Coopérative des femmes de Birettes Coopérative des femmes de Gidr El
Mohguène
Coopérative Bok Dioum de Keur Mour
Coopérative rizicole de Touguène
Coopérative maraichère de Touguène
Direction de l'Environnement et de l'Aménagement Rural (DEAR)
Direction Régionale pour la Promotion de la Santé (DRPS)
Direction régionale de la protection des sols du Gorgol (DRPG)
Fédération Luthérienne Mondiale (FLM)
Hôpital Régional de Kaedi
Lutte Contre la Pauvreté
Mairie d'Aleg
Ministère du Développement Rural et de l'Environnement
(MDRE)
Ministère de l'Hydraulique et de l'Energie (MHE)
Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS)
ONG SUD

Parc National de Diawling (PND)
Périmètre pilote du Gorgol (PPG)
Programme d'Appui aux Coopératives Agricoles en difficultés (PACAD)
Plan d'Atténuation et de Suivi des Impacts sur l'Environnement
(PASIE)
Programme des Nations Unis pour le Développement (PNUD)
Projet Développement Communautaire et Sécurité Alimentaire du Brakna
(PDCSAB)
Projet de développement rural pour le groupement des femmes de Kaédi Projet
Maghama Décrue
Société Nationale de Développement Rural (SONADER)
Société de Gestion de Diama (SOGED)
Service du suivi écologique du PND
Union Internationale pour la Conservation de la Nature (UICN)
Union Nationale des Coopératives Agricoles et de Crédit d'Epargne de
Mauritanie (UNACEM).

ANNEX 7
OMVS - MANDATE, ORGANIZATION AND PROGRAM

OMVS: *Organisation pour la Mise en Valeur du Fleuve Sénégal*

Three Decades of Cooperation. The Senegal river's development potential and regional importance have long been recognized. In 1968, Guinea, Mali, Mauritania and Senegal created OERS (*Organisation des États Riverains du Fleuve Sénégal*) with a view to realizing the potential offered by the basin's land and water resources in a framework of regional economic integration. Upon the withdrawal of Guinea from the organization in 1971, Mali, Mauritania and Senegal formed OMVS (*Organisation pour la Mise en Valeur du Fleuve Sénégal*) the following year.

OMVS was created in 1972 by Mali, Mauritania and Senegal to promote the economic development of the Senegal river basin for purposes of irrigation, power supply and navigation. Guinea, the upstream riparian did not join originally, but has now official status as an observer. In 1981, with financing of about \$620 million from 12 donors, construction began on two dams – one at Diama on the river delta, designed to prevent intrusion of salt water into the lower valley and to maintain a minimum depth of water for navigation upstream to Mali and a second at Manantali in western Mali, for water storage, river flow regulation and power generation. Both dams have been in operation since 1988, however the power generation facilities are only now (mid 2001) being completed. By the mid-nineties about 100,000 ha of controlled irrigation had been developed of which about 60,000 ha are actually cropped, mostly with rice. OMVS has also tried to maintain an artificial flood to support the people dependent on flood recession agriculture, with a target area of 50,000 ha that can be cultivated in all but the driest years.

OMVS Legislative Base. OMVS is governed by three principal legal texts: *Convention relative au statut du fleuve Sénégal (1972)*; *Convention portant création de l'OMVS (1972)*; and *Convention relative au statut juridique des ouvrages communs (1978)*. In 1992, Guinea and OMVS signed the *Protocole d'accord-cadre de coopération entre la République de Guinée et l'OMVS* with a view to creating a framework for cooperation in actions of mutual interest concerning the Senegal river and its basin, including a provision allowing Guinea to attend OMVS meetings as an observer. This agreement has yet to produce tangible results.

Management Bodies. The supreme body of OMVS is the Conference of Heads of State and Government. There are also three permanent organs: the Council of Ministers (COM), the High Commission (HC) and the Permanent Water Commission (PWC). Others may be created as needed. In addition there is an Advisory Committee. The Regional Planning and Monitoring Committee advises on whether projects and measures planned in member states are consistent with the organization's objectives and whether the available resources in the basin can meet the development plans (see also organizational chart overleaf).

National Offices. The National Cellules in the three countries are directly linked to the Committee of Experts of member states, established by the Council of Ministers to advise the Council. For example, the Coordinator of the OMVS National Cellule for Senegal is also a member of the COM's Committee of Experts. The National Cellule assists in the implementation of OMVS projects and the Cellule is a permanent member of the advisory body of OMVS. In addition, local committees at district level are needed to allow grass root participation.

The objectives of the national units are the same in each country and are:

- Monitoring activities of OMVS
- Formulation of advice for the Ministry

- Coordination of activities of OMVS (High Commission, SOGED and SOGEM) in the member states
- Catalyzing relations between OMVS and national structures of member states
- Participation in the implementation of programs of OMVS
- Functioning as a permanent member of the Advisory Committee of High Commission
- Undertakes stakeholder consultations in cooperation with OMVS

Consultative Committee of Donors. Liaison and coordination between donors and the organization are ensured through the Consultative Committee of Donors. As an important example of intervention and donor insistence, two separate and privatized agencies were created for the management of the two dams (SOGED for Diama and SOGEM for Manantali). The agencies are commercial companies with the Boards of Directors made up of members of the Council of Ministers who take their instructions from the Heads of State. The Council acts as the “General Assembly” of the companies.

Greater NGO involvement. Recently, OMVS has become more aware of, and open to, NGO participation and cooperation and has, thus, increasingly involved NGOs in the development process. NGOs and civil society are represented in the OMVS Steering Committee and NGOs have set up a coordination committee for OMVS programs.

Staffing. The distribution of senior positions at OMVS is based on a political agreement at the highest level. Since OMVS headquarters is located in Senegal the senior positions of High Commissioner and Secretary General, (4-year terms) are alternated between Mauritania and Mali. Other senior positions are distributed equally between the three member states. Other staff positions are open to competition with the general intention of keeping a balance between the countries. Junior staff are recruited locally mostly, therefore, in Senegal. For the operating agencies, the directors come from states different to the location of the headquarters.

Funding. Funding of OMVS is described in Article 15 of the Convention as well as in the Financial Convention. Investments are in the form of loans both to the states as well as directly to the organization. In the latter case, collateral is required from the member states. Each state pays its own share of its loans.

Allocation of Costs. The allocation of costs and debt-sharing is based on an agreed formula, covered in the conventions, with a proviso that the formula can be revised. The World Bank and the University of Utah helped develop the formula after testing several methods of apportioning costs and charges. The life span of an OMVS project is 50 years. The underlying philosophy for cost recovery is that the user pays, but prevailing conditions are also taken into account. Fees paid to the organization are used to pay for operating expenses.

OMVS revenue in 2000

| | |
|------------|-------------|
| MALI | \$429,435 |
| MAURITANIA | \$419,435 |
| SENEGAL | \$419,435 |
| TOTAL | \$1,268,305 |

Shared ownership of structures. As established by the Conventions, the Senegal river is of international stature and, by virtue of this, structures built on the river have an international character. The OMVS structures (Manantali located in Mali and Diama dam located in Senegal and Mauritania) are indivisible property, subject to common ownership. The river basin is in a sense common property and it should, therefore, be developed by taking on-board the interests of all riparian states. If there is a national project with an impact on the regime of the river or that could damage the interests of other members, it is normal

under the principle of cooperation among member states that such a project should be reviewed and modified.

Hydro-metric Network. Within the member states, OMVS maintains a network of automatic and manually read hydro-metric monitoring stations along the river that are connected to OMVS headquarters by radio-links. Some stations send out information via satellite with real-time data received in Dakar. The information is transmitted directly to a computerized data system where it is analyzed and disseminated to the dams and the regional OMVS offices for operation of the dams and schemes

The Water Charter. With support from the PASIE and donors, OMVS is in the process of drafting and discussing a Water Charter that will determine the guidelines for allocation of flow from the river. Several studies on flow management and on the potential benefits and costs to various users have been drafted recently and these are still under discussion.

OMVS in project execution. OMVS is executing and overseeing the overall river basin development program. This program consists of three main components namely irrigation, navigation and energy.

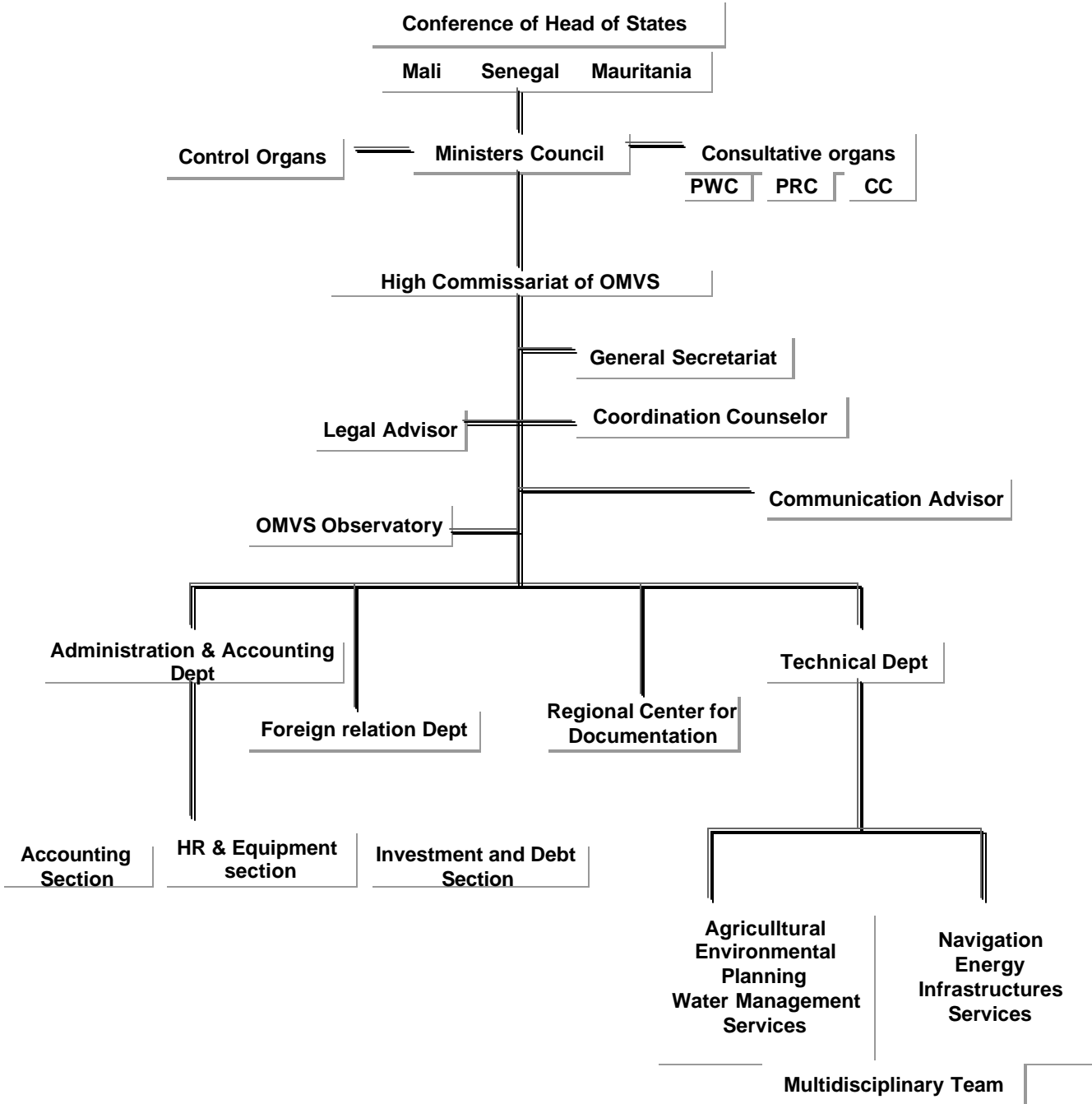
- The **irrigation component** aims to establish a total of 375,000 ha of irrigated agricultural land, with water being supplied from the Diama and the Manantali dams. The irrigation component has been under implementation since 1986.
- The **navigation component** includes the improvement of the main river channel to allow for year round navigation over some 905 km between Kayes and Saint Louis. The component also addresses the construction of ports and places of call, the establishment of fleet operating agencies and the maintenance of the navigable channel. The navigation component has not yet been started.
- The **energy component** is supported by the Manantali dam with a capacity of 200MW hydroelectric power plant generating 800 million Kwh/year. The power transmission to the main cities of the three member states is ensured by the 1,300 km long high voltage transmission lines which are almost completed. The first kilowatts from Manatali are expected to supply Bamako in early October 2001.

Dam construction and operation. OMVS has planned and overseen the construction of the two jointly owned and operated dams on the river. The Diama dam (located downstream) is an anti-saline intrusion dam with the basic purpose to halt salt water intrusion into the Senegal river, thereby making agriculture possible in the delta. The construction of Diama dam started in 1982 and was completed in 1986. The Manantali dam (upstream) is a multi purpose dam, which facilitates the regulation of the Senegal river flows (300m³/s) for the three main component defined above. The Manantali dam construction began in June 1982 and ended in August 1988.

Dam management. Two operating entities were created, the Diama management company (SOGED) and the Manantali management company (SOGEM), for the purpose of managing dam operations.

Mitigation of adverse impacts. OMVS has also received US\$17 million to finance the PASIE. The World Bank joined other donors, and is contributing \$3 million to this program. This program deals with areas as diverse as health, rural electrification, ecosystem and community involvement.

Institutional Chart of the Senegal River Basin Organization (OMVS)



ANNEX 8 PROJECT IMPLEMENTATION ARRANGEMENTS

PROJECT EXECUTION

OMVS - Project Executing Agency

OMVS will be the executing agency for this project. As such, OMVS will sign a **letter of agreement** with the World Bank for the execution of the project. Attached to the letter of agreement will be a draft management services agreement (MSA) which OMVS will subsequently sign with a project services agency (see below).

The project management unit (PMU) will be based at OMVS headquarters. The PMU will act at the regional, basin-wide level and will be responsible for managing and implementing the project in all four participating countries. The project manager, project technical specialists, as well as procurement and finance specialists will also be located in the PMU.

Project Services Agency

In order to demonstrate best practice in project implementation, an arrangement will be made with a project services agency (PSA) to deliver selected project services, thereby, ensuring that the standard procedures of the World Bank are followed.

The scope of project implementation services to be provided by the agency, directly or in part through the use of qualified subcontractors, has yet to be fully determined. In general, the project services agency will support the disbursement function, provide financial management and accounting services, and provide other project services support. Services will therefore likely include:

- Project Manager
- Procurement Advisor
- Financial Management Specialist

A specific agency to provide such services has not yet been selected, but discussions are underway to identify possible candidate agencies or organizations. Selection would be made in consultation with all partners. Once selected, a management services agreement (MSA) will be entered into between the project service agency and OMVS, detailing the kind of services which the agency would be supplying the PMU.

An important task which the project services agency will undertake during the period of project implementation, is to build the capacities of the OMVS and the PMU. Central to the terms of reference for the project services agency, therefore will be specific benchmarks and deliverables on project implementation (financial and procurement management systems, manuals, formats and procedure) as well as on capacity building for project implementation. This should help ensure that before the end of the project, the OMVS is fully enabled to handle project implementation and management of the future projects.

Senegal River Basin Steering Committee (SRBSC)

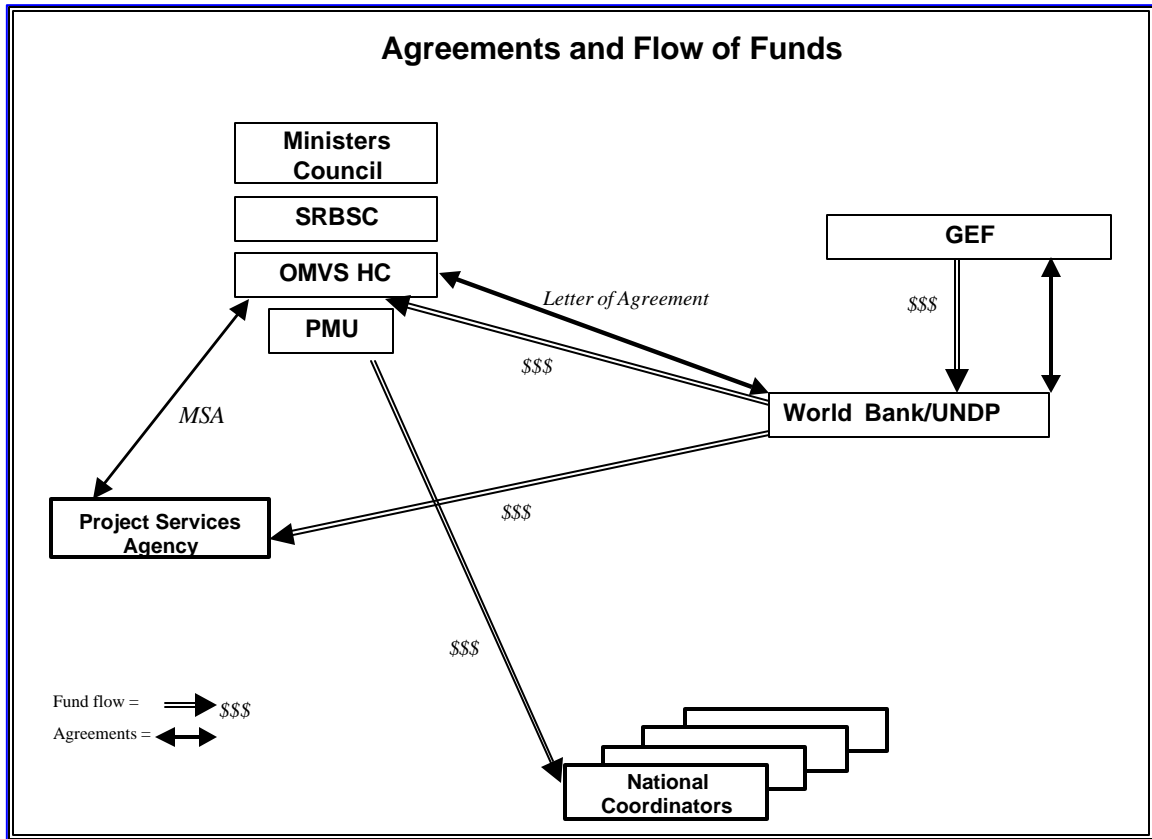
The SRBSC will oversee project implementation activities. Its membership will include representatives from the participating countries, OMVS, participating GEF implementing agencies, donors and selected participating NGOs. In addition, UNDP and the Project Managers/Coordinators of three “sister” GEF IW projects (Lake Chad, Niger River, Canary Current) will also be invited to attend the Steering Committee meetings as observers. The Project Manager will act as Secretary of the SRBSC. Close links will be maintained with the existing OMVS Committee, especially the Water Commission.

The SRBSC will:

- Have oversight of the project and will provide policy advice and guidance.
- Review the project portfolio and provide technical advice and guidance to the OMVS PMU
- Review and approve annual work plans and will receive and review annual substantive and financial reports on project activities.

Flow of funds

Payments will be made directly from the World Bank to the OMVS for project implementation and to the project service agency for the provision of the three staff listed above (Project Manager, Procurement Specialist, Finance Management Specialist).



Procurement Plan

The World Bank will receive a **procurement plan** prepared by the PMU. In preparing the procurement plan, the PMU will also liaise with OMVS to ensure that project inputs are used with efficiency. Upon approval of the plan by the World Bank/UNDP, the PMU will initiate action in accordance with the procurement plan.

For procurements of goods and services, the project services agency will establish contracts with contractors to supply goods and services in accordance with the procurement plan.

An **imprest account** will be established at the PMU level with a relatively low cash ceiling. The imprest account will facilitate procurement actions at the PMU level as well as at the national level (e.g. national consultants, workshops and consultations, local procurements, etc.). The World Bank/UNDP project will

replenish the imprest account upon receipt of an expenditure report. The PMU imprest account will be in hard currency and will be audited annually by internationally recognized auditors. An audit report will be submitted by the OMVS to the SRBSC and the World Bank and UNDP annually. Withdrawals from these accounts will require two signatures – such as those of the Project Manager and the finance or procurement specialist. Training will be needed for OMVS, PMU and national staff on World Bank and UNDP procurement procedures.

PROJECT REPORTING

1. Financial Reports

Monitoring and reporting on the use of GEF funds will be conducted in accordance with World Bank/UNDP guidelines. The financial reports will be prepared by the OMVS PMU (or on its behalf by its contracted agent) on an annual basis for review by the:

- SRBSC and OMVS for the Basin states and
- World Bank/UNDP as the administrator of trust fund resources on behalf of GEF,
- Consolidated financial reports will be provided to the OMVS Ministers meetings on a bi-annual basis.

2. Annual Progress Reports

A substantive progress report will be issued by the project on an annual basis. This report will be drafted by the PMU and approved by the SRBSC. The report will be submitted to the SRBSC members, the OMVS Ministers, the World Bank and UNDP. Extracts of the reports will also be posted on the worldwide web for public access as feasible.

3. Monitoring and Evaluation

Project supervision: The project will be supervised in accordance with World Bank supervision rules adapted to the multi-country nature of the project. The following elements make up the monitoring and evaluation program:

- **Annual supervision missions:** An annual supervision mission will be fielded to review project progress. This supervision mission will be a joint undertaking consisting of the World Bank/UNDP, other donors to the project and OMVS.
- **Annual Steering Committee meetings:** In conjunction with the annual supervision mission, an annual SRB Steering Committee meeting will be held. This meeting will be attended by the Steering Committee members as well as the supervision mission members. The Steering Committee will have received and reviewed the Annual Progress Report prior to the meeting.
- **Mid-term evaluation:** An independent mid-term evaluation will be carried out. The Terms of Reference, composition and timing of the mission will be agreed by the Steering Committee. The evaluators to be selected will have had no previous involvement in the design or monitoring of the project.

4. Audits

The project services agency will submit annual audit reports to the World Bank and UNDP. These audits will be undertaken by independent auditors.

5. Recruitment of PMU staff

Competitive and transparent selection

The project management unit will be staffed by personnel who have been recruited competitively following announcements and advertisements in the regional and international press.

For the three staff to be recruited by the project services agency, qualified applicants will be short-listed by the project services agency in cooperation with OMVS and World Bank/UNDP. In the interest of transparency, interview panels will be established to make the selections, and will be composed of project service agency representative, donor representatives, international and regional organizations and OMVS.

For the remaining PMU staff, qualified applicants will be short-listed by the Project Manager in cooperation with OMVS and the World Bank/UNDP. Interview panels consisting of the Project Manager, OMVS and the World Bank/UNDP will be established and the selection of staff will be made jointly by all members of the interview panels.

Selection will, therefore, be on a strictly competitive basis with a view to ensure broad regional coverage in the selection process. A preference exists for staff from the four countries, with assistance from regional or international consultants as necessary.

6. PMU Staff Reporting Lines

Once selected by the interview panel, the project services agency will appoint the three agency staff, while the PMU will appoint the remaining staff. The PMU staff will report to the Project Manager and the Project Manager will report to the Steering Committee through OMVS.

BASIN-WIDE COORDINATION

a) Senegal River Basin Project Roles and Responsibilities

The Senegal River Basin Steering Committee

- Will have overall oversight of the project and will provide policy direction, advice and guidance.
- Will review the project portfolio and provide technical advice and guidance to the OMVS PMU
- Will review and approve annual work plans and will receive and review annual substantive and financial reports on project activities.

OMVS

- Will be the executing agency for the project and will have overall responsibility for the project.
- Will sign a letter of agreement with the World Bank for the execution of the project.
- Will sign a project management agreement with the project services agency (see below).

Considerations for selection of project services agency

The following aspects will be relevant in the selection of the project services agency:

- Representations in all four riparian countries
- Bilingual ability
- Experience in working as project service agent to governments, where these have strong ownership of process
- Strong project implementation experience in the SRB countries
- Experience in provision of project services for regional and complex projects
- Ability to provide financial and accounting services, which are acceptable to World Bank standards
- Ability to provide insurance for agency staff
- Ability to run workshops to build capacities with local suppliers

ANNEX 9
PRELIMINARY FINDINGS
TRANSBOUNDARY DIAGNOSTIC ANALYSIS

1. Key Environmental Resources and their Uses

1.1 Water Resources

Rainfall occurs from April to October causing an annual flood from July to October which reaches its peak during the months of August, September and October. The flood is almost entirely generated by rain occurring in the upper basin over the Fouta Djallon highlands and there is negligible inflow downstream of Bakel which is at the head of the main valley.

The mean annual flow has varied from 1904 to the present day with a dramatic reduction of flow over the last twenty years. Today the average is less than half the overall average of 711 m³/s. While the mean annual flow is 20,903 Mm³, the minimum annual flow recorded was 6,695 Mm³ in 1984, with the maximum recorded annual flow being 41,769 Mm³.

In terms of flooding characteristics the valley may be divided into four stretches as follows:

| | Length (km) | Distance from sea (km) |
|-----------------|--------------------|-------------------------------|
| Gouina to Bakel | 202 | 996 |
| Bakel to Kaedi | 262 | 794 |
| Kaedi to Dagana | 363 | 532 |
| Delta | 169 | n/a |

In the upstream stretch from Gouina to Bakel the river is steep with a series of rapids, and lies within an incised valley without a significant floodplain. Downstream of Bakel the valley widens and the floodplain can be up to 10-15 km wide in peak flood. The average slope is 3 cm per kilometer. Downstream of Kaedi the river divides into two arms, the Doué on the left and the Senegal on the right. Downstream of Dagana, the river returns to a single channel before opening up into the delta. Flooding on the left bank has been controlled by embankments constructed in 1969 from Rosso to Saint Louis, however, following the construction of the Diama dam, barrage embankments control flooding on both banks as far upstream as Dagana.

The floodplain on both sides of the main river channel is made up of large natural depressions or basins termed *Unités Naturelles d'Equipements* (UNE). There are approximately seventy-two UNEs varying from 1,000 ha to over 15,000 ha in size, and it is the use of these UNEs that formed the basis of the traditional flood recession cropping. They serve to trap the flood long enough to collect moisture in the heavy soils sufficient to sustain crops.

1.2 Ecology

There is a major difference in ecological conditions between the highlands above Bakel, and the river valley downstream from Bakel.

The upper basin corresponds to the Fouta Djallon highlands and is characterized by different landscapes ranging from a mountainous ecosystem to savannah and steppe vegetation, with an elevation ranging from 500 to 1350m (Mount Tinka at Dalaba: 1320m and Mount Loura in Mali: 1538m). The highlands are also

significant for their biological diversity, which comprises 41 animal species including 3 rare species (small wild goat, crocodile and hippopotamus) and 3 threatened species, and 33 tree species including 4 threatened species.

In the lower part of the Senegal river basin, major changes in hydrology and floodplain ecology started in the 1960s. In 1964, part of the left bank deltaic ecosystem was dyked. Later on, the Fom Gleita dam was planned and built in early 1986 on the Mauritanian side of the basin. However, the major schemes that completely modified the river and floodplain hydrology were the Diama and Mananali dams which were completed in 1985 and 1987 respectively. An additional disturbance to the basin's hydrology and water resources development derives from the development of irrigated agriculture in the valley and delta, in particular, sugar cane perimeters in the delta.

Since these dams have been operational, the ecology of the floodplain has changed drastically. From salty and brackish water ecology with marked seasonal changes to a low flow perennial freshwater ecology. Inadequate agricultural practices and options have exacerbated existing poor hygiene conditions to set off a major health and nutrition crisis. Since 1987, the Senegal river has in effect become an artificial system. The Diama and Manantali dams were built for hydro-electricity generation, irrigation and navigation control, with the accompanying hydraulic networks needed for flood control and water supply in the valley and delta also having been constructed.

Before the Diama and Manantali dams were built the river had markedly different hydrological conditions that varied in time and space. Fluctuations occurred seasonally in water level and quality which added to the annual or cyclic episodes of dry and wet conditions. These fluctuations characterized by erratic flows and episodic inundation prevented a single species from dominating the ecology and contributed to the real diversity of habitats and species. In turn, this resulted in a variety of natural resources and production systems. The Diama and Manantali dams, and their accompanying infrastructure, contributed substantially to the uniformization of the ecosystem and provided the habitat for aquatic weeds and diseases vectors.

A number of other factors have contributed to the decline in environmental and social welfare. For example, the production of water intensive commercial crops which needed irrigating brought communities into contact with unsafe water without changing traditional attitudes towards water. Nor were these communities provided with safety knowledge and equipment. Another aspect of growing irrigated crops is that irrigation is labour intensive, which leaves little time to devote to traditional crops which used to be the major nutritional supply to households. In addition, communities have started to consume rice, the production of which is heavily subsidised by revenues sent back from migrant workers. These revenues previously were used to buy a variety of inputs to family nutrition. Under such conditions, malnutrition is likely among women, children and ethnic minorities. All these changes constitute a burden on the labour force and a trigger to social unease that in turn can disturb community life.

The river has distinctly different physiognomy in the upper, middle and lower reaches as described above and shows various soil types and agricultural activities in these different sections. The natural vegetation formations consist of:

- Seasonally flooded areas which are uniformly occupied by gallery forests where *Acacia nilotica* predominates, particularly in the alluvial valley; and
- Areas of semi-deciduous forests on laterite or sandstone, in the sub-Guinean domain, sparse woods slowly transforming to savannah trees in the Sudano-Sahelian domains, and shrub steppes in the Sahelian domain.

The natural vegetation has been profoundly degraded due particularly to impacts from the expansion of agricultural and resident and migratory herds of grazing animals. The clearing of gallery forests has been most extensive in the alluvial area, not only for agriculture but also for fuel wood.

The region is important for migratory birds, notably water birds, which arrive in large numbers during the European winters to wetlands in the Senegal valley and delta. There are protected areas of international significance such as the Djoudj National Bird Sanctuary on the Senegalese side of the delta which is a World Heritage Site, and the Diawling Strict Nature Reserve on the Mauritanian side.

1.3 Land Use

Land use varies throughout the basin too, showing similar differences between the upper watershed and the floodplain downstream from Bakel.

In the upper valley, the main agricultural production systems are:

- Intensive gardening around houses for family consumption and exchange goods;
- Extensive farming outside housing areas producing cereals (rice, fonio, millet) and groundnuts. The system is characterized by agro-pastoralism, shifting cultivation and ash farming;
- Farming of valley bottoms during the dry season for the market; and
- Animal husbandry which is another key feature of the region, either in a semi-sedentary form or based on seasonal transhumance. Over 40% of Guinea's dairy herd is located in the highlands.

Due to the high demographic pressure in the highlands, widespread poverty and the lack of alternative livelihoods, traditional land use practices have become unsustainable, these include:

- The practice of shifting farming by slash and burn cultivation coupled with increasingly short fallow periods;
- Excessive cutting down of forests to satisfy the ever-growing needs for firewood and timber; and
- Uncontrolled bush fires and overgrazing.

In the middle valley, downstream from Bakel, there is a major topographical division between the alluvial zone which can be inundated, and the higher ground which borders the valley. The alluvial zone of the main floodplain is characterised by three forms of land use:

- The river banks between the low water level and the normal annual flood level are seasonally cultivated. The local name for these is *falo*.
- Levées up to 10 m or more above the water level, which are only covered during the very worst floods. Quite a few villages are situated on these embankments, known locally as *fondé*.
- Seasonally flooded depressions between the levées and the valley sides, for which the local name is *walo*. These depressions are flooded via numerous creeks and small streams, and support a number of small, permanent bodies of water. Flood recession agriculture is practised in these areas.

Another zone comprises the areas further from the river (the higher banks and adjacent plateau), sometimes 15 km or more from the river itself. Conditions in these areas are semi-arid and are used primarily by nomadic herdsman.

2. Environmental Threats

The overall basin ecosystem and agricultural production systems are being degraded by the conjunction of natural drought and desertification processes, with inadequate land, forest and water resources uses and management. The degradation processes are dynamic and on a broad spatial and temporal scale. Despite a number of attempts at the national and international levels to initiate adequate management systems, the degradation continues with the intertwining of many environmental factors. Unsustainable land use derives

from the survival strategies employed by rural communities in the face of severe poverty. These communities often have low incomes but have to contend with high commodity prices. An additional factor is weak national afforestation policies.

2.1 Land Degradation

Land degradation processes severely impact on the stability of the physical environment, agricultural production systems and people's livelihoods. The effects on the regional environment can run deep in the longer term. Unfortunately, land degradation has long been neglected and has not been regarded as a priority for action by the national governments. This is due to a lack of hard evidence on perverse effects of degradation and insufficient information on the processes and magnitude of the problem, as well as the fact that it is mostly the poorest and least vulnerable people that are affected.

The interdisciplinary nature of land degradation may have contributed to the situation and there is a lack of adequate data. This has not helped governments to plan projects on the ground. At the basin level, changes in the hydrological cycle and /or availability of water resources have been linked to land degradation. This is particularly so in the Senegal river basin. Although flow regimes in the basin have been recorded for over a hundred years, data on land degradation are site specific, collected by national bodies, without any attempt to collect or analysis this data at the basin level.

By analysing the four intertwining processes (deforestation, soil erosion, overgrazing and desertification) involved in degrading land, a better understanding of the nature and impact of land degradation may be gained. Desertification is the sum of these processes and a final stage of land degradation.

Deforestation

Deforestation continues in the basin due to increased competition for agricultural land and firewood. This is especially so in the upper basin highlands in Fouta Djallon and around the Manantali dam. Yet, once soil fertility decreases on the area being cultivated, the land is abandoned for new more fertile land. However, this often results in the clearing of marginal land such as river banks and slopes of the basin thereby, triggering soil erosion. Increasing demand for fuel wood and charcoal, also from the urban areas, is encouraging uncontrolled logging and the abandonment of degraded areas without any attempt to reforest. The inadequacy of the forestry policies and services contribute to this problem.

Soil Erosion

Agriculture in sub-Saharan Africa is extensive rather than intensive and does not maintain soil fertility. With increased demographic pressures and demands for food the soils are mined for their fertility which is rapidly lost. Even in irrigated areas, fertility reduction is accompanied by rapid erosion and/or soil compaction. The land is then abandoned for newly cleared land where the organic matter and mineral content is still high. This clearing and abandoning cycle leaves vast areas exhausted, denuded and uncultivated. This situation derives from a lack of water and soil conservation practices, inadequate agricultural practices such as slash and burn, and from a lack of awareness on land and water interactions.

The importance of controlling erosion in the Senegal river basin is evident from the configuration of rainfall and runoff coming mainly from the Fouta Djallon highlands. Depletion of resources in the Fouta Djallon highlands is of major significance not only to the river system and its infrastructure, but also to the water systems and environment at the regional level.

In the floodplain ecosystems, land fertility, productivity and wetland maintenance occurred with the supply of organic matter from productive land in the upper basin. With the ecological degradation of highland ecosystems and damming of the river, morphological processes in the floodplains have turned from accretion and sedimentation to erosion, compaction and salinization. Due to a reduced hydraulic force induced both naturally and by the dams, sediment deposition is confined to the main river channel.

Overgrazing

Drought, desertification and the need for more agricultural land has gradually pushed livestock into marginal lands just as the number of cattle is growing. Even in areas that are intended to be used for grazing, the resources are usually ill-managed. Overgrazing leads to the destruction of topsoil by hydraulic and aeolian erosion, degradation of vegetative cover which is aggravated by use of tree canopy as fodder, and growing conflicts between farmers and herders, and among the herders themselves for the control of these scarce resources. Large areas of the basin have been denuded due to overgrazing, thereby changing completely the runoff and river regime.

Though large numbers of people within the Senegal basin depend completely upon livestock, and large areas are therefore being utilized, the riparian governments have not given their full consideration to formulating policies to better manage livestock. Therefore, the root causes of overgrazing which include population increase, increasing competition between agriculture and pastoralism, and abandonment of traditional transhumance practices have not yet found their way into the management of the Senegal river basin.

Desertification

Desertification is the degradation of drylands which involves the loss of biological productivity and complexity in croplands, pasture and woodlands, and consequentially a loss in economic productivity. It is due mainly to climate variability and unsustainable human activities leading to the overexploitation of natural resources. In the Senegal river basin desertification is mainly occurring in the marginal areas surrounding the dry ecosystems of Trarza, Ferlo and Yelimané, and is due to rainfall shortages, water resources depletion, drought, and land and flora destruction. The major impacts of desertification are lower soil productivity, destruction of vegetative cover, a re-activation of aeolian processes, watershed degradation and water scarcity, disturbance of fauna and flora and soil resources depletion (salinization, compaction etc.).

Some of desertification's consequences and impacts are borne by people living outside the area immediately affected. In the Senegal river basin, away from the immediately affected areas, the main impacts of the land degradation accompanying desertification are downstream flooding, reduced water quality, sedimentation in rivers and lakes, and the silting up of reservoirs and navigation channels. In addition, the floodplains experience dust and pollution, damage to machinery, mental stress and worsening health problems.

There are also social costs aside from the environmental impacts due to decreasing food production leading to malnutrition and famine, civil unrest and conflicts over access to, and control of, increasingly scarce resources.

2.2. Water Resources Management

Paradoxically, as rivers are controlled more and more through barrages and other infrastructure, the riverine response becomes increasingly unpredictable. The unpredictability produces unfavourable conditions for

communities living along a river, the environment and natural resources upon which they rely for their survival.

Information and data collection

Many of the negative consequences of river manipulation, such as ground and surface water quality deterioration or depletion, health risks and food production disruption derive from the use of inadequate data for planning purposes. Where data does exist it is either confined to sub-basins that generally correspond to national limits, or only a specific aspect of the resource is considered. Rarely do complete historical records exist from which patterns can be elicited.

Time series data on hydrology in the Senegal river basin does exist for the valley from Bakel to Saint-Louis in the delta. The data has been used for basin water resources planning and management. However, the changing patterns of rainfall and its implication on runoff and the governing processes are not yet fully understood. This problem originates from a lack of data in the catchment areas above Bakel, especially in the Guinean territory. This is partially due to Guinea's withdrawal from OERS and to its previous disinterest in collecting data in the Fouta Djallon highlands despite the fact that many rivers of regional importance originate from this area.

This problem is exacerbated by the weakness of ecological monitoring in almost all of the basin, and especially in the upper basin. Geomorphologic processes, dynamic ecological phenomena and associated modification of flow regimes have been totally ignored. Ecological, economic and social water demand is unknown, as well as water-flows and especially the extreme events such as floods and droughts. Hydrological instruments, remote sensing, conventional cartography and geographic information systems (GIS) tools, and adequate ground monitoring of all key elements of the landscape and dynamic processes would rapidly provide reliable knowledge and appropriate planning tools for the proper management of the basin's ecology and resources.

However, collecting new but disparate sets of data is unlikely to resolve the problem. It is important that the data protocols are agreed based upon which data can be collected, analysed and shared in a harmonized fashion.

Corrective measures are being taken by OMVS within the Regional Hydropower Project and the related program, PASIE. A water charter, hydrological studies and an Observatory of the Environment are being implemented. However, the problem of inadequate data is likely to remain until the upper basin in general, and Guinea in particular, is adequately instrumented and studied in terms of hydro-ecological conditions and the effects of production systems on land and water modifications.

Groundwater Resources

Despite the presence of a potentially large groundwater supply, riverine communities throughout the Senegal river basin remain dependent economically and socially upon the river's floods. Though the *Maastrichtien* and other *Cretaceous* sub-surface water bodies have started to be studied, the process is unsustainable. Groundwater monitoring in the valley has long been abandoned despite possible benefits from its use, and this should be rectified.

From the limited data that is available on water quantity and quality, negative changes such as salinization and lowering of the water table have been detected over the past decades. This is mostly attributed to a lack of groundwater recharge due to the reduction of flood areas. Underground and surface exchanges and lateral sub-surface interflows are found between the river, floodplains and deep aquifers.

Water Availability and Energy needs

It was acknowledged during the Manantali dam's planning and management for power generation that there is insufficient water to meet the energy needs of the member states without placing major economic, environmental and social burdens upon the communities and national economies. Recent studies of water availability have demonstrated that it will be necessary to reconcile all the potential uses and make a political choice as to how to utilize the resource. This includes reducing the forecasted yield of hydropower despite the present and acute energy crisis which results in frequent power failures, the unsatisfied energy demand in all the countries, and low connectivity in the rural areas.

This situation arises from inadequate energy policies, hydrodam planning and interconnection at a regional level, and a lack of financial resources to conduct hydrodam studies, planning and construction. Though Guinea has a large potential, it is limited in its capacity to exploit the opportunity because of a deficient energy transport and marketing system that would allow it to sell electricity to other countries where demand is very high. Therefore, the upper basin, despite its potential for hydropower highly dependent upon traditional energy sources such as kerosene, fuelwood and gas.

Water Quality

Water quality degradation can result from eutrophication processes due to reduced velocity and oxygenation present in bodies of stagnate or slow moving water reservoirs produced by damming and diking water bodies. Chemical and biological contamination through discharges of wastewater and agricultural water pesticide loaded can also degrade water quality. In Guinea, small-scale mining is a particular threat to water quality.

Water quality problems are due entirely to either a lack, or weak implementation, of water standards and regulation, the absence of treatment facilities, and a low environmental awareness and value for environmental protection. Water pollution occurs from point sources such as cities and irrigated areas, and non-point sources such as the Fouta Djallon highlands and delta. The impacts of pollution are a seasonal shortage of drinking water, waterweed infestation, a year-round increase of diarrhoeal diseases, and a serious threat to plant and animal ecology, and human health.

Food Security and Nutrition

Whether traditional cropping practices are better than irrigation has been debated since the dams of the Senegal river basin were first planned. Though there is insufficient data to conclude this debate, it is worth remembering that river basin management has an impact at the local level on people's livelihoods. What remains clear is that agricultural productivity has decreased with increasing land degradation. Any links to the development of the dams has not yet been elicited.

In the Fouta Djallon mountains and along the river, there appear to be two main problems: food diversity has decreased because of irrigation without substantially increasing production, and overall food production has decreased due to land degradation. Nutrition amongst the deltaic population has improved since the floods were artificially restored when compared to the dry years before the dam was built. The increased flooded areas and cropping patterns are likely to have been factors in this, due to the production of traditional staple crops and the availability of meat and dairy products.

Environmental Health

There is increased concern over issues of health, nutrition and sanitation. Poor water management results in pollution of sources and public health risks. Poor water management refers to inappropriate planning of the

water regime, a lack of secure water supply systems, and inadequate management of floods. The direct consequences of inadequate management include flooding and changes in the abundance and distribution of disease vectors. The indirect consequences of poor management can include malnutrition, contaminated drinking water, injury, stress, communal violence and a loss of well-being.

Communicable diseases such as diarrhoea, malaria and schistosomiasis (bilharzia) remain considerable problems and are strongly associated with a lack of infrastructure and poverty. Any immunity that a community develops to infection can be by malnutrition. These diseases and other health impacts can be avoided by improved planning and communication between the principal proponents and the health sector. Any water management plans that ignore the issue of health may be simply transferring hidden costs to the health sector, which is often already under-funded and stretched to capacity. This can lead to economic consequences such as lost productivity.

Malaria is the most important vector-borne disease and is likely to find increasing areas of favourable conditions with the decisions made regarding flood management in most hot climates. Bilharzia or schistosomiasis which comes second is found on many floodplains, and transmission depends on contact with water through fishing, bathing, farming, and washing. This is a chronic disease with relatively little apparent morbidity for many years, though with possibly high morbidity rates in later life. Two other mosquito-borne arboviruses are also important - rift valley fever and Japanese encephalitis. River blindness or onchocerciasis still occurs in a few areas such as those with rapid stream flows above the floodplain.

The construction of the dams changed the Senegal basin's floodplain ecology from a salty and brackish aquatic environment with marked seasonal changes, to a low flow perennial freshwater ecology. Apart from urinary bilharzia which was and is endemic in the whole basin, other water-borne diseases were not as common. Seasonal fluctuations in water level and water quality prevented any particular species from dominating. Malaria was then cyclical, arriving with the rains and disappearing in the dry season, with an endemicity which mirrored the rainfall. Incidences of malaria varied across the basin, it was low in the delta, medium in the middle valley and high in the upper valley. Onchocerciasis was an important public health concern for riverine communities while tripanosomiasis, skin leishmania and Guinea worm cases were rare.

2.3. Biodiversity Conservation

Biodiversity Degradation

Fauna and flora diversity has decreased because of drought and impacts from development of dams and irrigation. Riverine forests that constituted habitats for fauna have been cleared in many parts of the basin for irrigation and fuelwood. In some parts species have disappeared because unsuitable modification of flow regimes or improved accessibility of the highlands with roads to and around the Manantali dam has led to increased hunting in those areas. While protection remains insufficient in most of the basin, the loss of rare species justifies the creation of protected areas around the Manantali reservoir in the upper basin, and the Djoudj and Diawling in delta. The evolution of fish diversity is less evident though studies have shown that there is a loss of some species, though other species are simultaneously being found.

Wetland Degradation

Due to the construction of the dams and irrigation infrastructure and drought, the wetlands have diminished. The conversion to agricultural land, deforestation and overexploitation of water resources have dried out some wetlands in the basin. The principal culprit seems to be a lack of awareness of the role a wetland plays in the ecosystem and, therefore, its value to the ecological and economic processes depending upon it. Throughout the basin, poverty continues to put pressure on natural resources, especially on wetland products

due to a shortage of land, water and wood. Visible deterioration is occurring in confined ecosystems such as the Magui and Lere ponds, cuvettes around Kayes, deltaic and lacustrine environments in the lower valley and delta (Lake de Guiers and Rkiz and floodplain cuvettes).

3. Opportunities and an Agenda for Action

A thorough knowledge of the riverine ecosystem, productivity and actual efforts for poverty alleviation would greatly ease pressure on natural resources, and stimulate sustainable development. For this to happen, capacity building is necessary, as is the development of institutional framework for regional cooperation because of the transboundary nature of the key environmental and resources issues in the basin.

National priorities reflect the general concern to account for the needs of local communities in natural resources utilization. There is a substantive interest in promoting sustainable development at the basin level based on:

- Integrated hydro-ecology and natural resources management which would include mapping and collecting data on natural resources (land, water and forests), groundwater monitoring and modelling the interaction between ground and surface water, and flow forecasting;
- Community-based integrated rural development schemes including land and water management, health and nutrition improvement and ecological maintenance of natural vegetation; and
- Wetland restoration and biological resources conservation by studying the feasibility of transboundary nature reserves and wildlife management, aquatic weeds control programmes and ecological rehabilitation of wetlands for fishery development.

These concerns reflect the view that environmental management is the key to maintaining political and economic equilibrium in the Senegal river basin. The natural phenomena of drought and desertification, in addition to the decades of infrastructure development have left unresolved the major challenges of providing economic benefits to the riparian countries and improving livelihoods in the basin. Based upon key environmental threats and resource use, activities can be initiated in four major fields:

- Regional cooperation on water resources and environmental management to build capacity at the regional and national level to manage their shared natural resources, promote a participatory approach based on the identification of priority actions and their implementation, and initiate coordination and reconciliation of resource use and opportunities for economic and environmental cooperation;
- Conduct studies and data collection on hydrological and sediment regimes including rainfall/runoff and sediment transfer monitoring, water quality monitoring and groundwater modeling, initiating erosion control and soil investigation measures;
- Develop land and water management projects by investigating opportunities for developing small hydrodams and smallscale irrigation, extend erosion control and land resources conservation, promote integrated agro-ecological and sustainable agricultural schemes; and
- Wildlife and biodiversity conservation projects through ecosystems and habitats inventory, hydroecological restoration of floodplains and low flow waters, constitution of natural reserve for large mammals in highland ecosystems and control of waterweeds and disease vector habitats.

ANNEX 10
TRANSBOUNDARY ENVIRONMENTAL ANALYSIS
ROOT CAUSE ANALYSIS

| Issues | Symptoms/Impacts | Immediate Causes | Root Causes | Extent | Severity |
|-------------------------|---|---|---|---|--------------------|
| Land degradation | | | | | |
| Deforestation | <ul style="list-style-type: none"> Decreasing of vegetation/loss of savanna and forest cover; Energy crisis associated with competition for fuelwood and charcoal; Large-scale habitat destruction and loss of wildlife, progressive degradation of national parks and protected areas | <ul style="list-style-type: none"> Increased competition on arable land leading to the extension of bushfire methods and savanna clearing for agriculture; Uncontrolled logging for charcoal and fuel wood production which remains the main energy source; Non-planting or replanting of degraded areas | <ul style="list-style-type: none"> Poverty stricken population with an obvious lack of food security High charcoal and fuelwood prices due to increasing demand from urban areas; Absence of sound policy for re/afforestation | Basin-wide Critical areas: Fouta Djallon; Manantali areas; Senegal Valley | Very High |
| Soil Erosion | <ul style="list-style-type: none"> Loss of soil of fertility leading to extended cultivated areas; Loss of habitats and biodiversity; Degradation of river banks with water surface siltation leading to increased water quality concerns | <ul style="list-style-type: none"> Inappropriate agricultural practices and increased pressure on fragile areas; Lack of soil and water conservation practices; Neglect of soil restoration and protection; Bush fire and slash & burn practices | <ul style="list-style-type: none"> Increased population with urgent economic needs; Topography and geology not suited to current agricultural practices; Lack of awareness of land/water interaction | Basin-wide Critical areas: Fouta Djallon, Upper basin and Middle valley | Very high |
| Overgrazing | <ul style="list-style-type: none"> Appearance & large scale spread of “bowe” in mountainous areas; High degradation of vegetative cover; Reduced grazing areas and increased conflicts over shared natural resources | <ul style="list-style-type: none"> Inappropriate control and management of land pasture; Increase of erosion and top soil losses resulting from overexploitation of natural resources; Property damage of farming exploitation | <ul style="list-style-type: none"> High livestock density; Non integration of farming and pastoral practices; Inefficient / inappropriate policies on transhumance practices | Regional Critical areas: Fouta Djallon; Magui pond and Bafoulabe areas in Mali; Senegal valley around the sylvo-pastoral zone and Trarza region | Very High |
| Desertification | <ul style="list-style-type: none"> Destruction of vegetation; increase of dune formation & mobility; Watershed degradation and increase of water scarcity; Disappearance of fauna and flora; Soil salinization due to dry conditions; | <ul style="list-style-type: none"> Rainfall shortages associated with water resource depletion ; Increase of drought periods; Inappropriate land and flora protection; | <ul style="list-style-type: none"> Growing trend of climatic variability; Overexploitation of natural resources; Land tenure issues; Lack of investments; | Localized: Mainly in the northern part of the basin. Critical areas: North eastern part of Yelimane area, eastern part of Trarza, surrounding part of the Ferlo. | Moderate to severe |

| Issues | Symptoms/Impacts | Immediate Causes | Root Causes | Extent | Severity |
|--|---|---|---|---|---|
| Water Resources Management | | | | | |
| Groundwater Use | <ul style="list-style-type: none"> Groundwater depletion due lack of recharge; Inadequate supply for rural population | <ul style="list-style-type: none"> Reduction of flooded areas for aquifer recharge; Insufficient aquifer reserve to provide enough water quantity; Emerging water quality issues including salt intrusion | <ul style="list-style-type: none"> Insufficient water release from storage facilities; Overpumping of groundwater aquifers; Inadequate knowledge on groundwater reserve | Localized Critical areas: Fouta Djallon, Brakna region; Ferlo and delta areas | Moderate Severe in certain locations |
| Information and Data Collection | <ul style="list-style-type: none"> Unreliable water resource data and information; Absence of basin wide data collection network; Lack of cooperation for basin wide information sharing; Absence of basin-wide data collection parameters; Absence of reliable measuring stations | <ul style="list-style-type: none"> Lack of water availability and demand data; Lack of upstream upstream water flow information; Absence of basin-wide forecasting system for of extreme weather events (flood or drought); No harmonization of software and GIS for data and information collection & management; Outdated and out of repair gauging stations | <ul style="list-style-type: none"> Sectoral management of data and information gathering; Lack of financial means for sustainable data and information collection; Lack of attention on the centrality of data and information sharing | Basin-wide Critical areas: Bafing basin in Guinea; Basin wide for environmental data and information | Very high to high |
| Water Quality | <ul style="list-style-type: none"> Degradation of water quality making water unsuitable for domestic, industrial, agricultural uses; Pollution of groundwater and water storage resulting in contamination of drinking water; Adverse impact on water dependent flora and fauna; Nutrients and pesticides discharges leading to increase eutrophication; Decrease in environmental quality and water weeds infestation | <ul style="list-style-type: none"> Uncontrolled effluents, discharge of untreated water from urban areas, industrial water release and non-point sources from agricultural sector; Degradation of vegetative cover; especially Gonaïke forest and wetlands which could act as filters; Inadequate response mechanisms | <ul style="list-style-type: none"> Non existence of harmonized water quality standards, laws and regulation; Lack of funding and appropriate policy on operation and maintenance for treatment facilities; No operational laboratories for water source pollution control; Low environmental awareness and sense of value of environmental protection | Basin-wide Critical areas: <ul style="list-style-type: none"> Point source pollution localized around urban center such as Kayes, Matam, Podor, Dagana Rosso and St-Louis; Non point sources: regional problem causing water weed infestation (largely Typha and Salvina on all water surface areas in the middle valley and the delta region) | Severe |

| Issues | Symptoms/Impacts | Immediate Causes | Root Causes | Extent | Severity |
|----------------------|---|--|--|---|-----------------|
| Energy Needs | <ul style="list-style-type: none"> • Absence of alternative energy sources; • Electricity crisis and low connection rate within countries; • Persistence of energy outages and related inconvenience for the economies | <ul style="list-style-type: none"> • Energy shortages mainly firewood & electricity; • Low electrification rates of rural areas; • Economy slow down due to lack of energy supply; • High prices applied for electricity connection; | <ul style="list-style-type: none"> • Absence basin-wide energy planning forum to optimize energy production and use • Lack of financial and human resources to explore alternative energy options and multipurpose developments | Basin-wide Critical areas: Bafing basin in Guinea; upper basin in Mali and Guinea | Severe |
| Food Security | <ul style="list-style-type: none"> • Low food production and occurrence of famine; • Inefficient irrigation practices with predominance of rice; • Limited capabilities in comparison with the international market | <ul style="list-style-type: none"> • Inadequate extension & technical inputs in irrigation sector; • Undiversified crop production; • Limited understanding of macro-economic policies and their impact on incentive structures in agriculture sector | <ul style="list-style-type: none"> • Huge constraint on the acquisition of modern technology and extension services; • Lack of capacity and financial resources to develop performing agriculture; • Lack of policy reform based on analysis of macro-linkages to low agricultural outputs production | Basin-wide Critical areas: Upper basin and middle valley | Severe |

| Issues | Symptoms/Impacts | Immediate Causes | Root Causes | Extent | Severity |
|---------------------------|--|--|---|--|-----------------------|
| Waterborne Disease | <ul style="list-style-type: none"> • Pollution of drinking water sources, spread of infectious diseases (diarrhea, bilharzia, cholera, malaria and Guinea worm); • Risk to public due to poor sanitation conditions especially in urban areas during the rainy season; • Increase of malnutrition among small children and the elderly; increased absence from work due to sickness | <ul style="list-style-type: none"> • Lack of water supply systems and reliable drinking water sources; • Insufficient facility maintenance; lack of urban storm-water sewers and solid waste disposal; • Annual high water volume in the river causing increased breeding ground for waterborne viruses in irrigation canals and waterweeds infested areas; | <ul style="list-style-type: none"> • Lack of environmental regulations and laws; • Urban population growth and absence of sanitation facilities; • High capital costs for investment, operation and maintenance for irrigation canals and schemes; • Lack of awareness and connection between stagnant water, sanitation, safe drinking water and waterborne diseases; • Poverty and poor health condition of large parts of the basin | <p>Basin-wide - localized</p> <p>Critical areas: Senegal valley Upper basin</p> | Very high to high |
| Siltation | <ul style="list-style-type: none"> • Siltation and reduced effectiveness of flood plains, ponds, and irrigation canals; • Reduction of wetlands areas and decrease of beneficial functions and uses; • Heavy silt load in water bed leading to formation of sand bars (marmite de geants) and river bank erosion | <ul style="list-style-type: none"> • Continuous degradation of fragile and mountainous areas upstream of the basin; • Poor land use practices and overuse of forest and vegetative cover; • Watershed degradation due to population pressures, wood energy demands and agricultural expansion | <ul style="list-style-type: none"> • Population pressure in the upper watershed and absence of non-wood based energy sources; • Inappropriate land and livestock management; • Absence of basin wide soil conservation and protection practices; • Lack of awareness of link between land based activities and water pollution | <p>Basin-wide - localized</p> <p>Critical areas:</p> <ul style="list-style-type: none"> • Tributaries of the Bafing river in the Fouta Djallon; • Tributaries of the Bakoye in the Manding plateau; • The Baoule sub-basin; • The Kolombine, Karakoro and Gordol sub-basins; • The Ferlo valley | Very high to moderate |

| Issues | Symptoms/Impacts | Immediate Causes | Root Causes | Extent | Severity |
|---|--|--|---|---|-------------------|
| Biodiversity conservation | | | | | |
| Fauna, Flora and Fisheries Degradation | <ul style="list-style-type: none"> • Increase of endangered species; • Decrease in fisheries productions; • Decline in species diversity; • Decrease in numbers of large mammals with negative impact on tourism; • Decrease in forest cover | <ul style="list-style-type: none"> • Disappearance of unique habitats and ecosystems; • Increase of poaching in protected areas; • Construction ; • Absence of nursery grounds and way of passage for fisheries at small dams; • Lack of alternative income sources especially in resettlement areas; • Introduction of exotic species | <ul style="list-style-type: none"> • Land use planning not enforced or absent; • Lack of appropriate policy and legislation for species protection; • Lack of awareness on biodiversity concerns and benefit from conservation; • High reliance on primary natural resources and income from agriculture; • Increased population pressure on natural resources coupled with climate change trend | Basinwide – localized Critical areas; Diawling and Djoudji National Parks; Bafing / Faleme protected areas; Baoule / Keniebako game reserve | High to moderate |
| Wetland Degradation | <ul style="list-style-type: none"> • Decrease and degradation of wetland areas (siltation, flood damage, low water flows water weeds infestation, agriculture extension); • Decrease in benefits from functioning wetlands (less groundwater recharge, destruction of habitats and loss of biodiversity, reduction of flood plain area; reduction in pasture grass (bourgou) | <ul style="list-style-type: none"> • Progressive intrusion into wetlands for agricultural purpose; • Deforestation, erosion, siltation; • Overuse of natural resources (over-fishing, hunting, overgrazing, farming practices) | <ul style="list-style-type: none"> • Lack wetlands protection and management regulation; • Lack of awareness on wetlands functions, value and cultural functions; • Poverty and population pressure; shortages of water and land | Basin-wide - localized: Threatened wetlands: <ul style="list-style-type: none"> • Magui and Lere ponds; • Kayes regions (basfonds) • Ndiael cuvette; • Guiers and Rkiz lakes; • Senegal valley floodplain | Very high to high |

ANNEX 11
ENVIRONMENTAL PRIORITY ACTION BY COUNTRY

Republic of Guinea

| Environmental issues | Priority Action | Spatial Scale | Type of Action | Urgency |
|-----------------------------------|---|----------------------|--|----------------|
| Land Degradation | | | | |
| Deforestation | <ul style="list-style-type: none"> Promote and enhance reforestation in mountainous areas; Promote and control overgrazing in slope areas; Develop and promote alternative energy source; Promote public awareness on environmental degradation and related impacts; Promote land reforms program; | National | <ul style="list-style-type: none"> Environmental and water resource management plans; Transboundary joint management; Bush fire management Awareness & education campaign Review of current land tenure system & recommend reforms through broad participation; | Very high |
| Erosion | <ul style="list-style-type: none"> Promote watershed management based on holistic approach and sound consultation between stakeholders | National | <ul style="list-style-type: none"> Land management program; Capacity building; Education program; | Very High |
| Mining | <ul style="list-style-type: none"> Monitor on-going activities and assess negative environmental impacts; | Regional | <ul style="list-style-type: none"> Environmental policy and regulation | Moderate |
| Water Resources Management | | | | |
| Information and data collection | <ul style="list-style-type: none"> Improve knowledge base on water availability (inventory: water demand, data base & groundwater monitoring); Updating basin master plan (1960s); | National Regional | <ul style="list-style-type: none"> Rehabilitation/ installation of key hydrometric stations; Diagnostic study of basin; Comprehensive water policy and enhanced legislation; Capacity building | Very High |
| Energy needs | <ul style="list-style-type: none"> Promote alternatives to wood as energy source Develop forest management program; Promote small sustainable hydro electric power generation; | National Regional | <ul style="list-style-type: none"> Sustainable energy options, including small scale hydro Reforestation and land management programs. Feasibility studies on identified small hydro sites ; | High |
| Groundwater use | <ul style="list-style-type: none"> Promote sustainable groundwater uses | National Regional | <ul style="list-style-type: none"> Groundwater aquifer studies Water supply development | High |

| Environmental issues | Priority Action | Spatial Scale | Type of Action | Urgency |
|---|--|----------------------|---|-----------|
| Biodiversity Conservation | | | | |
| Biodiversity conservation | <ul style="list-style-type: none"> • Species and habitat inventory; • Habitat mapping • Improve knowledge on endangered ecosystems and species; • Integration of biodiversity management concerns in land use planning | Regional | <ul style="list-style-type: none"> • Capacity building for biodiversity management; • Management plans for protected areas; | Very High |
| Community based biodiversity conservation | <ul style="list-style-type: none"> • Promotion of sustainable community based biodiversity conservation • Rehabilitation of degraded ecosystems ; • Enhance public participation in biodiversity conservation; • Inventory of and application of customary practices for biodiversity conservation and sustainable resources uses; | Regional Local | <ul style="list-style-type: none"> • Cooperation with community groups for conservation; • Reforms to ensure community captures part of conservation revenue; • Locally defined biodiversity management plans; | High |
| Biodiversity management and monitoring system | <ul style="list-style-type: none"> • Promote biodiversity monitoring program; • Create national forum for information sharing | National Regional | <ul style="list-style-type: none"> • Capacity building at local, regional and national levels • Awareness & outreach: information sharing; • Strengthening Ministry of Environment for biodiversity monitoring | Very High |
| Institutions, Policy and Capacity Building | | | | |
| Institutional capacity building | <ul style="list-style-type: none"> • Enhance the capacity of institutions involved with environmental management; • Promote cooperation among national institutions for efficient use of existing capacity | Regional National | <ul style="list-style-type: none"> • Capacity building; • Institutional reforms; | Very High |
| Legislative reforms | <ul style="list-style-type: none"> • Promote flexible land tenure reforms; | | <ul style="list-style-type: none"> • Land tenure legislation | High |

Republic of Mali

| Environmental issues | Priority Action | Spatial Scale | Type of Action | Urgency |
|-----------------------------------|---|-------------------------------|---|-----------|
| Land Degradation | | | | |
| Deforestation | <ul style="list-style-type: none"> Promote reforestation in fragile and marginal areas; Promote alternative energy sources; Promote alternative grazing source; | Local National Regional | <ul style="list-style-type: none"> Environment and water resource management plans; Enforce legislation on natural resources uses | Very High |
| Soil erosion and Siltation | <ul style="list-style-type: none"> Develop river bank management plans; | National Local Regional | <ul style="list-style-type: none"> Technical improvement of land use; Land tenure and water legislation | Very High |
| Overgrazing | <ul style="list-style-type: none"> Develop sound policy and management of transhumance | National Regional | <ul style="list-style-type: none"> Transboundary livestock management plan; | Very High |
| Desertification | <ul style="list-style-type: none"> Promote sound policy for desertification control and land conservation through the CCD convention | National Regional | <ul style="list-style-type: none"> Land use; Awareness campaign Bush fire management plan | High |
| Water Resources Management | | | | |
| Illegal water withdrawals | <ul style="list-style-type: none"> Develop a sound water resource management policy | Local Regional | <ul style="list-style-type: none"> Capacity building Water legislation; | Very High |
| Water allocation | <ul style="list-style-type: none"> Promote comprehensive water allocation among sector; | Local National | <ul style="list-style-type: none"> Water demand studies; Water allocation and management plan | Very High |
| Floods and droughts | <ul style="list-style-type: none"> Develop comprehensive disaster management plan; Improve water release information between Manantali and downstream; | Regional Local National | <ul style="list-style-type: none"> Water release forecasting model; Flood early warning system; Drought monitoring; Capacity building; Communication | high |
| Food security | <ul style="list-style-type: none"> Promote replication of village level small irrigation schemes | Local Regional | <ul style="list-style-type: none"> Rehabilitation of small PIV; Technical improvement; Dissemination of best practices; | Very high |
| Biodiversity Conservation | | | | |
| Biodiversity and habitat losses | <ul style="list-style-type: none"> Biodiversity management and capacity building; Protected areas management plans and implementation Enforcement of existing policies; Physical delineation of protected areas | Local National | <ul style="list-style-type: none"> Capacity building; &awareness PA mangmnt. plans; Strengthened enforcement capacity; Survey for delineation of park boundaries; | High |

| Environmental issues | Priority Action | Spatial Scale | Type of Action | Urgency |
|---|--|-------------------------------|---|----------------|
| Wetlands degradation | <ul style="list-style-type: none"> • Establish wetland development and conservation policies; | Local National Regional | <ul style="list-style-type: none"> • Conservation measures; • Enforcement of policies; • Public awareness; | Very High |
| Climate changes Climatic variability and trend of decreasing rainfall | <ul style="list-style-type: none"> • Improve collection of rainfall data to improve forecast abilities; • Long term forecasting and data exchange; | Regional National | <ul style="list-style-type: none"> • Improve knowledge and information; • Enhanced modeling capacity • Cooperation between countries | Very High |
| Institutions, Policy and Capacity Building | | | | |
| Stakeholder participation | <ul style="list-style-type: none"> • Enhance coordination/information sharing among stakeholders; | Regional National | <ul style="list-style-type: none"> • Coord. mechanism; • Awareness, education | Very high |
| Unplanned / badly planned settlement | <ul style="list-style-type: none"> • Undertake curative measures to reverse and rehabilitate degraded areas; • Provide support to areas to prevent wide spread degradation; • Migration management. | Local Regional | <ul style="list-style-type: none"> • Emergency plan and support; • Sustainable development; • Local consultation and participation | High |

Republic of Mauritania

| Environmental issues | Priority Action | Spatial Scale | Type of Action | Urgency |
|--|--|----------------------|---|-----------|
| Land Degradation | | | | |
| Soil salinization | <ul style="list-style-type: none"> • Appropriate policy and regulation on irrigation water use; • Adequate planning on drainage; | Local Regional | <ul style="list-style-type: none"> • Technical improvement of irrigation practices; • Capacity building; | Very High |
| Overgrazing | <ul style="list-style-type: none"> • Enforcement of legislation on transhumance; • Promote transboundary convention on transhumance issue • Land tenure policy and reforms | Local Regional | <ul style="list-style-type: none"> • Integration of livestock management and irrigation program; | Very high |
| Deforestation | <ul style="list-style-type: none"> • Promote reforestation of Gonakie areas; • Promote alternative energy sources | Local Regional | <ul style="list-style-type: none"> • Promote sound education and awareness on forest degradation; | Very High |
| Desertification | <ul style="list-style-type: none"> • Implementation of National Action Plan prepared under CCD; • Promote adequate land management; | Local | <ul style="list-style-type: none"> • Land management ; • Awareness and education; | Very High |
| Water Resources Management | | | | |
| Groundwater depletion | <ul style="list-style-type: none"> • Promote water planning and management policy; • Develop appropriate water allocation model for groundwater recharge; | Local | <ul style="list-style-type: none"> • Technical studies; • Awareness and education; | High |
| Waterborne diseases | <ul style="list-style-type: none"> • Promote and apply policies to stop spread of waterborne diseases | Local | <ul style="list-style-type: none"> • Medicine dissemination program • Awareness, education | Very High |
| Pollution increase | <ul style="list-style-type: none"> • Enforce legislation on pesticide use; • Control effluent, sewage and fertilizer uses; | Local | <ul style="list-style-type: none"> • Environment policy and regulation; • Create awareness among farmers | High |
| Water weeds infestation | <ul style="list-style-type: none"> • Develop adequate measures against water weed infestation; • Intensify research and possible use of removed water weeds; | Local Regional | <ul style="list-style-type: none"> • Management plan; • Capacity building | Very high |
| Food security | <ul style="list-style-type: none"> • Promote replication of village level small irrigation schemes (VSIP) | National Regional | <ul style="list-style-type: none"> • Rehabilitation of VSIP; • Technical improvement; • Dissemination of best practice | Very high |
| Biodiversity Conservation | | | | |
| Biodiversity and habitat losses, including fisheries degradation | <ul style="list-style-type: none"> • Biodiversity management and capacity building; • Protected areas management plans and implementation • Enforcement of existing policies; • Physical delineation of protected areas • Development of reliable model for water flow release; • Fisheries management • Enforce appropriate regulations on fauna and flora protection; | National Regional | <ul style="list-style-type: none"> • Capacity building; & awareness • PA mangmnt. plans; • Strengthened enforcement capacity; • Survey for delineation of park boundaries; • Creation of protected areas | High |

| Environmental issues | Priority Action | Spatial Scale | Type of Action | Urgency |
|---|--|---------------|--|---------|
| Institutions, Policy and Capacity Building | | | | |
| Legislative reforms | <ul style="list-style-type: none"> • Promote flexible land tenure reforms and water resources management legislation; | National | <ul style="list-style-type: none"> • Land tenure and water legislation; • Capacity building • Awareness and education | High |

Republic of Senegal

| Environmental issues | Priority Action | Spatial Scale | Type of Action | Urgency |
|---|--|----------------------|---|-----------|
| Land Degradation | | | | |
| Soil erosion and loss of soil fertility | <ul style="list-style-type: none"> Establish sound policy for land use agriculture practices; Promote program for soil conservation and restoration; Promote anti-erosion measures; | National Regional | <ul style="list-style-type: none"> Technical improvements in soil use practices; Management information; Capacity building ; | Very High |
| Deforestation | <ul style="list-style-type: none"> Promote restoration of Gonakie forest; Encourage creation of protected areas & forest reserves; Manage natural forest; | Regional Local | <ul style="list-style-type: none"> Develop transboundary action for Gonakie forest restoration and management; Enforce legislation and raise awareness | Very High |
| Transhumance and overgrazing | <ul style="list-style-type: none"> Develop adequate regulation on livestock management; Enhanced community based management of pasture on floodplains; Integrate livestock management with irrigation program; | National Regional | <ul style="list-style-type: none"> Integrate livestock and irrigation program; | High |
| Desertification | <ul style="list-style-type: none"> Promote sound policy for desertification control and land conservation through the CCD convention; Implementation of National Action Plan prepared under CCD; Promote adequate land management | National Regional | <ul style="list-style-type: none"> Land use planning; Sand dune fixation; Reflooding of floodplains; Awareness; | High |
| Water Resources Management | | | | |
| Prevalence of waterborne diseases | <ul style="list-style-type: none"> Promote program against waterborne spread of disease; Create awareness on waterborne sources; | National Regional | <ul style="list-style-type: none"> Education & awareness on water/sanitation; Medicine dissemination; | Very High |
| Water weeds infestation | <ul style="list-style-type: none"> Develop adequate measures against water weed infestation; Intensify research and possible use of removed water weeds; Floodplains management; | Local Regional | <ul style="list-style-type: none"> Technical studies Management plan Capacity building; | Very High |
| Water resources variability | <ul style="list-style-type: none"> Improve water release information between Manantali and downstream; Strengthen early warning system on drought and floods; Develop relevant data base; Increase communication between stakeholders on water precipitation and releases; | Local Regional | <ul style="list-style-type: none"> Water release forecasting model; Flood early warning system; Drought monitoring; Capacity building; communication Water release management plan; | Very High |
| Food Security | <ul style="list-style-type: none"> Manage low flows and levels ; Promote replication of village level small irrigation schemes; Stakeholders participation in management schemes; | Local Regional | <ul style="list-style-type: none"> Rehabilitation of small VSIP; Technical improvement; Dissemination of best practices; | Very high |

| Environmental issues | Priority Action | Spatial Scale | Type of Action | Urgency |
|--|--|----------------------|--|----------------|
| Biodiversity Threat to Fauna and fisheries | <ul style="list-style-type: none"> • Enforce appropriate regulation on fauna and flora protection; • Develop management plan; • Reduce fishing pressure | National Regional | <ul style="list-style-type: none"> • Enforce legislation (licenses); • Protection areas policy; • Protect and rehabilitate spawning and nursery grounds • Education, Awareness | High |
| Wetlands degradation | <ul style="list-style-type: none"> • Develop environmental management policy; • Monitor environmental conditions; • Provide water to wetlands ; | National Regional | <ul style="list-style-type: none"> • Enforce legislation on wetlands uses; • Awareness creation | Very high |
| Institutions, Policy and Capacity Building | | | | |
| Community based development | <ul style="list-style-type: none"> • Initiate poverty alleviation program | National Regional | <ul style="list-style-type: none"> • Feasibility studies; • Capacity building • Technical development | Very High |
| Strengthen EIA | <ul style="list-style-type: none"> • Institutional setting and reforms | National Regional | <ul style="list-style-type: none"> • Capacity building • Technical development | Very High |

ANNEX 12
PASEI – A SUMMARY OF THE PROGRAM

Plan d'Attenuation et de Suivi des Impacts sur l'Environnement (PASIE)

1. Background on PASIE:

Objective. The PASIE forms a component of the Regional Hydropower Development Project which is nearing completion in the Senegal river basin. The primary objective of the PASIE is to monitor and mitigate the environmental impacts of the Power project, including monitoring of its operation.

The objectives of the Hydropower project are to: (i) reduce the long-term cost of electricity supply to the 3 countries; (ii) contribute to meeting debt service associated with the building of the Manantali dam; (iii) contribute to increasing the efficiency and reliability of power systems; (iv) establish an effective organization to construct and operate the project facilities and to mitigate environment and health impacts of the projects and the Manantali dam; (v) promote competitive private sector participation; and (vi) support the traditional agricultural sector downstream through the rational management of the Manantali reservoir.

The Regional Hydropower Development Project is executed by SOGEM, except for the PASIE which is being executed by OMVS.

Financing and donors.

The total financing overview of the PASIE is reflected in the table below (US \$ thousands).

| Program | Total | High Comsn | States | IDA | France | CIDA | FAD |
|---|---------------|-------------------|---------------|--------------|---------------|--------------|--------------|
| Construction oversight | 200 | | | | | 200 | |
| Acquisition of right of way for transmission lines | 4,355 | | 2,895 | | | 1,460 | |
| Reservoir management program | 3,325 | | | 475 | 1,200 | 900 | 750 |
| Environmental health | 2,475 | | | 1,825 | | 0 | 650 |
| Coordination & monitoring | 4,060 | 350 | | 1,560 | 1,200 | 100 | 850 |
| Related measures (rural electrification, income generation, etc.) | 2,700 | | | 2,100 | | 0 | 600 |
| Total | 17,110 | 350 | 2,890 | 5,960 | 2,400 | 2,660 | 2,850 |

Program period, The PASIE started officially in 1998. The program was scheduled for completion at the end of 2001, however, due to start up delays, it should now be completed in 2002.

2. Mainstreaming environmental concerns in OMVS

During the past 10 years or so, OMVS and its donors have increasingly recognized the importance of the environmental impacts and linkages. The PASIE was the first real expression of this and it has set in place an important, but limited, set of measures which addresses environmental and social impacts of the dams. Moreover, in recognition of the fact that a long term environmental monitoring mechanism is needed to ensure improved management, the PASIE also supports the establishment of *l'Observatoire*, which is supporting OMVS in building capacities and a knowledge base for environmental management of the river.

As the PASIE is now coming to a close, there is in both OMVS and among its member states and donors, a clear desire to broaden the scope of the environmental management activities in the basin. Specifically, it is considered essential to ensure the inclusion of Guinea in the basin cooperation, as well as to complete the participatory process which will lead to the establishment of agreed regional priorities, as reflected in a transboundary diagnostic analysis and a Plan of Action which can guide the further sound development and management of the river basin.

3. Targeted Environmental objectives of the PASIE

The PASIE represents a significant step by the OMVS to mainstream environmental concerns within the OMVS management. While the PASIE is limited in its environmental management objectives, it does provide an important basis for improved environmental management of the river.

The specific components which directly address environmental objectives are summarized below:

Program A: Mitigation Of Hydropower Project Impacts
Guidelines for environmental protection.

Program B: Acquisition Of Right-Of-Way For Transmission Lines
Procedures for acquisition and use of lands.

Program C: Optimization Of Reservoir Management
Prepare Reservoir Management Manual and develop and apply a Water Charter.
Identification of negative impacts on ecosystems around the reservoir and downstream of the Manantali dam

Program D: Environmental Health
Implement an action plan to considerably reduce in the medium term the prevalence of bilharzia, malaria and other water borne diseases..

Program E: Complementary Measures
(i) the promotion of rural electrification; (ii) micro-projects to generate revenues and reduce poverty; and (iii) the promotion of the development of next-generation hydro power sites (at the Felou and Gouina falls on the Senegal River).

Program F: Coordination And Monitoring
Environmental management and monitoring actions and the Coordination mechanisms necessary for the effective implementation of PASIE. (*l'Observatoire*).

4. Outline of PASIE components.

Program A: Mitigation of Hydropower Project Impacts. Program A concerns the development of directives and their application by the relevant parties in the areas of: (i) locating the power transmission lines with a view to minimizing the negative impacts; (ii) environmental protection and mitigation measures to be applied during construction; (iii) environmental monitoring of construction works; and (iv) continued environmental protection and monitoring to be practiced in the operation of Manantali Dam.

Program B: Acquisition of Right-of-Way for Transmission Lines. Program B defines (i) the procedures for obtaining the rights required to construct transmission lines and substations on land belonging or assigned to individuals, and (ii) the conditions governing the use while executing the works of land occupied or used by individuals. The program also defines the principles and modalities for the installation of power lines on land belonging to or being administered by the State.

Program C: Optimization of Reservoir Management. Program C aims to study and thoroughly understand the relevant hydrologic phenomena and their interaction with other natural resources in order to maximize the water's uses and benefits and to develop a corresponding Reservoir Management Manual. The resulting flow regulation is expected: (i) to correct in part the negative effects that came about with the completion of Diama and Manantali Dam; (ii) to result in an equitable allocation of water to its various uses; and (iii) to mitigate the negative impacts on the population's health and on the environment. The following activities are underway/being finalized:

- Reservoir Management Manual (essentially a computer model producing operating instructions as a function of observed hydrologic conditions and agreed-upon flow objectives).
- Study on the Senegal River's fisheries resources and their dependence on the flood regime.
- Study on the influence of the flood on pasture, flood recession agriculture and the replenishment of aquifers.
- Cost/benefit study of dam operating scenarios
- Development of a Water Charter defining the principles and modalities of sharing the available water among the riparian countries and among the different water uses.

Program D: Environmental Health. Program D will produce and implement an action plan to reduce the prevalence of bilharzia, malaria and other water related diseases. This component also addresses study and experimentation of fluctuations of the water level in the Manantali and Diama reservoirs to combat water-borne diseases.

Program E: Complementary Measures. Program E includes the following activities:

- Promotion of rural electrification;
- Micro-projects targeting women with the objectives to generate revenues and reduce poverty;
- The promotion of the development of next-generation hydro power sites (at the Felou and Gouina falls on the Senegal River).

Program F: Coordination and Monitoring. Program F concerns a set of environmental management and monitoring actions and the coordination mechanisms necessary for the effective implementation of PASIE. The environmental management and monitoring actions include the following:

- (i) The establishment of a data base in the framework of an *Observatoire de l'Environnement*
- (ii) The reinforcement of the Manantali Limnology Unit
- (iii) The establishment of a general environmental action plan and a *Code de l'Environnement* applicable to the part of the Senegal River basin occupied by the OMVS member countries
- (iv) The establishment of institutional and communication framework to facilitate implementation of activities.

5. PASIE achievements

- Since the funding of the PASIE was received, somewhat later than originally anticipated, good progress has been made. The latest progress report shows that the first component related to construction has been completed and the second component relating to the rights of way is nearing completion. The *power connection* to Bamako has been completed and that to Senegal and Mauritania is underway.
- There is good progress on the environment related components, the *Observatoire* is established, the studies have been done for the cost benefit study and the reservoir management scheme and a draft Water Charter has been prepared. Further work on these will be required however and difficult decisions remain to be made.
- On the *environmental health* side, the PASIE has produced and is implementing an action plan to considerably reduce in the medium term the prevalence of bilharzia and malaria. A pilot composed of structural measures intended to eliminate or reduce the risk of bilharzia infection is ready for implementation. Further study and experimentation of fluctuations of the water level in the Manantali and Diama reservoirs to combat the snail acting as vector of the bilharzia parasite completed and the draft is under discussion. The ministries responsible for public health in the three OMVS member countries have developed and are now implementing an environmental health action plan combating water-borne diseases..
- Under the Monitoring Component, the *Observatoire* is established; the Steering Committee, as well as the national and local committees and the Consultative Group have all been established.
- The participation mechanism is established as is the *Environment Management Plan*.
- Harmonization of *environmental legislation* is underway and coordination mechanisms have been established for Health and Environment issues. The monitoring procedures have been designed and the limnology unit established.
- Under Complementary measures, the promotion of rural electrification is underway. The sites have been identified for the income generating projects. The promotion of 2nd generation hydro has not yet started.

6. Implementation of the PASIE

the PASIE implementation and coordination mechanisms comprise:

- Steering Committee
- Panel of Experts
- Monitoring Committee
- A coordination mechanism to coordinate environmental health programs and monitor the effects of the implementation of the health action plan; and
- *Comités nationaux de coordination* (CNCs) and of *comités locaux de coordination* (CLCs).

The relevant ministries of all three OMVS member countries have issued decrees and directives defining the establishment and functioning of the CNCs and CLCs.

7. Setting the state for broader environmental management actions

Although the prime purpose of the PASIE related to the construction of the Power project which will be completed soon, an important element for the future is the establishment of *L'Observatoire* which lays the foundations for broader environmental monitoring in the basin. The PASIE has thus laid a foundation which will facilitate the broadening and strengthening of environmental management actions in the basin.

For the future, there is a clear need to move beyond mitigation towards the development of a program of priorities for the long term sustainable management of the river and its resources. In addition, the emphasis is now on ensuring that an inclusive framework of cooperation is established, whereby Guinea can be included within the framework of OMVS cooperation.

Although the PASIE environmental management objectives are limited in scope, the program has spearheaded and created environmental capacities and awareness within OMVS and the countries concerned. Specifically, PASIE has provided an institutional and legislative setting which will facilitate a transboundary program addressing water and environmental concerns in a participatory and integrated manner. The creation of national and local cells which are directly involved in decision making and actions implemented will further facilitate the work to be undertaken under the proposed GEF project. In conclusion, therefore, the PASIE is seen as the vehicle which has created the platform for further and broader action in the environmental management field.

8. Strategic follow-on intervention from the GEF

The proposed GEF project will build on the PASIE achievements. Through the Transboundary Diagnostic Analysis and the proposed Action Plan, a basin-wide priority setting exercise will be supported which will establish an agreed and sustainable basis for future development actions and investments. Through the micro-grant program, additional actors will be brought into the process and given a voice, thereby facilitating greater stakeholder awareness and involvement in the management of the land and water resources. The program will also support further and broader building of capacities at both the national and the OMVS levels, - with special emphasis on the land/water interface and will support the broadening of the data and knowledge base by further strengthening *L'Observatoire*. Finally, and most significantly, the project will facilitate the inclusion of Guinea within the OMVS cooperative framework, thereby laying the foundation for holistic and integrated water and environment management in the basin.

Annex 12

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