

20 July 2018

Prepared by: RDGS/PGCL

Original: English

**BOARD APPROVAL**  
Lapse-of-time Procedure

20 July 2018

**FOR INFORMATION**

**MEMORANDUM**

**TO : THE BOARD OF DIRECTORS**

**FROM : Vincent O. NMEHIELLE**  
Secretary General

**SUBJECT : MOZAMBIQUE: MASSINGIR DAM EMERGENCY REHABILITATION**  
**PROJECT SUPPLEMENTARY LOAN II (MDERP-SLII) \***

**ADF GRANT OF UA 4.94 MILLION**

The above-mentioned **Grant proposal** together with the amended draft **Resolution** were submitted for your **consideration on a Lapse-of-time Basis** on 6 July 2018.

**Since no objection was recorded by 5:00 pm on 20 July 2018**, the said grant proposal is considered as approved and the amended Resolution adopted.

**Attach:**

**Cc : The President**

**\* Questions on this document should be referred to:**

Mrs. J. NGURE	Deputy Director General	RDGS	Extension 8501
Mr. M. FREGENE	Director	AHAI	Extension 5586
Mr. G. PENN	Ag. General Counsel	PGCL	Extension 3220
Mrs. A.M. MECCA	Division Manager	PGCL.1	Extension 3309
Mr. P. TOIGO	Country Manager	COMZ	Extension 1299
Mr. J. COOMPSON	Officer-in-Charge	RDGS.2	Extension 8415
Mr. Y. SILUNGWE	Team Leader	RDGS.2	Extension 1744

# AFRICAN DEVELOPMENT BANK



## MASSINGIR DAM EMERGENCY REHABILITATION PROJECT SUPPLEMENTARY LOAN II (MDERP-SLII)

**COUNTRY: MOZAMBIQUE**

### APPRAISAL REPORT

July 2018

Task Team	Team Leader: Yappy Silungwe, Senior Irrigation Engineer, RDGS.2 Team Members: Cesar Tique, Agriculture and Rural Development Specialist, COMZ/RDGS.2 Vinda Kisyombe, Agricultural Economist, COMW/RDGS.2 Mohammed Abdullahi, Senior Procurement Officer, RDGS.3 Maurice Wanyama, Senior Financial Mgt Specialist, RDGS.3 Linet Miriti, Principal Gender Specialist, RDGS.2 Annah Muja, Social Development Officer, RDGS.3
	Sector Manager: Mr. Joseph Coompson, OIC, RDGS.2 Country Manager: Mr. Pietro Toigo, COMZ Sector Director: Mr. Martin Fregene, AHAI.0 Director General: Ms. Josephine Ngure, OIC/DDG, RDGS.0
Peer Reviewers	Mr. James Opio-Omoding, Chief Agricultural Economist, ECNR.0. Ms. Yolanda Arcelina, Social Sector Specialist, COMZ Mr. Benson Nkhoma, Country Programme Officer, RDGS.0

# **AFRICAN DEVELOPMENT BANK**



## **MOZAMBIQUE**

### **MASSINGIR DAM EMERGENCY REHABILITATION PROJECT SUPPLEMENTARY LOAN II (MDERP-SLII)**

#### **APPRAISAL REPORT**

**RDGS/PGCL DEPARTMENTS**

July 2018

Public Disclosure Authorized

Public Disclosure Authorized

## TABLE OF CONTENTS

	<u>Page</u>
Currency Equivalents, Fiscal Year, Weights and Measures, Acronyms	i
Loan Information	iii
Project Summary	iv
Results Based Logical Framework (Project Matrix) ( <i>initial project</i> )	vi
Results Based Logical Framework (Project Matrix) – MDERP-SLII ( <i>new project</i> )	vii
I. INTRODUCTION AND LINKAGE OF PREVIOUS PROJECTS/LOANS	1
II. THE INITIAL PROJECT (MDERP AND MDERP-SL)	2
2.1 Project Objectives and Components	2
2.2 Project Costs and Financing Conditions	3
2.3 Legal Instruments and Authority	4
2.4 Implementation Status of the Initial Project	4
III. APPRAISAL OF THE SECOND SUPPLEMENTARY LOAN	6
3.1 Rationale for the Second Supplementary Loan (MDERP-SL-II)	6
3.2 Objectives and Description of the Supplementary Loan (MDERP-SLII)	8
3.3 Project Cost and Financing Arrangements (MDERP-SLII)	8
3.4 Project's Target Area and Population	10
3.5 Revised Implementation Schedule	10
3.6 Environmental and Social Impact Assessment	11
3.7 Implementation Arrangements	11
3.8 Financial Management and Disbursement Arrangements	12
3.9 Procurement Arrangement	12
3.10 Sustainability	12
IV. BANK POLICY AND STRATEGIC CONTEXT	12
V. TECHNICAL AND ECONOMIC JUSTIFICATION	14
5.1 Technical Justification ( <i>for initial project</i> )	14
5.2 Financial and Economic Revaluation ( <i>for initial project</i> )	15
VI. LEGAL INSTRUMENTS AND AUTHORITY (MDERP-SLII)	16
6.1 Legal Instruments	16
6.2 Conditions Associated with Bank's Intervention	16
6.3 Undertakings	16
6.4 Compliance with Bank Policies	16
VII. RECOMMENDATION	16
Appendix 1. Government's Official Request	I
Appendix 2. Massingir Dam – Previous Four Loans (Projects) Summary	IV
Appendix 3. Government's Request for Payment of Taxes	V
Appendix 4. Project's Detailed Cost Tables (DCTs)	VIII
Appendix 5. Map of Mozambique Showing the Project Area (Gaza Province)	XIV
Appendix 6. Compliance of the Supplementary Loan with Bank Policy	XV
Appendix 7. Financial and Economic Performance (Analyses)	XVI

*Volume II of II*

*Not Applicable (Similar to the initial Project – Massingir Dam Emergency Rehabilitation Project Supplementary Loan/MDERP SL). Additional information has been inserted in Appendices of this report.*

## **Currency Equivalents**

(April 2018)

1 UA	=	89.5850 MZN
1 USD	=	61.6187 MZN
1 UA	=	1.45386 USD

## **Fiscal Year**

1<sup>st</sup> January to 31<sup>st</sup> December

## **Weights and Measures**

1 metric tonne (t)	=	2,204 pounds (lbs)
1 metre (m)	=	3.28 feet (ft)
1 millimetre (mm)	=	0.03937 inch
1 kilometre (km)	=	0.62 mile
1 hectare (ha)	=	2.471 acres

## Acronyms and Abbreviations

AfDB/Bank	....	African Development Bank	GoM	....	Government of Mozambique
ADF	....	African Development Fund	HH	....	Household
ARA-Sul	....	<i>Administração Regional de Águas do Sul</i> (Southern Region Administration of Waters)	MDERP	....	Massingir Dam Emergency Rehabilitation Project
CPIA	....	Country Policy and Institutional Assessment	MDERP-SL	....	Massingir Dam Emergency Rehabilitation Project Supplementary Loan
CPPR	....	Country Portfolio Performance Review	MDERP-SLII	....	Massingir Dam Emergency Rehabilitation Project Supplementary Loan II
CSP	....	Country Strategy Paper	M&E	....	Monitoring and Evaluation
COMZ	....	Mozambique Country Office	MTR	....	Mid-Term Review
DNA	....	<i>Direcção Nacional da Águas</i> (National Directorate of Water)	O&M	....	Operation and Maintenance
EA	....	Executing Agency	PIMU	....	Project Implementation and Management Unit
EIRR	....	Economic Internal Rate of Return	PY	....	Project Year
ESMP	....	Environmental and Social Management Plan	UA	....	Unit of Account
FIRR	....	Financial Internal Rate of Return	USD	....	United States Dollars

## Grant Information

### Client's information

<b>BORROWER:</b>	Republic of Mozambique
<b>EXECUTING AGENCY:</b>	Ministry of Public Works, Housing and Water Resources
<b>IMPLEMENTING AGENCY:</b>	ARA-Sul ( <i>Administração Regional de Águas do Sul</i> - Regional Administration of Waters in the South)

### Financing plan

Source	Amount (UA)	%age	Instrument
ADF	4.94 million	100.0%	Grant
Government	0 (N/A)	0	N/A
<b>Total Cost</b>	<b>4.94 million</b>	<b>100.0%</b>	

### Important Financial Information

Grant Currency	UA
Grant Type	N/A
Interest Rate Spread	N/A
Commitment Charge/Fee	N/A.
Service Charge	N/A.
Tenor	N/A
Grace Period	N/A
FIRR, NPV (base case)	<i>Same as for initial project (18.77%; MZN 14,744.84 million)</i>
EIRR, NPV (base case)	<i>Same as for initial project (21.06%)</i>

### Timeframe - Main Milestones (expected)

Concept Note Approval (Director General)	May 2018
Board Approval	July 2018
Effectiveness	October, 2018
Completion	June, 2019
Last Disbursement	December, 2019
Last Repayment	N/A

## **PROJECT SUMMARY**

1. Mozambique, especially the Gaza Province, is vulnerable to changing climatic patterns, including extreme climatic events such as droughts and floods. For instance, during the extreme floods which occurred in Year 2000, 700 people lost their lives and about 250,000 were displaced. During 2013 rainy season, at least, 100 people were killed and 150,000 displaced in Gaza Province, with the Chokwe District among the worst affected by flooding in the Limpopo River Basin. Consequently, the rehabilitation works at the Massingir Dam has potential to enhance the dam's operational efficiency and largely contribute to reduced vulnerability to climate change through flood control and storage of sufficient water to be used during prolonged period of droughts. The water from the dam reservoir is supposed to be released through the main and auxiliary spillways, and also the bottom outlets for proper water management. Thus, the need to ensure all year round safety of Massingir Dam is of critical concern to the Government of Mozambique (GoM) in order to withstand and control the likely effects of floods, thereby, preventing great economic loss.

2. The initial Massingir Dam Emergency Rehabilitation Project (MDERP) was appraised in March 2009 as a response to an emergency when the Massingir Dam's bottom outlets collapsed resulting in the release of an uncontrollable outflow of water to downstream areas. The Government requested support from the Bank to address the situation and the Bank approved an emergency loan of UA 13.30 million in July 2009, against an estimated total cost for the repair of the bottom outlets of UA 21.44 million, with the understanding that GoM will meet the balance. The MDERP implementation commenced in 2010 with launching of the tender process for the rehabilitation of the bottom outlets, but the process proved unsuccessful as it resulted in extremely very high bids. The substantive bid exceeded the Project's available funds by about USD 37.00 million (UA 23.85 million). The cost increase was attributed to the sudden rise in the international steel prices, which represented the main component of the rehabilitation works, due to increase in demand, higher cost of raw material, improved activity in the automotive, appliance and other industrial activities. Prices had fallen by about 55% at the time of project appraisal in 2009 and swung back up at about the same rate by 2011. This, together with additional data on the extent of damage led the Engineers to revise the cost estimate for the rehabilitation of the bottom outlets upwards to USD 57.00 million (UA 36.75 million) in February 2012. In order to complement the financing resources from the Bank, GoM requested the Bank for a supplementary loan of UA 22.01 million in order to fill the financing gap and provide adequate resources for the rehabilitation of the bottom outlets, through Massingir Dam Emergency Rehabilitation Project Supplementary Loan (MDERP-SL), with Government cash contribution of UA 8.14 million. The MDERP-SL was approved in May 2013 and has two main components (i) Component A: Rehabilitation of the Massingir Dam Bottom Outlet, and (ii) Component B: Project Management. Unfortunately, due to financial problems which have been experienced by the Government during implementation of MDERP SL, the Government was unable to provide part of the required financial resources. This has resulted in an outstanding amount of about UA 4.94 million. In light of the foregoing and the high social and economic importance of Massingir Dam to Mozambique, it is recommended that a second Supplementary Loan (MDERP-SLII) of UA 4.94 million grant should be extended to the GoM, for smooth completion of the rehabilitation of the Massingir Dam bottom outlets.

3. Needs Assessment: Prior to initial rehabilitation of the Massingir Dam, the embankment used to be partially under distress hence the rehabilitation intervention came at a right time. The outcome of investigations and extensive structural analysis of the causes of failure revealed that the accident that occurred was due to combination of many factors, including high hydrostatic pressures generated in the bottom outlet that could not be restrained by the section where the accident occurred, inappropriate and leaking construction joints,



deficiency in design as well as inadequate reinforcement detailing. The completion of the rehabilitation works will prevent the risk of further damage to the bottom outlet thus avoiding the risk of loss of life as well as the ecological, environmental and economic implications to the national economy especially on employment, food security and livelihoods of the people who depend on the Massingir Dam. The need to ensure all year round safety of the Massingir Dam is of critical concern to the GoM as well as to be able to monitor and manage the likely effects of floods, thereby, preventing possible loss of life and economic properties. The Project, will therefore, address key priority challenge of GoM by providing guaranteed water supply for agricultural development in Gaza Province.

4. Bank's Added Value: The Project is of high economic importance to the Government. The implementation of this Project offers the opportunity to review, reinstate and improve the operational capabilities of the Massingir Dam by fixing some aspects of structural weakness of the bottom outlets, thereby, allowing the dam to operate at full potential. The Project will address the potential environmental and ecological problems that could arise as a result of the rehabilitation. The Bank already has experience in rehabilitation of the other aspects of the Massingir Dam using previous ADF loans and also rehabilitation and constructions of other dams in Africa. The Bank's investment would contribute to development of critical infrastructure, especially those that can stimulate pro-poor growth and economic development as per the GoM's poverty reduction agenda. Above that, investments already made by the Bank on the Massingir Dam could go to waste if there is no intervention to complete rehabilitation of the bottom outlets.

5. Knowledge Management: Based on the previous ADF loans/projects, the Massingir Dam rehabilitation projects have already introduced modern method of data collection and analysis (hydrological and dam instrumentation) to help predict flood events at the dam, thereby allowing advance measures to be put in place to minimize the effects of any unexpected floods. This has been achieved through installation of a state of the art early warning system using automated telemetric hydrological and meteorological monitoring network within operational flood management systems. The early warning of the expected floods and the advanced determination of expected water levels at the dam would secure its operation during a flood event by allowing Southern Region Administration of Waters (ARA-Sul) to launch its Emergency Preparedness Plan, consequently saving lives and property.

## RESULTS-BASED LOGICAL FRAMEWORK (PROJECT MATRIX) – MDERP AND MDERP SL (Initial Project)

Country and Project Name: Mozambique - Massingir Dam Emergency Rehabilitation Project – Supplementary Loan						
Purpose of the project: Ensure the urgent rehabilitation of the Massingir Dam bottom outlets so as to avoid serious future human and property risks.						
RESULTS CHAIN		PERFORMANCE INDICATORS			Means of Verification	RISKS / MITIGATION MEASURES
		Indicator (including CSI)	Baseline	Target		
IMPACT	Agricultural productivity is increased and food security ensured.	i) Growth rate of Agriculture's contribution to GDP;	5% (2009)	8% (2025)	a) Min. of Ag. Surveys.	
		ii) Proportion of the rural poor in Gaza Province below poverty line;	70% (2009)	55% (2025)	b) MPD Statistics	
OUTCOMES	1. Better safety for the downstream communities. 2. Increased agricultural productivity through efficient downstream irrigation.	1. Dam operation efficiency; 2. Irrigated area; 3. Productivity irrigated land; 4. Smallholders farmers' net income.	1. Min 1.5 Mm <sup>3</sup> / Max 2.0 Mm <sup>3</sup> (2009) 2. 19000 ha (2009) 3. 60% productive (2009) 4. USD 800 per annum (2009)	1. Full capacity 2,844 mill m <sup>3</sup> (2018) 2. 29000 ha fully developed (2025) 3. 100 % (2025) 4. USD 3200 per annum (2025)	-ARA-Sul statis. -B.line surveys -Impact Surveys -M&E Reports	<b>Risk</b> : Lack of Government Commitment  <b>Mitigation Measure</b> : Participative approach used in designing and processing this project
OUTPUTS	A: Rehabilitation of the Massingir Dam Bottom Outlet  - Repair of the Bottom Outlet conduits: - Rehabilitation of bottom Outlet Steel liner: - Rehabilitation and Refurbishment of the Bottom Outlet Hydro-mechanical Equipment:  B: Project Management - Consultancy Services for the Supervision of Engineering Works - Planning, management, coordination and implementation of project activities.	•Adherence to planned works schedule  •Dam operation efficiency;  •Number of additional hectares put under irrigated cultivation;  •Increased yield of the major crops grown on the irrigated fields as a result of water availability	•Zero (2009)  •55% (2009)  •Zero (2009)  •Zero (2009)	•Completed by 2018  •Full capacity by 2018  •10,000 ha developed by 2020  •40% increase in productivity by 2025	i) Consultants, Monthly/quarterly progress report, PIU reports ii) Dam operation records iii) Min. of Ag. Surveys. iv) MPD Statistics v) Xai-Xai district office statistics on irrigated area and land under cultivation	<b>Risks</b> /: Failure of the dame due to extreme events.  <b>Mitigation Measure</b> : The project includes the establishment of an early warning system that would trigger an advance warning and allow ARA-Sul engage its Emergency Preparedness Plan.  <b>Risks</b> : Instability in the PIU due to change of staff.  <b>Mitigation Measure</b> : International TAs will be recruited.  <b>Risks</b> : Delayed implementation and cost overruns: this would be mitigated through expedited  <b>Mitigation Measure</b> : procurement of the Bottom Outlets contract.
KEY ACTIVITIES	<u>Components</u> A: Rehabilitation of the Massingir Dam Bottom Outlet - Repair of the Bottom Outlet conduits - Rehabilitation of bottom Outlet Steel liner - Rehabilitation and Refurbishment of the Bottom Outlet Hydro-mechanical Equipment B: Project Management			INPUTS  A. UA 42.96 million  B. UA.0.49 million	Sources of financing (million UA/USD) ADF Initial Loan: UA 13.30 million (USD 20.42 million) ADF Sup. Loan: UA 22.01 million (USD 33.78 million) [UA 18.30 mill ADF 12 + UA 3.71 mill from cancelled projects] GOM: UA 8.14 million (USD 12.49 million) <b>Total: UA43.45 million (66.69 USD million)</b>	

## **RESULTS-BASED LOGICAL FRAMEWORK (PROJECT MATRIX) – MDERP SLII (New Project)**

<b>Country and Project Name:</b> Mozambique - Massingir Dam Emergency Rehabilitation Project Supplementary Loan II (MDERP SL II)						
<b>Purpose of the Project:</b> To ensure smooth rehabilitation of the Massingir Dam bottom outlets.						
RESULTS CHAIN		PERFORMANCE INDICATORS			MEANS OF VERIFICATION	RISKS/MITIGATION MEASURES
		INDICATOR (INCLUDING CSI)	BASELINE	TARGET		
IMPACT	1. Agricultural productivity is increased and food security ensured.	1.1 Growth rate of Agriculture’s contribution to GDP.	<u>2018</u> 1.1 5%	<u>By 2025</u> 1.1 8%	MPD Statistics Household survey.	
		1.2 Proportion of rural poor in Gaza Province below poverty line.	1.2 70%	1.2 55%		
OUTCOME	2. Improved Massingir Dam management.	2. Increase in Massingir Dam reservoir capacity.	<u>2018</u> 2. Reservoir full capacity 2.0 million cubic metres (m³).	<u>By 2021</u> 2. Reservoir full capacity 2.844 million cubic metres (m³).	Project reports.	<u>Assumptions:</u> Continued Government support to rehabilitation of Massingir Dam
OUTPUTS	3. Rehabilitation of Massingir Dam Bottom Outlets <i>(Note: indicators have been measured in percentage since the works are on-going)</i>	3.1.1 % of subsurface drains. 3.1.2 % of slab deck-structural concrete to upper part of the bottom outlets. 3.1.3 % of new crump gauge weir. 3.1.4 % of pedestrian bridges. 3.1.5 % of sundry steel works items.	<u>(May 2018)</u> 3.1.1 (0) 3.1.2 (0) 3.1.3 (0) 3.1.4 (0) 3.1.5 (0)	<u>(April 2019)</u> 3.1.1 (100) 3.1.2 (100) 3.1.3 (100) 3.1.4 (100) 3.1.5 (100)	Project Progress Reports.	<u>Risk #1:</u> Unwillingness of existing main contractor to carry out outstanding works after demobilisation.  <u>Mitigation #1:</u> Government and contractor to sign memorandum of understanding (MOU) for completion of outstanding works. If Contractor terminates the contract, then the Project will pay the arrears and the loan balance will be cancelled.
	3.1 Dam safety structures completed.	3.1.6 % repairs to the erosion of the embankment. 3.1.7 % of dam crest survey beacons and bench marks. 3.1.8 % of electrical pore pressure cells for existing vibrating wire piezometers. 3.1.9 % completion of meeting room and office. 3.1.10 % of fencing of the dam. 3.1.11 % of lighting of the dam crest. 3.1.12 % of works-supply of tools and equipment. 3.1.13 % of settlement of works-vat and other arrears. 3.1.14 % contractors P&G (for remobilisation).	3.1.6 (0) 3.1.7 (0) 3.1.8 (0) 3.1.9 (40) 3.1.10 (0) 3.1.11 (0). 3.1.12 (0) 3.1.13 (0) 3.1.14 (0)	3.1.6 (100) 3.1.7 (100) 3.1.8 (100) 3.1.9 (100) 3.1.10 (100) 3.1.11 (100) 3.1.12 (100) 3.1.13 (100) 3.1.14 (100)		
	3.2 Project management improved.	3.1.15 % of works-supervision/existing supervising firm. 3.2.1 % of project support services - existing PIMU staff.	3.1.15 (80) 3.2.1 (80)	3.1.15 (100) 3.2.1 (100)		
	<b>Components</b>				<b>Inputs</b>	
KEY ACTIVITIES	<b>Component 1: Rehabilitation of Massingir Dam Bottom Outlets, UA 4.94 million (100%).</b> Sub-component 1.1: Completion of Dam Safety Structures, UA 4.86 million (98.3%). Sub-component 1.2: Project Management, UA 0.08 million (1.7%).				<b>Project Cost: UA 4.94 million.</b> <b>ADF Grant:</b> UA 4.94 million (100%). <b>Government:</b> N/A. <b>Beneficiaries:</b> N/A.	

## **REPORT AND RECOMMENDATION OF THE MANAGEMENT OF THE ADF TO THE BOARD OF DIRECTORS ON A PROPOSED SECOND SUPPLEMENTARY LOAN FOR THE MOZAMBIQUE MASSINGIR DAM EMERGENCY REHABILITATION PROJECT II (MDERP-SLII)**

Management submits the following Report and Recommendation of an ADF Grant proposal of UA 4.94 million from the Bank resources to finance the Massingir Dam Emergency Rehabilitation Project Supplementary Loan II (MDERP-SLII) in Mozambique.

### **I INTRODUCTION AND LINKAGE OF PREVIOUS PROJECTS/LOANS**

1.1 The construction of Massingir Dam was initiated by the Government of Portugal in 1972 and was partially completed in 1977 after Mozambique became independent. However, the dam exhibited serious seepage problems at the toe of the right embankment. Consequently, the Government of Mozambique (GoM) requested for the Bank Group's financial assistance in 1986 to rehabilitate the Massingir Dam. This was followed by a Feasibility Study in 1992. An ADF loan (UA 55.00 million) for the Massingir Dam and Smallholder Agriculture Rehabilitation Project (MDSARP) was approved by the Board on 24<sup>th</sup> November 1993 for the rehabilitation of the Massingir Dam and also to support smallholder irrigation schemes downstream at Chokwe and Xai-Xai Districts. The MDSARP was completed and a Project Completion Report (PCR) was prepared in 2009. During implementation of MDSARP, a need was identified for construction of an auxiliary spillway at Massingir Dam in order to ensure dam safety, rehabilitation of gates and installation of pumps to prevent salt intrusion from high tides, and increase protection during floods. The Government submitted a request to the Bank and a supplementary loan of UA 17.00 million was approved on 2<sup>nd</sup> March 2007 for the Massingir Dam and Smallholder Agriculture Rehabilitation Project (MDSARP-SL). The MDSARP-SL was completed and a PCR was prepared in 2016.

1.2 On 22<sup>nd</sup> May 2008, before implementation of the MDSARP-SL could commence, the bottom outlets of the Massingir dam collapsed resulting in the release of an uncontrollable outflow of water to downstream areas. This event occurred as a result of the high hydraulic pressures generated on the dam embankment, when for the first time in the dams operation the water level in the reservoir had reached elevation 122.6 meters (about 90% of the design capacity). The collapse of the bottom outlets made it impossible to operate the dam and provide water downstream whenever the water level in the reservoir is below elevation of 115 meters (55% of the design capacity), which corresponds to the crest of main spillway. Besides this constraint, the collapse of the bottom outlets raised safety concerns, and also limited the dam flood control capabilities since vertical upstream gates used to stop the flow of water through the gates are not designed for partial opening.

1.3 As a result of the above-mentioned event, the GoM approached the Bank for an emergency loan of UA 13.30 million that was approved in July 2009, for the Massingir Dam Emergency Rehabilitation Project (MDERP). The MDERP's GoM cash-contribution was supposed to be UA 8.14 million. The MDERP is on-going with an ADF loan disbursement rate of 96.90%<sup>1</sup> and Government contribution of 32.13% (30<sup>th</sup> May 2018). However, based on the response from the civil works tender for the rehabilitation of the bottom outlets, the said amount was not adequate due to the price increase of international steel which represented the main component of the works. With respect to this, the GoM requested the Bank for additional UA 22.01 million shortfall through the Massingir Dam Emergency Rehabilitation Project Supplementary Loan (MDERP-

---

<sup>1</sup> The MDERP's PCR is under preparation and the report will be posted by October 2018.

SL), which was approved in May 2013. The MDERP-SL is on-going with a disbursement rate of 82.97% (30<sup>th</sup> May 2018). For MDERP, the GoM's contribution was supposed to cover 20% of Project contracts including VAT and taxes. However, due to financial problems, the GoM has not been able to provide part of the required resources which resulted in slow implementation of Project activities. Based on the request from the Government, the Bank agreed to cover 20% of GoM's contribution so as to accelerate implementation of civil works contract. Considering that the Bank was providing resources to cover GoM's contribution, it resulted in revision of Contractor's Bill of Quantities (BoQs) items by pending the activities which were deemed to be not very critical. As per Contractor's contract, there is need to fund all the agreed Bills of Quantities (BoQ) items, at a cost of UA 4.94 million, in order to avoid claim of loss of profit and other damages, by the Contractor.

1.4 Based on outstanding civil works issues, and in light of the crucial importance of Massingir Dam to Mozambique for crop production, flood control, safety concerns, and also the huge amounts already invested by the Bank on the rehabilitation of the dam (UA 123.34 million, thus ADF UA 107.31 million and GoM UA 16.03 million), the Government requested the Bank to consider a request for additional funding (UA 4.94 million) in order to cover the shortfall for the on-going civil works contract for rehabilitation of the bottom outlets. The GoM's official request for a second supplementary loan (Massingir Dam Emergency Rehabilitation Project Supplementary Loan/MDERP-SLII) is indicated in Appendix 1. It should be noted that the official request was included in the proposed Mozambique Agricultural Value Chain and Youth Empowerment Project. However, the Mozambique Country Team<sup>2</sup> recommended that 2 separate Projects should be appraised, one covering activities related to completion of rehabilitation works for Massingir Dam bottom outlets and another for the agricultural value chain project so as to better appreciate the outstanding issues, including (i) why the second supplementary loan should be considered by the Bank, and (ii) what has been put in place to ensure that this is the last time a supplementary loan should be considered for this project.

## **II THE INITIAL PROJECT (MDERP AND MDERP-SL)**

### **2.1 Project Objectives and Components**

2.1.1 The sector goal of the on-going MDERP and MDERP-SL is to contribute to increasing agricultural productivity to ensure food security. The Project objectives are to: (i) to ensure sustainability of the Massingir Dam by preventing its total collapse in the event of heavy downpour; and (ii) improve food production and the living standards of the target group through sustainable improvement of the operational efficiency of the Dam. This would facilitate the productive capacity of farmers both small and medium scale to produce major crops downstream in Chokwe and Xai-Xai Districts.

2.1.2 The on-going MDERP has 2 components (i) rehabilitation of Massingir dam bottom outlets, and (ii) project management. The Project is a response to an emergency situation which occurred on 22<sup>nd</sup> May 2008, in which the Massingir dam's bottom outlets collapsed resulting in the release of uncontrollable water to downstream areas. The MDERP-SL funds were meant to fill the financing gap in the rehabilitation of the dam's bottom outlet. Consequently, the Project has similar components, as for the initial main Project above, thus (i) rehabilitation of Massingir dam bottom outlets and (ii) project management. The first component includes Rehabilitation of the Massingir Dam Bottom Outlet (i) Repair of the Bottom Outlet conduits: The demolition of the concrete around (three sections of each conduit approximately 52 meters length) and

---

<sup>2</sup> Mozambique Country Team meeting of 23<sup>rd</sup> March 2018, which considered the Project Concept Note (PCN).

reconstruction, including steel lining; and Repairs of the entire length of the outlet conduits including joints and cracked concrete; (ii) Rehabilitation of bottom Outlet Steel liner: Installation into the conduits of new steel liners incased in concrete extending through the impervious zone about 183 metres; and Rehabilitation of the two conduits steel liners in the rectangular section close to the radial gates (including the repairs of the cracked concrete); (iii) Rehabilitation and Refurbishment of the Bottom Outlet Hydro-mechanical Equipment: Repair the radial gates including the alignment and reinforcements of the gates, replacement of hydraulic jacks and provision of hydraulic operating equipment; Refurbishment of the intake gate of the upper conduit; and Rehabilitation/replacement of downstream gate stoplogs; and (iv) Upgrade of the Early Warning System. The second component covers (i) Consultancy services for the supervision of engineering works; (ii) Planning, management, coordination and implementation of project activities, monitoring and evaluation and technical assistance; (iii) Management of all procurement activities; and (iv) Dam management.

2.1.3 The MDERP and MDERP-SL's basic data is indicated below:

Item Description	MDERP		MDERP-SL	
	ADF	Government	ADF	Government
Project ID/SAP Code	P-MZ-AAC-002	N/A	P-MZ-AAC-005	N/A
Approval Date	15.07.2009	N/A	22.05.2013	N/A
Signature Date	23.10.2009	N/A	28.05.2013	N/A
Effectiveness Date	12.02.2010	N/A	26.02.2014	N/A
Loan Number	2100150020395	N/A	2100150029094	N/A
Loan Amount (UA)	13,300,000	8,140,000	22,010,000	N/A

2.1.4 The main expected outcomes of the project are better operating conditions for the dam leading to increased safety of the downstream communities, as well as increased agricultural productivity through efficient downstream irrigation.

## 2.2 Project Costs and Financing Conditions (MDERP and MDERP-SL)

2.2.1 Project Costs: The total project cost including contingencies was estimated at UA 43.45 million, as tabulated below. The financing gap of UA 22.01 million is the one which was meant to be filled by the MDERP-SL.

Components	Total Cost (US\$ million )			Total Cost (UA million )		
	Initial	Revised	Gap	Initial	Revised	Gap
A. Rehabilitation of the Bottom Outlet	29.19	58.75	29.56	19.02	38.28	19.26
B. Project Management	0.74	0.73	0.00	0.48	0.48	0
<b>Base Cost</b>	<b>29.92</b>	<b>59.48</b>	<b>29.56</b>	<b>19.50</b>	<b>38.77</b>	<b>19.26</b>
Physical contingencies	2.02	4.58	2.56	1.32	2.99	1.67
Financial contingencies	0.97	2.62	1.65	0.63	1.71	1.08
<b>Total Project Cost</b>	<b>32.91</b>	<b>66.69</b>	<b>33.77</b>	<b>21.44</b>	<b>43.45</b>	<b>22.01</b>

2.2.2 Sources of Finance: In line with Bank guidelines, the Project activities were supposed to be financed from ADF loan of UA 13.30 million (MDERP) and ADF supplementary loan of UA 22.01 million (MDERP-SL). For the MDERP loan (UA 13.30 million), the Government was supposed to contribute about UA 8.14 million. Therefore, the revised Project financing plan was as tabulated below:

Financing Source	Amount (US\$ '000)			Amount (UA '000)			%
	Local	Foreign	Total	Local	Foreign	Total	
ADF Loan	4,766.24	15,645.20	20,411.44	3,105.43	10,193.57	13,299.00	31
Supplementary ADF Loan	8,655.39	25,125.78	33,781.17	5,639.39	16,370.61	22,010.00	51
The Government	3,886.42	8,606.94	12,493.35	2,532.18	5,607.82	8,140.00	19
<b>Total</b>	<b>17,308.04</b>	<b>49,377.92</b>	<b>66,685.96</b>	<b>11,276.99</b>	<b>32,172.01</b>	<b>43,449.00</b>	<b>100</b>

## 2.3 Legal Conditions and Authority (MDERP and MDERP-SL)

### 2.3.1 Legal instrument

The Project was then financed with an ADF loan of UA 22.01 million (granted to the Republic of Mozambique) and the standard ADF terms and conditions then prevailing applied.

### 2.3.2 Conditions associated with the Fund's intervention

#### A. Conditions Precedent to Entry into Force of the Loan Agreement

(i) Conditions precedent to entry into force of the Loan was the fulfillment by the Borrower of the conditions of section 12.01 of the General Conditions Applicable to Loan Agreements and Guarantee Agreements of the ADF.

#### B. Conditions Precedent to First Disbursement

(i) The first disbursement of the Loan was subject to the effectiveness of the Loan Agreement signed.

### 2.3.3 Compliance with Bank Policies

The Project is in consonance with all the relevant Bank's policies.

## 2.4 Implementation Status of the Initial Project (MDERP and MDERP-SL)

2.4.1 Status of Fulfillment of Loan Conditions: As previously indicated MDERP-SL<sup>3</sup> was approved on 22<sup>nd</sup> May 2013. The loan agreement was signed on 28<sup>th</sup> May 2013. The loan conditions were fulfilled and loan was declared effective on 26<sup>th</sup> February 2014.

2.4.2 Summary of Implementation Status: As at 30<sup>th</sup> May 2018, the overall Project physical implementation progress reached 95%, with Component 1 - Rehabilitation of Massingir Dam Bottom Outlets at 96.8%, and (ii) Component 2 - Project Management at 94.7%, with respect to extended implementation time which has elapsed.

2.4.3 Component 1 Rehabilitation of Massingir Dam Bottom Outlets: The bottom outlets consist of 2 horseshoe-shaped conduits and 1 hydro-power conduit. Each bottom outlet is equipped with an upstream emergency gate in the intake tower which is controlled by a hydraulically operated radial gate. Although the contract is referred to as rehabilitation of the "bottom outlets", it also includes (a) construction of new water supply and distribution network for the Massingir town, (b) rehabilitation of the access road to ARA-Sul residential complex, (c) building works (staff houses) in Massingir town, (d) the dam crest lighting, (e) rehabilitation and construction of drainage at the Dam toe, (f) installation of new instruments (relief wells, piezometers and benchmarks), and (g) fencing of the dam area.

<sup>3</sup> MDERP-SL ID/SAP code is P-MZ-AAC-005 with a loan number of 2100150029094 (UA 22.01 million).

2.4.4 The design and tender documents, for civil works (rehabilitation of the Massingir Dam bottom outlets), were completed and approved by the Bank in 2010, under the MDERP. However, the procurement process for selecting the Contractor was cancelled on 3<sup>rd</sup> February 2011 due to unrealistic and non-responsive technical and financial proposals submitted by the Bidders. After securing the MDERP-SL (UA 22.01 million), the Government relaunched the international competitive bid and successful Bidder was CMC Ravenna/CMC AA Joint Venture (CMC/CMCAA Joint Venture). The associated civil works contract was signed on 18<sup>th</sup> July 2014. The accepted contract amount is USD 50,998,586.23 (inclusive of unconditional discount USD 1,000,000). The Contractor mobilised to the site in October 2014.

2.4.5 The civil works are currently being carried out by the Contractor (CMC Ravenna/CMC AA Joint Venture). However, based on multi-disciplinary nature of the works, requiring specialised interventions, the Contractor has recruited the following sub-contractors: (i) ATB for fabrication and installation of steel liners and hydro-mechanical equipment; (ii) PROFURO for drilling & grouting and also domestic water supply; (iii) HYDRAFORM for the rehabilitation and construction of houses; (iv) SORADIO for electrical installations; and (v) SULBRITA for concrete works. The physical progress, for major items, is as follows: (a) rehabilitation of the bottom outlet (conduit) works is 98%; (b) construction of new domestic water supply and reticulation system for the Massingir town is 100%; (c) rehabilitation of the access road to ARA-Sul residential complex is 100%; (d) building works - staff houses is 100% but office block including conference room are 0% and 40% respectively, since they were shelved due to inadequate funds; (e) the dam crest lighting is 0%, and (f) dam fencing activities have not commenced (0%). The physical implementation progress is commendable considering numerous financial problems which were faced by the Contractor due to Government's inability to release counterpart funds (20% of contract amount). Despite good progress, it should be noted that, the outstanding/uncompleted works can overshadow excellent work which the Project has already implemented on site.

2.4.6 Under consultancy services, the Project recruited the Supervising Firm/Engineer (Aurecon Mozambique LDA, contract sum USD 2,109,890.76), whose contract was signed on 18<sup>th</sup> December 2014, and is currently supervising the civil works Contractor. The External Auditor (Ernst and Young, LDA) was recruited to carry out the audit for (i) MDERP, and (iii) MDERP-SL, at a contract sum of UA 39,800. There is no outstanding audit report. The Government has also implemented the recommendations of the previous audits.

2.4.7 Component 2 Project Management: In 1996, the National Directorate of Water Affairs (DNA), as the Executing Agency, appointed Southern Region Water Administration (ARA-Sul) as the Project Implementation and Management Unit (PIMU), responsible for project implementation and management. This implementation arrangement has continued throughout all 4 Projects of the Massingir dam. The core PIMU personnel include the Project Manager, Resident Dam Engineer, Procurement Specialist, and Financial Accountant. In addition, ARA-Sul seconded 3 civil servants (Mechanical Engineer, Civil Engineer and Environmental Specialist) as full-time counterpart staff to the PIMU. The PIMU has so far been effective in managing the Project activities. The Project Steering Committee (PSC) was already established.

2.4.8 Other Procurement and Financial Issues: All major procurement activities under the 2 initial projects have been carried out. Payments to both the Contractor and Supervising Firm have not been timely due to delays by the Government process. Above that, the Government has partially been releasing the counterpart funds, which created financial problem, in terms of



payments to the Contractor and Supervising Firm. In order not to delay Project implementation, the Bank agreed to cover the Government's contribution (20% of contract value). However, this was deemed as a short-term solution by the Contractor, who threatened to abandon the site since there might not be resources when the Bank disburses 100% of the loan. Considering that the Government has been facing problems in releasing counterpart contribution, the Bank advised the Government to source additional funds so that if the Bank's resources are exhausted (100%), the said counterpart funds should cover the approved payment certificates and invoices in order not to paralyze the Contractor's and also the Supervising Firm's cash flows.

**2.4.9 Disbursement:** As at 30<sup>th</sup> May 2018, the MDERP and MDERP-SL's disbursement status is indicated below:

Item Description	MDERP		MDERP-SL	
	ADF	Government	ADF	Government
Loan Amount (UA)	13,300,000.00	8,140,000	22,010,000.00	N/A
Latest Disbursement (Amount, UA)	12,887,279.11	2,615,761.82	18,262,041.62	N/A
Disbursement Rate (%)	96.90%	32.13%	82.97%	N/A
First Disbursement (Date)	20.04.2011	N/A	07.07.2015	N/A
Original Last Date of Disbursement	31.12.2011	N/A	30.06.2018	N/A
Revised Last Date of Disbursement	31.12.2018	N/A	31.12.2018	N/A

**2.4.10 Environmental and Social Issues:** Both the Contractor and ARA-Sul have full-time Environmental and Social (E&S) Experts on site who are handling environmental, social and health and safety issues and also prepare periodic reports on E&S performance. In general, the environmental mitigation measures which have been carried out by the Contractor are in line with the approved Environmental and Social Management Plan (ESMP) and these include (i) maintaining suitable health and safety measure on sight including provision of PPE, training and safety information plan for workers and site visitors, (ii) awareness activities on HIV/AIDS, malaria and tuberculosis among the workers on site, (iii) an emergency vehicle is on site, (iv) availing first aid facilities on site, (v) medical clinic on site, (vi) number of road signs to improve road safety are still in place, (vii) erosion control measure, and (viii) regular water quality testing to ensure that there is no water pollution downstream of the construction site. The Contractor is also implementing an acceptable waste management system, which is part of the ESMP. On social activities, the Project has provided domestic water supply including site office for service provider, and construction of the semi-detached/twin houses which have already been completed. The PIMU, with relevant Government Department, is in the process of preparing the (i) updating the ESMP for the Operation Phase (ESMP - OP) in accordance with the National Requirements, and (ii) Dam safety measures/plans.

### **III APPRAISAL OF THE SECOND SUPPLEMENTARY LOAN (MDERP-SL-II)**

#### **3.1 Rationale for the Second Supplementary Loan (MDERP-SL-II)**

**3.1.1** Prior to rehabilitation, the Massingir Dam's damaged bottom outlets constituted a very serious and imminent risk in case of an extreme flood event, which could eventually have led to a total collapse of the dam embankment with serious consequences to human lives and properties. As previously indicated, the GoM requested for MDERP and MDERP-SL from the Bank for the rehabilitation of the Massingir Dam bottom outlets. Unfortunately, due to financial problems

which the Government faced during Project implementation, GoM was not able to contribute 20% of the contract value which led to shelving of some activities which were listed in the signed contract (Bills of Quantities/BoQs) for the civil works contractor (CMC). Apart from the safety concerns of the Massingir Dam embankment, and also the contractor's possibility of suing the Government for loss of profit amongst other things, there is need for the Government to source additional funds for smooth completion of the civil works contract. The Massingir Dam Project is of high economic, environmental and social importance to the country and without the second supplementary loan (MDERP-SL-II) to bridge the shortfall, the Project cannot be fully implemented which will result in exposure of uncompleted structures in Massingir District.

3.1.2 Upon practical completion of rehabilitation activities, the Project will facilitate improvement of the livelihoods of about 2 million people in the lower Limpopo Region. Above that, in Gaza Province, smallholder farmers will have access to water throughout the year. This will facilitate farming activities, even during dry season, which will enable farmers to have better quality of life in terms of increased income, food security and nutrition, and contribution to local economic development. The Project will also enhance the safety of downstream communities from extreme flooding during the rainy season.

3.1.3 The Bank had been actively involved in the previous Massingir Dam Project since 1993 through approval of 4 ADF loans amounting to UA 107.31 million, as tabulated below. The details are in Appendix 2.

No	Project Name	Approval Date	Planned Amount (UA million)			Project Status (as at 30 <sup>th</sup> May 2018)
			ADF Loan	Govt. Cash Contribution	Total	
1	Massingir Dam and Smallholder Agriculture Rehabilitation Project (MDSARP)	24.11.1993	55.00	6.00	61.00	Completed (PCR Done)
2	Massingir Dam and Smallholder Agriculture Rehabilitation Project Supplementary Loan (MDSARP-SL)	02.03.2007	17.00	1.89	18.89	Completed (PCR Done)
3	Massingir Dam Emergency Rehabilitation Project (MDERP)	15.07.2009	13.30	8.14	21.44	On-going
4	Massingir Dam Emergency Rehabilitation Project Supplementary Loan (MDERP-SL)	22.05.2013	22.01	-	22.01	On-going
<b>Total</b>			<b>107.31</b>	<b>16.03</b>	<b>123.34</b>	

3.1.4 As indicated above, for MDERP and MDERP-SL, the Bank's 2 loans amount to UA 35.31 million whilst the Government cash contribution was supposed to be UA 8.14 million. As per Sub-section 2.4, the Bank has disbursed 96.90% of MDERP loan and 82.97% of MDERP-SL, whilst the Government cash contribution is 32.13%. Although the Government cash contribution is only UA 2.62 million (32.13%) of the MDERP loan (UA 8.14 million), it should be noted that the Government already contributed a total UA 7.89 million for the first 2 loans (MDSARP and MDSARP-SL), resulting in overall cash contribution of UA 10.51 million to the rehabilitation of Massingir dam for 3 previous projects. This shows that there is political will and high Government commitment towards the rehabilitation of the important Massingir dam.

3.1.5 Some notable benefits of previous Bank intervention, include stability of dam embankment, proper flood control, increased crop production, improved fisheries, and potable domestic water supply, adequate water for livestock and also wildlife (Limpopo National Park).

However, these benefits were disrupted, especially at Chokwe Irrigation Scheme, as a result of the failure of the bottom outlets which has now been partially rehabilitated. Flood control is particularly very important as Mozambique had witnessed considerable climate change with the resultant increases in floods and their frequencies. Moreover, with assistance from the Bank an auxiliary spillway was duly completed which would work well in conjunction with the bottom outlets to enhance the flood handling capabilities of the dam. Consequently, the important role of Massingir Dam in the mitigation of social and economic negative impacts of the floods in the Limpopo River Basin cannot be disregarded.

3.1.6 There is, therefore, a need for second supplementary loan II (MDERP-SLII) to (i) meet the shortfall in funding the MDERP and MDERP-SL rehabilitation activities so as to ensure stability and safety of the dam, (b) withstand and control the likely effects of floods, (iii) meet the water requirements of the downstream users, (iv) make best use of the investments already made, and (v) reduce the vulnerability of the downstream riparian users/communities.

3.1.7 As indicated under Section II above, the revised Project cost was UA 43.46 million. However, despite allocation of UA 22.01 million through MDERP-SL, the funds were not adequate since the Government did not adequately provide the counterpart funds resulting in a financing gap of UA 4.94 million, which the GoM wants the Bank to fill using the MDERP-SLII. When this MDERP SL-II is approved by the Board, the cumulative ADF loan amounts under Massingir Dam rehabilitation projects will be UA 112.25 million.

### 3.2 Objectives and Description of the Second Supplementary Loan (MDERP-SLII)

3.2.1 Project Goal and Objectives: The sector goal is to contribute to national objective of increasing agricultural productivity to ensure food security and nutrition. The Project goal is to ensure smooth rehabilitation of the Massingir Dam bottom outlets. The Project objectives are to (i) ensure sustainability and operational efficiency of Massingir Dam, and (ii) improve food production and the living standards of the people around and downstream of Massingir Dam.

3.2.2 Project Components: The supplementary loan consists of one component, namely Rehabilitation of the Massingir Dam Bottom Outlets with two (2) sub-components (i) Completion of Dam Safety Structures, and (ii) Project Management. The associated activities are summarised in Table 3.1. It should be noted that the listed activities are all “on-going” whose contracts were already awarded under the MDERP and MDERP-SL. Consequently, no quantities have been provided below since this second supplementary loan (MDERP SL-II) will only be used to fill financing gap of these on-going works and services and also cover arrears including taxes (VAT), as per works contract’s bills of quantities, and also service contracts.

Table 3.1: Summary of Project Components, Sub-components and Activities

No	Component Name	Cost (UA million)	Sub-Component Description, Costs (UA million) and % allocation
1	Rehabilitation of Massingir Dam Bottom Outlets	UA 4.94 (100%)	<u>Sub-component 1.1: Completion of Dam Safety Structures (UA 4.86 million, 98.3%)</u> <ul style="list-style-type: none"> <li>• Subsurface Drains.</li> <li>• Slab Deck-Structural Concrete to Upper Part.</li> <li>• New Crump Gauge Weir.</li> <li>• Pedestrian Bridges.</li> <li>• Sundry Steel Works Items.</li> <li>• Repairs to the Erosion of the Embankment.</li> <li>• Dam Crest Survey Beacons and Bench Marks.</li> <li>• Electrical Pore Pressure Cells for Vibrating Wire Piezometers.</li> <li>• Completion of Meeting Room and Office.</li> </ul>

No	Component Name	Cost (UA million)	Sub-Component Description, Costs (UA million) and % allocation
			<ul style="list-style-type: none"> <li>Fencing of the Dam.</li> <li>Lighting of the Dam Crest.</li> <li>Works-Supply of Tools and Equipment.</li> <li>Works-new VAT and Other Arrears (outstanding VAT arrears).</li> <li>Contractors P&amp;G (for remobilisation) &amp; Works-Supervision.</li> </ul> <u>Sub-component 1.2: Project Management (UA 0.08 million, 1.7%)</u> <ul style="list-style-type: none"> <li>Project Support Services - Existing PIMU Staff</li> <li>Financial Audit</li> </ul>
<b>Total</b>		<b>UA 4.94</b>	

### 3.3 Project Cost and Financing Arrangements (MDERP-SLII)

3.3.1 The Project cost, including physical and price contingencies, is UA 4.94 million (including taxes and duties) which will be solely financed by supplementary ADF Grant of USD 4.94 million (100.0%) covering all major outstanding Project activities including arrears on taxes, previous payment certificates and invoices. The Government requested the Bank to pay taxes within the framework of ADF 14 for the 2017 and 2018 new projects, as indicated in Appendix 3. Based on the Government tax request, the Bank has already considered the Government's request for the 2 Mozambique projects, namely (i) Support to Skills Development for Agriculture and Infrastructure Project (UNILÚRIO), and (ii) Drought Recovery and Climate Resilience Project (DRARP), with respect to the Bank's Policy on Expenditure Eligible for Bank Group Financing, March 2008. The physical contingencies ranged from 0% (salaries) to 10% (works) based on common technical practices. Summary of the Project costs by components, sources of financing, expenditure categories and schedule by component are presented in Tables 3.2 to 3.5 and the detailed cost tables are in Appendix 4.

3.3.2 There will be no Government contribution since the supplementary loan has been requested by Government to fill the financing gap of the on-going civil works and services contracts under the initial Projects (MDERP and MDERP-SL).

3.3.3 The Project has been designed based on the assumption that the same main civil works contractor (CMC) will still be party to the existing contract. If the contractor legally terminates the contract, then the Project will pay the VAT arrears (outstanding amount) and then the grant balance will be cancelled.

Table 3.2: Project Cost Estimates by Components (MZN and UA '000)

Component Name	(MZN '000)			(UA '000)			% Foreign Cost
	Local	Foreign	Total	Local	Foreign	Total	
1. Rehabilitation of Massingir Dam Bottom Outlets	111,903.2	294,829.8	406,733.0	1,249.1	3,291.1	4,540.2	72
<b>Total Base Costs</b>	<b>111,903.2</b>	<b>294,829.8</b>	<b>406,733.0</b>	<b>1,249.1</b>	<b>3,291.1</b>	<b>4,540.2</b>	<b>72</b>
Physical Contingencies	1,951.0	28,587.8	30,538.8	21.8	319.1	340.9	94
Price Contingencies	2,044.1	3,234.2	5,278.3	22.8	36.1	58.9	61
<b>Total Project Costs</b>	<b>115,898.3</b>	<b>326,651.8</b>	<b>442,550.1</b>	<b>1,293.7</b>	<b>3,646.3</b>	<b>4,940.0</b>	<b>74</b>

Table 3.3: Sources of Financing

Source of Financing	Total Amount (UA '000) and Percentage Contribution (%)							
	Foreign		Local		Taxes		Total	
	Amount	%	Amount	%	Amount	%	Amount	%
ADF Grant	3,646.3	100.0	969.2	100.0	324.5	100.0	4,940.0	100.0
<b>Total</b>	<b>3,646.3</b>	<b>73.8</b>	<b>969.2</b>	<b>19.6</b>	<b>324.5</b>	<b>6.6</b>	<b>4,940.0</b>	<b>100.0</b>

Table 3.4a: Project Cost by Categories of Expenditure (MZN '000 and UA '000)

Category of Expenditure	Total Amount (MZN '000)			Total Amount (UA '000)			% Foreign Exchange
	Foreign	Local	Total	Foreign	Local	Total	
<b>A. Investment Costs</b>							
<b>1. WORKS</b>							
Massingir Bottom Outlet Structures	276,925.9	85,126.4	362,052.3	3,091.2	950.2	4,041.4	76
<b>2. SERVICES</b>							
Financial Audit	763.6	0	763.6	8.5	0	8.5	100
Consultancy	12,160.3	0	12,160.3	135.7	0	135.7	100
Personnel PIMU Staff (Direct Payment)	4,980.0	0	4,980.0	55.6	0	55.6	100
<b>Subtotal</b>	<b>17,903.9</b>	<b>0</b>	<b>17,903.9</b>	<b>199.9</b>	<b>0</b>	<b>199.9</b>	<b>100</b>
3. Duties & Taxes	0	26,776.8	26,776.8	0	298.9	298.9	0
<b>Total Investment Costs</b>	<b>294,829.8</b>	<b>111,903.2</b>	<b>406,733.0</b>	<b>3,291.1</b>	<b>1,249.1</b>	<b>4,540.2</b>	<b>72</b>
<b>Total Base Costs</b>	<b>294,829.8</b>	<b>111,903.2</b>	<b>406,733.0</b>	<b>3,291.1</b>	<b>1,249.1</b>	<b>4,540.2</b>	<b>72</b>
Physical Contingencies	28,587.8	1,951.0	30,538.8	319.1	21.8	340.9	94
Price Contingencies	3,234.2	2,044.1	5,278.3	36.1	22.8	58.9	61
<b>Total Project Costs</b>	<b>326,651.8</b>	<b>115,898.3</b>	<b>442,550.1</b>	<b>3,646.3</b>	<b>1,293.7</b>	<b>4,940.0</b>	<b>74</b>

Table 3.4b: ADF Grant's Category of Expenditure (UA)  
(For Grant Agreement and Disbursement Letter)

Category of Expenditure	Amount (UA)		
	Foreign Cost	Local Cost	Total
A. Works	3,434,400	1,250,300	<b>4,684,700</b>
B. Services	211,900	43,400	<b>255,300</b>
<b>Total Project Cost</b>	<b>3,646,300</b>	<b>1,293,700</b>	<b>4,940,000</b>

Table 3.5: Expenditure Schedule by Components (UA '000)

Component Description	Amount (UA '000)	
	PY1	Total
1. Rehabilitation of Massingir Dam Bottom Outlets	4,540.2	<b>4,540.2</b>
<b>Total Base Costs</b>	<b>4,540.2</b>	<b>4,540.2</b>
Physical Contingencies	340.9	<b>340.9</b>
Price Contingencies	58.9	<b>58.9</b>
<b>Total Project Costs</b>	<b>4,940.0</b>	<b>4,940.0</b>








### 3.4 Project's Target Area and Population

The Massingir Dam is located in Massingir Districts in Gaza Province (refer to Appendix 5). The Gaza Province has a total population of 1.6 million people out of which 56% are women. Gaza Province has a population of 1.6 million inhabitants of which 56% are women. The Province also

has the highest proportion of households headed by women. The local economy has a dominant role of women in agriculture and in the semi-formal and informal sectors. Poverty affects 60% of the population, yet the Province is characterized by comparatively good social indicators in terms of education and health with the exception of HIV/AIDS. This pandemic continues to pose a severe development challenge with rate as much as 25.1% in women. The indicators rates based on food consumption poses also a concern meaning that people in the region have not been able to transform the favorable conditions of education and health into increases in income and consumption patterns. Direct risk of food insecurity derives also from decreased production of some crops due to natural disasters.

### 3.5 Revised Implementation Schedule

The planned Project activities will be implemented within one calendar year since funds are meant to fill the financing gap on the on-going activities, under MDERP and MDERP-SL.

No	Description of Activities	2018				2019			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
0.0	Loan Signature and Ratification/Effectiveness		Govt						
1.0	Component 1: Rehabilitation of Massingir Dam Bottom Outlets								
1.1	Completion of Dam Safety Structures								
1.2	Project Management								
	Project Implementation								
	Final Financial Audit								
	Project Completion Report (PCR)								

### 3.6 Environmental and Social Impact Assessment

3.6.1 The original Project was classified as Environmental Category II according to the Bank Environmental and Social Assessment Procedures (ESAP 2001). Potential environmental impacts are localized and the proposed on-going interventions do not generate a new set of activities that are outside the scope of the earlier rehabilitation works that were planned under the original MDERP. The MDERP interventions seek to support repairs of the bottom outlet structure of the Massingir Dam to ensure the safety and operational efficiency of the dam. Potential environmental impacts of the project are site specific and minor and, thus are mitigated during the project implementation through the same environmental and social management plan (ESMP) which provides concise framework spelling out procedures and measures to avoid, minimize or mitigate any likely negative impacts during the construction and operational phases of the project. The MDERP ESMP is already posted on the Bank web site.

3.6.2 Mozambique is vulnerable to changing climatic patterns, including extreme climatic events such as droughts and floods. For example, during the 2000 floods, 700 people lost their lives and about 250,000 were displaced. During 2013 rainy season at least 100 people were killed and 150,000 displaced in Gaza Province, with the Chokwe District among the worst affected by flooding in the Limpopo River Basin. The rehabilitation works at the Massingir Dam has potential to enhance the dam operational efficiency and largely contribute to reduced vulnerability to climate change through flood controls and storage of sufficient water to be used during prolonged period of droughts and reduce sea water intrusion.

3.6.3 The on-going rehabilitation of the Massingir Dam guarantees increased production of the food and cash crops leading to more marketable surplus of these produce that will keep the women and youth marketers in business. The rehabilitation of the Massingir Dam aims to increase its operational efficiency which will support income generating activities and thereby likely to increase the socio-economic well-being of the women and youth who are actively involved in agricultural activities, improve food security and nutrition. In addition, during construction, the existing contractor's work force has largely consisted locally recruited personnel, which has enhanced economic opportunities for the local population belonging to working age group. The Project has also helped to alleviate the threat of internal displacement of well over one million people who would be affected should the Massingir Dam fail/collapse if the planned rehabilitation intervention is not smoothly completed.

### **3.7 Implementation Arrangements**

Based on the current arrangement, in line with the original 1996 agreement between the Bank and Government of Mozambique, the Executing Agency (EA) will still be National Directorate of Water (DNA) and implementation agency will still be ARA-Sul (*Administracao Regional de Aguas do Sul/Regional Administration of Waters in the South*). The existing ARA-Sul's Project Implementation and Management Unit (PIMU) will continue to manage MDERP, MDERP-SL and also MDERP-SLII. Based on this, MDERP-SLII will be implemented using the existing structures. The existing core PIMU staff consist of Project Manager, Resident Engineer, Procurement Specialist and Financial Accountant. Considering that the existing PIMU staff were recruited competitively, the proposed Project (MDERP-SLII) will retain the same PIMU staff to avoid negative impacts on implementation due to management disruption. Assuming that any PIMU staff member decides to resign, no new staff will be recruited, and associated activities will be carried out by one of the 3 ARA-Sul technical staff, who were seconded to the Project as full time counterpart staff. In case of resignation of Financial Accountant, then the ARA-Sul/Ministry's Accountant will take over the remaining activities. The existing Project Steering Committee (PSC) will continue to monitor the activities of MDERP-SLII.

### **3.8 Financial Management and Disbursement Arrangements**

A financial management review of ARA-Sul was carried out by the Bank and found to be adequate based on the current experience in implementing ongoing Bank-funded projects MDERP and MDERP-SL. The existing Financial Accountant will continue to be responsible for financial management and strengthening of the internal control system. The existing Audit Firm (Ernst and Young, LDA) will continue to audit the MDERP-SLII together with MDERP and MDERP-SL. The disbursement of the second supplementary loan (MDERP-SLII) will be made using Direct Payment Method in the line with the Bank's rules and procedures, covering on-going works and services contracts including PIMU staff salaries. Consequently, there will be no need to open a Special Account.

### **3.9 Procurement of Arrangements**

Procurement of works, goods and services for the Massingir Dam were already carried out under MDERP and MDERP-SL and some works and services contracts are on-going. As indicated above, the MDERP-SLII funds will be used to fill the financing gap of the on-going works and services contracts. Consequently, there will be no procurement under the proposed Project (MDERP-SLII). The outstanding activities are indicated in Table 3.1, above. In order to ensure uninterrupted delivery of the outstanding works, the Supervising Firm and the Government (ARA-Sul) will facilitate coordination between the main contractor and the various sub-contractors within the confines of the respective contracts.

### **3.10 Sustainability**

3.10.1 The securing of the "financing gap" through the provision of an ADF second supplementary loan (MDERP-SLII) will help to ensure smooth rehabilitation of the Massingir Dam bottom outlets. The current water resources management approach in Mozambique based on public-private partnership with risk sharing will help to increase the rate of return and sustainability of these infrastructures. This has already been exercised on the domestic water supply to Massingir town. Users of the various services and facilities have to pay fees/charges, which should cover part of the recurrent costs. Commercial and contract farming will result in the economic growth of the Gaza Province and the country, thereby stimulating the national private sector, which will increase the incomes generated, added value and the State tax base that will be used partly to sustain the efficient management of the dam in the long-run. The mini-hydropower station will provide additional financial resources which will assist to sustain the investments.

## **IV BANK POLICY AND STRATEGIC CONTEXT**

4.1 The Government approached the Bank to finance the Agricultural Value Chain and Youth Empowerment Project which is an investment in integrated agricultural development in the Lower (Baixo) Limpopo and Incomati Regions with focus on finalizing ongoing physical investment in irrigation and flood/drought control infrastructure including Massingir Dam, and also agricultural development for increasing agricultural productivity and producers' access to markets. The project was designed to support to small and medium sized farmers, with a particular focus on women and youth, to provide them with access to inputs, marketing services and support to building agri-business produce along the Limpopo and Incomati Valley. However, during the Mozambique Country Team meeting to discuss the Project Concept Note (PCN), it was agreed that the project should be split into 2 namely (i) Agricultural Value Chain and Youth Empowerment Project, and (ii) Massingir Dam Emergency Rehabilitation Project Supplementary Loan II (MDERP-SLII). This appraisal report will cover only the MDERP-SLII. The completing the Massingir Dam is a top priority for the Government of Mozambique as a key catalyzer of agriculture in the Lower (Baixo) Limpopo basin. However, providing infrastructures is only one step towards a commercially viable and inclusive agricultural sector. The Lower Limpopo Valley, lying downstream from the dam site, is one of the Government's 6 Agricultural Growth Corridors for Development. The multipurpose character of the Massingir Dam, means that, as well as being a key component of Mozambique's effort to "Feed Africa", it can also contribute to the High-5 "Light up & Power Africa". The dam includes hydropower potential to generate 40 MW of electricity, which can only become viable with completion of the Massingir Dam's bottom outlets and thereby restoration of the operational condition of the dam. The Limpopo corridor has high potential to unlock the development of approximately 300,000 ha of arable land, out of which 90,000 ha is suitable for irrigation development. The target staple commodities prioritized in the Limpopo Development Corridor include rice, vegetables, livestock and poultry.

4.2 The initial supplementary loan/project (MDERP-SL) was in line with the first thematic area of the Bank's Country Strategy Paper (2011-2015) which aimed to "enhance private sector competitiveness through infrastructure development". The strategic thrust of the Bank's CSP on Mozambique was the promotion of SMEs and social inclusion, which the project was fully adopting in the component of farm diversification. The project was also aligned to Agricultural Sector Strategy (2010-2014) which focussed on infrastructure improvements and protection of natural resources. The project was meant to support the Government's efforts to rehabilitate the Massingir Dam, not only to protect the dam embankment and the population downstream, but also provide enough water for irrigation development and diversification of crop production, for food security and increased rural incomes.



4.3 The second supplementary loan (MDERP-SLII) proposal is in line with the Bank Group Policy and Procedures for Supplementary Financing<sup>4</sup>. The Mozambique draft Country Strategy Paper (CSP: 2017-2022) has 2 strategic pillars, namely Pillar 1 - Infrastructure (focusing on energy and transport) and Pillar 2 – Agriculture. The Project is aligned to strategic Pillar 2 of the CSP. The proposed Project will promote agricultural development in line with Feed Africa’s commodity value chain development and empowerment of youth and women in order to improve their livelihoods. The current Projects (MDERP and MDERP-SL) implementation rate, despite the prolonged delays, is projected to be satisfactory, based on the good progress of the on-going civil works contract for rehabilitation of the Massingir Dam bottom outlets. The proposed second supplementary loan will utilize financial resources allocated to Mozambique under ADF-14. The Project compliance with the policy requirements for supplementary loans is indicated in Appendix 6.

4.4 The MDERP-SLII investments will also complement previously Bank financed projects such as Massingir Dam Agriculture Rehabilitation and Emergency Projects, Baixo Limpopo and Climate Resilience Project (BLICRP), Sustainable Land and Water Management Project (SLWMP) and Drought Recovery and Agriculture Resilient Project (DRARP). The proposed Project is in line with the Government’s poverty reduction efforts through increased agricultural production and employment promotion in particular for youth and women. The Project is aligned to the Bank’s Ten Year Strategy (2013-2022) particularly in its operational focus areas (agriculture and infrastructure) and areas of special emphasis (agriculture and food security). The Project is expected to provide an enabling economic environment for private sector development and participation. The infrastructure component of the Project will focus on the completion of additional works necessary for smooth operation of Massingir Dam, in terms of flood control and also transforming the agriculture sector into wealth creation for the rural population including women and youth in the lower Limpopo region, including the Baixo Limpopo and Chokwe irrigation schemes. The Project, through flood control and water management, will also take into account issues of climate change and variability including their significant impacts on the agriculture sector.

4.5 The overall performance assessment of the Bank’s portfolio in Mozambique conducted in 2017 is 2.75. The portfolio is comprised of 17 public sector projects, 2 private sector projects and 1 multinational project. There are no projects at risk. Lessons learnt from the recent PCRs and the on-going Bank-funded projects, in Mozambique, which have informed the design of MDERP-SLII include the need to (a) improve the project design process with consideration to existing capacity within the country so as to ensure timely implementation, (b) ensure project readiness and quality at entry, (c) rationalise the number of conditions necessary to declare the ADF Grant effective in order to minimise implementation and disbursement delays, (d) increase capacity of implementing agencies especially in project management, and (e) enhance the supervision of projects, particularly monitoring and evaluation to minimize implementation delays. For the closed Projects, in the last 5 years, the PCRs are up to date with all the reports prepared and posted on the Bank website.

4.6 The GoM has been making efforts to transform the agriculture sector which culminated in the preparation of the National Investment Plan for the Agrarian Sector (PNISA: 2014-2018). Through PNISA, the Government identified 6 Agricultural Growth Corridors for Development to promote agricultural development: (i) Pemba-Lichinga corridor that is suitable for the production of potatoes, wheat, beans, maize, soybeans, cotton, tobacco and poultry; (ii) Nacala corridor with potential to grow cassava, maize, cotton, fruits, poultry and peanuts; (iii) Zambezi Valley corridor

---

<sup>4</sup> Ref no. ADF/BD/WP97/90 of 11<sup>th</sup> August 1997.

that can produce rice, maize, potatoes, livestock, poultry and cotton; (iv) Beira corridor for maize, wheat, vegetables, soybeans, rice, livestock and poultry; (v) Limpopo corridor for rice, vegetables, livestock and poultry; and (vi) Maputo corridor that would focus on rice, vegetables, livestock and poultry. While these corridors are not necessarily aligned to the transport corridors, some have achieved high level of development in terms of infrastructure, institutions and agricultural development while others have not commenced any form of development. The proposed Project falls under the Limpopo corridor. The Project is also aligned to the Government's Socio-Economic Plan (SEP: 2015-2019) which aims at reducing poverty and promote human well-being and economic development through rapid, inclusive and broad-based growth, in line with 3 objectives (i) increase of agricultural and fisheries production and productivity, (ii) employment promotion, and (iii) social and human development.

## **V TECHNICAL AND ECONOMIC JUSTIFICATION**

### **5.1 Technical Justification (*for initial project*)**

5.1.1 The Massingir dam was constructed in 1977. When the dam started filling up, there were serious infiltration through the foundation of the dam, and the risk of piping led to the decision to keep the maximum water level of the reservoir at 112 metres above the sea level (masl). To address this problem and for the completion of the dam, the Bank financed in 1993-2008 its rehabilitation. However, an accident occurred in May 2008 leading to the rupture of the bottom outlets. Based on this accident, the Massingir dam could not be properly and efficiently operated. The rehabilitation of the bottom outlet would allow operating the dam between the levels 95 masl and 125 masl, thereby increasing the design (available) storage capacity to be about 2.844 million m<sup>3</sup> that is four times more than the situation without the project.

5.1.2 The Massingir Dam was supposed to supply water for irrigation in the Lower Limpopo area (mainly Chokwe and Xai-Xai), both for the existing irrigation schemes and for expansions made possible in vast areas of very suitable agricultural land. As with any large dam, Massingir would allow also for other economic activities, particularly hydropower generation, flood mitigation, smallscale-piped community water supply system, water for livestock and wildlife, fisheries at the reservoir, ecological flows and tourism. In addition, the bottom outlet was also expected to allow contributing safely to the passage of the design flood. Rehabilitating the dam bottom outlet would allow an increase in irrigated land from 20,600 ha to more than 56,600 ha, and induce complementary developments like production of sugarcane/ethanol and creation of a mini hydropower-power station of 10-15 megawatts.

### **5.2 Financial and Economic Revaluation (*for initial project*)**

5.2.1 The Massingir Dam currently provides irrigation water for an estimated 8,000 farmers located downstream at Xai-Xai and another 8,000 at Chokwe. The dam, at full reservoir capacity, is capable of providing irrigation water for a total land area of 90 000ha. At present the Dam is facilitating irrigation of about 19,000 ha (consisting of 12,000 ha at Xai-Xai and 7,000 ha at Chokwe). An additional 10,000 ha (consisting 3,000 ha at Xai-Xai and 7,000 ha at Chokwe) which are currently being developed will be brought under cultivation through the safe operation of the dam for irrigation which is the major objective of this project. In addition the Dam provides employment opportunity to about 550 fishermen with an average annual catch of 3,350 tonnes. The rehabilitation of Massingir Dam will also facilitate the development of the Procana Sugar Irrigation scheme (a private sector initiative dependent on the efficient operation of the Dam) which will lead to the development of over 20,000 ha for sugar plantation and employment of about 1,000 people who will be directly engaged by the sugar plantation; encourage out-growers and the development of associated agro-allied industries.

5.2.2 The financial and economic reevaluation of the project is based on the assumptions that the Massingir Dam would now operate at optimal capacity, thereby yielding the following benefits: (i) irrigation of about 32,000 ha of sugar cane plantations on the basis of out-grower scheme benefitting farmers, private sector and the Government; (ii) irrigation of 3,500 ha of food crops including maize, potatoes, and vegetables; (iii) provision of 2,000 ha of suitable grazing land with water for livestock, especially cattle estimated at about 8,500 heads; (iv) artisanal fisheries development at the reservoir; (v) possible development of a hydropower-power station of 10-15 megawatts; and (vi) enabling ecological flows with minimum flow in the order of 10 m<sup>3</sup>/s, also to control salt water intrusion. Many other benefits may be considered, such as the ecological balance through climate regulation and improvement of the biodiversity.

5.2.3 The yield of sugarcane at Chokwe Irrigation Scheme was expected to increase from 70 T/ha in year 3 (Y3) to 110 T/ha starting Y5 over for 30 years. Although ethanol is one of the by-products of sugarcane, it was not considered in this model. The technical conversion factors from cane to sugar and molasses was 11.5% and 3.65%, respectively. Yields of maize and rice was expected to increase from 1.5 T/ha and 1.2 T/ha to 3.5 T/ha and 4.5 T/ha, respectively as result of the project for a period of 15 years and starting year 3. Sweet potatoes yield was also expected to increase from 8.5 T/ha without the project to 25 T/ha.

5.2.4 In this condition, the financial performance of the project was assessed on the basis of prevailing market prices, with a NPV, IRR and B/C ratio equal to MZN 14,744.84 million, 18.77% and 1.9, respectively, as indicated in Appendix 7.

5.2.5 The economic performance of the project was assessed on the basis of shadow prices (prices in condition of efficient market operation). The economic analysis was conducted on the basis of sugar, maize and rice are considered as tradable goods and their respective economic prices were estimated using border pricing methods, that is the export-parity price at farm gate (CIF at point of import to Farm gate) for sugar, and the import-parity prices at farm gate (FOB at point of export to farm gate) for maize and rice. In this model sugar and molasses are expected to be exported, while maize and rice are treated as import substitutes. Under these conditions, the project economic worth was recalculated with NPV, IRR and B/C ratio equal to MZN 18,001.24 million, 21.06% and 2.09, respectively, as captured in the technical annexes. It is worth noting that the earlier cost invested in the project is considered as sunk cost and was not included in the economic analysis of the project. Moreover, what is more important is the protection of the Massingir Dam embankment from total collapse, than the EIRR.

## **VI LEGAL INSTRUMENTS AND AUTHORITY**

### **6.1. Legal Instruments**

The project will be financed pursuant to an ADF grant agreement between the Borrower and the ADF.

### **6.2. Conditions Associated with the Fund's Intervention**

6.2.1 Conditions Precedent to Entry into Force of the ADF: The grant agreement shall enter into force on the date of signature by the Recipient and by the Fund.

6.2.2 Condition Precedent to First Disbursement: The obligations of the Bank to make the first disbursement of the Grant shall be conditional upon the entry into force of the Protocol of Agreement.

### **6.3. Undertakings**

The Borrower undertakes to continue implementing the Environmental and Social Management Plan (ESMP, *produced for the initial project-MDERP*), and report to the Bank on a quarterly basis, as part of the quarterly progress report.

### **6.4 Compliance with Bank Policies**

This project complies with all applicable Bank policies.

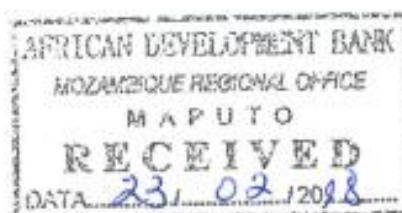
## **VII RECOMMENDATION**

Management recommends that the Boards of Directors approve the proposed second ADF Supplementary Grant of **UA 4.94 million** to the Republic of Mozambique for the purpose of implementing the Massingir Dam Emergency Rehabilitation Project and subject to the conditions stipulated in this report.



REPÚBLICA DE MOÇAMBIQUE  
**MINISTÉRIO DA ECONOMIA E FINANÇAS**  
GABINETE DO MINISTRO

**His Excellency**  
**Dr. Akinwumi A. Adesina,**  
**The President**  
**African Development Bank Group**  
**Abidjan – Côte d'Ivoire**



Nº **33** /GM/MEF/18  
Maputo, **22** February 2018

**Subject: LOWER LIMPOPO AGRICULTURAL VALUE CHAIN AND  
ENABLE YOUTH PROJECT- Proposal for Integrated  
Development of Lower Limpopo**

Your Excellency Dr. Adesina,

1. On behalf of the Government of Mozambique, I would like to express our sincere and profound gratitude to the African Development Bank (AfDB) for its continued cooperation and support to the socio-economic development of our country, through provision of technical and financial resources.
2. I also take this opportunity to reiterate that the Government of Mozambique is looking at the AfDB as the partner of choice in supporting the development of the agricultural sector. With large, transformational gas resources expected to come to production over the next five years or so, it is important that Mozambique invests in developing its agricultural base in order to diversify its economy and avoid excessive dependency on gas.
3. Increasing agricultural productivity, strengthening its resilience to climate shocks and building agriculture value chains are all areas where the Government of Mozambique is looking forward to working with the AfDB. In particular, I would like to highlight the importance of the proposed investment in integrated agricultural development in the Lower (Baixo) Limpopo region. The envisaged investment would have a component finalizing ongoing physical investment in

irrigation and flood/draught control infrastructure, and a second one leveraging that infrastructure to increase agricultural productivity and producers' access to markets.


4. The Massingir Dam is crucial to the Mozambican Government's efforts for climate change adaptation and transformation of the agriculture sector into wealth creation for the rural population. The dam controls a water flow of 20000m<sup>3</sup>/s along an affluent of the Limpopo river, with the potential to irrigate 90.000 hectares of land and significant input on food production and economic opportunities.
5. The multipurpose character of the Massingir Dam, means that, as well as being a key component of Mozambique's effort to "Feed Africa", it can also contribute to the High-5 "Light up & Power Africa". The dam includes hydropower potential to generate 40 MW of electricity, which can only become viable with completion of the Massingir Dam's bottom outlets and thereby restoration of the operational condition of the dam.
6. The completion of the Massingir Dam has been supported by the AfDB with a series of financing programs. While the Bank's lending has been performing well, with timely disbursement and no start up delays, completion of the dam has been hampered by recent fiscal tightening on the public budget, limiting the Government's ability to meet its commitment to contribute 20% of the cost of its each project, and by a catastrophic accident damaging the infrastructure as it was being rehabilitated.
7. Completing the Massingir Dam is a top priority for the Government of Mozambique as a key catalyzer of agriculture in the Lower (Baixo) Limpopo basin. However, as you know, providing infrastructures is only one step towards a commercially viable and inclusive agricultural sector. The Lower Limpopo Valley, lying downstream from the dam site, is one of the Government's 6 Agricultural Growth Corridors for Development. The Limpopo corridor has high potential to unlock the development of approximately 300,000 ha of arable land, out of which 90,000 ha is suitable for irrigation development. The target staple commodities prioritized in the Limpopo Development Corridor include rice, vegetables, livestock and poultry.
8. In order to tap into this potential, and fully leverage the benefits of the upstream Massingir Dam, the Government is seeking to complement the investment in infrastructure with a program of support to small and medium sized farmers, with a particular focus on women and youth, to provide them with access to inputs;



marketing services and support to building agri-business produce along the Lower Limpopo Valley.

9. The total amount of funding sought from the AfDB to finance this integrated agricultural development project in the Lower Limpopo area is of UAC 22.83 million. The proposed financing details are included in the Annex to this letter.
10. I would like to take this opportunity to share the Government commitment and trust in the African Development Bank as a partner of choice for continuous support to the socio-economic development of the country. We look forward to cooperate in future initiatives toward the implementation of the Bank's High 5's strategy for development of Africa.

Please, accept, Your Excellency, the assurances of my highest consideration.



**Adriano Afonso Maleiane**  
**Minister of Economy and Finance**

***C.C. H.E. Carlos Bonete Martinho, Minister of Public Works,  
Housing and Water Resources***

Appendix 2: Massingir Dam – Previous Four Loans/Projects’ Summary with History of Disbursement Deadlines (as at 30<sup>th</sup> May 2018)

No	SAP ID/Project Number	Project Name	Approval Date	Entry into Force	Loan Number	Amount (UA million)			ADF Loan - Disbursement Rate (%)	Government Cash Contribution (%)	Extension of Last Date of Disbursement (ADF Loan)						Project Status
						ADF Loan	Government Cash Contribution	Total			Original	First	Second	Third	Fourth	Fifth	
1	P-MZ-AA0-011	Massingir Dam and Smallholder Agriculture Rehabilitation Project	24.11.1993	30.05.1996	2100150000711	55.00	6.00	61.00	100.00	100.00	31.12.1998	30.04.2002	31.12.2005	31.12.2007	31.12.2008	30.03.2009	Completed (PCR Done)
2	P-MZ-AA0-026	Massingir Dam and Smallholder Agriculture Rehabilitation Project (Supplementary Loan)	02.03.2007	30.11.2007	2100150014043	17.00	1.89	18.89	100.00	100.00	31.12.2009	31.12.2011	31.12.2013	31.12.2014	30.06.2016		Completed (PCR Done)
3	P-MZ-AAC-002	Massingir Dam Emergency Rehabilitation Project	15.07.2009	12.02.2010	2100150020395	13.30	8.14	21.44	96.90	32.13	31.12.2011	31.12.2012	31.12.2014	31.12.2015	31.12.2017	31.12.2018	On-going
4	P-MZ-AAC-005	Massingir Dam Emergency Rehabilitation Project (Supplementary Loan)	22.05.2013	26.02.2014	2100150029094	22.01	-	22.01	82.97	N/A	30.06.2018	31.12.2018					On-going
Total						107.31	16.03	123.34									





REPUBLIC OF MOZAMBIQUE  
**MINISTRY OF ECONOMY AND FINANCE**  
NATIONAL DIRECTORATE OF TREASURY

**To:**  
**Dr Joseph Ribeiro**  
**Country Representative**  
**African Development Bank**  
**Maputo**

**No. /89 / DNT/GAB/ 17**  
**Maputo, 19 September 2017**

**Subject: Payment of taxes within the framework of ADF-14, for 2017 and 2018**

*With reference to the above mentioned subject, we hereby thank You for the meeting held with us on 6 September 2017, in order to review the portfolio of projects in accordance with the ADF-14, for 2017 and 2018.*

*In this context and since the country's current economic situation does not allow the Government to make a commitment related to VAT payment, I would like to take this opportunity to request Your Excellency, within your high discretionary power to consider and contribute to the financing of the 100% eligible projects.*

*Yours Truly,*

*(Illegible signature and stamp)*  
**Adriano Isaiás Ubisse**  
**National Director**

9

The undersigned, Eduardo da Costa José Viegas, translator, sworn in the Judicial Court of the City of Maputo, Licence No. 3/01 of 15/2/2001, I hereby declare that I translated the attached document, from Portuguese to English and the translation is correct and faithful to the original.

Maputo, 21 September 2017

Subscrevo-me, Eduardo da Costa José Viegas, tradutor oficial, ajuramentado no Tribunal Judicial da Cidade de Maputo, Licença nº 3/01 de 15/2/2001, declaro que o documento em anexo foi por mim traduzido de português para inglês e é uma tradução correcta e fiel à original.

Maputo, aos 21 de Setembro de 2017

EDUARDO JOSÉ VIEGAS  
TRADUTOR OFICIAL  
SWORN TRANSLATOR  
C. POSTAL 398 - TEL 21406689  
M A P U T O

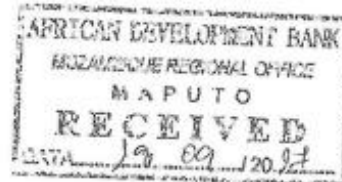
*Eduardo Viegas*

*Eduardo da Costa José Viegas*  
*Tradutor Oficial*  
*21-09-2017*  
*Maputo*  
*Reg. M.A.*



REPÚBLICA DE MOÇAMBIQUE  
**MINISTÉRIO DA ECONOMIA E FINANÇAS**  
DIRECÇÃO NACIONAL DO TESOURO

**Exmo Senhor**  
**Dr Joseph Ribeiro**  
**Representante Residente**  
**Banco Africano de Desenvolvimento**  
**Maputo**



Nº 189 /DNT/GAB/17  
Maputo, 19 Setembro de 2017

Assunto: **Pagamento de impostos no âmbito do ADF-14, para os anos 2017 e 2018**

*Relativamente ao assunto em epígrafe, serve a presente para agradecer o encontro mantido com V.Excia no dia 6 de Setembro de 2017, com o objectivo de passar em revista a carteira de projectos em alinhamento com o ADF-14, para os anos 2017 e 2018.*

*Neste contexto e uma vez que a situação económica actual do País não permite que o Governo assuma o compromisso quanto ao pagamento do IVA, gostaria de aproveitar a oportunidade para solicitar a V.Excia, dentro do seu alto poder discricionário para considerar e contribuir no financiamento dos projectos elegíveis a 100%.*

*Com os melhores cumprimentos,*

  
**Adriano Isaias Utsse**  
**Director Nacional**

#### Appendix 4a: Project's Details Cost Tables (DCTs)

1. Detailed Cost Tables (DCTs): The summary Project costs have been presented in sub-section 2.4, of this PAR. Consequently, this appendix provides the Detailed Cost Tables (DCTs) which have been aligned to the Project's sub-components for ease of implementation and also revision of List of Goods and Services (LOGS), when need arises. For instance, **"Detailed Cost Table #1"** reflects the costs for **Sub-component 1.1 "Completion of Dam Safety Structures"**, as per the Table-title. It should be noted that each DCT has been presented in two tables (that is, Detailed Cost Table #1a and Table #1b). The first one (Detailed Cost Table #1a) has MZN and UA costs including price contingencies, physical contingency rates, taxes and duties whilst the second one (Detailed Cost Table #1b) has MZN and UA costs including other accounts (disbursement account, financing rule, procurement account, and procurement method). **The Microsoft Excel File of the Detailed Cost Tables (DCTs) will be shared with the PIMU, during the Project implementation.** It should be noted that the unit costs are maximum limits/ceilings which are in the existing Contractor's signed contract (Bills of Quantities/BoQs). Consequently, it is expected that the Contractor will maintain the same costs. The DCT summary has been presented below and the details have been presented in the subsequent pages.

#### Summary of Details Cost Tables (DCTs)

Component and Sub-component Name	Cost (UA '000)	%age
Component 1 Rehabilitation of Massingir Dam Bottom Outlets		
Table 1. Completion of Dam Safety Structures	4,858.08	98.3
Table 2. Project Management	81.92	1.7
<b>Project Total</b>	<b>4,940.00</b>	<b>100</b>

2. Category of Expenditure Summary: Expenditure categories have been formulated based on the nature of expenditure that the Project is expected to incur over the period of the ADF Loan and provide a means to monitor and manage the expenditures. The summary of Categories of Expenditure have been tabulated below and will be reflected in the **"Grant/Legal Agreement (GA)"** and **"Disbursement Letter (DL)"**. In this case, all disbursements are supposed to be made within the limit of amounts allocated to each category. Grant proceeds may be used only for the purposes for which the grant was granted. The Bank, at the Government's request, may agree to reallocate contingency funds or uncommitted funds from other categories to another allowable category for the purposes of the implementation of Project activities. Proposed changes to the List of Goods and Services (LOGS) must receive prior written approval of the Bank (No Objection).

#### ADF Grant's Category of Expenditure Summary for LA and DL

Category of Expenditure	Amount (UA '000)		
	Foreign Cost	Local Cost	Total
A. Works	3,434.4	1,250.3	<b>4,684.7</b>
B. Services	211.9	43.4	<b>255.3</b>
<b>Total Project Cost</b>	<b>3,646.3</b>	<b>1,293.7</b>	<b>4,940.0</b>

Detailed Cost Table #1a:

## Sub-Component 1.1: Completion of Dam Safety Structures

Item Description	Unit	Quantities		Unit Cost (MZN '000)	Base Cost (UA '000)		Total Including Contingencies (UA '000)		Foreign Exchange	Local (Excl. Taxes)	Duties & Taxes	Total
		2018	Total		2018	Total	2018	Total				
<b>I. Investment Costs</b>												
<b>A. WORKS /a</b>												
<b>1. Dam Safety Structures and Instrumentation</b>												
Subsurface Drains /b	Lump Sum	1	1	520.00	5.8	5.8	6.4	6.4	6.1	-	0.4	6.4
Slab Deck-Structural Concrete to Upper Part /c	Lump Sum	1	1	90,560.00	1,010.9	1,010.9	1,031.1	1,031.1	-	969.2	61.9	1,031.1
New Crump Gauge Weir /d	Lump Sum	1	1	260.00	2.9	2.9	3.2	3.2	3.0	-	0.2	3.2
Pedestrian Bridges /e	Lump Sum	1	1	2,499.00	27.9	27.9	31.0	31.0	29.1	-	1.9	31.0
Sundry Steel Works Items /f	Lump Sum	1	1	2,670.00	29.8	29.8	33.1	33.1	31.1	-	2.0	33.1
Repairs to the Erosion of the Embankment	Lump Sum	1	1	2,780.00	31.0	31.0	34.5	34.5	32.4	-	2.1	34.5
Dam Crest Survey Beacons and Bench Marks	Lump Sum	1	1	908.00	10.1	10.1	11.3	11.3	10.6	-	0.7	11.3
Electrical Pore Pressure Cells for Existing Vibrating Wire Piezometers	Lump Sum	1	1	2,569.00	28.7	28.7	31.9	31.9	29.9	-	1.9	31.9
Completion of Meeting Room and Office /g	Lump Sum	1	1	35,740.00	399.0	399.0	443.2	443.2	416.6	-	26.6	443.2
Fencing of the Dam/h	Lump Sum	1	1	9,498.00	106.0	106.0	117.8	117.8	110.7	-	7.1	117.8
Lighting of the Dam Crest	Lump Sum	1	1	26,460.00	295.4	295.4	328.1	328.1	308.5	-	19.7	328.1
Works-Supply of Tools and Equipment /i	Lump Sum	1	1	3,098.00	34.6	34.6	38.4	38.4	36.1	-	2.3	38.4
Works-VAT and Other Arrears /j	Lump Sum	1	1	57,600.00	643.0	643.0	714.3	714.3	671.5	-	42.9	714.3
Contractors P&G (for remobilisation) /k	Lump Sum	1	1	150,000.00	1,674.4	1,674.4	1,860.2	1,860.2	1,748.6	-	111.6	1,860.2
<b>Subtotal</b>					<b>4,299.4</b>	<b>4,299.4</b>	<b>4,684.6</b>	<b>4,684.6</b>	<b>3,434.3</b>	<b>969.2</b>	<b>281.1</b>	<b>4,684.6</b>
<b>B. SERVICES</b>												
<b>1. Consultancy</b>												
Supervising Firm /l	Lump Sum	1	1	14,651.00	163.5	163.5	173.4	173.4	144.0	-0.0	29.5	173.4
<b>Total Investment Costs</b>					<b>4,462.9</b>	<b>4,462.9</b>	<b>4,858.1</b>	<b>4,858.1</b>	<b>3,578.3</b>	<b>969.2</b>	<b>310.6</b>	<b>4,858.1</b>
<b>Total</b>					<b>4,462.9</b>	<b>4,462.9</b>	<b>4,858.1</b>	<b>4,858.1</b>	<b>3,578.3</b>	<b>969.2</b>	<b>310.6</b>	<b>4,858.1</b>
\a Method of procurement of "Other" has been used since the items were already in the BoQs for the ongoing CMC civil works contract. Direct payment.												
\b Top-up funds for assorted subsurface drains. Already procured under the current CMC contract.												
\c Structural concrete to upper part at the bottom outlet including to central wall (on-going CMC works).												
\d Shelved item in BoQ for CMC civil works ongoing contract.												
\e Pedestrian bridges across toe drain. BoQ of ongoing CMC civil works contract.												
\f Sundry steelwork items complete installed and corrosion protected, ladders, handrails, grid covers, access covers and frames, etc. In the BoQ of CMC contract.												
\g The cost includes civil works including associated furniture and equipment. Works include construction of offices, rehabilitation of houses/buildings and completion of meeting rooms including furniture and equipment.												
\h Fencing of the dam, based on revised length of 3,000 metres, as indicated by ARA-Sul.												
\i Tools and equipment package linked to CMC civil works contract.												
\j To cover all VAT and other arrears for the CMC civil works contract and also Aurecon service contract, not paid by the Government.. If the Government pays the arrears, the funds should either be cancelled or allocated to another important activities under this Project.												
\k Funds to cover CMC-contractor's remobilisation and demobilisation costs. If the funds will not be used 100%, then the balance should be cancelled or reallocated.												
\l Fees for the existing Supervising Firm (Aurecon)-ongoing service contract.												

Detailed Cost Table #1b:

## Sub-Component 1.1: Completion of Dam Safety Structures (with Summary Divisions and Other Accounts)

Item Description	Total Including Contingencies (UA '000)		Foreign Exchange	Local (Excl. Taxes)	Duties & Taxes	Total	Other Accounts					
	2018	Total					Project Component	Expenditure Account	Disbursement Account	Financing Rule	Procurement Account	Procurement Method
<b>I. Investment Costs</b>												
<b>A. WORKS /a</b>												
<b>1. Dam Safety Structures and Instrumentation</b>												
Subsurface Drains /b	6.4	6.4	6.1	-	0.4	6.4	REHABILITATION OF MASSINGIR DAM BOTTOM OUTLETS	MASSINGIR BOTTOM OUTLET STRUCTURES EA	MASSINGIR BOTTOM OUTLET STRUCTURES DA	ADF LOAN (100%)	MASSINGIR BOTTOM OUTLET STRUCTURES PA	OTHER_PM (100%)
Slab Deck-Structural Concrete to Upper Part /c	1,031.1	1,031.1	-	969.2	61.9	1,031.1						
New Crump Gauge Weir /d	3.2	3.2	3.0	-	0.2	3.2						
Pedestrian Bridges /e	31.0	31.0	29.1	-	1.9	31.0						
Sundry Steel Works Items /f	33.1	33.1	31.1	-	2.0	33.1						
Repairs to the Erosion of the Embankment	34.5	34.5	32.4	-	2.1	34.5						
Dam Crest Survey Beacons and Bench Marks	11.3	11.3	10.6	-	0.7	11.3						
Electrical Pore Pressure Cells for Existing Vibrating Wire Piezometers	31.9	31.9	29.9	-	1.9	31.9						
Completion of Meeting Room and Office /g	443.2	443.2	416.6	-	26.6	443.2						
Fencing of the Dam/h	117.8	117.8	110.7	-	7.1	117.8						
Lighting of the Dam Crest	328.1	328.1	308.5	-	19.7	328.1						
Works-Supply of Tools and Equipment /i	38.4	38.4	36.1	-	2.3	38.4						
Works-VAT and Other Arrears /j	714.3	714.3	671.5	-	42.9	714.3						
Contractors P&G (for remobilisation) /k	1,860.2	1,860.2	1,748.6	-	111.6	1,860.2						
<b>Subtotal</b>	<b>4,684.6</b>	<b>4,684.6</b>	<b>3,434.3</b>	<b>969.2</b>	<b>281.1</b>	<b>4,684.6</b>						
<b>B. SERVICES</b>												
<b>1. Consultancy</b>												
Supervising Firm /l	173.4	173.4	144.0	-	29.5	173.4		CONSULTANCY_EA	CONSULTANCY_DA	ADF_LOAN (100%)	CONSULTANCY_PA	OTHER_PM (100%)
<b>Total Investment Costs</b>	<b>4,858.1</b>	<b>4,858.1</b>	<b>3,578.3</b>	<b>969.2</b>	<b>310.6</b>	<b>4,858.1</b>						
<b>Total</b>	<b>4,858.1</b>	<b>4,858.1</b>	<b>3,578.3</b>	<b>969.2</b>	<b>310.6</b>	<b>4,858.1</b>						

Detailed Cost Table #2a:

Sub-Component 1.2: Project Management

Item Description	Unit	Quantities		Unit Cost (MZN '000)	Base Cost (UA '000)		Total Including Contingencies (UA		For. Cost	Local Cost (Excl.	Duties & Taxes	Total Cost
		2018	Total		2018	Total	2018	Total				
<b>I. Investment Costs</b>												
<b>A. SERVICES</b>												
<b>1. Project Support Services</b>												
Existing PIMU Staff /a	Lump Sum	1	1	6,000.00	67.0	67.0	71.0	71.0	59.0	-	12.1	71.0
<b>2. Financial Audit /b</b>												
Financial Audit	Lump Sum	1	1	920.00	10.3	10.3	10.9	10.9	9.0	-	1.9	10.9
<b>Total Investment Costs</b>					77.2	77.2	81.9	81.9	68.0	-	13.9	81.9
<b>II. Recurrent Costs</b>												
<b>Total</b>					77.2	77.2	81.9	81.9	68.0	-	13.9	81.9
\a Direct payment of salaries etc for existing PIMU staff.												
\b Top-up funds for additional audit period (existing Auditor's contract).												

Detailed Cost Table #2b:

Sub-Component 1.2: Project Management (with Summary Divisions and Other Accounts)

Item Description		Total Including Contingencies (UA)		For. Cost	Local Cost (Excl. Taxes)	Duties & Taxes	Total Cost	Summary Division	Other Accounts				
		2018	Total					Component	Expenditure Account	Disbursement Account	Financing Rule	Procurement Account.	Procurement Method
<b>I. Investment Costs</b>													
<b>A. SERVICES</b>													
<b>1. Project Support Services</b>													
	Existing PIMU Staff /a	71.0	71.0	59.0	-	12.1	71.0	REHABILITATION OF MASSINGIR DAM BOTTOM OUTLETS	PERSONNEL PIMU STAFF EA	PERSONNEL PIMU STAFF DA	ADF LOAN (100%)	PERSONNEL PIMU STAFF PA	OTHER PM (100%)
<b>2. Financial Audit /b</b>													
	Financial Audit	10.9	10.9	9.0	-	1.9	10.9		AUDIT EA	AUDIT DA	ADF LOAN (100%)	AUDIT PA	OTHER PM (100%)
<b>Total Investment Costs</b>		81.9	81.9	68.0	-	13.9	81.9						
<b>II. Recurrent Costs</b>													
<b>Total</b>		81.9	81.9	68.0	-	13.9	81.9						
\a Direct payment of salaries etc for existing PIMU staff.													
\b Top-up funds for additional audit period (existing Auditor's contract).													



Appendix 4b: Breakdown of ADF Grant (UA '000)

Component Name	ADF Grant						Foreign Cost	Local Cost (excluding taxes)	Duties & Taxes
	Amount	%	Taxes and Duties	%	Total	%			
1. Rehabilitation of Massingir Dam Bottom Outlets	4,615.5	93.4	324.5	6.6	4,940.0	100.0	3,646.3	969.2	324.5
<b>Total Project Costs</b>	4,615.5	93.4	324.5	6.6	4,940.0	100.0	3,646.3	969.2	324.5

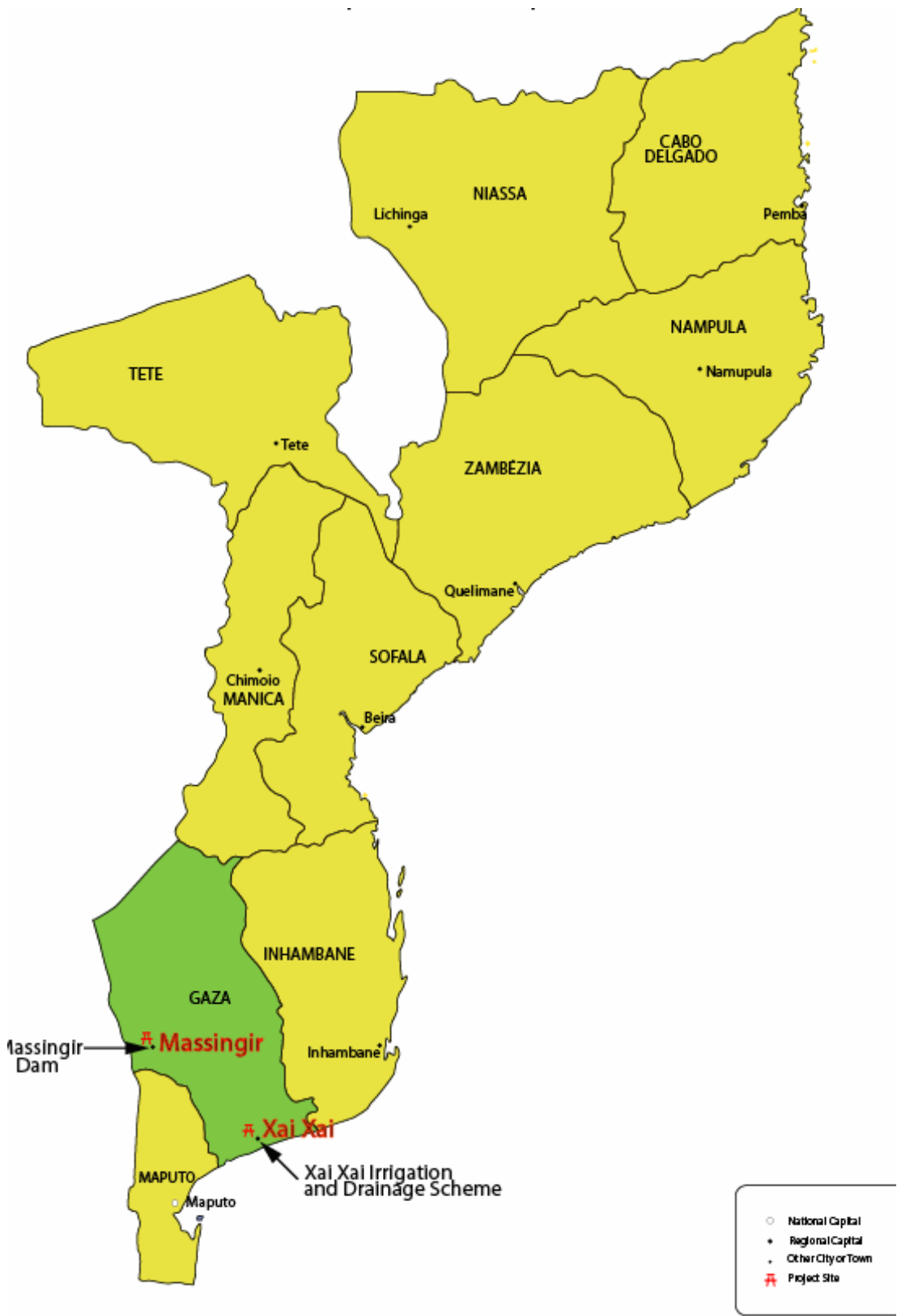
Appendix 4c: Procurement Methods for ADF Grant (UA)

Category of Expenditure	Procurement Method (N/A)	Total (UA)
<b>B. WORKS</b>		
Massingir Bottom Outlet Structures	4,684,700	4,684,700
<b>C. SERVICES</b>		
Financial Audit	10,900	10,900
Consultancy-Supervising Firm	173,400	173,400
Personnel PIMU Staff	71,000	71,000
<b>Total</b>	<b>4,940,000</b>	<b>4,940,000</b>

Appendix 4d: ADF Grant's Category of Expenditure (UA) (For Grant Agreement and Disbursement Letter)

Category of Expenditure	Amount (UA)		
	Foreign Cost	Local Cost	Total
A. Works	3,434,400	1,250,300	<b>4,684,700</b>
B. Services	211,900	43,400	<b>255,300</b>
<b>Total Project Cost</b>	<b>3,646,300</b>	<b>1,293,700</b>	<b>4,940,000</b>

Appendix 5: Map of Mozambique Showing the Project Area (Gaza Province)



**Appendix 6: Compliance of the Supplementary Grant with Bank Policy**

<b>Specific Conditions</b>	<b>Compliance (Yes/No)</b>	<b>Justification</b>
1. The project has an overall supervision rating to be “satisfactory” or higher	Y	Overall supervision rating is Non Potentially Problematic Project/NPPP (>satisfactory)
2. The provision of supplementary financing from the Bank’s ADB or ADF resources would depend on the eligibility status of the RMC concerned in accordance with the arrangements for lending from ADF prevailing at the time processing this grant	Y	The proposed grant is in line with the 2018 allocations for Mozambique under ADF 14.
3. The recipient country is making a determined effort towards national development in general and towards the mobilization of internal and external resources	Y	The Government of Mozambique is determined to complete the subject project, and ranks it as a very high priority project.
4. The implementation environment of a country is favorable	Y	The implementation environment of Mozambique is favourable. This is in line with new conducive Government institutional and reform policies towards energy generation to drive industrialization and employment.
5. The cost overrun is due to circumstances beyond the control of the Borrower	Y	There is no cost overrun. The resources will be used to cover taxes (including tax arrears/refund) and also the 20% Government contribution to the contract sum/value due to the reasons cited earlier in the PAR.
6. The cost overrun cannot be met by the borrower and the borrower has not been able to find other financiers and the borrower provides justification for the request for additional Bank Group financing	Y	The Government could not avail financing by other donors. The Government provided justification for the request for supplementary financing by the high human and economic risks associated to the stability of the Massingir Dam if the project is not completed.
7. It has not been possible to reduce total cost of the project through changes of specifications or scope of work or services without significantly affecting the objectives and viability of the project	Y	The second supplementary grant (MDERP-SLII) will just cover the shortfall and outstanding payments which were supposed to be settled using Government contribution.
8. The project is technically, economically and financially viable even with the cost overruns	Y	The project is still technically sound, environmentally sustainable, socially desirable and economically viable. Its completion will enable the Bank and Government to achieve the developmental objective set forth at appraisal.
9. The project cannot be reduced in size without damaging its ability to achieve objectives or its sustainability	Y	The developmental objectives of the Massingir Dam can only be met by the full rehabilitation of the Bottom Outlets to enable full control of the downstream flow of the dam, the project cannot be reduced in size or scope.
10. There are no other exogenous constraints: financial, managerial or technical that would hinder the completion of the project	Y	All financial, managerial and technical aspects of the project is favourable to completing the project once financing is available.

## Appendix 7: Financial and Economic Performance (Analyses), extracted from Initial Project

1. The financial and economic reevaluation of the project is based on the assumptions that the dam would operate at optimal capacity as result of the rehabilitation, thereby yielding the following benefits: (i) irrigation of about 32,000 ha of sugar cane plantations on the basis of out-grower scheme benefitting farmers, private sector and the Government; (ii) irrigation of 3,500 ha of food crops including maize, rice, potatoes, and vegetables; (iii) provision of 2,000 ha of suitable grazing land with water for livestock, especially cattle estimated at about 8,500 heads; (iv) artisanal fisheries development at the reservoir; (v) possible development of a hydropower-power station of 10-15 MW; and (vi) enabling ecological flows with minimum flow in the order of 10 m<sup>3</sup>/s, also to control salt water intrusion. Many other benefits may be considered, such as the ecological balance through climate regulation and improvement of the biodiversity.
2. The model was based on cash a crop model (sugar cane); food crops models (maize, rice, potato and vegetables); and animal production/activities models (fisheries and livestock). The basic assumption for sugar cane was that yield was expected to increase from 70 T/ha in year 3 (Y3) to 110 T/ha starting Y5 over for 30 years. The technical conversion factors from cane to sugar and molasses were 11.5% and 3.65%, respectively. Although ethanol can be one of the by-products of sugar can, it was not considered in this model. The sugar cane model also included such production costs as the initial investment of plant, input costs, operating inputs costs, labor costs and taxes. Yields of maize and rice was expected to increase from 1.5 T/ha and 1.2 T/ha to 3.5 T/ha and 4.5 T/ha, respectively as result of the project for a period of 15 years and starting year 3. Sweet potatoes yield was also expected to increase from 8.5 T/ha without the project to 25 T/ha with the project.
3. In this condition, the financial performance of the project was assessed on the basis of the prevailing market prices, with a NPV, IRR and B/C ratio equal to MZN 14,744.84 million, 18.77% and 1.9, respectively, as captured in the tables below.
4. The economic performance of the project was assessed on the basis of shadow pricing method (use of prices in condition of efficient market operation). The economic analysis was conducted on the basis of sugar, maize and rice considered as tradable goods and their respective economic prices were estimated using border pricing methods, that is the export-parity price at farm gate (CIF at point of import to Farm gate) for sugar, and the import-parity prices at farm gate (FOB at point of export to farm gate) for maize and rice. In this model sugar and molasses are expected to be exported, while maize and rice are treated as import substitutes. In addition, the amount of taxes was deducted from the production costs in the models, and investment and operating labor costs was adjusted to 0.65, in line with current practices, with unemployment rate prevailing in the region. All benefits and costs without and with project were discounted over time for 30 years, at 10% opportunity cost of capital, in line with the common practice in Mozambique analysis, as reflected in the analysis of the COFAMOSA sugar cane irrigation project. Under these conditions, the project economic worth was recalculated with NPV, IRR and B/C ratio equal to MZN 18,001.24 million, 21.06% and 2.09, respectively, as captured in the technical annexes.
5. A sensitivity analysis was also conducted to assess the robustness of the project worth against the most sensitive model endogenous variables (commodity prices). The sensitivity analysis shows that breakeven commodity prices drop is -32.44% (switching value). Therefore the model is robust.

### Summary of the Financial Analysis (in MZN million)

ITEMS	Situation without project	Situation with project (30 Years Management Period)					
	1 to 30	1	2	3	4	5	6 to 30
<b>PRODUCTION</b>	<b>1 797,55</b>	<b>1 797,55</b>	<b>3 147,57</b>	<b>5 394,41</b>	<b>8 115,50</b>	<b>8 115,50</b>	<b>13 103,11</b>
Sugarcane (Sugar & Molasses Income)	1 137,55	1 137,55	1 787,57	3 064,41	5 107,35	5 107,35	7 946,22
Food Crops (Maize & Rice Income)	336,60	336,60	693,60	1 188,30	1 982,88	1 982,88	3 083,97
Vegetables (Potatoes, Beans & Tomatoes Income)	115,5	115,5	238	407,75	680,4	680,4	1 058,23
Fisheries Income	56,1	56,1	115,6	198,05	330,48	330,48	514,00
Livestock (Cattle & Small Ruminants Income)	151,8	151,8	312,8	535,9	894,24	894,24	1 390,81
<b>PRODUCTION COSTS</b>							
Sugarcane Production Investment	10 896,55	9 988,51	8 172,41	0,00	0,00	0,00	0,00
Sugarcane Inputs Costs	93,85	93,85	147,47	252,81	421,36	421,36	655,56
Sugarcane Operating Costs	250,26	250,26	393,27	674,17	1123,62	1123,62	1748,17
Sugarcane Hired Labor Costs	156,41	156,41	245,79	421,36	702,26	702,26	1092,61
Sugarcane Production Taxes	130,82	130,82	205,57	352,41	587,35	587,35	913,82
Food Crops Investment Equipment	105,52	105,52	217,44	372,53	621,63	621,63	966,82
Food Crops Inputs & Operating Costs	57,56	57,56	118,61	203,20	339,07	339,07	527,36
Food Crops Production Labor	47,97	47,97	98,84	169,33	282,56	282,56	439,47
Vegetables Investment Equipment	34,94	34,94	72,00	123,34	205,82	205,82	320,11
Vegetables Inputs & Operating Costs	19,06	19,06	39,27	67,28	112,27	112,27	174,61
Vegetables Production Labor	15,88	15,88	32,73	56,07	93,56	93,56	145,51
Fisheries Production Investment	15,74	15,74	32,43	55,55	92,70	92,70	144,18
Fisheries Operating Costs	8,01	8,01	16,51	28,28	47,19	47,19	73,40
Fisheries Production Labor	5,72	5,72	11,79	20,20	33,71	33,71	52,43
Fisheries Production Taxes	2,00	2,00	4,13	7,07	11,80	11,80	18,35
Livestock Production Investment	39,24	39,24	80,86	138,53	231,16	231,16	359,52
Livestock Operating Costs	21,40	21,40	44,10	75,56	126,09	126,09	196,10
Livestock Production Labor	17,84	17,84	36,75	62,97	105,07	105,07	163,42
<b>PROJECT COSTS (Revised)</b>	<b>0,00</b>	<b>950,54</b>	<b>928,64</b>	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>
Discounted Factor @10% OCC		1	0,9091	0,8264	0,7513	0,6830	0,62

IRR = 18.77%, NPV = MZN 14,744.84 Million, BCR = 1.91

Summary of the Economic Analysis (in MZN million)

ITEMS	Situation without project	Situation with project (30 Years Management Period)					
	1 to 30	1	2	3	4	5	6 to 30
<b>PRODUCTION</b>	<b>2 337,34</b>	<b>2 337,34</b>	<b>3 677,51</b>	<b>5 990,11</b>	<b>9 881,35</b>	<b>9 881,35</b>	<b>15 631,05</b>
Sugarcane (Sugar & Molasses Income)	1 630,55	1 630,55	2 281,57	3 332,40	5 405,77	5 405,77	9 046,19
Food Crops (Maize & Rice Income)	336,60	336,60	693,60	1 188,30	1 982,88	1 982,88	3 083,97
Vegetables (Potatoes, Beans & Tomatoes Income)	115,5	115,5	238	407,75	680,4	680,4	1 058,23
Fisheries Income	56,1	56,1	115,6	198,05	330,48	330,48	514,00
Livestock (Cattle & Small Ruminants Income)	151,8	151,8	312,8	535,9	894,24	894,24	1 390,81
<b>PRODUCTION COSTS</b>							
Sugarcane Production Investment	10 896,55	9 988,51	8 172,41	0,00	0,00	0,00	0,00
Sugarcane Inputs Costs	93,85	93,85	147,47	252,81	421,36	421,36	655,56
Sugarcane Operating Costs	250,26	250,26	393,27	674,17	1123,62	1123,62	1748,17
Sugarcane Hired Labor Costs	96,41	96,41	185,79	271,36	435,26	435,26	692,33
Food Crops Investment Equipment	105,52	105,52	217,44	372,53	621,63	621,63	966,82
Food Crops Inputs & Operating Costs	57,56	57,56	118,61	203,20	339,07	339,07	527,36
Food Crops Production Labor	30,97	30,97	64,84	99,33	177,56	177,56	257,47
Vegetables Investment Equipment	34,94	34,94	72,00	123,34	205,82	205,82	320,11
Vegetables Inputs & Operating Costs	19,06	19,06	39,27	67,28	112,27	112,27	174,61
Vegetables Production Labor	11,88	11,88	22,73	36,07	60,56	60,56	98,51
Fisheries Production Investment	15,74	15,74	32,43	55,55	92,70	92,70	144,18
Fisheries Operating Costs	8,01	8,01	16,51	28,28	47,19	47,19	73,40
Fisheries Production Labor	5,72	5,72	11,79	20,20	33,71	33,71	52,43
Livestock Production Investment	39,24	39,24	80,86	138,53	231,16	231,16	359,52
Livestock Operating Costs	21,40	21,40	44,10	75,56	126,09	126,09	196,10
Livestock Production Labor	17,84	17,84	36,75	62,97	105,07	105,07	163,42
<b>PROJECT ECONOMIC COSTS</b>	<b>0,00</b>	<b>828,55</b>	<b>779,39</b>	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>	<b>0,00</b>
Discounted Factor @10% OCC		1	0,9091	0,8264	0,7513	0,6830	0,62

IRR = 21.06%, NPV = 18,001.24 Million, BCR = 2.09

# **AFRICAN DEVELOPMENT FUND**

## **BOARD OF DIRECTORS**

### **Resolution N° F/MZ/2018/56**

Adopted by the Board of Directors on a Lapse-of-time basis on 20 July 2018

### **Supplementary Grant to the Republic of Mozambique to finance part of the costs of the Massingir Dam Emergency Rehabilitation Project (MDERP)**

#### **THE BOARD OF DIRECTORS,**

**HAVING REGARD** to: (i) Articles 1, 2, 11, 12, 14, 15, 16, 26 and 30 of the Agreement Establishing the African Development Fund (the “Fund” or “ADF”); (ii) the Report on the Fourteenth General Replenishment of the Resources of the Fund (ADF-14); (iii) the applicable ADF-14 Country Resource Allocation; (iv) Operational Guidelines of the ADF-14 Resource Allocation Framework (the “ADF-14 Guidelines”); (v) the Bank Group Policy and Procedures for Supplementary Financing; and (vi) the appraisal report contained in document ADF/BD/WP/2018/106/Corr.1/Approval (the “Appraisal Report”);

#### **RECALLING:**

- (a) Resolution N° F/MZ/2009/45 adopted on 15 July 2009 by this Board awarding to the Republic of Mozambique from the resources of the Fund, an initial loan of an amount not exceeding the equivalent of Thirteen Million, Three Hundred Thousand Units of Account (UA 13,300,000) to finance the Massingir Dam Emergency Rehabilitation Project (the “Project”);
- (b) Resolution N° F/MZ/2013/21 adopted on 22 May 2013 by this Board awarding to the Republic of Mozambique from the resources of the Fund, a supplementary loan of an amount not exceeding the equivalent of Twenty-Two Million, Ten Thousand Units of Account (UA 22,010, 000) to finance the Project; and
- (c) Document ADF/BD/WP/2018/110/Approved entitled “Note on the Implications of Mozambique’s March 5, 2018 IMF Debt Sustainability Analysis on its ADF-14 Performance-Based Allocation” approved by this Board on 18 July 2018, and in particular, the waiver therein from the provisions of the ADF-14 Guidelines so as to permit:
  - (i) the use of the March 5, 2018 Debt Sustainability Analysis (DSA), where the Republic of Mozambique was classified as being in debt distress, instead of the February 22, 2018 DSA which had the Republic of Mozambique in moderate risk of debt distress;
  - (ii) the conversion of the Republic of Mozambique’s 2018 Performance-Based Allocation (PBA) and the indicative 2019 PBA into grants only; and
  - (iii) the conversion of any unused loan allocation from Republic of Mozambique’s 2017 PBA into grants only available for use in 2018 or 2019;

**NOTING** the availability of sufficient resources to enable the Fund to commit the amount of the supplementary grant;

**DECIDES** as follows:

1. To award to the Republic of Mozambique (the “Recipient”), from the resources of the Fund, a supplementary grant of an amount not exceeding the equivalent of Four Million, Nine Hundred and Forty Thousand Units of Account (UA 4,940,000) (the “Supplementary Grant”) to finance part of the costs of the Project;
2. To authorize the President to conclude a protocol of agreement between the Fund and the Recipient (the “Protocol of Agreement”) on the terms and conditions specified in the General Conditions Applicable to Protocols of Agreement for Grants of the African Development Fund and the Appraisal Report;
3. The President may cancel the Supplementary Grant if the Protocol of Agreement is not signed within ninety (90) days from the date of approval of the Grant by this Board; and

This Resolution shall become effective on the date above-mentioned.