

Document of  
The World Bank

Report No: ICR2653

IMPLEMENTATION COMPLETION AND RESULTS REPORT  
(IDA-41820 IDA-41830 IDA-41840 IDA-H2310 TF-94727)  
ON  
THREE PROPOSED CREDITS  
IN THE AMOUNT OF

SDR 21.0 MILLION (US\$30.08 MILLION EQUIVALENT)  
TO THE REPUBLIC OF MALI

SDR 22.2 MILLION (US\$31.78 MILLION EQUIVALENT)  
TO THE ISLAMIC REPUBLIC OF MAURITANIA

SDR 21.0 MILLION (US\$30.08 MILLION EQUIVALENT)  
TO THE REPUBLIC OF SENEGAL

ONE GRANT  
IN THE AMOUNT OF SDR 12.60 MILLION (US\$18.04 MILLION EQUIVALENT)  
TO THE REPUBLIC OF GUINEA

AND ONE GRANT FROM THE DUTCH TRUST FUND IN THE AMOUNT OF SDR 8.5  
MILLION (US\$12.12 MILLION EQUIVALENT)  
TO THE ORGANISATION POUR LA MISE EN VALEUR DU FLEUVE SENEGAL

FOR A  
SENEGAL RIVER BASIN MULTI-PURPOSE WATER RESOURCES  
DEVELOPMENT PROJECT

IN SUPPORT OF THE FIRST PHASE OF THE SENEGAL RIVER BASIN MULTI-  
PURPOSE WATER RESOURCES DEVELOPMENT (APL) PROGRAM

September 25, 2013

AFTN2  
AFCRI  
AFRVP

## CURRENCY EQUIVALENTS

(Exchange Rate Effective August 27, 2013)

Currency Unit = F CFA

FCFA 1000 = US\$ 2.03

(Exchange Rate Effective April 4, 2006)

Currency Unit = F CFA

FCFA 1000 = US\$ 1.85

US\$ 1.43 = SDR 1

## FISCAL YEAR

July 1 – June 30

## ABBREVIATIONS AND ACRONYMS

ADRS	National Department for Rural Development in the Senegal Valley, Mali ( <i>L'Agence de développement rural de la vallée du fleuve Sénégal</i> )
APL	Adaptable Program Loan
CAS	Country Assistance Strategy
CPS	Country Partnership Strategy
DO	Development Objective
DNGR	National Department for Rural Engineering, Guinea ( <i>Direction nationale du Génie rurale</i> )
ERR	Economic Rate of Return
ESIA	Environmental and Social Impact Assessments
ESMF	Environmental and Social Management Framework
GPRS	Government Poverty Reduction Strategy
IDA	International Development Agency
ISR	Implementation Status and Results Report
IRR	Internal Rate of Return
ILL	Local Coordination Committee
LLIN	Long Lasting Insecticide-Treated Bed Net
M&E	Monitoring and Evaluation
MTR	Mid-term Review
MWRD	Senegal River Basin Multi-Purpose Water Resources Development Program
MWRD 1	Phase 1 of the MWRD
MWRD 2	Phase 2 of the MWRD
NC	National Cellule
NIA	National Implementing Agency
NPV	Net Present Value
OMVS	Senegal River Basin Organization ( <i>Organisation pour la Mise en Valeur du fleuve Sénégal</i> )
PAD	Project Appraisal Document
PDIAM	Program for the Development of Irrigation Downstream of Manatali ( <i>Programme de Développement de l'Irrigation en aval de Manantali</i> )
PDO	Project Development Objective
PIU	Project Implementation Unit
PPMP	Pest and Pesticide Management Plan
PRSP	Poverty Reduction Strategy Paper

RPM	Regional Project Management
RSC	Regional Steering Committee
SAED	Delta Management Holding Company, Senegal ( <i>Société d'Aménagement des Terres du Delta</i> )
SAR	Staff Appraisal Report
SOGED	Diama Dam Holding Company
SOGEM	Manantali Dam Holding Company
SONADER	National Company for Rural Development, Mauritania ( <i>Société Nationale de Développement Rural</i> )
SRB	Senegal River Basin
UIVDD	Inter-Village Unit of Durable Development (Unité Inter-Villageoise de Développement Durable)
WB	The World Bank

Vice President:	Makhtar Diop
Country Director:	Colin Bruce
Sector Manager:	Jonathan S. Kamkwala
Project Team Leader:	Shelley McMillan
ICR Team Leader:	Claire Grisaffi



## Guinea, Mali, Mauritania, Senegal

### Senegal River Basin Multi-Purpose Water Resources Development Project

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MAP



## A. Basic Information

Country:	Africa	Project Name:	Senegal River Basin Multi-purpose Water Resources Development Project
Project ID:	P093826	L/C/TF Number(s):	IDA-41820,IDA-41830,IDA-41840,IDA-H2310,TF-94727
ICR Date:	01/08/2013	ICR Type:	Core ICR
Lending Instrument:	APL	Borrower:	GUINEA, MALI, MAURITANIA AND SENEGAL
Original Commitment:	Total XDR 76.80M	Disbursed Amount:	XDR 68.01M
Revised Amount:	XDR 76.80M		

### Environmental Category: A

**Implementing Agencies:** Senegal River Basin Organization *Organisation pour la Mise en Valeur du fleuve Sénégal*

**Cofinanciers and Other External Partners:** Government of the Netherlands

## B. Key Dates

Process	Date	Process	Original Date	Revised / Actual Date(s)
Concept Review:	04/26/2005	Effectiveness:	03/14/2007	03/14/2007
Appraisal:	02/13/2006	Restructuring(s):		06/17/2011
Approval:	06/08/2006	Mid-term Review:		01/11/2010
		Closing:	09/08/2011	03/31/2013

## C. Ratings Summary

### C.1 Performance Rating by ICR

Outcomes:	Satisfactory
Risk to Development Outcome:	Moderate
Bank Performance:	Satisfactory
Borrower Performance:	Satisfactory

### C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

Bank	Ratings	Borrower	Ratings
Quality at Entry:	Moderately Satisfactory	Government:	Moderately Satisfactory
Quality of Supervision:	Satisfactory	Implementing Agency/Agencies:	Satisfactory
<b>Overall Bank Performance:</b>	Satisfactory	<b>Overall Borrower Performance:</b>	Satisfactory

<b>C.3 Quality at Entry and Implementation Performance Indicators</b>			
<b>Implementation Performance</b>	<b>Indicators</b>	<b>QAG Assessments (if any)</b>	<b>Rating</b>
Potential Problem Project at any time (Yes/No):	No	Quality at Entry (QEA):	None
Problem Project at any time (Yes/No):	No	Quality of Supervision (QSA):	None
DO rating before Closing/Inactive status:	Satisfactory	QAG Learning review 2008	Moderately Satisfactory
		QAG Learning review 2009	Moderately Unsatisfactory

## **D. Sector and Theme Codes**

	<b>Original</b>	<b>Actual</b>
<b>Sector Code (as % of total Bank financing)</b>		
Animal production	22	22
Central government administration	7	7
General water, sanitation and flood protection sector	27	27
Health	22	22
Irrigation and drainage	22	22

<b>Theme Code (as % of total Bank financing)</b>		
Administrative and civil service reform	14	14
Land administration and management	14	14
Pollution management and environmental health	14	14
Regional integration	29	29
Water resource management	29	29

## **E. Bank Staff**

<b>Positions</b>	<b>At ICR</b>	<b>At Approval</b>
Vice President:	Makhtar Diop	Gobind T. Nankani
Country Director:	Colin Bruce (Regional Integration)	Mark D. Tomlinson
Sector Manager:	Jonathan S. Kamkwala	Eustache Ouayoro
Project Team Leader:	Shelley Mcmillan	Ousmane Dione
ICR Team Leader:	Claire Grisaffi	
ICR Primary Author:	Richard Carroll /Stanislaw Manikowski	



## F. Results Framework Analysis

### Project Development Objectives (from Project Appraisal Document)

The development objective of the MWRD program is to enhance regional integration among the riparian countries of the Senegal River Basin through OMVS for multi-purpose water resources development to foster growth including improved community livelihoods.

### Revised Project Development Objectives (as approved by original approving authority)

The Program Development Objective is to enhance regional integration among the riparian countries of the Senegal River Basin through OMVS for multi-purpose water resources development to foster improved community livelihoods.

The Project Phase 1 Development Objective is to improve management and use of water resources in the Senegal River Basin.

#### (a) PDO Indicator(s)

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
<b>Indicator 1:</b> Improved management of natural resources and improved socioeconomic conditions in the project intervention areas.				
Value (quantitative or qualitative)	No baseline	No target value	Dropped during restructuring	Substantially achieved
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target substantially achieved.</b> Management of the Senegal River Basin (SRB) natural resources has improved with the integration of Guinea. The majority of the planned investments for the improvement of socio-economic conditions were successfully achieved at the end of the project in 2013.			
<b>Indicator 2:</b> Pre-investment framework (technical, environmental, social, etc.) is in place to build the selected dam.				
Value (quantitative or qualitative)	Four dams selected for investment	Introduced during restructuring	Feasibility studies for 3 dams launched and Strategic Regional Assessment (SRA) prepared.	Feasibility studies of three dams and the Strategic Regional Assessment (SRA) have been completed.
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target achieved.</b> The feasibility studies for three dams and complementary documents have been completed, including the Strategic Regional Evaluation, Environmental Study, the Senegal River Master Plan and the study on developing the local power pool. On			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
	March 25, 2013 the heads of States of OMVS decided to finance and build Gouina and Koukoutamba dams.			
<b>Indicator 3:</b> Guinea is fully integrated into the decision-making structures of OMVS.				
Value (quantitative or qualitative)	Guinea becomes the 4 <sup>th</sup> member of OMVS	Introduced during restructuring	Reforms of OMVS to include Guinea are proposed and adopted;  New organogram and personnel in place	Guinea is fully integrated into the OMVS structure. New organogram is developed and adopted and the personnel is in place.
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments (incl.% achievement)	<b>Target achieved.</b> Guinea is fully integrated. The reforms proposed were validated and approved. OMVS employs 3 high level staff from Guinea, including the current High Commissioner.			
<b>Indicator 4:</b> At least 80% of children under 5 years old living in the Project areas are sleeping under long-lasting insecticidal nets.				
Value (quantitative or qualitative)	58% of children are sleeping under long lasting insecticidal nets (LLIN)	Introduced during restructuring	80% of children are sleeping under LLIN	84% of children are sleeping under LLIN
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments (incl.% achievement)	<b>Target exceeded</b> by 4%. The Project distributed more than 2.6 million nets. More than half of them are used for the whole family.			
<b>Indicator 5:</b> A decision has been made to build at least one dam to complement the hydroelectric capacity of the OMVS member countries.				
Value (quantitative or qualitative)	No decision	Introduced during restructuring	Decision made	Decision made to finance and build two dams- Koukoutamba and Gouina
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments (incl.% achievement)	<b>Target achieved.</b> Indicator revised at 2010 restructuring. Original indicator was “A decision has been made to build at least one dam and at least 20% additional megawatts added to the hydroelectric capacity of the OMVS member countries upon completion of the second phase of the project.”			
<b>Indicator 6:</b> At least 100% increase in the flow of water passing through the principal water intakes (Laouēja, Gorom Aval and Dioulol).				
Value (quantitative or qualitative)	Water flow equal to 15 cubic meters per second	Introduced during restructuring	100% increase of the flow of water	Increase of flow of water by 133%
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments	<b>Target exceeded.</b> The improved bulk water infrastructure benefits Mauritania and			

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
(incl.% achievement)	Senegal. The increased flow ensures that 6000ha of existing irrigation development can be put into production and supports two crops per year since 2010.			
<b>Indicator 7:</b> 4,400 hectares of irrigated areas are rehabilitated or developed.				
Value (quantitative or qualitative)	0	Introduced during restructuring	4,400 hectares of irrigated areas are rehabilitated or developed	5,223 hectares of irrigated areas are rehabilitated or developed
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments (incl.% achievement)	<b>Target exceeded</b> by 19%			
<b>Indicator 8:</b> 15,000 direct beneficiaries to the irrigated areas, of which 5% are women.				
Value (quantitative or qualitative)	0 New activity	Introduced during restructuring	15,000 direct beneficiaries of which 5% are women	15,000 direct beneficiaries of which 14% are women
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments (incl.% achievement)	<b>Target exceeded.</b> The target concerning the number of the direct beneficiaries has been met. Percentage of women among the beneficiaries is 9 points higher than targeted <sup>1</sup> . The women benefited mostly from the newly developed or rehabilitated small market gardens.			

**(b) Intermediate Outcome Indicator(s)**

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
<b>Component 1: Regional Institutional Development for Water Resources</b>				
<b>Indicator 1:</b> Application of internationally recognized management practices, (including legal, human resources, financial)				
Value (quantitative or qualitative)	No baseline	No target values	Dropped during restructuring	Implementation of MWRD 1 complied with internationally recognized management practices
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013

<sup>1</sup> The majority of landowners are male and are therefore counted as the direct beneficiary even if the whole household benefits or if the rehabilitated / developed areas are used predominately by women. Two of the four national executing agencies highlighted that they were active in ensuring that women retained rights to access and use irrigated agricultural land, however this has not been tracked in project implementation.

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (incl. % achievement)	<b>Target partially achieved.</b> Achievement estimated as 30%. The implementation of MWRD 1 complied with internationally recognized management practices (including legal, human resources, financial). PIU and Bank staff completed training and capacity building for the High Commission and national cellules.			
<b>Indicator 2:</b> Existence of protocols and other arrangements for coordination and cooperation among the institutions with more effective operations				
Value (quantitative or qualitative)	Existing protocols between OMVS and other relevant agencies	At least 2 protocols and performance contracts signed or renewed	Dropped during restructuring	Four performance contracts were signed with project executing agencies
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target achieved.</b> Target achieved in terms of coordination and cooperation for project implementation. Performance contracts were signed with the four national executing agencies. Agreements were also signed for implementation of health activities.			
<b>Indicator 3:</b> 20% of Water User Associations with increased capacities, access to information, and decision-making processes				
Value (quantitative or qualitative)	35%	55%	Dropped during restructuring	Approximately 80%
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target achieved.</b> This objective was met through the Dutch Trust Fund financed activities. Eight new WUA were created, and 40 existing WUA were supported and remobilized with training and equipment			
<b>Indicator 4:</b> Effective M&E system is in place and fully operational				
Value (quantitative or qualitative)	Nature of M&E system at the start of the project	Changes to M&E capacity evidenced by improved data collection capacity	Dropped during restructuring	Data collection capacity improved in terms of tracking project implementation, progress reports are timely, accurate and detailed.
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target partially achieved.</b> Data collection capacity improved in terms of tracking project implementation, progress reports are timely, accurate and detailed. However, the M&E system does not have the capacity to measure impacts on poverty reduction in the basin			
<b>Indicator 5:</b> Use of M&E data to improve program management				
Value (quantitative or qualitative)	Nature of evidence-based decision-making before project	Increased use of M&E data for project management and decision-making.	Dropped during restructuring	M&E data used to focus supervision and inform the development of MWRD 2

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target partially achieved.</b> M&E data on project progress informed decisions during restructuring to refocus the project. Post restructuring, M&E data has identified problem areas and informed supervision efforts. M&E data has also informed the development of MWRD 2			
<b>Indicator 6:</b> Integration of Guinea into OMVS' decision-making process				
Value (quantitative or qualitative)	Status of Guinea at the start of the project	Degree of integration over the life of the project	Elevated to PDO indicator (3)	Yes
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target achieved.</b> Reforms have been completed. Guinea is integrated into the CoM, the Permanent Water Commission and is represented in the High Commission. However the partition of costs and benefits for investment in the basin does not yet include Guinea.			
<b>Indicator 7:</b> 35% increase of people who use the documents and information at the documentation center				
Value (quantitative or qualitative)	448	604; 35% increase	Unchanged	752; 68% increase
Date achieved	May 10, 2006	September 8, 2011	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target exceeded.</b> The Center is operational and equipped. It has collected 14,000 documents; their digitalization is ongoing.			
<b>Component 2: Local Level Multipurpose Water Resources Development</b>				
<b>Indicator 1:</b> Concrete activities carried out with positive socio-economic impacts on communities across the Basin				
Value (quantitative or qualitative)	No baseline	No target values	Dropped during restructuring	Planned activities to improve livelihoods and health in the basin are completed.
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target partially achieved.</b> Estimated at 80% complete. Anecdotal evidence indicates that positive socio-economic benefits have been realized; however more time is needed for all irrigation areas to be put into production, markets to be put into full use etc.			
<b>Indicator 2:</b> 3 intakes built and 2 intakes rehabilitated in the coverage areas				
Value (quantitative or qualitative)	0	5	Unchanged	5
Date achieved	May 10, 2006	September 8, 2011	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target partially achieved.</b> Estimated as 95% complete. Two intakes were constructed and one rehabilitated. Two further intakes were rehabilitated, snagging works remain. The built and rehabilitated intakes improve flow control.			
<b>Indicator 3:</b> 50 km of irrigation canals built and rehabilitated in the coverage areas (bulk water supply)				
Value (quantitative or qualitative)	0km	50km	Unchanged	88km
Date achieved	May 10, 2006	September 8, 2011	March 31, 2013	March 31, 2013

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (incl. % achievement)	<b>Target exceeded.</b> The constructed canals improved access to water and eliminated the shortage of water for irrigation across about 8,000 hectares of rice fields. In addition 35km of channel were cleared in the fight against invasive aquatic species			
<b>Indicator 4:</b> 80 km of drainage canals built and rehabilitated in the coverage areas.				
Value (quantitative or qualitative)	240km	320km	Dropped during restructuring	Not measured
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	Drainage canals were constructed for all irrigation projects developed.			
<b>Indicator 5:</b> Number of pumping stations (6 stations and 4 motor pumps) installed or rehabilitated in the coverage areas to be fully functional				
Value (quantitative or qualitative)	0	10	Unchanged	47
Date achieved	May 10, 2006	September 8, 2011	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target exceeded.</b> The project purchased and installed 25 motor pumps and rehabilitated/enlarged or built 22 pumping stations.			
<b>Indicator 6:</b> 5% increase in number of women's cooperatives with access to irrigated areas				
Value (quantitative or qualitative)	212 cooperatives	223 cooperatives	Unchanged	234 cooperatives
Date achieved	May 10, 2006	September 8, 2011	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target exceeded</b> with an increase of 10%. The total number of women that benefited from the project investments in irrigation is estimated at 2,100.			
<b>Indicator 7:</b> At least 900 ha of lowland areas ( <i>Bas-fonds</i> ) in the project are developed and protected				
Value (quantitative or qualitative)	0	80% of identified lowland areas	900	534
Date achieved	May 10, 2006	September 8, 2011	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target partially achieved.</b> Estimated as 60% complete. Target partially met due to suspension of works in Mali and Guinea due to political instability in the country			
<b>Indicator 8:</b> 25% of farmers in the coverage areas use the irrigation facilities to improve agricultural yield/production				
Value (quantitative or qualitative)	30%	55%	Dropped during restructuring	Not measured
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	The rehabilitated or developed schemes have been transferred to farmers and anecdotal information indicates that yields have increased, however no quantitative data is available.			
<b>Indicator 9:</b> 35% increase of acreage under cultivation				
Value (quantitative or qualitative)	40%	75%	Dropped during restructuring	Not measured
Date achieved	May 10, 2006	September 8, 2011	September 8,	March 31, 2013

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
			2011	
Comments (incl. % achievement)	A total of 5,223ha has been put into production.			
<b>Indicator 10:</b> 35% increase of crop yields				
Value (quantitative or qualitative)	43%	78%	Dropped during restructuring	Not measured
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	The rehabilitated or developed schemes have been transferred to farmers and anecdotal information indicates that yields have increased, however no quantitative data is available.			
<b>Indicator 11:</b> 30% of communities in the coverage areas in the basin applying better land and water management practices				
Value (quantitative or qualitative)	15%	45%	Dropped during restructuring	Not measured
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	Farmers' cooperatives and water user associations have been trained in improved land and water management practices through MWRD 1 and the parallel Dutch Trust Fund financing. It has not been possible to monitor the change in behavior.			
<b>Indicator 12:</b> 50 km of river banks restored				
Value (quantitative or qualitative)	25km	75km	Dropped during restructuring	83.5km
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target achieved.</b> 58.5km of riverbanks were restored, in addition to the 25km baseline including 20km along tributaries in Guinea and 38.5 in the Cercle of Kayes in Mali.			
<b>Indicator 13:</b> 15% of communities in the coverage areas in the basin area applying better agro forestry practices				
Value (quantitative or qualitative)	5%	20%	Dropped during restructuring	Not measured
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	5,700 people were trained in agroforestry practices across 273 villages in Guinea. However due to delays in the implementation of the agro forestry activities it is difficult to measure improved practices.			
<b>Indicator 14:</b> 2500 ha of forest area are rehabilitated				
Value (quantitative or qualitative)	0	Introduced during restructuring	2,500	1,570
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013

Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Comments (incl. % achievement)	<b>Target partially achieved.</b> Estimated as 63% complete. Target partially met. Work in Mali was cancelled due to political instability. All cancelled agroforestry activities in Mali will now be financed under MWRD 2.			
<b>Indicator 15:</b> 15% increase in the quantity of total fish sold from the main markets or depots rehabilitated under the Project				
Value (quantitative or qualitative)	98,760	113,501; 15% increase	Unchanged	111,598; 13% increase
Date achieved	May 10, 2006	September 8, 2011	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target partially achieved.</b> Estimated as 87% complete. The quantity of fish sold from the main markets or depots in March 2013 represent a 13% increase. During restructuring this indicator was expanded to specify the location of sales			
<b>Indicator 16:</b> At least 60% of school aged children in the Project areas targeted for treatment by the baseline survey receives treatment for schistosomiasis				
Value (quantitative or qualitative)	0	Introduced during restructuring	60%	80%
Date achieved	October 18, 2010	September 8, 2011-	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target exceeded</b> by 20%.			
<b>Indicator 17:</b> 80% of households in the Project areas with at least one LLIN				
Value (quantitative or qualitative)	No baseline	80%	Dropped during restructuring	84%
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target exceeded.</b> Percentage household coverage with LLINs in 2012 was: Mauritania 85%, Senegal 90%, Mali 96% and Guinea 65%			
<b>Indicator 18:</b> 1,509 LLINs delivered to distribution sites per 10,000 population				
Value (quantitative or qualitative)	0	1509/10,000 population	Dropped during restructuring	See indicator 21
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	Superseded by indicator 21			
<b>Indicator 19:</b> 60% of the population in the Project areas where the prevalence crosses WHO-approved thresholds have been treated for schistosomiasis				
Value (quantitative or qualitative)	No baseline	60%	Dropped during restructuring	See indicator 16
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	Superseded by indicator 16 above			
<b>Indicator 20:</b> 1,836 doses of Praziquantel and Albendazole delivered to distribution sites per 10,000 population				



Indicator	Baseline Value	Original Target Values (from approval documents)	Formally Revised Target Values	Actual Value Achieved at Completion or Target Years
Value (quantitative or qualitative)	0	1836 doses	Dropped during restructuring	See indicator 16.
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target achieved</b> , see indicator 16. 14 million tablets of praziquantel and 4.6 million of albendazole tablets delivered to distribution sites			
<b>Indicator 21:</b> 3,000,000 long-lasting insecticide-treated bed nets distributed				
Value (quantitative or qualitative)	0	Introduced during restructuring	3,000,000	2,625,580
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target partially achieved.</b> Estimated as 88% complete. All nets could not be distributed in Guinea because of the civil strife			
<b>Component 3: Multi sectoral and multipurpose planning</b>				
<b>Indicator 1:</b> The Senegal River Basin Master Plan is available for effective management of water resources for multi-purpose development				
Value (quantitative or qualitative)	Nature of management practices at the start of the project	Effective systems have been established to facilitate multi-purpose development	Dropped during restructuring	Comprehensive Senegal River Basin Master Plan is adopted as a planning tool
Date achieved	May 10, 2006	September 8, 2011	September 8, 2011	March 31, 2013
Comments (incl. % achievement)	<b>Target achieved.</b> Refer to indicator 2.			
<b>Indicator 2:</b> Comprehensive Senegal River Basin Master Plan is adopted as a planning tool for optimal management and development of water resources				
Value (quantitative or qualitative)	OMVS does not have an integrated planning tool	Introduced during restructuring	Master Plan available	Comprehensive Senegal River Basin Master Plan is adopted as a planning tool
Date achieved	October 18, 2010	March 31, 2013	March 31, 2013	March 31, 2013
Comments (incl. % achievement)	<b>Target achieved.</b> The Comprehensive Senegal River Master Plan was adopted in 2012. The Plan has developed various scenarios with a horizon of 2025 and proposed a regional action plan. The plan is used by OMVS for orienting development programs.			

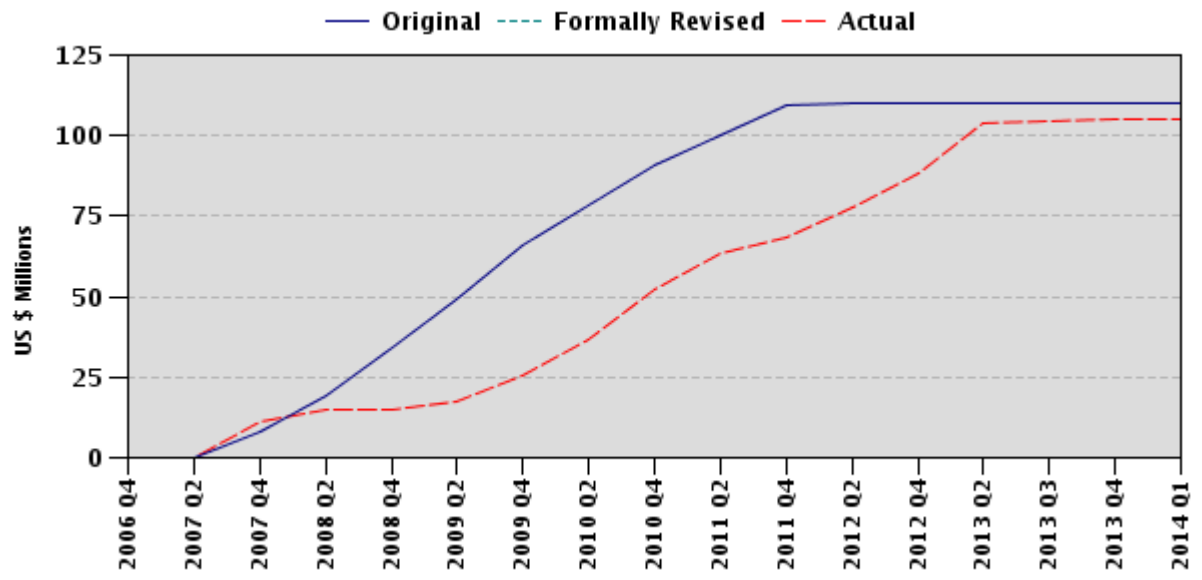
## G. Ratings of Project Performance in ISRs

No.	Date ISR Archived	DO	IP	Actual Disbursements (USD millions)
1	11/01/2006	Satisfactory	Satisfactory	0.00
2	05/18/2007	Satisfactory	Satisfactory	9.33
3	11/16/2007	Satisfactory	Satisfactory	15.16
4	05/28/2008	Moderately Satisfactory	Moderately Satisfactory	15.16
5	08/01/2008	Moderately Satisfactory	Moderately Satisfactory	15.16
6	12/22/2008	Moderately Satisfactory	Moderately Satisfactory	17.52
7	05/19/2009	Moderately Unsatisfactory	Moderately Unsatisfactory	18.02
8	12/04/2009	Moderately Unsatisfactory	Moderately Unsatisfactory	32.16
9	04/17/2010	Moderately Satisfactory	Moderately Satisfactory	49.88
10	09/23/2010	Satisfactory	Moderately Satisfactory	57.97
11	04/30/2011	Satisfactory	Satisfactory	68.47
12	09/22/2011	Satisfactory	Satisfactory	74.23
13	03/19/2012	Satisfactory	Satisfactory	79.30
14	07/27/2012	Satisfactory	Satisfactory	99.93
15	03/29/2013	Satisfactory	Satisfactory	104.73

## H. Restructuring (if any)

Restructuring Date(s)	Board Approved PDO Change	ISR Ratings at Restructuring		Amount Disbursed at Restructuring in USD millions	Reason for Restructuring & Key Changes Made
		DO	IP		
06/17/2011	Level 1	S	S	68.47	Reason: Improve implementation Key changes: Clarify PDO. Modify and simplify results framework. Cancel low priority activities.

## I. Disbursement Profile





# Guinea, Mali, Mauritania, Senegal

## Senegal River Basin Multi-Purpose Water Resources Development Project

### 1. Project Context, Development Objectives and Design

#### 1.1 Context at Appraisal

1. At appraisal the four riparian countries within the Senegal River Basin, Guinea, Mali, Mauritania and Senegal were listed among the 25 poorest countries in the world and all had critical needs for energy supply and food security. In 2005, of the countries' combined population of 35 million, 12 million were living in the Senegal River basin (SRB). These were mostly subsistence or smallholder farmers and were among the most vulnerable groups in the region. The river basin had significant undeveloped agricultural and hydropower potential. In 2006, less than 30% of the 320,000 ha of the irrigable land were developed, and less than 25% of the estimated 1,200 MW of hydropower potential was exploited.

2. In 1972, Mauritania, Mali and Senegal established the Organization for the Development of the Senegal River Basin (OMVS), mandated to secure countries' economies and reduce the vulnerability of peoples' livelihoods through coordinated water resources and energy development. Between 2002 and 2006 a number of critical events occurred. In 2002 the mandate for irrigation development was conferred on OMVS and the Water Charter was ratified. The Nouakchott Declaration of May 2003 set the strategic orientation for development of the Senegal River Basin, including accelerating the development of multi-purpose water resources infrastructure. In 2006 Guinea joined OMVS which created an opportunity, given its critical location at the headwaters of the river, as well as a risk, given its much lower capacity. OMVS has pursued its mandate for infrastructure successfully, including the joint ownership and operation of the Diama and Manatali dams. However, at Project appraisal the negative impacts from the dams on recessional farming and fisheries development and the limited development of irrigated agriculture for local communities still persisted. Diseases associated with large infrastructure, particularly malaria and schistosomiasis, significantly affected the health of the basin population.

3. The Senegal River Basin Multi-Purpose Water Resources Development Project (MWRD 1), approved in 2006, helped address these issues and was consistent with the countries' aims and the World Bank's strategy. One of the general objectives of the Guinea PRSP for the years 2002 – 2005 was Rural Development including improvement of living conditions for the rural population and ensure food security. The Mali Growth and Poverty Reduction Strategy (GPRS) Paper prepared in 2006 aimed at ...*accelerating economic growth, mainly through development of rural and mining resources*. Pillar 2 of the Mauritania PRS) (2002) *Growth anchored in the economic sphere of the poor*, includes rural development as one of the principal measures of the poverty reduction.

Finally, the Senegal PRSP (2002) considered the strengthening of basic infrastructures and development of agriculture as priority objectives for the poverty reduction. The World Bank's Strategic Framework for Assistance to Africa (2004) supported decentralized service provision and empowerment through community-driven development, and encouraged the incorporation of regional, gender and rural issues into the country assistance strategies.

4. At the time of Project preparation OMVS therefore had the mandate and legal basis to promote livelihoods development and environmental management in the basin. Guinea's entrance to OMVS was an opportunity to review and update the inclusive framework governing OMVS. Thus, it was a critical moment for the WB to support a Project which could (i) support a key organization in West Africa through a potentially difficult period; (ii) advance transformative investments; and (iii) support local livelihoods and mitigate the negative impacts of hydraulic infrastructure. The economic importance of the basin, the countries' ownership of the OMVS and their readiness for further cooperation provided an enabling environment for the Bank support to regional efforts.

### **1.2 Original Project Development Objective (PDO) and Key Indicators (*as approved*)**

5. The original program development objective of the Senegal River Basin Multi-Purpose Water Resources Development Program (MWRD) was *to enhance regional integration among the riparian countries of the Senegal River Basin through OMVS for multi-purpose water resources development to foster growth including improved community livelihoods*. Initially phase 1 of the Project (MWRD 1) did not have a separate Project Development Objective (PDO). For the purposes of assessment, the ICR uses the Program DO up to the date of Project restructuring. Table 1 presents the original and revised PDO indicators.

### **1.3 Revised PDO (as approved by original approving authority) and Key Indicators, and reasons/justification**

6. At the June 2011 restructuring<sup>2</sup> the *Program* DO of the Senegal River Basin Multi-Purpose Water Resources Development Program (MWRD) was revised and a *Project* DO was introduced for MWRD 1. The original *Program* DO indicator was replaced by seven new indicators, summarized in Table 1. The changes were made to the *Program* DO because overall growth in the river basin could not be clearly attributed to the Project. The *Project* DO was introduced to clarify the focus of the first phase of this program. The *Project* DO indicators were revised to be more measurable within the Project timeframe and to ensure a closer alignment of the *Project* DO with the food security and energy production objectives included in the CAS of the OMVS member countries.

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<sup>2</sup> Although the official date of the restructuring was June 17, 2011, the Project was effectively restructured by the latter part of 2010.

**TABLE 1: Original and Revised PDO and PDO Indicators**

<b>Subject</b>	<b>Original</b>	<b>Revised</b>
<b>Program Development Objective</b>	To enhance regional integration among the riparian countries of the Senegal River Basin through OMVS for multi-purpose water resources development to foster growth including improved community livelihoods	To enhance regional integration among the riparian countries of the Senegal River Basin through OMVS for multi-purpose water resources development to foster improved community livelihoods
<b>Project phase 1 objective</b>	N/A	To improve management and use of water resources in the Senegal River Basin
<b>Project Development Objective Outcome Indicators</b>	Improved management of natural resources and improved socioeconomic conditions in the Project intervention areas	<ul style="list-style-type: none"> <li>• Pre-investment framework (technical, environmental, social, etc.) is in place to build the selected dam</li> <li>• Guinea is fully integrated into the decision-making structures of OMVS</li> <li>• At least 80% of children under 5 years old living in the Project areas are sleeping under long lasting insecticidal nets</li> <li>• A decision has been made to build at least one dam to complement the hydroelectric capacity of the OMVS member countries</li> <li>• At least 100% increase in the flow of water passing through the principal water intakes (Laouéja, Gorom Aval and Dioulol)</li> <li>• 4400 hectares of irrigated areas are rehabilitated or developed</li> <li>• 15000 direct beneficiaries to the irrigated areas, of which 5% are women</li> </ul>

#### **1.4 Main Beneficiaries**

7. The main beneficiaries for MWRD 1 fall into two distinct categories; (i) Regional and national institutions who benefit from institutional strengthening, capacity building, planning tools and other analytical work and (ii) Rural populations living within the eight target regions in the upper basin, middle valley and the delta of the river basin who benefit from improvements in health and livelihoods. The direct beneficiaries targeted did not change over the life of the Project, however the rural population impacted by the Project was greater than anticipated.

8. Regional and national institutions:

- a) OMVS High Commission and National Cellules benefitting from hardware, capacity building, analytical work and institutional strengthening;
- b) Agencies within OMVS responsible for dam operation, the Diama Dam Holding Company (SOGED) and the Manantali Dam Holding Company (SOGEM), from studies for new dams and assessments of existing infrastructure;
- c) The Permanent Water Commission benefitting from analytical work to support decision making;
- d) National executing agencies responsible for agricultural development in the Senegal River Basin; Delta Management Holding Company, Senegal (SAED), National

Company for Rural Development, Mauritania (SONADER), National Department for Rural Development in the Senegal Valley, Mali (ADRS, previously PDIAM) and National Department for Rural Engineering, Guinea (DNGR); benefitting from performance contracts and on-going capacity building through Project implementation;

- e) Health agencies and local NGOs benefitting from on-going capacity building through Project implementation;
- f) Users (final estimates 752 individuals per year) of the rehabilitated OMVS documentation center, including the research community and interested institutions such as the *Institut fundamental d’Afrique noire* or *École des Bibliothécaires, Aschividstes et Documentalistes* in Senegal, development Projects and NGOs operating in the SRB.

9. Rural Populations: At Project appraisal two million people in rural communities were expected to benefit from improved water resources management. Ultimately more than three million people in these communities benefitted from Project implementation as outlined below:

- a) Local farmers, benefitting from rehabilitated or developed agricultural land, training and participatory assistance (final estimates are a total of 15,000 beneficiaries, of which 14% are women);
- b) Water user associations benefitting from support to clear and maintain hydraulic axes (final estimate 48 cooperatives);
- c) Women’s cooperatives managing small market gardens (final estimate 234 cooperatives);
- d) Communities in the upper basin benefitting from agroforestry activities (final estimates are a total of 5,700 beneficiaries);
- e) Traditional fishermen, and those involved in processing and selling fish, benefitting from technical assistance and investment in more efficient fishing activities (final estimates are a total of 4,000 beneficiaries);
- f) Children under 5 receiving treatment for schistosomiasis (final estimate 84% of the target population);
- g) Households benefitting from bed net distributions (final estimate of three million people taking a conservative value of one person per bednet).

### **1.5 Original Components (as approved)**

10. The Project had three components:

- a) Component 1. Regional Institutional Development for Water Resources to (i) reform OMVS and enhance its institutional capacities, (ii) achieve effectiveness of Guinea membership to OMVS, and (iii) rehabilitate the OMVS Regional Documentation Center.
- b) Component 2. Local Level Multi-Purpose Water Resource Development for (i) development of small hydraulic infrastructure, (ii) development of sustainable and efficient traditional fisheries, (iii) planning and management of land and water resources collectively at the community and sub-basin levels, (iv) reduction of



waterborne diseases at the community level and (v) control of invasive aquatic species, primarily typha.

- c) Component 3. Regional Multipurpose and Multi-sectoral Master Planning to (i) prepare the SRB Comprehensive Master Plan, (ii) ensure the pre-investment support for the OMVS Guinea hydroelectric and for a number of multi-purpose dams, and (iii) participate in Multipurpose and Master Planning.

## **1.6 Revised Components**

11. The Project restructuring in 2011 cancelled the following activities listed in Component 2 and Component 3:

- a) Component 2: Development of small hydraulic infrastructure and related activities:
  - (i) Develop recessional agriculture: Identification of suitable options for processing and marketing agricultural products; and improvements to cropping systems including inter-cropping and integrated pest management practices, (ii) Expansion and rehabilitation of small-scale irrigation and drainage schemes: Support to crop diversification and training in grading, packaging, processing, and marketing agricultural products.
- b) Component 3: Pre-investment support for OMVS Multi-purpose Dams (Balassa): (i) support to prepare a comprehensive feasibility study (and update previous studies if necessary) for Balassa (Guinea) and (iii) prepare other relevant assessments to determine the nature and scope of environmental and social safeguards to be addressed for Balassa.

12. These activities were cancelled for the following reasons: (i) the costs of implementing the agricultural activities were underestimated at preparation. Therefore the support to the activities for improving crop yields and adding value post-harvest were deleted, because they were lower priority activities and because full implementation of this longer term support was not feasible during the Project life after the delays before the midterm review; and (ii) the cost of design studies for dam development had been underestimated during the Project development. Balassa was the lowest priority within the pipeline of dams planned for review.

## **1.7 Other significant changes**

13. The level 1 Project restructuring of June 17, 2011 established a specific Project DO and modified the Program DO (discussed in Section 1.3), extended the Project closing date, modified the results framework, modified the audit requirement for the Project executing agency in Guinea and changed the implementation arrangements for the executing agency in Mali.

- a) Extension of the Project closing date from September 8, 2011 to March 31, 2013: The extension was required to compensate for the 6-month delay in Project effectiveness and additional delays due to (i) the suspension of Guinea and Mauritania for more than a year from Bank support; (ii) political instability in three of the four riparian countries and (iii) delays in procurement.
- b) Revisions to the Results Framework: In addition to the changes to the program and project development objectives a number of changes were made to the intermediate indicators to make them more precise and measurable within the project timeframe;

20 indicators were dropped, four were revised, four indicators were introduced and four retained as originally worded.

- c) A waiver of the audit requirements for the executing agency in Guinea (DNGR): According to the general practice of the International Development Agency (IDA), the separate annual audits of the DNGR are not required since the DNGR audits are part of the procedures included in the financing of the MWRD Project prepared by the OMVS.
- d) Change in implementation arrangements for the executing agency in Mali: The activities of PDIAM, the previous executing agency in Mali that was a Project with limited implementation time, were discontinued at the end of June 2010. To replace the PDIAM, Mali has created new *l'Agence de développement rural de la vallée du fleuve Sénégal* (ADRS) that, beginning July 1, 2010, became the executing agency of the Project in Mali. In practical terms implementation was unchanged.

## 2. Key Factors Affecting Implementation and Outcomes

### 2.1 Project Preparation, Design and Quality at Entry

14. **Application of Lessons Learned.** The Project design took into account lessons from World Bank and external experience of implementing complex regional projects. As a result the Project design (i) was basin wide, inclusive and multi-sectoral; (ii) included regional, national and local stakeholders at the preparation stage; and (iii) used the Adaptable Program Loan (APL). In addition, MWRD 1 took into account (i) the different priorities and capacities of the member countries; (ii) the regional dimension to mobilize resources, maximize profits and ensure the fair distribution of benefits; (iii) the perspective of the river basin as the basic unit for planning; and (iv) a basin wide institutional framework including both top-down and bottom-up planning and control instruments.

15. **Stakeholder consultation.** The Project preparation was highly participatory and involved a vast number of stakeholders and their representatives. Consultations were completed at the regional, national and community level, involving at least 87 communities, institutions and associations. At the national level consultations were held with all relevant ministries; water resources, agriculture, fisheries and health. Government and community buy-in was promoted through addressing regional water resources issues which were the mandate of OMVS but also key national and local priorities. Consultations were mostly effective however there were isolated incidents where they could have been improved. For example in the health program in Senegal the timing of ongoing programs was not fully taken into account in Project design, partly due to efforts to maximize the regional impact of bednet distributions. The communities' participation in the Project design increased the ownership of the Project and allowed them to plan to incorporate the Project outputs into their livelihoods strategies. It also allowed the Project to identify areas for agricultural development or rehabilitation where (i) there were no land tenure issues, (ii) there were existing community structures and (iii) levels of demand were high. Feedback on the community consultation process was positive overall, however during the field visits it was noted that in some isolated

instances, specifically for the distributions of fisheries and agroforestry equipment, ongoing consultation was not adequately followed through, as described in the next section.

16. **Risks and their mitigation.** The multi sectoral and multi-level scope led to a Project design that was both ambitious and complex. For example the Project was one of the first within the Africa region of the World Bank to integrate waterborne disease management into water resources management Projects. The structure of the project also ensured that local and national priorities were taken into account. This complexity, combined with a lack of background studies and baseline data, increased the risk for implementation of the project, as reflected in some inaccurate budget estimates and the overly complex results framework.

17. The implementation of the Project was anchored at the regional level at the OMVS High commission. This meant that the Project had an established base in one of the strongest organizations in the region and in a relatively politically stable city. The design of implementation arrangements were adapted to the different mandates of organizations, and to allow the Project to work on regional, national and local levels dependent upon the ultimate beneficiary. For example, components 1 and 3 were completed by and for regional level decision makers, with capacity building provided to the national level. Component 2 was implemented by national level or community level implementing agencies under the technical supervision of the OMVS. Procurement was controlled by OMVS for all activities apart from hydro agricultural investments which were managed by the national executing agencies through performance management contracts. These implementation arrangements were considered to be the key risk mitigation measures.

18. The preparation team assessed the overall risk level for implementation as 'substantial', mostly due to the Project complexity and the anticipated difficulties in linking OMVS and the communities. The risk of interruption to Project implementation due to civil strife in the countries or in the region was not taken into consideration in spite of the volatile political situation in Guinea and the past conflicts in Mauritania and Senegal. In addition the risk of the long term adoption and maintenance of investments was not considered in detail. The ICR concludes that the overall risk level should have been 'high' and further consideration given to issues of political instability and sustainability.

However, the design is recognized to be innovative, the high level of participation increased ownership and the implementation arrangements allowed the Project to achieve the target outputs even in adverse security conditions. The Project design and quality at entry has therefore proven to be appropriate. Since the implementation of the first phase confirmed the robustness of the structure it became a model for the programmed second phase.

## 2.2 Implementation

19. Implementation has been effective with disbursement close to 100% and the majority of planned activities completed. However there were a number of issues which had to be addressed during implementation, including:

- a) Three member countries experienced coups (Guinea in December 2008, Mali in March 2011 and Mauritania in August 2008) and major security problems in Mali hindered field activities until the end of the Project;
- b) Lack of supervision by national cellules and executing agencies and poor selection of contractors for implementation of the hydro agricultural works led to delays<sup>3</sup>;
- c) The costs of some activities were underestimated, and a number of planned activities had to be cancelled or postponed to the second phase of the program;<sup>4</sup>
- d) Counterpart payments were delayed throughout the project.

20. Due to these issues the Project experienced a two year period of moderately satisfactory to moderately unsatisfactory implementation from 2008 to 2010. The Project was therefore restructured in June 2011 following the mid-term review. The restructuring measures contributed to the improvement of the Project implementation. The cancellation of activities under the restructuring meant that budget could be reallocated to higher priority activities. The 1.5 years extension allowed for successful Project completion in spite of ongoing civil strife. The revised results framework clarified the objectives and fostered a greater results focus in Project management. Important lessons were learnt through the restructuring process in terms of simplifying the scope and aims.

21. The impact on the project from delayed counterpart payments was limited because counterpart funding was not allocated to specific activities and IDA could fund 100 percent of expenditures. The minimal requirements on counterpart funding afforded the advantage of not having to suspend procurement processes nor disbursements. However the Project had to relegate certain project activities until such a time as counterpart funds were provided.

22. A number of mitigation measures were introduced after the mid-term review and the project restructuring including (i) increased supervision of national activities by

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<sup>3</sup> Under the initial program planning it was intended that the majority of hydro agricultural activities would be completed by year 4, to allow at least 12 months of support in putting fields into production. Some activities in Mali and Guinea were planned to finish in year 5 due to the time required for studies. Investments were completed from 2010 onwards and land was handed over progressively, however some irrigated perimeters were not completed until end March 2013 – three years later than initially planned. Therefore the delay to some hydro agricultural activities was between 1.5 to 2.5 years.

<sup>4</sup> Some activities were under estimated and others overestimated as a result of the difficulty in getting accurate budget data. The main problems of budget estimation were in the dam design development. The project initially planned \$5,510,000 to complete dam studies for four dams. Ultimately it was found that almost double the budget was required to complete the planned work. In addition some per hectare costs for irrigation works were underestimated. For example in Mauritania approximately \$5,000/ha was estimated, however the actual costs (taking into account the volatility of petrol and other costs) was closer to \$8,000/ha.

OMVS regional staff, (ii) rigorous application of the Monitoring and Evaluation framework and (iii) continued close supervision by the World Bank. The stable base of OMVS in Dakar, Senegal, centralizing the vast majority of procurement in the OMVS High commission, and the close collaboration between OMVS and the national counterparts were recognized to be major factors in risk mitigation. Following the project restructuring, a few implementation issues persisted:

- a) Supervision by national cellules continued to be weak, partly due to the lack of resources assigned for these activities during preparation; and
- b) Capacity of national executing agencies in terms of selection of contractors and supervision of works continued to be marginal.

### **2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization**

23. **Design:** The original design of the M&E system contained only one PDO indicator which had neither a baseline nor a target. In addition there were many intermediate indicators that proved unfeasible to monitor. As described previously, the Project restructuring substantially revised the results framework. The revisions improved the alignment of the results indicators with the PDO. However, the indicators could have more comprehensively captured improvements in community livelihoods. Further baseline analysis, including gender studies, should also have been completed to allow the project to monitor changes and optimize impacts. Information was collected at the ICR stage to provide evidence of these benefits.

24. **Implementation:** The M&E capacity within OMVS improved considerably over the life of the Project. The PIU within OMVS had a dedicated M&E specialist responsible for tracking and reporting on project progress. The M&E system was decentralized and, following a slow start, operated in a relatively efficient manner, regularly collecting and disseminating essential information about the Project's progress. Project monitoring data were collected through: (i) the national data collection networks; (ii) implementing agencies' field visits and (iii) the monitoring field trips of the PIU. Following collection, all data was stored in the OMVS Environmental Service Observatory. The widespread use of mobile phones and the Internet enabled the Project to collect the needed information in a timely fashion. The progress reports prepared twice a year were detailed, accurate and clearly presented.

25. **Utilization:** M&E results were used to track actual versus planned progress and to adjust allocation of resources, which was critical to support the day-to-day project management. The data collected were also used to follow-up on environmental issues, identify problem areas of the project and reflect on corrective measures required. M&E data and reports were also essential to determining how the Project would be restructured at the mid-term. Better costing and re-confirmation of national priorities helped ensure improved implementation post-restructuring. Physical progress was well-tracked throughout project implementation; however data on the outcomes of these investments, for example data on yield increases from rehabilitated perimeters, was less readily available. The main weakness of the system was its lack of capacity to evaluate the impact of the activities on the project beneficiaries, both the socio-economic at the household level for community activities and at the regional level for institutional

strengthening work. Specifically, although the project completed activities targeting women the total number of female beneficiaries supported by the project and the impacts on their livelihoods was not monitored. This has meant that the impact on gender, although expected to be positive, is not well understood.

#### **2.4 Safeguard and Fiduciary Compliance**

26. **Safeguards.** The Project is classified as category A in the Environmental Assessment classification of the Bank, primarily due to the preparation of studies for large hydropower dams. The individual subprojects financed by the Project were not expected to have significant negative social or environmental impact; nevertheless, their combined action might have consequences, such as the accumulated use of pesticides over developed agricultural areas. The following safeguards policies were therefore triggered: Environmental Assessment (OP/BP/GP 4.01), Natural Habitats (OP/BP 4.04), Pest Management (OP 4.09), Cultural Property (OP 4.11), Involuntary resettlement (OP/BP 4.12), Indigenous Peoples (OP 4.10), Forests (OP/BP 4.36), Safety of Dams (OP/BP 4.37), Projects in Disputed Areas (OP/BP/GP 7.60) and Projects in International Waterways (OP/BP/GP 7.50).

27. A dedicated safeguards specialist was included in the PIU. To ensure safeguards compliance the Project established a screening procedure for the subprojects financed under Component 2. In the overall project budget there was no specific line for safeguards activities, however the costs of mitigation measures were included in subprojects; mitigation measures have included, for example, additional intakes to ensure flooding of the Djoudj wetlands, walkways and access ramps in slope stabilization or flood defense works. The safeguards team was included in validation workshops and their advice was included in the program development. Initially the specialist within the PIU required significant support from the Bank team, however eventually, and particularly following the Mid Term Review, the specialist was able to take on greater responsibility and, in turn, build capacity at the national level. The training sessions provided by the PIU specialist to national cellules and executing agencies were well received and follow on training has been requested.

28. The compliance of the small scale construction activities with the safeguards requirements was consistently rated satisfactory during Bank supervision missions. Environmental protection measures were normally well done although contractors needed regular follow-up to ensure basic measures, such as sanitation facilities for laborers, were maintained. The executing agencies fulfilled their responsibilities in the majority of cases. For example in Mali delays in the rehabilitation of agricultural land led to loss of crops over two seasons and ADRS distributed food directly to beneficiaries. There was positive feedback from the local population on a number of the mitigation measures. For example the walkways were noted to have reduced the time and cost to access the local markets. The main issues were (i) the difficulties in supervision of the large number of sites progressing in parallel and (ii) the lack of a dedicated budget to support monitoring and capacity building in safeguards issues. Some issues were not tracked effectively. For example in one perimeter in Mauritania the OMVS completion assessors noted that crops

had been destroyed by the implementation of the project and no compensation had been paid.

29. **Procurement.** The procurement activities were conducted by the PIU and the national executing agencies for the hydro agricultural activities. At both of these levels, the procurement system was satisfactory to Bank requirements and operated according to the established procurement manual. Procurement plans were established annually for OMVS and each national executing agency (SAED, SONADER, DNGR, ADRS) and managed by the PIU. The procurement specialist in the OMVS High Commission worked closely with the PIU procurement specialist, to build capacity and alleviate the workload. In turn the PIU procurement specialist provided support and training to the national executing agencies; this “cascading capacity building” has been a real strength of the Project. As a result of gains in procurement capacity, thresholds for review have been raised for the second phase of the Project, reflecting the increased level of confidence.

30. The weaknesses of the procurement system were: (i) delays in approvals from the Bank, remedied in 2009 by strengthening the Bank procurement team; (ii) the unequal capacities in the National Executing Agencies; procurement methods were not tailored to each agency; (iii) insufficiently stringent Performance Contracts for the National Agencies; being based mainly on disbursement, rather than results, and (iv) the absence of a procurement specialist in SONADER, in Mauritania. Procurement delays contributed to the need for a project extension; however, OMVS invested a great deal of time working together with the national agencies to improve the quality of the terms of references produced. This delayed procurement, but led to an improvement in capacity and in the quality of documents produced over the life of the project.

31. **Financial Management.** The financial management system functioned well and complied with the Bank’s requirements. However there were sometimes reporting delays due to the high workload on external auditors. Money flow through Project was efficient; centralizing the majority of the financial management in OMVS increased confidence and facilitated monitoring. There were no suspected leakages. Due to the difficulties with auditing the accounts across four countries, each year the national cellules and executing agencies would send their accounts information to Dakar for audit. This practice saved time and money. As noted previously, the payment of counterpart contributions from riparian Governments was often delayed. The SAR consistently rated the financial management as satisfactory or highly satisfactory (in 2007) with the exception of end 2009 to beginning 2010 where it was rated moderately satisfactory due to the delays in preparation and transmission of the financial reports to the Bank and the lack of a 2009 audit for SONADER. At the beginning of 2012 due to the reporting delays, the performance was once again rated moderately satisfactory.

## **2.5 Post-completion Operation/Next Phase**

32. The Project met the required triggers to progress from the first to the second phase. The OMVS mission to Washington in March 2012 requested the Bank to advance with preparation of the second phase of the MWRD. The Project Steering Committee, during its last meeting in September 2012, also requested the initiation of the second

phase. MWRD 2 is currently under preparation and is expected to go to the Board in late 2013. The design of MWRD 2 builds on the achievements of MWRD 1 in a number of key areas: institutional strengthening, water resources protection, extension of irrigated areas, fisheries management and aquaculture, and finally dam management. MWRD 2 will continue to support the sustainability of the first phase of the project through training the water user associations, irrigation cooperatives and fishing councils impacted by MWRD 1. The project will also build upon analytical work and implement design studies completed in MWRD 1.

### 3. Assessment of Outcomes

#### 3.1 Relevance of Objectives, Design and Implementation

**Rating:           Before restructuring—Substantial**  
**After restructuring—High**  
**Overall—High**

33. **Relevance of Objectives.** The Project objectives are highly relevant; they remain consistent with the member countries development strategies and the Bank assistance strategy. The MWRD 1 Development Objective was *to improve management and use of water resources in the Senegal River Basin*. About 90 percent of the Project budget was allocated to achieving this objective through Component 2, which was designed mainly to develop agroforestry, watershed protection and expand and rehabilitate small-scale irrigated agriculture. All OMVS member states development strategies and the Country Assistance Strategies (CAS) / Country Partnership Strategies (CPS) (or Interim Strategy Notes - ISN) for these countries support the development of smallholder agriculture. The development strategies referenced below are the most recent documents currently available:

**Guinea:** the PRSP prepared in 2011, aimed at development of two sectors: (i) Sector with strong growth potential and (ii) Development of basic infrastructure. The first sector includes the agriculture development with the principal objectives: (i) ensure food security; (ii) develop food crops and export crops, and (iii) create jobs and income for populations, particularly those living in rural areas. The ISN (2011 to 2012) supports service provision and job creation, namely development of agriculture and water management.

**Mali:** the Government Poverty Reduction Strategy (GPRS) for the years 2007-2011 in the framework of the strategic orientation *Development of infrastructure and the productive sector* defined in the National Prospective Study, Mali 2025 aimed at *Improving the productive environment to ensure better productivity of factors of production and economic growth*. The rural development objective includes development of water control (irrigated) agriculture along with associated energy services as water drainage, pumping for the irrigation of farm areas and mechanization of agriculture. The rural sector should contribute to the development of agricultural, pastoral, fisheries and forestry production subsectors. Also the ISN (2011) includes among the priorities (i) building of the agricultural competitiveness and diversification, and (ii) improvement of access to and quality of health and education.



**Mauritania:** In Mauritania, the PRSP and the National Environmental Action Plan both identify development of agriculture, livestock, forestry and fisheries as the priority areas. The CAS (2008-2011) and the CPS for the years 2013-2016 both highlight the importance of the development of agriculture in order to generate rural employment and increase food security.

**Senegal:** The CPS for the years 2013 to 2017 considers sustainable land and water management as a basis for future development. The CAS, through its Pillar 1, targets agricultural growth and sustainable fisheries management.

34. The objectives of the Project are also in line with (i) Pillar 2 of the World Bank Strategy for Africa *Vulnerability and Resilience* which stresses the importance of increasing resilience to health shocks; and (ii) the Regional Integration Assistance Strategy for Sub-Saharan Africa Pillar 1 *Regional infrastructure, development of transboundary waters*), Pillar 2 *Cross border malaria prevention* and Pillar 3 *Coordinated intervention to provide public goods*.

35. The relevance of the continued priorities is reflected in the request from riparian countries to continue with a similar program of activities for MWRD 2. OMVS was requested to continue developing community livelihoods, specifically small scale irrigation, in parallel with institutional strengthening, even at the expense of large scale hydropower. The riparian countries and OMVS prioritized rural livelihoods for IDA financing as it is easier to source private financing, or alternative development partners, for hydropower development.

36. **Relevance of design.** The relevance of Project activities and scope of the project continues to be substantial:

- a) Combining institutional strengthening at the regional level with visible activities on the ground in basin communities demonstrated the tangible benefits of cooperation and reinforcing the relationships between the national and regional level. It also enabled on the job training to build capacity.
- b) The protection of health reinforced livelihoods by enabling people to take advantage of opportunities provided.
- c) As described later in this report the fisheries sector is highly profitable, and requires minimal inputs, but can only be exploited during certain times of the year and within sustainable limits. Combining fisheries development with development of agriculture and agroforestry, which have a lower financial return, but a greater number of beneficiaries, continues to be more robust than a single sector response. The impact of not including fisheries is indicated in the negative overall rate of return for Guinea.
- d) Local capacity building for fisheries councils, water user associations and irrigation cooperatives continues to be very important for operation and maintenance of the schemes.
- e) Work financed by the Dutch Trust Fund to control invasive species in the main hydraulic axes supplying agricultural areas facilitated the development of irrigation schemes.

- f) Regional implementation of the health component allowed cost savings because bednets and medication were bought in bulk and distributed simultaneously in the four countries, increasing impact.

37. As described previously there were, however, shortcomings of the design which required improvement at the midterm review, specifically the following:

- a) Inaccurate budget development meant that lower priority activities were deleted. This restructuring improved implementation as activities were more focused on high priority activities. The removal of value chain support for irrigation cooperatives, although in line with the mandate of OMVS, may have adverse impacts on the sustainability of the project.
- b) The results framework was initially too far reaching; the intermediate indicators attempted to measure the majority of the sub activities and also appraise impacts which were beyond the timescale of the project.

38. **Relevance of implementation.** The high overall relevance of the implementation arrangements has been confirmed, particularly the important support provided by OMVS which allowed national level implementation to move forward in a very difficult context. This success is evidenced by the implementation of agricultural activities following a stasis in some national programs for a number of years. Local level health services noted that the support of OMVS was essential for implementation. Positive feedback was received on the implementation of the project through community level structures. For example fisheries councils were noted as being an effective vehicle to support sustainability and monitoring.

39. Certain aspects of the implementation arrangements could have been improved, however, as summarized below:

- a) Although on-going consultation and sensitization in communities was mostly adequate, it was not consistent across all areas and activities. This led to some incidents of beneficiaries either rejecting or not using the equipment distributed by the project, for example; fishing nets and pirogues in some fishing communities, watering cans in communities working on agroforestry.
- b) Working through irrigation cooperatives for operation and maintenance schemes is now accepted good practice for more sustainable systems.<sup>5</sup> However a number of drawbacks have also been noted, for example the division of responsibility and liability can lead to lack of ownership and these cooperatives are sometimes created ad-hoc in response to the potential investment. Ideally the Project should have considered a more nuanced approach to beneficiaries including closer assessments of each cooperative and the possibility of working with individual smallholders.

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<sup>5</sup> Countries in the basin are moving away from large publicly funded irrigation schemes (apart from bulk water infrastructure) and are instead working together with communities to develop local ownership of infrastructure. Previously the state financed rehabilitation, fertilizers, seeds etc., often with very little engagement with local communities. Cooperatives of smallholder farmers are formed to pool human and financial resources to support operation and maintenance.

### **3.2 Achievement of Project Development Objectives**

**Rating:**            **Before restructuring—Moderately Satisfactory**  
                         **After restructuring—Satisfactory**  
                         **Overall—Satisfactory**

40.    **Original Program/Project Development Objective:** *To enhance regional integration among the riparian countries of the Senegal River Basin through OMVS for multi-purpose water resources development to foster growth including improved community livelihoods.* – **Partially achieved**

41.    The ICR evaluates both the original and revised project and program objectives. Table 4 combines the individual ratings for the original and revised PDOs for an overall rating. The original PDO was modified three years after the Project became effective and when 52% of the Project budget was disbursed. By that time, regional integration among the SRB countries was enhanced: Guinea became a full member of OMVS and the feasibility studies for Koukoutamba and Gouina dams were already advanced. Water resource development was in progress; water flow through the principal water intake had increased by 30% (end of project target was 100%) and further improvement works were ongoing; 1,900 hectares of irrigated areas (out of 4,400 hectares targeted at the end of project) were rehabilitated or developed; and more than 3,000 farmers of which 11% were women (end of project target was 15,000 beneficiaries and 5% of women beneficiaries) had started to cultivate the newly available parcels. Additionally, community livelihoods had improved through the distribution of 1.5 million of long lasting insecticidal nets (LLIN) that allowed 75% of children (under 5 years) living in the Project area to sleep under the mosquito net (the end of project target was 80%).

42.    **Revised (at restructuring) Program Development Objective:** *To enhance regional integration among the riparian countries of the Senegal River Basin through OMVS for multi-purpose water resources development to foster improved community livelihoods.* – **Achieved**

43.    **Project Development Objective (at restructuring):** *To improve management and use of water resources in the Senegal River basin.* – **Achieved**

44.    At the end of the Project, all of the PDO indicator targets were met or exceeded. The vast majority of revised intermediate indicators that contributed to achieving the Program Development Objective and the Project Development Objective were also met or exceeded. A wide range of activities were completed contributing to regional level coordination and planning and local level livelihoods, as outlined below and detailed in Annex 2. Many of these investments are in the early stages of utilization and, therefore, the long term outcomes on regional integration and local livelihoods are not yet measurable. However clear causal links can be made between outputs and potential outcomes.

### **Regional Integration**

45. PDO Indicators: The objectives of enhanced regional integration and improved river basin management were promoted by fully integrating Guinea into the decision-making structure and processes of OMVS. The Project supported Guinea's integration through studies of the OMVS administrative structure, making proposals for reform (validated by the Council of Ministers in February 2008) and supporting their implementation.

46. Intermediate indicators:

- a) The Project developed and the OMVS member states adopted the Comprehensive Senegal River Master Plan as a planning tool for optimal management and development of water resources—also an intermediate indicator of improved water resource management
- b) Around 750 people per year, an increase of 68% compared to a target increase of 35%, now use the Documentation Centre in St Louis, indicating improved data sharing in the basin.

47. Additional evidence: The successful integration of Guinea, and their immediate involvement in a large regional project, is a major step in the history of OMVS. Guinea has been integrated into the 6-monthly decisions made by the Permanent Water Commission and the Council of Ministers recently jointly decided to move forward with financing and building two major pieces of infrastructure (Gouina in Mali and Koukoutamba in Guinea), illustrating the active cooperation.

48. On a day-to-day level, information sharing has been facilitated by the improved documentation center and the investments in web pages and IT hardware at the national level. Steps were taken in Guinea to build understanding in Government and Civil Society on the benefits and responsibilities of OMVS membership. The rapid preparation of MWRD 2, including agreement on jointly financed activities (with further hydropower development in Guinea and irrigation development across the basin) also reflects the high level of regional integration.

49. It is expected that regional cooperation within OMVS will contribute to bringing together basin technicians and local politicians and will be conducive to a climate of mutual cooperation and trust. The value of this cooperation is recognized in the Interim Strategy Note for the Republic of Guinea (2011) that highlighted that *'after several years of isolation ... [Guinea can]... start reaping organizational and efficiency gains from cooperation with countries with whom Guinea shares ... rivers....*

### **Improved Community Livelihoods**

50. PDO indicators: 84% of children under 5 years old living in the SRB are sleeping under long lasting insecticidal nets (exceeding the target of 80%).

51. Intermediate indicators

- a) 5,223 hectares of irrigated lands were rehabilitated or developed (823 hectares more than targeted).

- b) The number of beneficiaries of the newly constructed or rehabilitated irrigated lands and the developed lowlands are estimated to exceed 15,000 (the target value) of which 14% are women (9% more than targeted).
- c) 1,507 ha of agroforestry were developed (against a target of 2,500ha).
- d) An estimated 534 ha of lowland areas (against a target of 900ha) were developed and protected.
- e) There was an estimated 13% (against a target of 15%) increase in the quantity of fish sold from the rehabilitated main markets or depots.
- f) 80% of school aged children in the target Project areas received treatment for schistosomiasis (against a target of 60%).

52. The investments to increase productivity of fisheries and agriculture, diversify crops through small market gardens, flood agriculture, irrigation, agroforestry, and protect against waterborne diseases are expected to lead towards improvements in community livelihoods. Increased productivity in the agriculture and fishing sectors would provide improved nutrition and ultimately increase household incomes. Health improvements, resulting from the distribution of 2,625,580 Long Lasting Insecticide (LLITN) Treated Nets in the Senegal River basin and more than 14 million tablets of praziquantel and 4.6 million of albendazole tablets, would reduce household expenditures and increase productivity.

53. Additional evidence: Some parcels of irrigable land were transferred to farmers at the end of the project so this incremental production has not yet been measured. However, anecdotal evidence indicates a positive impact. The hydro agricultural investments were reported to have increased productivity. Farmers in Senegal have reported increased incomes, and one village financed electrical connections using income from the cooperative. In field discussions, beneficiaries spoke of the benefits of being able to pay health and school fees. In Mauritania, farmers reported the improved water supply facilitated two harvests a year and increased economic activities. In Mali the market gardens were noted to have contributed to improved household nutrition. The control and clearance of invasive aquatic species has facilitated the development of the fisheries sector at these locations and, in addition to supplying downstream schemes, also supported the development of irrigation adjacent to the channel.

54. The distribution of equipment, construction of infrastructure and training in the fisheries sector was noted to have improved working conditions and reduced post capture losses overall, including an increase in supply at some project sites.

55. Malaria prevalence was monitored through the baseline (2009) and final (2012) Malaria Indicator Surveys (MIS), however comparison of point estimates from the two surveys was not possible due to significant concerns related to the biological component of the 2009 survey, including methodological issues, lack of metadata and inconsistency with other portions of the study, such as frequency of febrile illness. However as can be seen from the table below current levels of parasitemia are significantly lower than averages in the region. Although it is not possible to report a trend specific to the population living in the Senegal River basin, program data from Senegal and Mali

support the hypothesis that malaria prevalence has declined significantly. The basis for this is the decrease in clinical consultations for suspected malaria in regions which include the river basin population and the decrease in the percentage of fever cases which test positive for malaria parasites.

56. Guinea is a clear outlier in part due to differences in environmental and climatic conditions and in part due to the collapse of health service provision during a period of political unrest. Health officials in Guinea are looking closer into this issue and a survey has recently been concluded.

**TABLE 2: Prevalence of Malaria Parasitemia 2012 MIS Final**

<b>Country</b>	<b>Parasitemia in children &lt; 5 years</b>	<b>Parasitemia in pregnant women</b>
Guinea	54.7	53.6
Mali	3.1	1.0
Mauritania	1.2	0.5
Senegal	2.1	0.2
Total	14.3	9.0

57. A clear reduction can also be observed in the monitoring of prevalence of schistosomiasis infections. The project aimed to reduce the prevalence of severe infections. It was not anticipated that it would also be successful in reducing the prevalence of all infections, given the high probability of re-infection following treatment.

**TABLE 3: Prevalence of Schistosomiasis Infections: Estimates from Sentinel Site Surveys**

	<b>2010 baseline</b>	<b>2013 follow-up</b>
Any urinary	65.8%	38.1%
Severe urinary	18.9%	12.8%
Any gastrointestinal	30.5%	3.0%
Severe gastrointestinal	10.6%	0.7%

58. In addition to health improvements the major impacts of the program, noted by the health services and also by partners in the Roll Back Malaria program, were twofold;

- a. Initiating or reinvigorating the national schistosomiasis control programs, via the basin level program. At the beginning of the project in three of the basin countries the schistosomiasis control programmes were extremely weak and had not been able to complete routine distributions of medication. In one country there was no national system in place at all. MWRD 1 increased the level of interest and enabled national health services to use the successful basin program to leverage national programs, evidenced in part by the willingness of the WHO to provide free medication for integrated disease management. In the ‘without project scenario’ it is likely that national programs would have remained dormant.
- b. The mobilization of bednet distributions and the transparency of MWRD 1 in publicising financing and works planned have supported Roll Back Malaria to

mobilise other development partners in Mali, Senegal and Guinea. In Mauritania malaria interventions were initiated for the first time.

### **Improved management and use of water resources**

#### **59. PDO Indicators**

- a) The Council of Ministers signed the agreements to finance and to start work on the Gouina and Koukoutamba dam sites (original target was the agreement to construct at least one dam) in March 2013
- b) Water flow in the principal bulk water intakes for irrigation increased by 133% (100% increase was targeted) facilitating the development of 6000ha of agricultural land

#### **60. Intermediate indicators:**

- a) The pre-investment framework to build the Gouina dam is in place. The feasibility study and environmental and social impact assessments were completed and the financing modality for dam construction was determined.
- b) The Project has developed, and the OMVS member states adopted, the Comprehensive Senegal River Master Plan as a planning tool for optimal management and development of water resources.
- c) 88 kilometers of bulk water supply canals were rehabilitated (50 km was targeted) and in addition 35 kilometers of bulk water supply canals were cleared of invasive plants and reshaped.

61. Additional evidence: In addition to the activities described above the project financed the feasibility studies of three other hydroelectric dams: Goubassi, Koukoutamba and Boureya. The Project thereby supported the future development of reliable sources of electric power in the region. The Project financed a number of other analytical studies to support the different arms of OMVS, for example, (i) maintenance requirements for Diama dam to ensure the continued safe operation, (ii) flood risk and abstraction levels for different permitting requirements to support future decision-making by the Permanent Water Commission on water allocations and dam releases.

62. The rehabilitation of bulk water infrastructure is expected to lead to cost savings. SAED in Senegal reported that they have already seen saving in infrastructure maintenance costs. Improved bulk water infrastructure will also facilitate future irrigation development. The forty eight water user associations formed or supported through the project are contributing to the control of invasive species in the region.

### **3.3 Efficiency**

**Rating:           Before restructuring—Modest**  
**After restructuring—Substantial**  
**Overall—Substantial**

63. The ERR of 20.5% supports a rating of substantial to high efficiency of resource use. The NPV at 12% is US\$80 million. The ICR analysis also indicates that during

2008-2013, approximately 19,000 new jobs were created in the fishing and agricultural sub-sectors (16,700 and 2,300 respectively). Strengthening the case for a substantial rating for efficiency, the ERR remains economically viable at 16.5%, even with a combined 10% increase in the variable costs and a 20% reduction in benefits (benefits estimates vary more than cost estimates). This analysis uses actuals for the years 2008-2012, so these figures are not subject to hypothetical increases/decreases in costs and/or benefits. The extension of the project closing date and the delays subtract somewhat from the overall rating. There were also some instances of Project outputs not meeting expectations of beneficiaries. Thus, the overall rating is substantial rather than high. The decision to finance MWRD 2 shows that, after seven years of implementation, the core MWRD activities were recognized by the Bank as viable investments.

### **Project Benefits Realized But Not Included in the ERR**

64. The Project produced and/or moved toward the production of other important benefits. These benefits are more difficult to quantify, particularly health, poverty reduction, energy and environmental benefits, but if included they would certainly elevate the 20.5% base case ERR.

65. **Health.** The \$5 per cost of each of the treated mosquito nets (including the logistical costs) is expected to have high economic returns over the 3 years life. Studies of malaria prevention estimate that providing malaria prevention and treatment interventions to at risk populations in sub-Saharan Africa would yield a benefit-cost ratio of \$20 for every dollar invested<sup>6</sup>. Leading economists have estimated that malaria is responsible for an 'economic growth penalty' of up to 1.3% per year in malaria endemic African countries<sup>7</sup>. This high benefit cost ratio is supported by evidence provided in paragraph 58.

66. **Poverty alleviation.** The incremental number of people reaching or crossing over the poverty line because of Project support to fisheries, is approximately 30,100 persons. The implementation of agricultural activities has helped about 2,700 persons to emerge from poverty for a total of 32,800 persons<sup>8</sup>.

67. **Food security.** The rehabilitated areas were transferred progressively (approximately 2000 hectares in 2011, 3000 hectares in 2012, remainder in 2013) to the farmer's associations that started to cultivate them. The incremental food production is estimated at 77,130 tons per year (71,853 tons of diversified agricultural products and 5,277 tons of fish), the vast majority of which would be consumed locally. Although detailed data are not available, it was reported on the ICR mission that malnutrition is

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<sup>6</sup> Jamison DT, Jha P, Bloom D, 2008. Disease Control, Copenhagen Consensus Challenge Paper, April 2008. Copenhagen Consensus Center

<sup>7</sup> Sachs and Malaney 2002. The economic and social burden of malaria. *Nature*. 415(6872): 680-5.

<sup>8</sup> This number is based on the following assumptions: (i) the daily absolute poverty line is US\$2 as frequently used for international comparisons by the United Nations; (ii) the family average size in the project area is of about 7 people; and (iii) each of the 3,340 fishery units employ 4 additional people in their activities.



becoming less prevalent. This output level meets the nutritional requirements for approximately 600,000 persons per year.

68. **Environmental benefits.** The environmental impacts induced by the implementation of the project include: (i) improved land and water management through the use of more efficient irrigation technologies; (ii) river bank protection, forest regeneration and afforestation, and (iii) improved control of invasive species.

69. **Energy generation.** The construction of the Koukoutamba dam was decided in March 2013. It is anticipated that this dam will have a generating capacity of 294 MW.

### 3.4 Justification of Overall Outcome Rating

**Rating: Satisfactory**

70. The relevance rating before restructuring was substantial, while the efficiency rating was modest. In achieving the original objective, the rating is moderately satisfactory (4 on the six-point scale, with highly unsatisfactory a 1 and highly satisfactory a 6) before the restructuring. The combination of these pre-restructuring ratings yields a moderately satisfactory rating of 4.0 (Table 4). With the adjustments of the 2011 restructuring, the relevance improves to high and achievement of objectives and efficiency ratings improve to substantial (5.3 overall). These two overall ratings are weighted by disbursement percentages at end-2010, when these changes were implemented by the project team. The overall weighted rating is 4.58 which is Satisfactory.

**TABLE 4: Calculation of Weighted Outcome Rating**

	Assessment 1	Assessment 2- Closing	Overall
Rating	MS	S	
Rating Value	4.0	5.3	
Weight	52%	48%	
Weighted Value	2.08	2.5	4.58
<b>Final Rating</b>			<b>Satisfactory</b>

### 3.5 Overarching Themes, Other Outcomes and Impacts

#### Poverty Impacts, Gender Aspects, and Social Development

71. **Poverty Impacts.** The Project target areas were identified based on the high level of poverty, among other factors. The populations living in these target areas were living on an average of 255 FCFA (approximately \$0.5 per person per day) and the majority of households were reliant upon rain fed subsistence agriculture. Thus, the income and employment gains were realized by relatively poorer people.

72. **Gender aspects.** The Project took the welfare of women in the Project area explicitly into account by supporting revenue generating activities for women, mainly through the support to small market gardens and the processing and selling of fish (investment in markets, smoking ovens and cold storage, for example), all of which are

sectors which are dominated by women. Fourteen percent of the beneficiaries of the newly created or restored irrigated parcels were women. Finally, any health improvements would reduce the domestic burden on women as they are mainly responsible for the care of the household. Despite these activities it is not possible to state unequivocally that women received an adequate share of the Project's benefits. A gender analysis was not completed, and OMVS did not have a gender specialist until 2013. The Project investments were oriented toward irrigated agriculture that is dominated mostly by male landowners.

### **Institutional Change/Strengthening**

73. As the PDO indicates, institutional strengthening was at the core of MWRD 1. The program demonstrated the benefits of enhanced regional integration and showed that coordinated and cohesive actions can reduce costs and increase impact. The Project contributed to OMVS' capacity to operate under politically volatile conditions. Riparian countries were willing to invest to strengthen the organization, and have seen in return the substantial contribution to the implementation of their own development plans. In addition to the points raised previously, joint seminars and workshops drew the attention of the riparian countries to problems that can be resolved only through the implementation of regional transboundary programs, both within the project, for example, management of fisheries and malaria; and outside of the project scope, for example a coordinated response to migratory pests during the harvest, or actions to reduce the risk of conflict among fishermen.

### **Other Unintended Outcomes and Impacts**

74. One unintended outcome noted during the OMVS evaluation process was that, in some areas, the rehabilitated or developed irrigation channels are also being used for informal fisheries development. Future projects could capitalize upon this by providing additional capacity to increase fisheries productivity or introduce larvae eating fish species which may reduce local risk of malaria.

75. Procurement processes for medication helped to leverage more rigorous product testing by national level programs.

## **4. Assessment of Risk to Development Outcome**

### **Rating: Moderate**

76. OMVS is recognized as being one of the strongest organizations in the region, which underlines how important it is to continue working with them to sustain long term change in the region. The will to maintain and enhance the regional integration of the riparian countries was repeatedly expressed by the Heads of States (or representatives) and stated in the meetings of the ICR mission with the Project implementing agencies and is evidenced through support to develop MWRD 2. The implementation of the second phase will continue to build capacity at the regional and national level and will build on the studies completed, for example implementing essential maintenance for the Diama

dam. The volatile political situation in the region may slow development but, as the past experience indicates, should not interrupt further regional integration. The benefits of transboundary cooperation may even contribute to strengthened collaboration.

77. The main risk to the development outcome is the sustainability of local level activities. The delays in implementing activities meant that there was limited time to support community organizations in the uptake and sustainable management of the investments made. Value chain development is reliant upon national level agencies fulfilling their mandate. There are therefore residual risks that the benefits of these investments will not be fully realized and sustained following the closure of the Project, specifically:

- a) The small holder farmers targeted by this project may have limited access to credit and insufficient liquidity to purchase inputs, such as seeds, pesticides and fertilizers. This has already been highlighted as a problem at some project sites in Mali.
- b) The river basin has a highly diverse ecology and, although there are characterization studies on the fish stocks at project sites, there is no overall study showing the long term trends in overall fish stocks. Under MWRD 1 the following measures were taken to support the sustainability of the fisheries sector; (i) distribution and promotion of nets with a wider mesh to prevent over fishing of juveniles, (ii) the closure of the river during critical reproductive periods both through providing alternative means of generating livelihoods (market gardens) and through supporting the fisheries councils and technical directorates to monitor restrictions. Future interventions should deal more directly with the issues of sustainable fishing practices.
- c) Upfront distributions of LLINs have been recognized as one of the most efficient ways to impact on the incidence of malaria. Mass coverage and sensitisation helps to protect people who are not included in distributions and helps create a culture of bed net use, which is essential for sustainability. However LLINs have a design life of 3 or 5 years before needing to be re-impregnated or replaced, and can be as short as 2 years due to inappropriate handling and other damage. In theory OMVS are only providing a 'top-up' to national health programs and commercial market provision is not within their mandate

78. The risks to the Development Outcome at the community levels should be rated as Moderate. This takes into account the implementation of MWRD 2 which is critical to ensuring the impacts of MWRD 1 are sustained. This second phase will need to include measures to continue to support the irrigation cooperatives and fishing councils from MWRD 1, and to continue to work with the local health agencies.

79. OMVS is starting to design an integrated financing system where some income from Manantali dam (currently paid directly to the states) would be used to cover both investment programs and also operation and maintenance costs. However, this will be some years in development and the continued interest of the wider donor community will therefore be needed to contribute to maintaining the risks to a moderate level. For example, the Global Environment Facilities/Least Developed Countries Fund is coordinating with the implementation of MWRD 2 in preparing a grant to finance

strengthening the capacity of OMVS to lead climate adaptation efforts in the region. The Dutch Government will continue to finance the control of aquatic invasive plants and support to the water users associations. OMVS is also approaching other development partners to finance (i) the dissemination and implementation of analytical work financed under MWRD 1, for example the Comprehensive Senegal River Basin Master Plan and (ii) hydropower dam construction.

## **5. Assessment of Bank and Borrower Performance**

### **5.1 Bank Performance**

#### **(a) Bank Performance in Ensuring Quality at Entry**

##### **Rating: Moderately Satisfactory**

80. The Bank's performance in the Project's identification, support for preparation and appraisal was moderately satisfactory. The Project was consistent with the regional, national and World Bank priorities to reinforce the regional integration of the OMVS member states, and foster economic growth of the region. The Bank took measures to ensure that the Project was demand driven and helped maximize the participation of beneficiaries. The Bank team supported a complex, multi-sectoral approach, which required persuading internal management to integrate sectors such as health and fisheries with more traditional water resources work on dams and irrigation. The Bank also pushed for the layered intervention, with responsibilities at the regional, national and community level, which increased the robustness of the project during implementation.

81. As noted previously there were some moderate shortcomings in the quality at entry, specifically in M&E and budget development. These shortcomings were remedied at the mid-term evaluation after three years of implementation. The political and security situation was not adequately considered at preparation as a risk to implementation; however it is not clear how this would have been mitigated beyond the measures already taken in project design. Another minor shortcoming was that the associations that benefited from the Project investments were not formally assessed for their capacity to use the new infrastructure and equipment, the only assessment was of land tenure issues and the level of demand. The Project did not include data collection on the socioeconomic impact of the project beyond immediate implementation.

#### **(b) Quality of Supervision**

##### **Rating: Satisfactory**

82. As reported in the previous QAG reviews, the project team was extensive, experienced, dedicated to the task, and impressive in its enthusiasm. The continuity of the supervision task team supported the development of close relationships with the client; the majority of the current team members, including the current Task Team Leader, have been involved in the project since 2005. Supervision missions have been frequent and well-funded.

83. The Bank team correctly identified the Project's shortcomings and proceeded with an appropriate restructuring. The decision to delete lower priority activities in order to fund higher priorities was correct and resulted in successful completion of these activities. Intense supervision by WB safeguard and procurement/financial management teams helped the sector specialists in the PIU to build capacity. The PIU was then able to build capacity in the national cellules in a kind of cascading effect. The WB agricultural specialists were also instrumental in providing active support to both the PIU specialist and directly to national agencies in the supervision of works. During the ICR field mission, the national implementing agencies and the relevant ministries praised the quality of the Project and the Bank's support. The main issue noted with the interactions with the Bank was the delays in no objections which slowed the procurement process.

**(c) Justification of Rating for Overall Bank Performance**

**Rating: Satisfactory**

84. With the Bank performance at entry rated as moderately satisfactory, performance at supervision rated satisfactory and an overall outcome rating of satisfactory, overall Bank performance is rated satisfactory.

**5.2 Borrower Performance**

**(a) Government Performance**

**Rating: Moderately Satisfactory**

85. The Governments of the OMVS member states were responsible for establishing the Regional Steering Committee (RSC) and for paying counterpart contributions. The RSC met once a year to review and approve the Project's programs. The relevant ministries from the OMVS member States were fully involved in implementation of the Project activities. The moderate shortcoming was the continued arrears in counterpart contributions. The riparian Governments justified these delays as being due to political volatility, budgetary constraints and by the lack of satisfactory information on the use of their contributions.

**(b) Implementing Agency or Agencies Performance**

**Rating: Satisfactory**

86. OMVS implemented the project successfully, mobilised and managed the national level institutions and community organizations. The participatory approach of the Project management, frequent field visits and numerous meetings and workshops have contributed to the smooth functioning and achievement of the Project objectives in spite of the political, technical and administrative differences among the member countries. The OMVS PIU supervised activities over large geographical distances and the wide ranging requirements of the rural communities from desert to semi-tropical forest. Fiduciary and safeguard policies were complied with, both Bank team and QAG reviews rated these as satisfactory, the financial management was highly praised. The

procurement staff in the national executing agencies was dedicated and were often multi-tasking across a number of different roles.

### **(c) Justification of Rating for Overall Borrower Performance**

#### **Rating: Satisfactory**

87. The Government's rating is moderately satisfactory, the Implementing Agencies' rating is satisfactory and with an outcome rating of satisfactory, the overall Borrower performance rating is satisfactory.

## **6. Lessons Learned**

88. **The Bank should consider the advantages of a multi-sector project and/or a regional project when dealing with issues that are closely related and/or trans-boundary.** The integration of fisheries, agriculture, environmental management and health under a single water integrated resources project has yielded gains that would not have been realized in discrete sector projects. For example, there were clear advantages of treating malaria across the four countries since the population is constantly moving in this area. In addition, OMVS, as a regional organization transcended the political instability that affected the individual national governments. The implementation arrangement of channeling funds to the regional organization also had the advantage of keeping implementation moving forward despite coups in three of the four riparian states. Furthermore, the project was designed so that only the tasks that fit within the mandate and responsibility of the regional organization were assigned to them to implement. For national activities, the national agencies were closely involved. For example for the agriculture-related activities, performance management contracts were signed between the regional organization and the national line agencies and the national line agencies were directly responsible for implementation. This helped to ensure sustainability and to prevent over-reach of the regional organization. Similarly MOUs were signed between the regional organization and the national health and fisheries agencies for close collaboration on the implementation of the health and fisheries activities respectively. However it should be noted that OMVS is a unique organization in the region with a long history and strong legal base.

89. **Dated covenants are preferred to open-ended commitments to provide counterpart funding.** In MWRD 1, the Bank had minimal leverage in trying to effect more timely payment of counterpart funding. In future phases the requirements on member states to pay contributions will need to be increased, for example through dated legal covenants, and linking payments to clearly defined activities.

90. **Costing of activities should be based on actual contracts, wherever possible, or on more detailed market reviews even if it leads to taking studies out of the project to be funded from other sources.** During the preparation of MWRD 1, many of the budget allocations were underestimated, particularly for the dam studies. For future phases, feasibility studies are prepared in advance so there is a better estimation of costs.

91. **Close collaboration between the Project executing agencies and with the beneficiaries can mitigate the negative effects of national civil strife on project implementation.** The successful continuation of the Project's activities was possible because of:(i) the close collaboration of OMVS with the national agencies; (ii) their well established presence in the field and (iii) the collaboration with the local communities. Close contact and the mutual trust established helped the Project to neutralize the potentially paralyzing effects of political instability. It should be noted that this assumes an adequate level of security at the level of individual communities so that work can progress safely.

92. **Additional support following delivery of assets is needed for better outcomes** To maximize development impacts the program needs to go beyond delivery and provide follow up support to recipients. Some agencies and cooperatives highlighted that they were not sufficiently prepared to maintain and manage these assets in the long term; this was specifically an issue for the use of mini-diggers provided under the Dutch Trust fund. Introduction of a more nuanced selection process among potential Project beneficiaries is good practice, however a 'capacity requirement' may conflict with the focus of the project on the poorest communities in the basin. Increased capacity building for beneficiaries before and after handing over assets is recommended.

93. **Development outcomes may be limited if links in the value chain are not considered.** The Project increased the local productive capacity in agriculture and fisheries. A rapid increase of production may lead to bottlenecks unless the whole value chain is considered, including processing, storage and marketing. An appropriate value chain should be analyzed as part of Project preparation.

## **7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners**

### **Borrower/implementing agencies**

94. The majority of the recommendations and issues raised by the Borrowers and Implementing Agencies have been incorporated into the second phase of the project, for example:

- a) Expanding the fisheries sector into Guinea;
- b) Focusing on livelihoods development and prioritizing small scale irrigation development;
- c) Including the treatment of additional neglected tropical diseases (such as schistosomiasis, soil transmitted helminthes/geohelminths, trachoma, lymphatic filariasis and onchocerciasis) in the health sub component;
- d) Supporting mapping and hydrological and climate change models to improve planning and monitoring;
- e) Increased support to monitoring and evaluation and safeguards implementation; and
- f) Increased support to national cellules to complete supervision.

95. Another issue was the adequacy of M&E resources provided to the Borrower by the Project. The Project provided \$362,000 of IDA resources plus co-financing for project monitoring and evaluation. However a specific budget line was not provided for safeguards monitoring and no resources were allocated to supporting the national cellules. The conclusion of the Bank ICR team is that sufficient resources were allocated to ensure that minimum safeguard requirements and project monitoring needs were met. However there was limited financing to support wider capacity building and supervision should have been more regular and comprehensive. These issues are therefore accepted and are being addressed through the second phase with a requirement for quarterly supervision mission by OMVS and increased support to the national cellules.

96. Some of the issues raised and requests for extension of the project are not within the mandate of OMVS, for example – supporting livestock and sanitation interventions are difficult to justify unless they have a transboundary impact or can be linked to the impacts of large hydraulic infrastructure. In addition some of the issues raised are the core responsibility of OMVS and should not be covered by a temporary project. For example the Implementing Agency requested support to cover the running costs of the Documentation Centre; however this needs to be financed through the annual budget of OMVS in order to be sustainable.

97. The Borrowers have also identified that procurement should be more decentralized and certain sub components should be implemented through national agencies. For example during MWRD 1 the health sub component was implemented through NGOs and the procurement controlled through OMVS. This has not been accepted for MWRD 2 due to (i) the increased administrative burden for OMVS and (ii) the increased risks from a plethora of organizations managing procurement. Instead, the procurement limits for OMVS have been increased to build capacity at the regional level and a formal role has been introduced for Ministries in the steering committees for sub components.

### **Cofinanciers**

The ICR was shared with the Netherlands on 09/10/13 and to date no comments nor issues were raised.

### **Other partners and stakeholders**

The majority of the recommendations made by civil society to review the mechanisms and type of materials to be distributed have been taken on board and included as lessons learnt for the second phase of the project.



## Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

### IDA:

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)*	Percentage of Appraisal
<b>Total Baseline Cost</b>			
Component 1	7.6	10.47	138
Component 2	90.6	87.96	97
Component 3	5.2	8.12	156
<b>Total</b>	<b>103.4</b>	<b>106.55</b>	<b>103</b>
Physical Contingencies	2.3	0.00	0
Price Contingencies	4.2	0.00	0
<b>Total Project Costs</b>	<b>110.00</b>	<b>106.55</b>	<b>97</b>
Front-end fee PPF	1.70	1.80	106
Front-end fee IBRD	0.00	0.00	0
<b>Total Financing Required</b>	<b>111.70</b>	<b>108.35</b>	<b>97</b>

\*Latest estimate based on August 2013 figures

### French Agency for Development

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Component 1	2.4	2.7	113
Component 2	3.6	4.0	111
Component 3	2.4	2.7	113
<b>Total</b>	<b>8.32</b>	<b>9.3</b>	<b>112</b>

### European Commission

Components	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
Component 1	-	-	-
Component 2	-	-	-
Component 3	1.8	2.6	144
<b>Total</b>	<b>1.8</b>	<b>2.6</b>	<b>144</b>

(b) Financing

Source of Funds	Type of Cofinancing	Appraisal Estimate (USD millions)	Actual/Latest Estimate (USD millions)	Percentage of Appraisal
African Development Bank	Grant	2.00	0.00	0%
Borrower	Grant	12.00	12.00	100%
EC: European Commission	Grant	1.80	2.6	144%
FRANCE: French Agency for Development	Grant	8.32	9.3	112%
International Development Association (IDA)	Grant	93.38	90.57	97%
IDA Grant	Grant	18.04	17.50	97%
NETHERLANDS: Min. of Foreign Affairs / Min. of Dev. Coop.	Grant	6.63	12.54	189%
Total	Grant	142.17	144.51	102%

## Annex 2. Outputs by Component

### **Component 1: Regional Institutional Development for Water Resources (US\$8.1 million IDA, US\$3.3million co-financing)**

Objective: *Support actions at the regional level to consolidate and strengthen policies and plans, relating to integrated water resources development.*

The component's activities were designed to: a) Modernize OMVS and enhance institutional capacities, b) Operationalize Guinea's inclusion in OMVS, and c) Rehabilitate the OMVS Documentation Center.

The integration of Guinea allowed OMVS to:

- Reduce the risks of water related conflicts among the riparian countries
- Strengthen the integration of OMVS member countries, and widening the common economic area
- Protect water resources through upstream work on erosion protection and guarantee the durability of the undergoing investments
- Increase hydropower development in the basin
- Improve governorship of the OMVS macro-economic framework and adjustment of the cost and benefit share among the countries.

#### a) Modernization of OMVS and enhancement of its institutional capacities and b) Operationalization of Guinea's inclusion in OMVS

The modernization of OMVS and enhancement of its institutional capacities were fully achieved. The main outputs of the modernization can be summarized as follows:

- The project provided ongoing support to the integration of Guinea since its integration into OMVS on the 14 March 2006.
- Revised organogram to rationalize the structure of OMVS including;
  - o *Creation of two new departments:* Environment and Sustainable Development, Regional Infrastructure
  - o *Creation of two advisory bodies:* The Basin Committee (*Comité du Bassin*) composed of representatives of the civil society and locally elected members of the political bodies and The College of Users (*Collège des Usagers*) regrouping the representatives of the users and beneficiaries of the OMVS infrastructures and goods
  - o *Effective integration of Guinea into the decisional structures:* Including training on the basic texts of OMVS, data management, procurement and environmental management. Guinea is now an operational member of OMVS; Guinea has ratified the OMVS convention, is paying contributions, has adopted OMVS legislation as the overarching legal framework for water resources management and Guinean staff are fully integrated into the revised operational structure of OMVS.

- *Evaluation and Restructuring the National OMVS Offices (Cellules Nationales)* including roles, responsibilities and composition
- *Modernization of the infrastructure of OMVS:* Including new office buildings, IT support (hardware and software), website development, transport and so on.
- *Analytical work to support decision making:* Study on flood hazards and abstraction limits in the river basin
- *Improve the capacity of SOGED to manage infrastructure:* Study to assess and design the maintenance works required on Diama dam including electrics, control board and corrosion protection

In addition the project supported cooperation and coordination through a series of meetings and workshops based around development in the basin. Training and capacity building for OMVS has been ongoing through the 6 years of the project.

Communication and diffusion of information was improved including; documentaries on schistosomiasis and malaria (shown on national television channels and Africable), and an OMVS journal incorporating regular project updates.

#### c) Rehabilitation of the OMVS Documentation Center.

The rehabilitation of the Documentation Center premises started in 2010 and the Center building was inaugurated in December 2012. The Center is operational and equipped. It has collected more than 14 000 documents; their digitalization is ongoing. The internet portal for the documentation center was updated with an online database (OMVSDOC, RESOLUDOC and Archives). Furniture and other materials were provided.

### **Component 2: Local Level Multi-Purpose Water Resources Development (US\$96.4 million IDA, US\$12.12 million Dutch Trust Fund, US\$9.3million co-financing)**

Objective: *to promote income-generation activities at the grassroots level and ensure that benefits spillover across the Basin.*

The component was divided into five local level activities: a) Development of small hydraulic infrastructure and related activities, b) Improvement of traditional fisheries, c) Water resources protection, d) Reduction of waterborne diseases, e) Control of invasive aquatic plants (Dutch Trust Fund Financed)

#### a) Development of small hydraulic infrastructure and related activities

The subcomponent was designed to:

- Develop infrastructure (rehabilitation and construction of intakes, pumping stations and hydraulic waterways);
- Develop recessional (flood) agriculture (land leveling, development and promotion of income generation activities, provision of agricultural equipment and improvement of cropping system); and

- Expand and rehabilitate small-scale irrigation and drainage schemes (construction and rehabilitation of canals, expansion of irrigated areas, support to crop diversification and training).

Globally, the Project subcomponent achieved its targets: The flow capacity of the main water intakes has increased by 133% in comparison to the baseline, well more than 4 400 ha were rehabilitated or developed for irrigation, 88 kilometers of irrigation canals were built or rehabilitated (instead of the targeted 50), but only 460 hectares of lowlands were developed in place of 900. In consultation with beneficiaries the specification for the pumps changed so that a larger number of motor pumps were purchased, in addition a larger number of pumping stations were required in order to effectively supply the area developed for irrigation; therefore 47 pumping stations (25 motor pumps and 22 rehabilitated/enlarged/new pumping stations) were installed instead of 10.

The management of the infrastructures was transferred to the State agencies and the rehabilitated or constructed irrigated parcels were assigned to the producers association for exploitation according to the general irrigation parcels rules applied by the OMVS irrigated land exploitation agencies.

According to the testimonials from direct beneficiaries and the rural development institutions, there is no doubt that the installation or rehabilitation of the irrigated parcels and the new cultivation opportunities increased the agricultural production of the region and generated both increased income and employment opportunities. However, these more long term impacts have not been quantified.

In addition studies were completed in Mauritania and Senegal to enable national Governments to prepare an investment pipeline.

#### Improvement of traditional fisheries

The programmed activities were executed in Mali, Mauritania and Senegal; they covered:

- Studies about fishing in the zone of intervention of the Project
- Training of about 1200 beneficiaries (fishing, wholesale fish merchants, transformers and carpenters)
- Assistance with installation or animation of 5 Fishing Councils;
- Acquisition of fishing gears and equipment for processing or storage
- Purchase of 185 dugouts and 50 outboard motors;
- Construction of small infrastructure, including; one structure for controlling floodwaters, four unloading docks, three fish markets, one fisheries center, three fish processing areas, smoking ovens and conservation facilities,

The activities have combined to redynamise the sector. The quantity of fish sold from the main market or depots rehabilitated under the Project has increased by 13%, just under the target of 15%. The benefits from the fishery improvements on household incomes are not yet evaluated.

### Water resources protection

The subcomponent was intended to support land and water resources management at the community or sub-basin levels.

The water and soil laboratory in Ross-Béthio (Senegal) was successfully installed, personnel trained and the laboratory is now employed for the soil and water samples analyses needed for the determination the needed fertilizers quantities and the water salinity.

Due to the political instability in Guinea, only 460 hectares of lowlands instead of 900 hectares were developed and 1,500 hectares of the forest area were rehabilitated instead of 2,500 hectares. The developed lowlands are under production. The areas developed for agroforestry are in the early stages of development, however the planted areas are protected and local communities have received training and tools.

In addition slope stabilization was completed over at least 58.5 km. Improvements were made to access and services along the river as part of the mitigation measures, for example washing areas, walkways and access ramps as part of the slope works.

### Reduction of waterborne diseases

The 2009 survey confirmed the endemic dimension of schistosomiasis and high proportion of the population suffering from malaria.

The subcomponent focused on reducing the burden of schistosomiasis and controlling the transmission of malaria in the Basin. It built upon the existing waterborne diseases programs and regional health plans. The community approach accompanied the water borne diseases action to ensure the implication of the communities concerned in all the phases of the program.

The key activities of the schistosomiasis control included: (i) provision of praziquantel and albendazole to the targeted communities, (ii) information and education on preventive health practices and mechanisms to prevent the disease from spreading to other areas in the basin. Two campaigns were executed: In 2010 more than 2 million school age children were treated for schistosomiasis and geohelminthiasis and 1 million adult at risk were treated against bilharzia, which represents respectively 80% and 69% of the targeted population at risk. In 2011 and 2012 the treatment covered more than two million children representing 91% of the target and 1.7 million adults (81% of the target)

The malaria vector control and prevention activities included: (i) mass distribution of long-lasting insecticide treated bed-nets including community mobilization and other preparatory activities in support on the nets distribution, (ii) malaria impact mitigation activities, (iii) community mobilization and other preparatory activities in support of the mass treatment including linkage to basic public health activities, (iv) disease surveillance and operational research on joint malaria-schistosomiasis control activities.

To implement the malaria control, in 2010 the Project distributed 1,500,000 impregnated mosquito nets were distributed to protect children of less than 5 years (that represented 95% of the targeted children in Guinea, 52% in Mali in 84% Mauritania, and 79,5 in

Senegal). In 2011/12, another 1,125,580 nets were distributed. Community sensitization included proper use of the nets and appeared to have an impact with a high uptake of nets and no reported incidents of families using them for fishing etc. The 2011/2012 survey indicated an increase (from 40% in 2009 to 84%) of the percentage of people sleeping under mosquito nets.

Ten thousand people were trained and involved in the control of waterborne diseases as part of this subcomponent.

Specific data on the current prevalence of malaria and schistosomiasis are lacking.

#### e) Control of invasive aquatic plants (Dutch Trust Fund Financed)

This subcomponent was complementary to the development of small hydraulic infrastructure through the control of invasive aquatic species which impede the development of irrigation. This subcomponent was designed to:

- Increase the conveyance in hydraulic axes supplying agricultural areas
- Support the implication of local and national actors in the control of invasive aquatic species

The works cleared a total of 35 kilometers of canals and supported 48 water users associations with training, tools, equipment for local administration and support to obtain legal status. The subcomponent also supported the training and sensitization of local partners and Government bodies responsible for providing backstopping support to the user associations.

### **Component 3: Regional multi-purpose and Multi-sectoral Master Planning (US\$12.61 million IDA, US\$6.2million co-financing)**

*Objective: To present a plan for the optimal use and management of the Basin's water resources, taking into consideration all sectors and stakeholders.*

The component's activities complemented the efforts for least cost energy development throughout the region under the West Africa Power Pool framework. Three sets of activities were programmed and fully executed:

- Masterplanning
  - Preparation and validation of the Senegal River Basin Master Plan including tools for the dissemination and training on this document
  - An overarching plan for energy transmission – to develop the local power pool –
  - Strategic regional environmental and social evaluation
- Dam development
  - Pre-investment support for the OMVS Gouina Hydroelectric Project
  - Pre-investment support for OMVS Multi-purpose Dams (Boureya, Gourbassi and Koukoutamba)

- Dam management
  - Capacity building for dam operating agencies
  - Studies for the renovation of; electric and electronic installations for automatic and command systems and cathodic corrosion control systems at Diama dam

The Project achieved the end of Project indicators:

- During the XV Conference of the Heads of States of OMVS the March 25, 2013 the Heads of States decided to finalized the signature of the convention of financing and starting the implementation of the Gouina and Koukoutamba Dams.
- The pre-investment framework is in place to build the Koukoutamba and Gouina dams.
- The Comprehensive Senegal River Basin Master Plan was adopted as a tool for optimal management and development of water resources.



## Annex 3. Economic Analysis

### Overview

The economic analysis of MWRD 1 captures the combined benefits and costs of the agriculture and fisheries activities of the Project, with agriculture accounting for about 90% of the net benefits. The analysis covers 30 years, including 5 years of actual production and cost data (2008-2012), with 25 years of projected costs and benefits (2013-2037). As Annex Table 3.1 shows, separate ERRs and NPVs (at 12%) are calculated for each of the four countries in the project.

At a 12 percent discount rate, the analysis confirms that MWRD 1 activities had positive NPVs at 12% in Mali, Mauritania and Senegal. The negative financial and economic NPV for Guinea are due to: (i) the absence of income-generating activities from fisheries; and (ii) the late exploitation of irrigation agricultural areas (340 ha in the low-lands that were just coming into production at the end of the Project. The combined effect of these two factors has led to lower job creation and revenue generation. The high productivity of Mali and Senegal’s investments are mainly explained by the: (i) higher surface areas cultivated under the project; and (ii) higher number of primary fishery beneficiaries. The overall ERR for the Project is 20.5% and an NPV at 12% of US\$80,012,000.

**ANNEX TABLE 3.1: Results of Financial and Economic Analyses of Investments under MWRD1**

Country	FINANCIAL VIABILITY		ECONOMIC VIABILITY	
	Financial IRR (%)	NPV (USD)	ERR (%)	NPV (USD)
Guinea	(0.1)	(5,756,000)	(4.2)	(16,560,000)
Mali	31.6	33,578,000	24.6	37,112,000
Mauritania	18.1	9,114,000	13.5	3,778,000
Senegal	40.2	51,289,000	28.3	50,796,000
<b>Project</b>	<b>25.9%</b>	<b>81,752,000</b>	<b>20.5%</b>	<b>80,012,000</b>

Annex Table 3.2 summarizes the “with” and “without” Project benefits with respect to job creation and income generation. The project’s economic efficiency was evaluated through the identification of some economic benefits generated during the implementation period at the regional level. The analysis also confirms that employment and income generation created by the Project has begun to considerably improve the livelihood of local communities in the Project areas. The exception is in Guinea where the project’s financial and economic impacts are not yet noticeable.

The analysis also indicates that during 2008-2013, approximately 19,000 new jobs were created in the fishing and irrigated-agricultural sub-sectors (16,700 and 2,300 respectively). The incremental income generation is estimated to be US\$154 million (US\$61 million in fisheries and US\$92 million in irrigated-agriculture). The related per capita daily average revenue has increased from **US\$1.34** to **US\$3.67** in the fisheries and from **US\$0.43** to **US\$0.79** in agriculture. The associated daily incremental income is US\$2.34 and US\$0.36 for primary beneficiaries and employees, respectively.

**ANNEX TABLE 3.2: Incremental Socioeconomic Benefits Generated by MWRD1**

<b>COUNTRY/ SECTOR</b>	<b>Job Creation</b>			<b>Income Generation</b>		
<i><b>FISHERIES</b></i>						
	<b>Without MWRD1</b>	<b>With MWRD1</b>	<b>Incremental Per country %</b>	<b>Without MWRD1</b>	<b>With MWRD1</b>	<b>Incremental per country %</b>
GUINEA	NA	NA	NA	NA	NA	NA
MALI	1,540	7,655	46%	4,963,000	33,237,000	45%
MAURITANIA	660	3,333	20%	2,127,000	14,471,000	20%
SENEGAL	1,140	5,712	34%	3,674,000	24,801,000	34%
<b>Sub-Total</b>	<b>3,340</b>	<b>20,040</b>	<b>16,700</b>	<b>10,764,000</b>	<b>72,509,000</b>	<b>61,745,000</b>
<i><b>AGRICULTURE</b></i>						
GUINEA	560	672	4%	135,000	1,272,000	4%
MALI	3,758	4,510	30%	1,734,000	6,419,000	16%
MAURITANIA	2,868	3,400	23%	11,410,000	16,875,000	18%
SENEGAL	5,520	6,400	43%	26,460,000	45,389,000	63%
<b>Sub-Total</b>	<b>12,706</b>	<b>14,982</b>	<b>2,276</b>	<b>39,739,000</b>	<b>69,954,000</b>	<b>30,215,000</b>
<b>Total both Sub-sectors</b>	<b>16,046</b>	<b>35,022</b>	<b>18,976</b>	<b>50,503,000</b>	<b>142,463,000</b>	<b>91,960,000</b>

### **Net Benefit Streams and Assumptions of the Analysis**

The economic net benefit stream for the Project as a whole is presented in Annex Table 3.3. The net benefits included all realized and projected income generation from agriculture and fisheries activities. Total costs include all actual investment expenditures from IDA and Government, as well as annual O&M costs throughout the 30-year period through 2037. The actual data were collected from more than 60 project reports covering most of the project area. This data was assembled by a team who visited the project area during June/July 2013 and who also developed the economic analysis for the follow up operation, MWRD 2. The net benefit streams do not take into account health, energy, environmental or social benefits. Because all project costs are balanced against fisheries and agricultural benefits, these additional benefits would further raise the ERR of 20.5% were the analysis to account for them. In addition, while job creation is a quantified benefit, specific benefits beyond income generation are not added to the calculation of the ERR.

**ANNEX TABLE 3.3: Net Benefits Stream for MWRD 1**

	<b>Project Benefits</b>	<b>Project Costs</b>	<b>Project Net Benefits</b>
2008	6,035,578	11,080,832	(5,045,254)
2009	11,377,655	44,053,228	(32,675,573)
2010	18,293,934	37,959,984	(19,666,050)
2011	25,320,356	37,356,511	(12,036,155)
2012	30,489,890	8,855,741	21,634,149
2013	30,489,890	3,461,163	27,028,728
2014	30,400,690	3,461,163	26,939,528
2015	30,400,690	3,461,163	26,939,528
2016	30,400,690	3,461,163	26,939,528
2017	30,400,690	3,461,163	26,939,528
2018	30,400,690	3,461,163	26,939,528
2019	30,400,690	3,461,163	26,939,528
2020	30,400,690	3,461,163	26,939,528
2021	30,400,690	3,461,163	26,939,528
2022	30,400,690	3,461,163	26,939,528
2023	30,400,690	3,461,163	26,939,528
2024	30,400,690	3,461,163	26,939,528
2025	30,400,690	3,461,163	26,939,528
2026	30,400,690	3,461,163	26,939,528
2027	30,400,690	3,461,163	26,939,528
2028	30,400,690	3,461,163	26,939,528
2029	30,400,690	3,461,163	26,939,528
2030	30,400,690	3,461,163	26,939,528
2031	30,400,690	3,461,163	26,939,528
2032	30,400,690	3,461,163	26,939,528
2033	30,400,690	3,461,163	26,939,528
2034	30,400,690	3,461,163	26,939,528
2035	30,400,690	3,461,163	26,939,528
2036	30,400,690	3,461,163	26,939,528
2037	30,400,690	3,461,163	26,939,528

All costs from 2013 onwards are O&M costs.

When comparing the estimated returns calculated in the PAD with those in the ICR, it is necessary to consider the updated assumptions in the ICR analysis (Annex Table 3.4). The main difference is that the original PAD analysis did not include benefits from fisheries. Other major differences are that the ICR analysis accounts for three rather than

two growing seasons and yield improvements an average of 45 percent, which is reasonable with the introduction of irrigation.

**ANNEX TABLE 3.4: Main Assumptions Used in the Economic Analysis of MWRD1**

<b>Assumption</b>	<b>PAD (2006)</b>	<b>ICR (2013)</b>
Number of sectors analysed	1 (Agriculture)	2 (Agriculture, Fisheries)
Number of countries	4	4
<b>Agriculture</b>		
Differences between countries taken into account	No	Yes (according to the existing infrastructure)
Number of crops	4	4
Number of seasons	2 (hivernage, contre saison)	3 (hivernage, contre-saison chaude, contre-saison froide)
Type of infrastructure (Aménagement)	1	5 (Grand PIV, Petits PIV, Bas-fonds, Delta, Culture de Décru)
Productivity	Same for all crops	70% (without project) and 100% (with project)
Intensity	Same for all crops	83% (Without project) and 140% (with project)
Operating sheets (Fiches d'Exploitation) for each crop	Same with and without project	Different. With and without project inputs and outputs are different (including costs and benefits)
Surface area (ha)	Agriculture systems assumed identical	Five different types of agricultural systems
Family members (number of)	Not taken in consideration	Average 7 for the valley and different according the national average (5,9 in Guinea to 10 in Senegal) – numbers taken from the social and economic study done by the project.
Investments in Agriculture	Initial investment	Actual investments
Years used to calculate the Rate of Return (FIRR and ERR)	30 years (from 2008)	30 years (from 2008)
Job creation	NA	10% incremental
<b>Fisheries—ICR Only</b>		
Family members (number of)	Average 7 for the valley and different according the national average (5,9 in Guinea to 10 in Senegal) – numbers taken from the social and economic study done by the project.	
Investments in Agriculture	Real investments	
Years used to calculate the Rate of Return (FIRR and ERR)	30 years (from 2008)	
Number of units (Fisheries)	Actual	
Job creation	4 jobs as following :  3,5 jobs per unit (paid)	

	0,5 family jobs
Number of days of production	200 (without project) 260 (with Project)
Productivity	Average of 6.79kg per day (without project) Average of 11.3 kg per day (with Project)
Operating costs and benefits	Different between With and Without project.

### **Sensitivity of ERR**

Annex Table 3.5 shows that the ERR remains economically viable with a combined 10% increase in the variable costs and a 20% reduction in benefits at 16.5%. This analysis uses actuals for the years 2008-2012 so these figures are not subject to the hypothetical increases/decreases in costs and/or benefits.

**ANNEX TABLE 3.5: Sensitivity of ERR to Changes in Costs and Benefits**

Sensitivity of ERR to Changes in Costs and Benefits	
Benefits Down 20%	16.70%
Costs Up 10%	20.30%
Benefits Down 20% , Costs up 10%	16.50%

## Annex 4. Bank Lending and Implementation Support/Supervision Processes

### (a) Task Team members

Names	Title	Unit	Responsibility/ Specialty
<b>Lending</b>			
Amarquaye Armar	Program Manager	SEGES	Team management
Sidi Mohamed Boubacar	Chief Counsel	LEGAM	Legal
Aissatou Diack	Senior Health Specialist	AFTHW	Waterborne diseases
Bourama Diaite	Senior Procurement Specialist	AFTPW	Procurement
Ousmane Dione	Task Team leader	EASPS	Team management
Yvette Laure Djachechi	Senior Social Development Spec	AFTCS	Social safeguards
Daryl Fields	Sr Water Resources Spec.	ECSEG	Water resource management
Assiata Houedanou Soro	Sr Program Asst.	AFCF2	Team support
Martha Jarosewich-Holder	Consultant	ECSEG	Natural resources management
Yohannes Kebede	Information Officer	AFRIT	Communications support
Shelley Mcmillan	Sr Water Resources Spec.	AFTN3	Assistant TTL
Fanny Kathinka Missfeldt-Ringius	Senior Energy Economist	MNSSD	Economist
Alessandro Palmieri	Lead Dam Specialist	TWIWA	Hydropower development
Robert A. Robelus	Consultant	AFTN2	Environmental safeguards
Fily Sissoko	Lead Financial Management Spec	AFTMW	Financial management
Marie-Adele Tchakounte Sitchet	Language Program Assistant	AFTU2	Team support
El Hadj Adama Toure	Senior Agriculture Economist	AFTA1	Irrigation specialist
Aissata Z. Zerbo	Procurement Specialist	AFTU2	Procurement
<b>Supervision/ICR</b>			
Andrew Osei Asibey	Senior Monitoring & Evaluation	AFTDE	Monitoring and evaluation
Salamata Bal	Senior Social Development Spec	AFTCS	Social safeguards
Suprotik Basu	Public Health Spec.	AFTHE	Waterborne diseases
John Paul Clark	Sr Technical Spec.	AFTHW	Waterborne diseases
Zie Ibrahima Coulibaly	Senior Infrastructure Specialist	AFTU2	Water resources development
Renee M. Desclaux	Senior Finance Officer	CTRLD	Financial management
Aissatou Diack	Senior Health Specialist	AFTHW	Waterborne diseases
Bourama Diaite	Senior Procurement Specialist	AFTPW	Procurement management
Ousmane Dione	Task team leader	EASPS	Team management
Sidy Diop	Senior Procurement Specialist	AFTPW	Procurement management
Saidou Diop	Sr Financial Management Specialist	AFTMW	Financial management

Mahine Diop	Senior Municipal Engineer	AFTU2	Water resources development
Matar Fall	Lead Water and Sanitation Spec	AFTU2	Interim Task team leader
Alassane Guisset	Sr. Irrigation Consultant	FAO	Agriculture specialist
Abdoulaye Keita	Senior Procurement Specialist	MNAPC	Procurement management
Marie Constance Manuella Koukoui	Sr Program Asst.	GEFVP	Team support
Shelley Mcmillan	Sr Water Resources Spec.	AFTN3	Task team leader
Osva Rocha Andrade Romao	Financial Management Specialist	AFTMW	Financial management
Ibrah Rahamane Sanoussi	Senior Procurement Specialist	AFTPW	Procurement management
Fily Sissoko	Lead Financial Management Spec	AFTMW	Financial management
Amadou Soumaila	Sr. Irrigation Consultant	FAO	Agriculture specialist
Marie-Adele Tchakounte Sitchet	Language Program Assistant	AFTU2	Team support

(b) Staff Time and Cost

Stage of Project Cycle	Staff Time and Cost (Bank Budget Only)	
	No. of staff weeks	USD Thousands (including travel and consultant costs)
<b>Preparation</b>		
FY05	31.86	151.75
FY06	48.64	221.28
<b>Total:</b>	<b>80.50</b>	<b>373.03</b>
<b>Supervision/ICR</b>		
FY07	13.568	155.14
FY08	42.328	326.79
FY09	35.660	334.75
FY10	27.750	325.62
FY11	30.651	301.97
FY12	28.224	382.09
FY13	44.846	395.18
<b>Total:</b>	<b>223.027</b>	<b>2,221.55</b>

## **Annex 5. Beneficiary Survey Results**

In 2010, the Project financed a socioeconomic study of the SRB that covered 1 980 families living within the area covered by the Project and 740 families living in the SRB outside the Project covered area. The families were randomly selected through a two stage sampling. In the first stage, from the 19 403 localities situated in the SRB, 625 localities were selected (428 situated in the area covered by the Project); in the second stage the families covered by the study were selected in proportion to the number of families in the localities. Since there was no great difference between the data from the area covered by the Project and those from the other SRB zones, and the difference was not statistically evaluated, only the data concerning the Project covered area was described.

### **Results**

#### Population

The women represent 51.4% of the population; 17.6% of them are family heads. The average age of the population is 24.9 years; the family is composed on average of 6.5 persons. Only 10.1% of the adult population has the primary education and 4.5% of the family heads are alphabetised.

Agriculture is the principal source of revenue for 71% of the families, 31% practice animal husbandry, 3.3% are craftsmen and 1% fishermen. Slightly less than 5% of the population migrate for economical reasons. In 2009, the average revenue per person was 93,060 FCFA which corresponds to 255 FCFA per day.

#### Schools

On average there is at least one school per village, teaching 243 students (including 118 girls). In each locality there is on average 4.3 koranic schools receiving totally 149 students. One locality in four has a secondary school. Ten percent of the localities has library and 66% some place for sporting events.

#### Health

Half of the localities have a health center receiving 22.4 patients per day, and 37% has a pharmacy store. Malaria is the first reason for a visit to the center; then goes diarrhea and schistosomiasis. At least 2 children per family have received anti schistosomiasis treatment and 75% of the families have mosquito nets.

#### Housing and sanitary

Ninety seven percent of families are owners of their house. A family house has on average 3.4 rooms; 29% rooms have cemented floors; 47% houses are covered by a metallic roof. In 25.7% of villages the traditional wells are the only source of drinking water, 25.7% take drinking water from improved (modern) wells. The river or mare water is used regularly by 10% of the villages, 28% use it as a secondary and 46% as a tertiary



source. Seventy seven percent of families are equipped with a traditional latrine and 30.3% with a separate washing place.

### Energy

Wood is the quasi unique source of energy for cooking; only 0.5% of families use gas. Four percent of households use solar energy kits for lighting, 4.3% electricity, the rest other source as for example petrol lamps.

### Accessibility and communication

Only 42% of the localities are easily accessible; 7% are inaccessible in the rainy season. Nine percent of the localities have a fix telephone line, but 79% are accessible by the mobile phone. The television can be received in 52% of the localities.

### Economic activities

#### *Agriculture*

A family cultivates on average 8.5 hectares of land but 7.2% of farmers have more than 50 hectares. More than 94 % own the land they cultivate. Ninety percent of fields are cultivated in the rainy season; only 4.3% are irrigated and 3.6 % are situated in the soils suitable for the recessional agriculture. In 38% of the localities one can find machinery for mechanized agriculture and in 31% farmers utilize the animal traction. Only 15,5% farmers use fertilizers; phytosanitary material was in 3.3% of localities. The yield of cereals in the Project area and in the SRB in general is similar to those in the geographically corresponding other parts of the counties, but that of tomatoes and onions are much lower for unknown reasons. Between 80% and 90% of the cereal production is auto-consumed; half of rice and tomatoes production and up to 80% of potatoes are marketed.

#### *Husbandry*

The families practicing husbandry have on average 11.4 bovines, 16 sheep and 14.5 goats. Milk and meet are auto-consumed.

#### *Fishery*

Fishing season lasts five months; only one-third of the fishermen are working in team (70% in Guinea); but 56% of fishermen are members of a fishermen's association. Three hundred and forty kilograms of fish are captured by an average fisherman per month; 37% is self-consumed 44% sold fresh and 19% after transformation by drying or smoking. Reduction of the fish stock is the most important obstacle for extension of fishing activity (70% of answers) then goes lack of fishing equipment (14%).

#### *Agro-forestry*

Within the Project area, almost all families (94%) collect wood for cooking, 67% cut trees for construction and 69% collect fruits in the forests. In only 8% of the localities the trees are planted for wood for cooking. The trees are most frequently planted for fruit production (in 54% of the localities), for wind erosion protection (9.5%) and as ornaments (5.4%).

## **Annex 6. Stakeholder Workshop Report and Results**

*N/A*

## **Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR**

### **Annex 7.1 IDA Financed activities**

ICR authors: Mbaye Mbengue FAYE, IWRM and Safeguards Specialist; Chérif Sala BAH, Expert Economist

Completed July 2013

*Notes and comments on the Borrower's ICR are provided in the end of this summary in italics.*

*The Project Context, Development Objectives and Design as described in the Borrower's ICR do not differ from the main document and are not reproduced here.*

### **1. Key Factors Affecting Implementation and Outcomes**

#### **Overview**

The design of MWRD 2 overall was highly participatory, took into account the concerns of the riparian states, and supported the development of a cooperative dynamic. The objectives of MWRD 1 are relevant to the national and sub-regional policies and strategies. The activities were in line with the national and local plans. However, the project development suffered from a lack of background studies and baseline data. This led to a number of problems including inaccurate budget development. At the mid-term review a number of issues were noted and the design of the project was reviewed. This was due to three main reasons; the delays in implementation, the lack of accuracy of certain objectives and the overly ambitious aims from the beginning of the project. The implementation post mid-term review was much faster and aims were clearer.

The choice to use counterpart funds for consultancies and studies, rather than for direct implementation of field activities was positive and it ensured that financing for these activities was always secured.

Framework contracts with states and annual management contracts with the implementing agencies were established by OMVS. However, constraints were noted in the contracting process due to the weak capacity of providers and delays in approvals. Contracts and financing arrangements were standardized across all four countries, rather than being customized to the needs and capacity of each country. This meant that management arrangements were not always relevant to the context and in-country capacity.

Implementation of the hydro agricultural component was impacted by (i) delays in completing studies and the procurement process, (ii) contractors and supervising engineers with limited technical capacity and poor quality equipment.

In the health sector, during the project design the activities were very widely spread and were not always completely customized to the existing capacity in each country in the fight against water-borne diseases. In addition the ongoing activities, specifically in Senegal, were not taken into account in project design. Implementation of the health component by (i) the lack of project supervision by the central health agencies outside of the supervision missions completed by OMVS staff, (ii) the poorly defined relationship between the community executing agencies and the health agency and (iii) the lack of skilled human resources in the community executing agencies.

### **Safeguard Compliance**

The OMVS procedures followed World Bank procedures. Environmental and social dimensions were taken into account throughout the project. The screening of sub projects, the regional strategic framework for environmental and social management (including the EMF, the ESIA, the RPF, and the PPMP) and the supervision of the national agencies by the OMVS specialists provided a strong basis for compliance with the environmental safeguards. SAED and DNGR have specialists in safeguard monitoring.

Measures were taken to control negative impacts of works, for example fuel leaks during construction or wastewater from fish markets. In the four countries there have been no significant environmental impacts from the project. Some activities had a positive environmental and social impact, for example the promotion of sustainable fisheries practices.

Costs for mitigating the environmental and social impacts of works were included during the design development. The safeguards team was included in validation workshops and their advice was included in the development of the design of activities. Mitigation measures have included for example additional intakes to ensure flooding of the Djoudj wetlands, walkways and access ramps, construction of latrines and laundry areas. However in the overall project budget there was no specific line for safeguards activities. The main difficulty was found in supervision of the large number of sites progressing in parallel, in particular as some contractors did not engage environmental specialists to monitor these issues. Training was completed for the national agencies; however monitoring implementation continued to be challenging.

The focus of safeguards activities in the fields often focused on the environmental, or physical, issues to the detriment of social issues. For example in one perimeter in Mauritania it was noted that the winter crops were destroyed by the implementation of the project and no compensation had been paid.

In Mali delays in the rehabilitation of agricultural led to loss of crops over two seasons and ADRS had to distribute food directly to beneficiaries.

There have been no land disputes following rehabilitation of the irrigation areas.

## **2. Achievement of Project Development Objective**

Overall the MWRD 1 has contributed to the social and economic development of the four riparian countries and has supported OMVS to embrace integrated water resources management. The majority of indicators have been met.

### **2.1 Component 1:**

The following indicators have been met:

- The institutional reform of OMVS was completed; the frameworks were put into place, including the new organogram, and are effective.
- The priority actions to facilitate the integration of Guinea into OMVS were put into place and a new model for the repartition of costs and benefits was developed.
- The Documentation Centre was rehabilitated and modernized

Access to information for OMVS was supported by provision of IT hardware and the design of webpages for each national cellule. The capacity of SOGED and SOGEM was increased by the completion of studies on the maintenance required for Diama dam to ensure the continued safe operation. The Permanent Water Commission was supported through studies on flood risk and abstraction levels for different permitting requirements. Workshops were held with Government ministries, with the media and civil society to disseminate the basic texts of OMVS and also to explain the environmental and social safeguards in place in parallel with projects implemented. Work on the Documentation Centre, including improving archive and data management systems, website development and capacity development led to an increase in the number of visitors to the documentation center by 68% to around 750 per year.

All countries recognize the inclusive framework as the optimal solution.

### **2.2 Component 2: Local Water Resources Development**

Hydro agriculture development and fisheries development have contributed to economic development in the area. These were concrete actions which have led to the improvement in the quality of life for beneficiaries. Hydro agricultural and fisheries sub components rightly put a strong accent on revenue generating activities for women. The gender aspects of the project were developed through the activities to generate revenue for women (mainly the small market gardens which also included toilets and washing areas and distributions of dummies to pacify infants while their mothers worked) and also for the investment in infrastructure and equipment to improve processing and sales of fish (markets, ovens, cold storage for example). In the health component pregnant women and children under 5 were targeted for distributions of mosquito nets.

#### **Sub Component 2.1 Hydro agricultural development and water resources protection**

The following indicators were reached or exceeded

- Hectares irrigated, developed or with a secured water supply
- Number of intakes constructed or rehabilitated

- Length of canals rehabilitated

The following indicators were partially reached

- Number of pumping stations rehabilitated / installed and operational
- Hectares of low lands developed and protected
- Hectares of agroforestry developed

Globally the local population reported positive impacts from this sub component in terms of generating employment and creating revenue. The lack of support for putting the developed/rehabilitated areas into production limited the impact of the sub component in some areas. Training provided to the beneficiaries, for example on maintenance of motor pumps, contributed to the long term sustainability. However this was not always sufficient for the irrigation cooperatives to be ready for the full handover of the parcels. In some areas it seemed that local consultation had not been sufficient on the details, for example fencing in one area was noted to be inappropriate and watering cans for agroforestry works had to be replaced after being rejected by the beneficiaries. Implementation problems are noted in the previous sections and were found across all countries. The use of local labor for the construction works generated temporary employment and temporary increases in income.

In **Senegal**, the planned works were completed; however some areas were not transferred to local communities by the end of the project. Certain issues which require further attention by SAED were noted including; early establishment of typha and slope instability at the Krankaye canal which may affect its functionality, difficulty in accessing some plots, lack of guard rails at some locations and recycled drainage water in one location. Overall however the results led to positive impacts - for example electrical connections at the village of Thilene using the proceeds from the irrigation cooperative. The works also reduced the cost of the maintenance required of joint infrastructure by 150 million CFA according to SAED. Improved water management has led to the increased development of fishing in project areas which has also led to increased incomes for some households. Production of increased quantities of rice combined with reduced pumping costs for the same irrigation areas have also increased incomes. One producer highlighted that the income from farming now enabled him to cover school and health costs.

In **Mauritania** the quality of agriculture development was generally very good. However there were some delays in implementation and also miscommunication which meant that some producers were not ready to manage the parcels of developed land once they were handed over. The improved water supply has facilitated two harvests per year in the project area. Increased yields had opened some new economic activities including commerce. The waste from the harvests were also used for cattle feed in some locations. Women have put the market gardens into production and optimized their use; in one area women have also planted crops in the dykes. However in some locations the training provided for women was thought not to be sufficient for them to manage the small market gardens in the long term.

In **Mali** the work completed were relatively well appreciated by the local population and significantly raised hopes for future development. Mali was noted for the good support provided, through training etc., to putting rehabilitated/developed areas into production. However some of the village irrigation areas have not been moved into production because communities are not able to access the inputs. Local authorities noted that, although the work completed was visible, the unmet demand for further development was significant.

Overall the market gardens were positively received and noted to contribute to the diversification of crops, increased yields, improved household nutrition and increased revenues. For at least one village in the area it is the first time they have had a market garden. Certain design issues were noted in the market gardens; Californian systems for irrigation of market gardens were found to be difficult to maintain without additional training and supply of spare parts.

In **Guinea** the majority of activities were completed and significant additional training was completed for the Guinean executing agency. There was positive feedback from beneficiaries in the agroforestry activities particularly regarding the training provided in slope stabilization and tree nurseries. Although the beneficiaries and authorities responded that the majority of work was well executed there were some issues which could have been avoided by improved planning and consultation; for example watering cans had to be replaced en mass, some seedlings were lost and so on. The works on slope stabilization, including ramps for livestock and footbridges have reduced the time and cost to access markets.

The following measures were taken to increase the sustainability of the hydro agricultural component:

- User associations for management of perimeters and cooperatives for management of production
- Framework for consultation through village level organizations, including the UIVDD
- Joint maintenance responsibility, including financial responsibility, for irrigation schemes by both users and the state; with the state taking responsibility for bulk water supply and the cooperatives for local works. For example the pump at Kaedi is managed by a cooperative, but with support from the state for major repair works.
- Operation and maintenance systems have been adapted to the local situation.

### **Sub Component 2.2 Sustainable Fisheries development**

The following indicator was partially reached

- The quantity of fresh fish sold in the main markets and landing sites

The project activities impacted almost 4000 people, grouped in 122 organizations. Community infrastructure included; three markets, two landing sites (of four planned), an artisanal fisheries center (partially completed with many snagging issues) and two areas for fish processing (of three planned). The main factor affecting the efficiency of the fisheries component was the high cost of this infrastructure and financing was sometimes diverted away from other activities such as training. Equipment donated to fishing communities included fishing materials, pirogues, motors, cold storage, smoking ovens, and so on. There is satisfactory completion of planned works. The impact of the project on the sales of fish is expected to be reached.

In terms of socio economic impact the activities improved working conditions (product, processing and sales) in many locations and reduced post capture losses. In the markets constructed the quantity of fish sold increased and the quality improved. The supply to local markets was also reliable, for example at Kayes the shortage of fish has been reduced. In **Senegal** the quality of fish sold at the market improved and revenue increased. In **Mauritania** continental fisheries were reported to have expanded to the point that they impacted sales of marine fish. In **Mali** at Manantali the combination of the improved road access, landing point and ice producing facilities provided by the project has led to an increase in fishing activity in the village. The small market gardens put in place for women in order to support the family outside of the fishing season were noted to be an important activity across all countries; however these should have been supervised by agricultural specialists to improve the sustainability.

The specification of some fishing equipment was problematic due to lack of consultation, particularly in Mauritania. The 8mm nets provided to prevent over fishing of juveniles were rejected by some communities in Mauritania. Some of the pirogues manufactured outside the communities were also not accepted and some broke en route to the communities. Beneficiaries reported that these pirogues could have been locally fabricated which would also have provided temporary increases in employment.

The institutional capacity of the fishing councils was increased through the training, and also by the experience of managing the repartition of fishing equipment. Increased financial capacity was noted in particular. Councils were noted to be active, but limited by lack of resources. The sustainability of the fisheries component is supported through creation of a committee for the management of a revolving fund of equipment in the fishing zones and discounts on equipment for cooperative members.

### **Sub Component 2.3 Fighting Waterborne Diseases**

The following indicators were realized;

- More than 80% of school age children were treated for schistosomiasis – 14 million Praziquantel tablets and 4.6 albendazole tablets were distributed
- 3,100,000 mosquito nets were distributed

The following coverage was recorded in project surveys:



Mosquito net coverage, % of households:

Mauritania	85%
Senegal	90%
Mali	96%

Targets were not met in Guinea due to the suspension of activities following political unrest. Household surveys completed by the team indicated that overall 84% of households were supplied with mosquito nets as opposed to 40% in 2009. In addition 83% of children less than 5 years and 81% of pregnant women were sleeping under mosquito nets. In Mali Mauritania and Senegal on average 85% of households were sleeping under mosquito nets, in Guinea 65% of households, as compared to 30% in 2009. The distribution of mosquito nets has facilitated capacity building, including cross border coordination in fighting malaria and exchanges of experience. A reduction in the incidence of malaria and bilharzia was noted in target areas and supported with anecdotal information.

### **2.3 Component 3 Planning for Water resources development**

The following indicators were realized:

- SDAGE is elaborated and adopted as a planning tool for the optimum use of water resources and the pre investment framework is in place.

In addition dam studies were advanced for three dams and studies integrating OMVS power supply into the regional power pool were completed. Studies were validated and approved.

### **3. Assessment of Risk to Development Outcome**

*No assessment of risk at the institutional level*

The high level of participation during the initial stages for the development of local level activities was the base with which the project aimed to install the sustainability of the investments. However the beneficiaries were not well prepared in terms of the future maintenance, and local community mobilization of people and funds.

The second phase is essential for the long term durability of the program, both to build upon the achievements of the first phase and to correct the weaknesses and to complete the insufficiencies.

### **4. Assessment of Bank and Borrower Performance**

#### **4.1 Bank Performance**

During project preparation the Bank supported institutional assessments of all implementing agencies and supported the development of the experts in the PIU. During

supervision missions the Bank made varied and practical recommendations to improve works and stimulated supervision by the national cellules of OMVS. The partnership between the Bank and OMVS, national governments and implementing agencies was noted to be a major success of the project. Delays in approvals were noted as causing implementation delays in implementation of hydro agricultural activities in Mauritania. The procurement procedures were also noted as causing delays in the project.

## **4.2 Borrower Performance**

### **(a) Government Performance**

The national cellules found it difficult to justify obtaining matching funds from the national ministries.

### **(b) Implementing Agency or Agencies Performance**

#### OMVS

Regional supervision by OMVS in the hydro agricultural activities was limited because the PIU staff did not spend sufficient time supervising field activities. In addition the PIU did not have sufficient resources for monitoring and evaluation of field activities or for monitoring safeguards issues. Positive support from OMVS was however noted in other sectors, including the Fisheries Councils and Health sector. National health staff noted that implementation of the health sub component would have been impossible without the support of OMVS. The centralization of procurement in OMVS was seen as a problem which blocked project advancing.

National cellules of OMVS would also only supervise the works in parallel with Bank missions which limited the impact of their action. The weak implication of the national cellules and the lack of responsibility devolved to the national level affected the local supervision of the project implementation. This was seen as a step backwards compared to earlier projects such as the first GEF funded project. National cellules were not provided with dedicated funding for the supervision of works; in Guinea for example field visits were supported by DNGR which created a conflict of interest.

#### National agencies

Hydro agricultural component: Problems relating to project development and implementation are noted above. In general the national agencies did not complete sufficient regular supervision. They were not able to ensure that the recommendations made by the Bank and OMVS were implemented or to lift the constraints affecting implementation. Contract requirements were sometimes not enforced and there was poor application of criteria for the choice of contractors. Plans for long term maintenance were also sometimes poorly executed. Reporting was often delayed.

Health Component: Community Executing Agencies implemented the health component satisfactorily, but did not always build relationships with the central health service which would have increased national capacity.

Fisheries component: The National Department of Fisheries suffered from a lack of human resources which limited the reporting and supervision. Local implementation through fisheries councils was supported by the PIU specialist.

The UIVDD installed by the project are the framework for local management and promotion of the local space. The creation of these new structures (instead of the involvement of existing frameworks) is justified by the sectoral and zonal character of the project activities. They provided labor and led mobilization efforts. However, they did not receive financial support from the project which limited their function (difficulties to hold meetings due to the distance between the villages, lack of resources for monitoring etc).

## **5. Recommendations for the next stage**

### Agriculture

- Supervision of implementation needs to be improved and financed by the project including; 3 monthly supervision by regional specialists and increased delegation to the national cellules. Performance criteria for contractors need to be reviewed and strengthened.
- The studies should be completed well in advance, if possible only works with completed studies should be financed. These studies should be carefully validated.
- Support the development of livestock in the basin

### Fisheries:

- Extend the fisheries section across the rest of the basin, extend distributions, but agree the technical specifications with the fisheries councils.
- Support the training of fishermen in line fishing
- Support the fisheries services to complete monitoring and evaluation – including provision of hardware
- Clarify the responsibility for infrastructure maintenance between the state, commune and fisheries councils
- Support local production of pirogues, or provide fiberglass boats (to reduce deforestation)

### Health:

- Increase implication of other sectors (environment, security, education)
- Make the selection process for AEC more rigorous, have a clear justification for the use of each agency, clarify roles and responsibilities
- Strengthen supervision by national health agencies and OMVS cellules
- Tighter control of the procurement process – certification for distributions
- Take into account additional NTDs
- Extend scope to include WASH interventions and treatment for livestock

#### Implementation:

- Increase decentralization of responsibilities to the national cellules of OMVS and reinforce the staff and capacity at this level
- Have clearer criteria for the choices of investments made and ensure that these are justified by the executing agencies
- Strengthen the method for selecting contractors and supervising engineers, require that each organization has a focal point for safeguards issues
- Plan how to spend unallocated funds
- Activities financed by counterpart funding should be more concrete
- Meetings to disseminate the basic texts of OMVS should be organized with the state, academic institutions, civil society
- Complete an analysis of UIVDD and other community based organizations with a view to extending the principles of the UIVDD systems
- Assess the functionality of cooperatives for agriculture and fisheries development and define the support required to increase organizational and managerial capacity
- Develop an extended approach to include and implicate more actors in the implementation of the project
- Further investment should be made into the operation and maintenance of schemes to assure sustainability. This should also include supporting local artisan workers to provide support services – carpenters, mechanics etc.
- Executing agencies should have focal points for safeguards implementation , all sub projects should be screened for environmental and social impacts and all design/tender documents and terms of reference should include the safeguard requirements
- Implicate women and vulnerable groups in the development and implementation of the project

*Note: Recommendations which are incorporated into MWRD 2 are underlined above for ease of reference.*

#### **Annex 7.2 Dutch Trust Fund Financed activities**

Completed April 2013

#### **1. Key Factors Affecting Implementation and Outcomes**

##### **Overview**

The design of the project was participative and engaged community organizations actively in the implementation. Capacity building activities were well received however there was initially insufficient discussion and consultation when determining what tools

should be distributed to water user associations. This was addressed during project implementation and specifications were amended.

### **Financial management and Procurement**

Financial management respected the procedures required by the Bank. Late delivery and distribution of the tools for water user associations meant that maintenance of channels was delayed following initial mechanical clearance. This led to typha reoccurring in some locations and required additional effort and works to address.

## **2. Achievement of Project Development Objective**

Overall TF 094727 has contributed to the local social and economic development and has supported integrated water resources management, through the control of invasive aquatic species. This was achieved through the following key outputs:

- Support to forty existing water user associations (including, 25 associations, four cooperatives, seven unions, one federation and three committees at water intakes)
- Formation of eight new water user associations
- Associations mobilized, supported to develop and implement action plans, provided with manual and motorized tools to clear water channels and actively implicated in management of the hydraulic axes and control of typha
- Training of water user associations and community contact points on management and technical issues in the control of typha
- Technical training to local operators clearing channels – in mini diggers, motorized pirogues, and hand held equipment
- Support to associations to put administrative processes in place to manage equipment
- Hydraulic channels were identified, assessed and prioritized
- A total of 35 kilometers of channel was cleared using both water user associations and contractors

The key observed impacts are as follows:

- Increased water flow and improved access to water leading to a perceptible increase in the area developed for irrigated agriculture and the development of the fisheries sector in some locations, beneficiaries reported the possibility of an increased number of harvests. Other irrigation projects have been facilitated, for example MCA Senegal.
- Strengthened perception at the community level of the links between improved water resources, control of typha and the revenue generation

An increase in irrigated areas adjacent to the cleared channel has been observed; an increase of more than 4,000 ha between 2010 and 2012.

## **3. Assessment of Risk to Development Outcome**

The national and local authorities, including SAED and SONADER, were implicated in the preparation and implementation of the project. They were closely involved in the

support to the water user associations and the handover of equipment. The local authorities were closely involved in supporting the water user associations to become legal entities. The intent is that these authorities are able to act as backstopping agencies in the future. Training included long term management issues to support the sustainability of the investment. Initiatives were started with a number of partners to support the development of markets on controlling and harvesting typha, including the production of charcoal, among other initiatives.

Despite these measures to support the long term sustainability of the development outcome a number of issues at the community level were highlighted which may impact on the development outcome including the lack of spare parts and the difficulties of financing long term maintenance, particularly of more expensive equipment such as the mini-diggers. These problems were considered by OMVS during project implementation, but were not fully resolved.

#### **4. Assessment of Bank and Borrower Performance**

##### **4.1 Bank Performance**

###### Highly Satisfactory

The Bank team completed supervision missions regularly and in a timely fashion. They were closely coordinated with those of OMVS. The experienced team were an important support to OMVS and reduced the project risks and improved implementation performance by providing practical and relevant advice. All requests for support and No Objections were treated within a satisfactory delay. The Bank team played a catalytic role in the implementation of the project.

##### **4.2 Implementing Agency Performance**

###### Satisfactory

OMVS were active in engaging with the national governments to ensure the effective design and implementation of the work. The project met the specific targets and objectives set for the Dutch Trust Fund financed works.

#### **5. Recommendations for the next stage**

Support to water users associations needs to be continued to ensure that the level of Typha within the river basin is maintained within manageable levels. A continuation of this work has been proposed to the Dutch Government and the project preparation is currently ongoing.

**Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders**

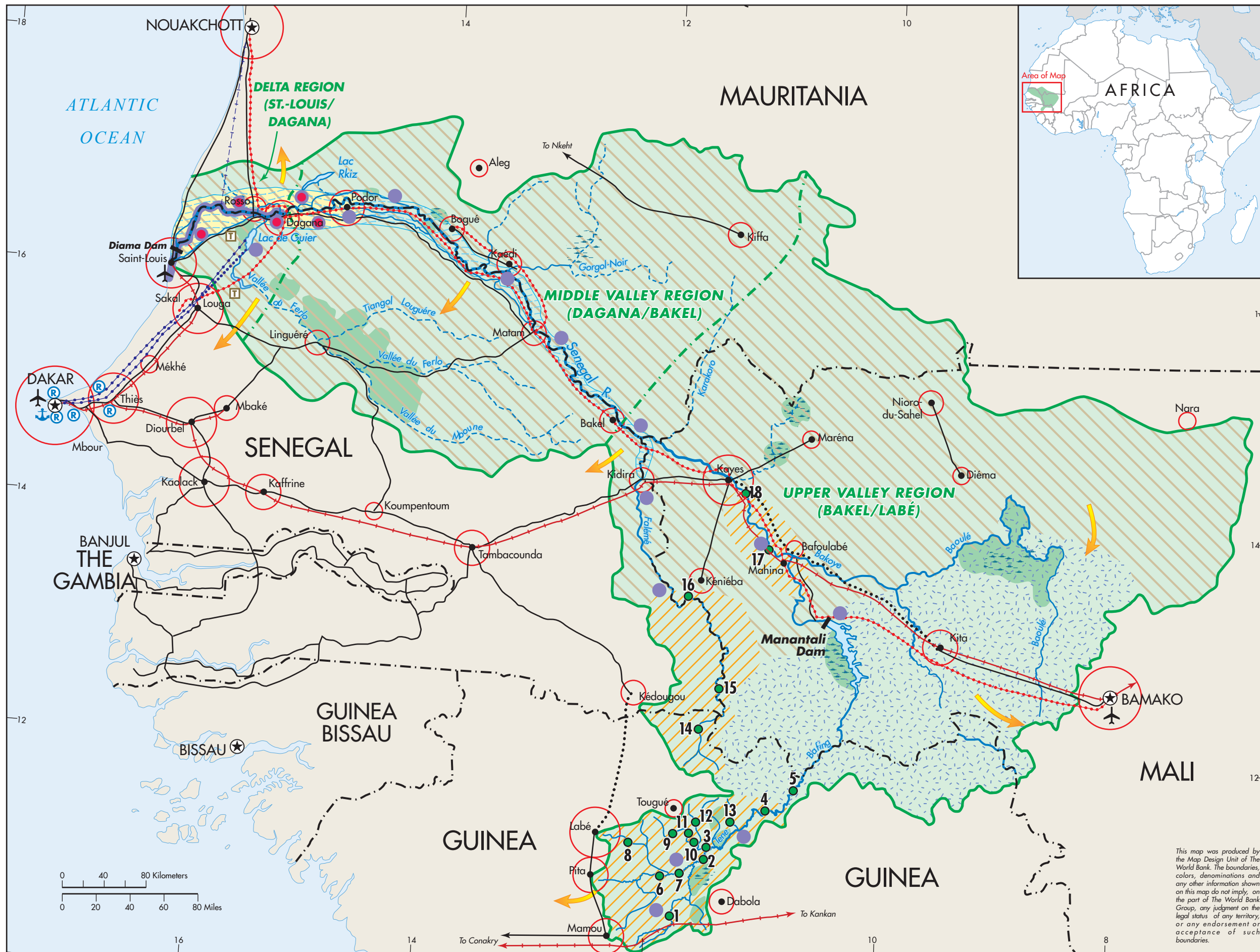
*None received*

## *Annex 9. List of Supporting Documents*

1. OMVS, Aménagement hydroélectrique de Koukputamba République de Guinée. Phase 1 : Étude de faisabilité
2. OMVS, 2006: Étude d'impact environnemental (EIE), Cadre de politique de réinstallation des Populations (CPRP), Plan de gestion des Pestes et pesticides (PGPP) pour les différentes activités du projet vol. 2 Rapport principal version définitive
3. OMVS, 2008: Etude sur la reforme institutionnelle du systeme OMVS rapport final. 2008
4. OMVS, 2011: Étude d'actualisation de la monographie du fleuve Sénégal et d'évaluation des inondations dans le bassin du fleuve Sénégal, Rapport d'orientation, version définitive
5. OMVS, 2011: Étude d'actualisation de la monographie du fleuve Sénégal et d'évaluation des inondations dans le bassin du fleuve Sénégal, Première partie: Monographie du fleuve Sénégal, Rapport d'étape
6. OMVS, 2013: XVème Conférence des Chefs d'État et de Gouvernement
7. OMVS, Actualisation des instruments de sauvegarde
8. OMVS, Évaluation Régionale Stratégique (RES) des options de développement hydroélectrique et des ressources en eau dans le basin du fleuve Sénégal
9. OMVS, PGIRE, 2006: Plan de gestion des pestes et des pesticides
10. OMVS, PGIRE, 2007-2009, Janvier-Juin 2010, Juillet-Décembre 2010, 2012, 2013: Rapports d'avancement des activités du PGIIRE
11. OMVS, PGIRE, 2012: Élaboration de la nomenclature des seuils d'autorisation et de déclarations de prélèvements d'eau du fleuve Sénégal
12. OMVS, PGIRE, 2013: Actualisation du Instruments de Sauvegarde Phase 2 du Programme (PGIRE, FEM, TF) actualisation de l'étude d'impact environnemental et social (EIES) Résumé non technique/ executive summary
13. OMVS, PGIRE, 2013: Actualisation du plan de gestion Des pestes et des pesticides (PGPP) resume executif/ executive summary, Mbaye Mbengue FAYE Consultant en Evaluation Environnementale et Sociale
14. OMVS, PGIRE, 2013: Phase 2 du Programme (PGIRE, FEM, TF) Resumé non technique/ executive summary. Bah Ould Sid'Ahmed, Environnementaliste
15. OMVS, PGIRE, Projet de Gestion Intégrée des Ressources en Eau et de Développement des Usages Multiples du Bassin du fleuve Sénégal, actualisation de l'étude d'impact Environnemental et social (EIES)
16. OMVS, PGIRE. Etudes socioéconomiques de base. Rapport de synthèse, MCG Rapport définitif 1
17. OMVS. Étude d'impact environnemental (EIE), Cadre de politique de réinstallation des Populations (CPRP), Plan de gestion des Pestes et pesticides (PGPP) pour les différentes activités du projet
18. OMVS. PGIRE, 2009: Étude sur évaluation des Cellules nationales OMVS, Revue des rôles, responsabilités et composition



19. Project Information Document (PID) Concept Stage Report No.: PIDC736
20. République du Mali, Présidence de la République, 2010: Loi No 10-012 du 20 mai 2010 Portant création de l'Agence de Développement Rural de la Vallée du Fleuve Sénégal (ADRS)
21. World Bank, Learning Review of Regional Projects. Summary Assessment Sheet
22. World Bank, OMVS, PGIRE, 2010: Mission de Revue à Mi-parcours
23. World Bank, 2006: Project Appraisal Document on Three Proposed Credits in the Amount of SDR 21 Million (US\$30.08 Million Equivalent) to the Republic of Mali SDR 22.2 Million (US\$31.78 Million Equivalent) to the Islamic Republic of Mauritania, SDR 21 Million (US\$30.08 Million Equivalent) to the Republic of Senegal, in the Amount of SDR 12.60 Million (US\$18.04 Million equivalent) to the Republic of Guinea for a Senegal River Basin in Support of the First Phase of The Senegal River Basin Multi-Purpose Water Resources Development Program
24. World Bank, 2010: Restructuring Paper on a Proposed Project Restructuring of Senegal River Basin Multi-Purpose Water Resources Development Project Three Proposed Credits in the Amount of SDR 64,200,000 (US\$91.959M Equivalent) to Mali, Mauritania, Senegal and one Grant in the Amount of SDR 12,600,000 (US\$18.043M Equivalent) to Guinea
25. World Bank, Nov-2006, May-2007, May-2008, Aug-2008, Dec-2008, May-2008, May-2009, Nov-2009, Aug-2010, Apr-2011, Jun-2011, Feb-2012, Jul-2012, Mar-2013: Implementation Status and Results
26. World Bank, OMVS, PGIRE, 2012: Missions d'appui à la mise en œuvre: Mission d'identification de la deuxième phase
27. World Bank, Implementation Completion and Results Report Guidelines, OPCS, 2006, last updated on: 10/05/2011
28. World Bank, OMVS, PGIRE, 2005: Missions d'appui à la mise en œuvre: Mission de Pré-évaluation
29. World Bank, OMVS, PGIRE, 2012: Missions d'appui à la mise en œuvre : Mission d'identification des activités du volet santé
30. World Bank, OMVS, PGIRE, 2013: Mission de pré-évaluation de la deuxième phase
31. World Bank, OMVS, PGIRE, September 2004, December 2008, Avril 2009, Decembre 2009 April 2010, June 2010, February 2011, June, 2011, December 2011, June 2012, November 2012, January 2013: Missions d'appui à la mise en œuvre



### SENEGAL RIVER BASIN

- INFRASTRUCTURE:**
- EXISTING RAILROAD WITH FREQUENT OUTBREAK
  - MAIN ROADS
  - PROJECTED ROADS
  - POWER TRANSMISSION LINES
  - EXISTING WATER PIPELINES
  - WATER PIPELINE UNDER CONSTRUCTION
  - PLANNED WATER PIPELINE (NOUAKCHOTT WATER SUPPLY)
  - WATER RESERVOIR
  - TREATMENT PLANT
  - EXISTING DAMS
  - IDENTIFIED DAM SITES (SEE LIST\*)
  - AIRPORTS
  - MAIN PORTS
  - NAVIGABLE WAY

- HUMAN DYNAMICS:**
- POPULATION
- > 1,000,000 INHABITANTS
  - > 500,000 INHABITANTS
  - > 100,000 INHABITANTS
  - > 50,000 INHABITANTS
  - > 20,000 INHABITANTS
  - > 5,000 INHABITANTS
- MIGRATION FLOWS
- PREVALENCE IF WATERBORNE DISEASES
- ENDEMIC WATERBORNE AREAS WITH SERIOUS WATER QUALITY ISSUES

- ENVIRONMENTAL ISSUES:**
- DRYLAND AREAS
  - AREAS SUBJECT TO HIGH EROSION
  - PROTECTED AREAS WITH BIODIVERSITY RESOURCES (NATIONAL PARKS, GAME RESERVES,...)
  - WETLANDS
  - AREAS OF FLOOD EROSION AGRICULTURE
  - AREAS OF BIG IRRIGATION SCHEMES
  - AREAS OF POTENTIAL SILTATION

- GEOGRAPHY:**
- BASIN BOUNDARY
  - BASIN SUB-DIVISIONS
  - STREAMS
  - SEASONAL STREAMS
  - LAKES AND RESERVOIRS
  - NATIONAL CAPITALS
  - INTERNATIONAL BOUNDARIES

**\* DAM SITES:**

1 BALASA	10 TOUGUE
2 NIAGARA	11 SAMENTA
3 KOUKOUTAMBA	12 KOLE
4 DIAOYA	13 FAGAN
5 BOUREYA	14 FADOUGOU
6 TENE I	15 GALOUGO
7 TENE II	16 GOURBASI
8 GAYA	17 GOUINA
9 SALOUMA	18 FELOU

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