PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE

Report No.: PIDC19840

Project Name	Senegal River Basin Integrated Water Resources Management Project (P153863)
Region	AFRICA
Country	Africa
Sector(s)	General water, sanitation and flood protection sector (45%), Public administration- Water, sanitation and flood protection (25%), He alth (20%), Irrigation and drainage (10%)
Theme(s)	Water resource management (40%), Environmental policies and institutions (25%), Other communicable diseases (20%), Regional integrat ion (15%)
Lending Instrument	Investment Project Financing
Project ID	P153863
Borrower(s)	OMVS - Organisation pour la Mise en Valeur du Fleuve Senegal
Implementing Agency	OMVS
Environmental Category	C-Not Required
Date PID Prepared/ Updated	09-May-2015
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Concept Review Decision	Track I - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

The Senegal River, which is 1,800 km long, originates in the Fouta Djallon Mountain highlands of Guinea and flows through Mali, before forming the boundary between Mauritania and Senegal to its estuary on the Atlantic Ocean. The, 300,000 km2, Senegal River Basin has three distinct parts: (i) the upper basin, which is mountainous, (ii) the valley and the delta which are sources of biological diversity and (iii) the wetlands. The average annual rainfall for the Basin is 550 mm/year, the southern Guinean part records close to 1,500 mm/year compared to 200–250 mm/year in the northernmost part of the Basin. Hence, each year, the river transfers billions of cubic meters of water from the upper basin’s regions with plentiful rainfall to the dry Sahelian regions of the valley

and delta.

The four riparian countries of the Senegal River Basin rank among the poorest countries in the world with 42-53% of the population living below the poverty line and a GNI per capita as low as $430 in Guinea. The total riparian population is estimated at 35 million inhabitants, of which 12 million live in the Basin. They are mostly subsistence or smallholder farmers and are therefore among the most vulnerable groups in the region. The population growth rate is estimated at 2.7 percent and the population is expected to double every 25 years.

Water resources play a major role in the river's ecosystem and in the Basin area's economic development. About 85% the Basin's population relies on the watershed for their livelihoods while approximately 700,000 in riparian communities of the Middle Valley depend on the estuarine environment . The river's main economic functions are electricity generation, navigation, irrigation, fisheries, drinking water and social functions.

Two major factors have exerted pressure on the Basin's water environment in recent years: (a) climate variability and change; and (b) infrastructure development (dam construction). These factors have had significant consequences on the Basin's natural environment and have been further intensified by demographic growth, and by the expansion of farming practices. Deforestation and erosion (including riverbank erosion, are serious problems particularly in the Upper Basin). In the upper part, the valley and the delta, there is a decrease in the vegetation cover and a loss of soil fertility, often due to anthropogenic causes. The deforestation phenomenon is worsened by wind action, rainfall deficits, increases in salinity, and the lack of drainage in the irrigated perimeters.

Deforestation reduction in wooded cover is widespread in the Senegal River Basin. The 2005 Environmental Observatory Report estimates that on a national level, forest surface area decreased by 800,000 ha in Senegal between 1981 and 1990, and that Mali and Mauritania loses 100,000 ha and 10,000 ha per year, respectively (SOE, 2005). In Guinea, the national rate of deforestation was 2.08% for 1981–2000. Although the highest levels of degradation occur in Forest Guinea and Maritime Guinea, the Fouta Djallon Massif has also undergone intense deforestation. The environs of urban centers (Kayes, Kita, Kolokani, Kati, etc.) are also severely deforested, by processes explained in part by the need to respond to high demand for firewood in these cities and expanding farm and pastureland.

Although agriculture is the main economic activity for the majority of the population, less than half of the irrigation potential for the Basin is currently developed. There is still much which remains to be done to increase food security in the region through irrigated agriculture. The increased regulation of the Senegal River and associated infrastructure help to provide a regular supply of water for irrigated agriculture but have also resulted in altered estuarine and freshwater system dynamics which have led to; losses of flood-recession agriculture, reduced pasture lands, degradation of fish populations, changes in forests downstream of Diama dam and river bank erosion in the upper valley.

One of the Senegal River Basin's most serious problems relates to the massive presence of aquatic invasive species (particularly typha), which is linked to the construction of the Diama dam. The dam has created a permanent and fairly stable freshwater body whose shores have been invaded by a dense growth of unwelcomed aquatic plants. These species form extensive meadows covering entire water surfaces, preventing oxygen and light penetration, thus severely impacting native fish

species, particularly in the submerged zones. They also affect the productive capacity of the land as farmers can no longer use the irrigation channels and river arms for irrigation, which threatens food security. In addition to their immediate and visible economic and social impacts, the invasive species affect the ecological stability of the Senegal River Basin as well as productive activities (agriculture, fishing and livestock farming).

Another of the invasive plants' effects is the habitat they create for vectors of waterborne diseases. An increase in mosquito and snail populations resulted in widespread malaria and schistosomiasis in the Basin, which severely impeded the health of the local population. Also, growing urbanization combined with lack of sanitation facilities has increased water pollution. The practice of drawing water from the river has become increasingly hazardous, particularly in the dry season (there has been increased use of pesticides and fertilizers in irrigation schemes in the valley). Data and information as well as awareness related to national and trans-boundary impacts of this pollution are scarce.

Organisation pour la Mise en Valeur du Fleuve Senegal (OMVS) has the mandate of securing countries' economies and reducing the vulnerability of peoples' livelihoods through coordinated water resources and energy development. OMVS was established in 1972 in the context of severe droughts, famine and degradation of the natural resource base. The current OMVS structure includes four countries: Guinea, Mali, Mauritania and Senegal. Guinea is a recent entrant since 2006. Following the Nouakchott Declaration of May 2003, which sets the strategic orientation for development of the Senegal River Basin, the OMVS vision for regional integration includes accelerating the development of multi-purpose water resources infrastructure to augment the availability of water and generate low cost hydroelectricity. OMVS is a strong, stable regional organization and critically important for regional integration in West Africa.

The proposed Dutch Trust Fund, which is co-financing to the Senegal River Basin Multi-Purpose Water Resources Development (MWRD2), is intended to address some of the issues identified above (the proliferation of typha, which leads to the clogging of irrigation canals; upstream erosion; and waterborne disease transmission-particularly schistosomiasis). MWRD2 is the second phase of a 10-year Program. Phase 1 of the program (MWRD1) has positively impacted the Basin across the agriculture, health and fisheries sectors. MWRD2 is currently co-financed by two grants from the Global Environmental Facility (GEF), the Least Developed Countries Trust Fund for Climate Change. The new activities to be supported under this TF will build upon previous Trust Funds and will be complementary to MWRD2 so as to mutually reinforce integrated water resources management and development to improve community livelihoods.

OMVS has previous experience working with the Dutch Government and has successfully implemented projects supported by two previous Dutch trust funds. The previous TFs provided institutional support at the regional, national and community levels and improved knowledge and monitoring and evaluation of water resources. . The 2nd TF also supported: (i) the protection of public health through water supply reinforced livelihoods; (ii) capacity building for water user associations and irrigation cooperatives; and, (iii) river and irrigation channel clearance and slope stabilization.

The proposed project will expand the positive economic effects generated by MWRD2 and further contribute to poverty alleviation for local populations living along the Senegal River. Major benefits such as increased food security will continue to accrue from the development of hydro-agricultural

activities. The project through the reduction of typha proliferation will result in increased cultivated area as well as increased crop productivity and the associated economic returns. In addition, crop diversification incorporating high value crops will lead to improved financial yield.

The indirect benefits of this Trust Fund are expected to be extensive. For example, typha management will lead to food security, as it will enable additional areas to be put into production for irrigated agriculture. Control of public health risks will improve productivity of the population; and, the erosion protection works will lead to the development of agroforestry activities driving the economic development of the region.

The overall zones of intervention for this project have been identified and prioritized to complement current activities in MWRD2 and have been developed to consolidate the achievements under the previous trust-funded projects.

Sectoral and Institutional Context

In the Senegal River Basin sustainable development requires development in the water and agriculture sectors while protecting local health and livelihoods. In addition, planning for development needs to be done including climate change scenarios. OMVS, which is one of the most advanced basin organizations in the region, fosters an environment conducive to investments and is well-positioned to undertake multi-sectoral investments, as those proposed in this Trust Fund.

Climate change threatens to put pressure on water resources due to a possible increase in the already high variability in rainfall and river flows and changes to the geographical distribution of water resources, some areas possibly becoming drier, whilst others becoming wetter. Adaptation is complicated by the trans-boundary nature of water resources in the Senegal basin. Within the Senegal River Basin, and beyond in the region, food insecurity is increasing in parallel with very sluggish development of the large potential irrigation development. The Basin has seen considerable migration of people due to worsening droughts and desertification since the early 1970s. Annual rainfall has a high variability between wet and dry seasons and also from year to year. Currently, irrigated farming remains limited to the middle and lower river valley between Mauritania and Senegal. Less than half of the irrigation potential for the Basin, estimated at 375,000 ha, is currently developed. Of the 130,000 ha to 140,000 ha that are developed, only 90,000 ha are really usable.

Since 2007, the Dutch government has supported the OMVS to fight the aggressive invasive aquatic plants and to improve water resources management through training and supporting water user associations (WUAs) and irrigation cooperatives. Lost irrigated surfaces of land have been regained for agriculture, hence improving food security. Continued support, through this project, will enable OMVS to consolidate its achievements to date as (financially and institutionally) sustainable local maintenance systems combined with regional monitoring and planning systems will be strengthened.

The 2nd Trust Fund developed a suite of methods for clearing typha and also investigated different options for minimizing the rate of typha reemergence. The post-project evaluation found that the cost per kilometer for typha clearing was too high. Considering the continuing severity of the infestation of aquatic invasive species, and the need to develop a cost-effective typha control system, the need to regularly update the remote sensing inventory of these species is urgent. Access to the latest advances in spatial information systems offers a sizable advantage to those who have it. The project will therefore support installation of a remote sensing system for local and regional

planning and monitoring purposes.

Water supply systems, installed under TF2, were chosen because of their potential efficiency, in the local context. A framework for establishing WUAs was also developed; WUAs were supported to put in place mechanisms for recovering capital and maintenance costs. The majority of WUAs formed and supported by the project have some level of functionality. Some WUAs are very active in channel/canal maintenance, managing water supplies and other development activities. However an evaluation in 2013 found that some WUAs are not effectively functioning as they suffer from internal conflict and are focused on internal politics rather than on the coordinated management of the hydraulic axes. The proposed Trust Fund will train WUAs on organizational management and on invasive aquatic species management.

Institutional Context:

Since 1978, OMVS has formally adopted the principles of equality and equity, with the allocation of benefits and costs based on the needs of the member states, their capacity to put to use the benefits provided by the river, and the actual uses derived from the river (Nguyen, 1982). Over this period OMVS has become a key river basin authority in the region, with influence beyond the Basin boundaries; for example it has hosted the African Network of Basin Organizations since its formation in 2002. As one of the most advanced basin organizations in the region, OMVS ensures an environment conducive to investments, particularly large water-related infrastructure. With a long-standing, established track record spanning more than 40 years, OMVS is well-positioned to undertake the multipurpose and multi-sectoral investments proposed in this program.

The inclusion of Guinea within OMVS in 2006 was a critical step for regional development and economic integration. This is only the second time the Bank has brokered such an agreement on international waters (the first time being the Indus Treaty). By joining OMVS, Guinea has benefited from the lifting of financial constraints to developing its significant hydropower potential, thereby strategically positioning itself in the West Africa Power Pool market. However the inclusion of Guinea also introduces a number of risks into the operations of OMVS due to the country's much lower capacity and critical position at the source of the Senegal River.

Furthermore, the inclusion of Guinea provided an opportunity for OMVS to embark on a comprehensive program of legal and institutional reforms, incorporating environmental and social issues, among other aspects which were not fully considered at the initial establishment of the organization. The institutional reform of OMVS was completed with the implementation of a new organizational structure. This new structure better positions the organization for the current and future challenges as well as strengthens the involvement of all stakeholders in the decision-making processes. This is important as other development issues come to the forefront of water resources management (e.g. health and climate change adaption) and more participation from civil society is demanded.

The management and the development of water resources in the Basin are carried out within the framework of the OMVS. As previously mentioned, the proposed project is intended as co-financing to the second phase of the 10-year Senegal River Basin Multi-Purpose Water Resources Development (MWRD2) Project. MWRD1 positively impacted the Basin across the energy, environment, agriculture, health and fisheries sectors. There have also been important contributions

at the regional level for improved water resources management and it is expected that MWRD2 and this proposed project will scale up these positive impacts.

Relationship to CAS

Higher Level Objectives to which the Project Contributes

The project is consistent with the general goals of improved water resources management expressed in the riparian countries' Country Partnership Strategies (CPS: Senegal, Mauritania, Guinea) and Interim Strategy Note (ISN: Mali). For all recipient countries, the project is also consistent with the general sector goals of building institutional capacity and increasing sustainable management practices to reduce poverty as described in the strategy documents. In the same way, the project conforms to the countries' PRSP goals for good governance and sustainable development.

Mali. The Interim Strategy Note (ISN, 2014-2015) has a dual focus: it maintains the course of the ongoing engagement in support of urgent needs while scaling up efforts to target the longer-term drivers of the crisis. The ISN adopts an approach aimed at both addressing the drivers of fragility and transition priorities and scaling up immediate support in the areas of human development and economic recovery. It furthermore proposes to both focus on national programs and activities that can be scaled up and implemented across the country and a set of regional activities that address the need for integration and cross-border engagement. The ISN proposes three priority areas as starting points for the Bank’s engagement over the next two years: (i) Laying the foundations for long term accountability and stability; (ii) Protecting human capital and building resilience; and (iii) Preparing the conditions for economic recovery. This approach will hopefully help create short-term stability and generate space to start building the foundations for peace and stability.

Mauritania: The CPS (2013-2016), approved in October 2013, highlights the importance of Mauritania's cooperation with the OMVS on sustainable development of the Senegal River Basin, specifically to develop irrigated agriculture for food security, developing infrastructure for electric power production and transport, and improving economic returns from forestry management, including agroforestry. The PRSP, within the context of the country's National Environmental Action Plan (NEAP), identifies development of agriculture, livestock, forestry, and fisheries as some of the priority areas for intervention to address the national challenges for preserving natural resources while achieving sustainable development. This project also contributes to the Rural Development Strategy which focusing on agriculture development in order to generate rural employment and increase food security.

Senegal: The updated CPS (2013-2017), dated February 2013, for Senegal for the period highlights sustainable land and water management as a foundation of development. The importance of joint management of the Senegal River Basin is also identified. Pillar 1 of the CAS, Accelerating Growth and Generating Employment, targets sustainable management of fisheries, agricultural development- all of which will be enhanced through the project.

Guinea: The Guinea CPS (2014-2017) is consistent with the Africa Regional Strategy. The CPS focuses on areas where the Bank can contribute directly to strengthening human capital, with a strong focus on regional synergies. The Bank’s strategy for the agriculture sector will support enhanced food production would increase incomes from smallholder farming and employment opportunities in commercial agriculture.

World Bank Strategy for Africa: The proposed project is in line with Pillar 2 of the 2011 World Bank Strategy for Africa, Vulnerability and Resilience which highlights the importance of increasing resilience to health shocks with preventative treatment and resilience to climate change. The project works in the context of these issues.

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The development objective of the Senegal River Basin Integrated Water Management Project is to strengthen the capacity of OMVS and local water user associations to improve the environmental conditions of the Senegal River's water resources.

Key Results (From PCN)

i. Direct Project Beneficiaries (number), of which female (%)
ii. Slope stabilization through agroforestry development or reforestation (Ha)
iii. Operational water user associations created and/or strengthened (#)
iv. Installation of potable water stations in 8 villages (#)
v. Reduction in the proportion of target beneficiaries infected by schistosomiasis (%)

III. Preliminary Description

Concept Description

The project design aims to simultaneously protect the natural environment of the Basin while enabling macro-economic growth and safeguarding the health and livelihoods of vulnerable communities in the intervention areas. The three components are mutually reinforcing. Component 2 contains the major investments into the fight against invasive aquatic species. The cooperative implementation of this project will be supported by Component 3 and the investments into the Upper Basin will be advanced under Component 1. The proposed project is designed taking into consideration the lessons learned from the previous TFs and to be complementary to MWRD2.

Program Components
The proposed project has the following components:

Component 1- Upper Basin Activities (US$5.5 million): This component aims to address the challenge of degradation in the Upper Basin particularly the restoration of the main headwaters of the Senegal River, the banks of rivers, and the deforested slopes in Guinea and Mali through the sustainable reversal of the process of deforestation and erosion in Térékolé/Kolimbine/Lac-Magui system (TKLM), north of Kayes. In addition, the river banks protecting Kayes will be restored, continuing works initiated in TF2. This first component will support the following sub-components:
1.1 Diagnostic studies on deforestation, erosion and sedimentation in the Upper Basin (Guinea and Mali). The diagnostic studies will be designed to: (i) determine the sensitivity of different landscapes, in the Upper Basin, to deforestation and erosion due to differences in their geomorphological, geological, and vegetation attributes; and, (ii) identify high erosion and deforestation risk areas in order to plan site-specific management interventions.
1.2 The implementation of effective soil and water resource protection strategies. The efficiency of conservation measures may vary depending on the prevailing deforestation and erosion processes and controlling factors determined in sub-component 1.1. This sub-component will support the implementation of the most effective soil, vegetation and water resource protection strategies, in the Upper Basin, including strategies from the previous phase of the TF, such as: (i)

slope stabilization works and reforestation of river banks, and (ii) agroforestry on slopes adjacent to low-land agricultural areas.

Component 2- Management of Invasive Aquatic Plants in the Delta and the Operationalization of Water User Associations (WUAs) (US$6.3 million): This component aims to control and manage the proliferation of typha, to a level where it does not constitute a threat to the ecological balance and to economic activities the Basin This component also aims to improve access to drinking water and operationalize WUAs in continuity with the activities from the previous TFs. Specifically, this component will support the following sub-components:

2.1 Completion of a needs assessment on the control of invasive aquatic species in the Delta. The aim of this sub-component is to conduct a needs assessment to understand and synthesize the implications of the harvesting of Typha and other invasive plants. The needs assessment will ensure that the activities in subcomponent 2.2 are implemented, in the best way possible, to balance social, economic and environmental needs and concerns.

2.2 Invasive aquatic plant management: (i) annual inventory of the spatial distribution of the typha by remote sensing; (ii) cost-recovery plans of typha management and development of maintenance schedules; (iii) mechanical removal of typha.

2.3 Installation of potable water supply stations in project area villages.

2.4 Training and support to existing WUAs on (i) invasive aquatic plant management; (ii) organizational management; and, (iii) the management of water stations.

Component 3- Institutional Support for OMVS and National Agencies (US$3.3 million): This component aims to build the capacity and skills of OMVS and National Cellule staff through training and the exchange of lessons learned. The component will support the management and implementation of regional and state level activities. The component will primarily target the OMVS bodies responsible for implementing the program. The component will also target national technical services to support the activities of the program based on areas of expertise relevant to this project: environment, forestry, water resource management, and public health. This sub-component will support:

3.1 Strengthening the capacity of OMVS and national agencies to lead invasive species management efforts in the region.

3.2 Strategic management of the Trust Fund.

IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	×		
Natural Habitats OP/BP 4.04	×		
Forests OP/BP 4.36	×		
Pest Management OP 4.09	×		
Physical Cultural Resources OP/BP 4.11	×		
Indigenous Peoples OP/BP 4.10		×	
Involuntary Resettlement OP/BP 4.12	×		
Safety of Dams OP/BP 4.37	×		
Projects on International Waterways OP/BP 7.50	×		
Projects in Disputed Areas OP/BP 7.60		×	

V. Financing (in USD Million)

Total Project Cost:	15.10	Total Bank Financing:	0.00
Financing Gap:	0.00		

Financing Source	Amount
Borrower	0.00
Free-standing TFs AFR COUNTRY DEPARTMENT, West 1	15.10
Total	15.10

VI. Contact point

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