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Report No: PAD3411

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL GRANT

IN THE AMOUNT OF SDR 80.4 MILLION
(US$110 MILLION EQUIVALENT)

INCLUDING US$90 MILLION
FROM THE IDA CRISIS RESPONSE WINDOW

TO THE

REPUBLIC OF MOZAMBIQUE

FOR THE

INTEGRATED FEEDER ROAD DEVELOPMENT PROJECT

September 17, 2019

Transport Global Practice
Infrastructure Practice Group
Africa Region

CURRENCY EQUIVALENTS

Exchange Rate Effective August 31, 2019

Currency Unit = New Mozambique Metical (MZN)

MZN 62.12 = US$1

SDR 0.73081252 = US$1

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

ABMS	Area-Based Maintenance System
ADT	Average Daily Traffic
AF	Additional Financing
AHP	Analytic Hierarchy Process
ANE	*Administração Nacional de Estradas* (National Roads Administration)
CERC	Contingent Emergency Response Component
CESMP	Contractor's Environmental and Social Management Plan
CoC	Code of Conduct
CPF	Country Partnership Framework
CRPT	Climate Resilience Planning Tool
CRW	Crisis Response Window
ESHS	Environmental, Social, Health, and Safety
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
EU	European Union
FM	Financial Management
GBV	Gender-based Violence
GoM	Government of Mozambique
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
IFR	Interim Financial Report
IFRDP	Integrated Feeder Road Development Project
IPF	Investment Project Financing
IRM	Immediate Response Mechanism
IRR	Internal Rate of Return
MCA	Multicriteria Analysis
MGCSA	Ministry of Gender, Children and Social Action
MZN	New Mozambique Metical
NGO	Nongovernmental Organization
NPV	Net Present Value
OHS	Occupational Health and Safety

OPRC	Output and Performance-based Road Contract
PDO	Project Development Objective
PDNA	Post-disaster Needs Assessment
POM	Project Operations Manual
PPSD	Project Procurement Strategy for Development
RAMS	Road Asset Management System
RAP	Resettlement Action Plan
RBMMP	Roads and Bridges Management and Maintenance Program
RPF	Resettlement Policy Framework
RUC	Road User Cost
SDR	Special Drawing Rights
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
UGEA	*Unidade Gestora Executora das Aquisições* (Central Unit in Charge of Procurement Functions)
UN	United Nations
UNFPA	United Nations Population Fund

Regional Vice President:	Hafez M. H. Ghanem
Country Director:	Mark R. Lundell
Regional Director:	Riccardo Puliti
Practice Manager:	Maria Marcela Silva
Task Team Leaders:	Rakesh Tripathi, Nargis Ryskulova

Mozambique

Additional Financing for Integrated Feeder Road Development Project

TABLE OF CONTENTS

BASIC INFORMATION – PARENT (Integrated Feeder Road Development Project - P158231)

Country	Product Line	Team Leader(s)		
Mozambique	IBRD/IDA	Rakesh Tripathi		
Project ID	Financing Instrument	Resp CC	Req CC	Practice Area (Lead)
P158231	Investment Project Financing	IAFT2 (9538)	AFCS2 (5547)	Transport

Implementing Agency: Road Fund, National Roads Administration (Administração Nacional de Estradas, ANE)

Is this a regionally tagged project?	

Bank/IFC Collaboration

No

Approval Date	Closing Date		Original Environmental Assessment Category	Current EA Category
08-May-2018	31-Dec-2024		Partial Assessment (B)	Partial Assessment (B)

Financing & Implementation Modalities

[ ] Multiphase Programmatic Approach [MPA]	[ ] Contingent Emergency Response Component (CERC)
[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Disbursement-Linked Indicators (DLIs)	[ ] Small State(s)
[ ] Financial Intermediaries (FI)	[ ] Fragile within a Non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[ ] Responding to Natural or Man-made disaster
[ ] Alternate Procurement Arrangements (APA)	

Development Objective(s)

The Project Development Objective is to enhance road access in selected rural areas in support of livelihoods of local communities and to provide immediate response to an eligible crisis or emergency as needed.

Ratings (from Parent ISR)

	Implementation
	26-Feb-2019
Progress towards achievement of PDO	S
Overall Implementation Progress (IP)	S
Overall Safeguards Rating	S
Overall Risk	S

BASIC INFORMATION – ADDITIONAL FINANCING (Additional Financing for Integrated Feeder Road Development Project - P171093)

Project ID	Project Name	Additional Financing Type	Urgent Need or Capacity Constraints
P171093	Additional Financing for Integrated Feeder Road Development Project	Cost Overrun, Restructuring, Scale Up	Yes
Financing instrument	Product line	Approval Date	
Investment Project Financing	IBRD/IDA	30-Sep-2019	
Projected Date of Full Disbursement	Bank/IFC Collaboration		
30-Apr-2026	No		
Is this a regionally tagged project?			
No			

Financing & Implementation Modalities

[ ] Series of Projects (SOP)	[ ] Fragile State(s)
[ ] Disbursement-Linked Indicators (DLIs)	[ ] Small State(s)

[ ] Financial Intermediaries (FI)	[ ] Fragile within a Non-fragile Country
[ ] Project-Based Guarantee	[ ] Conflict
[ ] Deferred Drawdown	[✓] Responding to Natural or Man-made disaster
[ ] Alternate Procurement Arrangements (APA)	
[✓] Contingent Emergency Response Component (CERC)	

Disbursement Summary (from Parent ISR)

Source of Funds	Net Commitments	Total Disbursed	Remaining Balance	Disbursed
IBRD				%
IDA	150.00	35.00	112.37	24 %
Grants				%

PROJECT FINANCING DATA – ADDITIONAL FINANCING (Additional Financing for Integrated Feeder Road Development Project - P171093)

FINANCING DATA (US$, Millions)

SUMMARY (Total Financing)

	Current Financing	Proposed Additional Financing	Total Proposed Financing
Total Project Cost	185.00	132.00	317.00
Total Financing	185.00	132.00	317.00
of which IBRD/IDA	150.00	110.00	260.00
Financing Gap	0.00	0.00	0.00

DETAILS - Additional Financing

World Bank Group Financing

International Development Association (IDA)	110.00
IDA Grant	110.00

Non-World Bank Group Financing	
Counterpart Funding	22.00
Borrower/Recipient	22.00

IDA Resources (in US$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Mozambique	0.00	110.00	0.00	110.00
National PBA	0.00	20.00	0.00	20.00
Crisis Response Window (CRW)	0.00	90.00	0.00	90.00
Total	**0.00**	**110.00**	**0.00**	**110.00**

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any other Policy waiver(s)?

[ ] Yes [✓] No

INSTITUTIONAL DATA

Practice Area (Lead)

Transport

Contributing Practice Areas

Agriculture and Food
Climate Change

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Rakesh Tripathi	Team Leader (ADM Responsible)	Transport	IAFT2
Nargis Ryskulova	Team Leader	Transport	IAFT2
Amos Martinho Malate	Procurement Specialist (ADM Responsible)	Procurement	EA1RU
Antonio Laquene Chamuco	Procurement Specialist	Procurement	EA1RU
Eldio Venancio Mapoissa	Financial Management Specialist (ADM Responsible)	Financial Management	GGOAC
Eden Gabriel Vieira Dava	Social Specialist (ADM Responsible)	Social	SAFS1
Paulo Jorge Temba Sithoe	Environmental Specialist (ADM Responsible)	Environmental	SAFE3
Atsushi Iimi	Team Member	Economics	IAFT2
Desta Wolde Woldearegay	Team Member	Administration	IAFT2
Emerson John Vasco Siquice	Team Member	Administration	AFCS2
George Ferreira Da Silva	Team Member	Disbursement and Financial Management	WFACS
Karla Dominguez Gonzalez	Team Member	Gender	IAFT4
Norman Bentley Piccioni	Team Member	Agriculture	SAFA2

Xavier Espinet Alegre	Team Member	Climate Change	SEAU1

Extended Team

Name	Title	Organization	Location

I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING

A. Introduction

1. **This Project Paper seeks the approval of the Executive Directors to provide an Additional Financing (AF) in the amount of SDR 80 million (US$110 million equivalent) from the International Development Association (IDA) to the Republic of Mozambique for the Integrated Feeder Road Development Project (IFRDP).** The proposed financing includes US$90 million from the IDA Crisis Response Window (CRW) and US$20 million from the national IDA allocation. The proposed AF will also have counterpart financing in the amount of US$22 million. This AF is part of the World Bank's broader regional package which comprises a set of operations totaling about US$700 million in IDA resources—including up to US$545 million from the IDA CRW—to support cyclone response in Malawi, Mozambique, and Zimbabwe.

2. **The proposed AF is prepared under paragraph 12 of the World Bank Investment Project Financing (IPF) Policy: Projects in Situations of Urgent Need of Assistance or Capacity Constraints to support the country's post-disaster recovery needs in the roads subsector by increasing the scope of the project** through (a) financing the reconstruction/rehabilitation of rural roads and bridges in the four additional provinces of Sofala, Manica, Tete, and Cabo Delgado, affected by Cyclones Idai and Kenneth, as well as related designs and supervision services, gender-based violence (GBV) prevention and management in the same four provinces, and a pilot on routine maintenance through microenterprises (US$70 million); (b) replenishing the project financing that was reallocated toward the Contingent Emergency Response Component (CERC), activated post disaster under the parent project[1] (US$35 million); and (c) financing additional technical assistance on the climate resilience planning tool (CRPT), Road Network Preservation Strategy and Action Plan (including road reclassification), and project management and capacity-building activities (US$5 million).

3. **The project is proposed to be restructured (Level 2 restructuring) to** (a) revise costs of Components 1 and 4 to reflect the increased scope of these components; (b) extend the closing date of the project by one year to December 31, 2025; and (c) modify the Results Framework by adjusting selected targets to reflect the scaled-up investments, the extended closing date of the project, and introduction of two new intermediate indicators. The Project Development Objective (PDO), the safeguards category, and the implementation arrangements of the project will remain the same.

B. Rationale for Additional Financing from the IDA Crisis Response Window

4. **In the spring of 2019, Mozambique was hit by two cyclones: Idai in March and Kenneth in April.** These cyclones affected over 1.7 million people, killed 644 people, and destroyed partially or totally around 275,000 houses.[2] Cyclone Idai with heavy rains (more than 200 mm in 24 hours), winds (180 to 220 km per h), and flooding severely affected the central and northern regions of the country from March 4 to 17, 2019. On March 19, 2019, the Government of Mozambique (GoM) declared a national emergency, triggering major emergency response interventions. On April 25, 2019, Cyclone Kenneth hit the northern region of the country. Cyclone winds and floods destroyed or damaged critical infrastructure such as roads

[1] Integrated Feeder Road Development Project (P158231).
[2] As of May 2, 2019.

and bridges, as well as buildings used to facilitate trade, such as warehouses, and caused trade disruptions. The GoM, the United Nations (UN), the African Development Bank, the European Union (EU) and the World Bank led a Post-disaster Needs Assessment (PDNA) identifying US$1.5 billion of damages and US$3 billion of needs, with road sector needs estimated at nearly US$500 million.

5. **For the poor, the rural roads are the only connection to essential medical services, schools, social objects, and broader economic opportunities.** Large communities were cut off for weeks and failure of bridges meant large detours and alternative routes, adding in some cases more than 50 km to the commute. A road system in shambles has direct repercussion on the health, education, and livelihood of the residents and has large post-disaster implications as damaged roads make emergency recovery and reconstruction efforts difficult in every other sector of the economy.

6. **The Immediate Response Mechanism (IRM)-CERC was activated in April 2019.** Due to Mozambique's high vulnerability to natural disasters, the country's investment portfolio, including the IFRDP, uses an IRM CERC approach, which allows IDA countries to rapidly access up to 5 percent of the undisbursed IDA investment project balances to cope with the consequences of natural disasters or eligible emergency. Upon the activation of IRM-CERC, US$35 million was reallocated to the CERC of the parent project to address immediate emergency activities to restore basic road connectivity affected by Cyclone Idai. The National Directorate for Monitoring and Evaluation of the Ministry of Economy and Finance is the IRM Coordination Authority, responsible for coordinating the implementation of cyclone response emergency activities, while the National Road Agency (*Administração Nacional de Estradas*, ANE) acts as a Special Implementation Unit and is responsible for fiduciary management and implementation of activities.

7. **Alignment with the Country Partnership Framework (CPF).** The AF is fully aligned with the Mozambique CPF 2017–2021.[3] The framework's three focus areas include (a) promoting diversified growth and enhanced productivity; (b) investing in human capital; and (c) enhancing sustainability and resilience. The project addresses the first and third focus areas directly. The project responds to Objective 2 of the first focus area, which calls for increasing agricultural growth by improving road conditions. On the third focus area, the project addresses Objective 11, improving management of climate risk and natural resources by integrating climate resilience into road investment planning and designs.

C. Country Context

8. **Mozambique is highly exposed to extreme rainfall and flooding that may become even more frequent because of global climate change.** Mozambique's geography and long coastline and the impacts of climate change, mean that it is regularly affected by extreme weather events, principally flooding. Catastrophic flooding occurs almost annually during the rainy season and is largely influenced by La Niña and the Intertropical Convergence Zone. Before the most recent cyclones, Idai and Kenneth, devastating floods in 2015 affected 326,000 people, killed 140, and caused damages estimated at US$371 million in parts of Zambezia, Nampula, and Niassa Province, another northern province. In 2013, a flood affecting the Limpopo lower basin killed 113 people, displaced more than 200,000, and ruined nearly 89,000 ha of

[3] Report No. 104733-MZ, March 30, 2017.

cultivated land. Other major floods (in 2000 and 2007) and cyclones (in 2008, 2012, and 2017) caused fatalities and severe damage in different parts of the country.

D. Sector Context/Key Challenges

9. **Due to recurrent climatic events and the lack of maintenance,** the road and rail networks have suffered extensive damage over the last 20 years, with substantial sums being diverted from network improvement to the repair of flood-related damage. Because the Mozambican road network has a low redundancy, those disruptions sometimes isolate communities for extended periods of time and thus have a significant detrimental impact on their local economics. Following the devastation due to Cyclones Idai and Kenneth, the GoM, the UN, World Bank, and the African Development Bank in partnership conducted a PDNA.

The PDNA process identified over US$3 billion worth of damages, with road sector needs estimated at nearly half a billion dollars. The PDNA process documented the severe damage and loss due to this disaster on the road system of the country. The damages caused by the cyclone and heavy rains in the central region affected roadways the most: about 1,968 km of roads, 142 culverts, 29 bridges, and 35 drifts were damaged, resulting in the impassability of 6,142 km. This situation resulted in reduction of the transit ability in Sofala, Manica, Tete and Cabo Delgado by about 24 percent for the network of the central region and 7 percent for the national classified network.

Table 1. Damages Caused by Cyclones Idai and Kenneth

Provinces	Culverts Damaged (No)	Bridges Damaged (No)	Drifts Damaged	Total Extension Affected (km)	Total Extension Damaged (km)
SOFALA	55	1	0	1,450	1,011
MANICA	8	5	4	667	69
TETE	10	4	8	1,003	89
ZAMBEZIA	17	5	12	1,493	783
NAMPULA	11	7	6	939	9
CABO DELGADO	41	7	5	590	7
Total	142	29	35	6,142	1,968

E. Lessons Learned and Reflected in the Project Design

10. **Sustainability of public investments in the road sector.** The GoM acknowledges that prioritizing road expenditure to ad hoc emergency and urgent rehabilitation needs at the expense of routine and periodic maintenance outside of systematic asset management system is not a sustainable way forward. To address shortage of resources for maintenance, the Road Fund and ANE have started paying more attention to the contract modalities that would address the need for better maintenance as well as invest resources toward better road asset management. The proposed AF will support government efforts in improving the sustainability of public investments by reflecting some of the lessons learned through

previous operations in Mozambique as well as internationally through piloting routine maintenance through microenterprises, improving road asset management planning by developing a Road Network Preservation Strategy and Action Plan, and enhancing the road asset management system (RAMS) with systematic climate data.

11. **Piloting routine maintenance through microenterprises.** Performance-based contracting is now a default contract modality for primary roads (as under Component 2 of the parent project). ANE is also adopting area-based multiyear rehabilitation and maintenance contracts for secondary and feeder roads. There is no single model to ensure more efficient maintenance contracts for the whole network and low-cost solutions are particularly needed given limited resources. Some innovative approaches, such as routine maintenance by microenterprises, have been successfully implemented in Latin America and adapted in Africa and South Asia in recent years. The use of microenterprises for routine maintenance, which is proposed to be piloted under the AF, can ensure that basic routine maintenance, involving grass cutting and culvert cleaning, is performed at a very minimal cost, which would be appealing for feeder roads. This approach can also increase entrepreneurship, community involvement, and ownership of lifeline roads, especially engaging and empowering women.

12. **Road network preservation strategy and action plan.** Addressing the issue of sufficient maintenance would require better assessment of the needs and options for financing of the road sector. Moving toward road asset management, which will be financed through the parent project, would further improve the sustainability of public investments. International best practice shows that road maintenance and network improvements can be more efficiently implemented by determining priorities through the use of an RAMS. Prioritization of expenditures through the proper monitoring, planning, and programming of maintenance and rehabilitation works through RAMS limits less-productive expenditures and redirects funds to higher-priority projects, which yield greater economic return. A modernized RAMS ensures that initial public investments are more efficiently spent. It also helps prevent underfunding and deferred maintenance as it considers life cycle cost of roads. Such a system exists in Mozambique; however, in its current form it does not support decision making and budget planning and its use is limited due to the absence of a strategic planning and updated information on the network. While the parent project will address the software and data part, the proposed AF will finance preparation of a Road Network Preservation Strategy and Action Plan (including road reclassification).

13. **Implementation of Sexual Exploitation and Abuse (SEA) provisions.** The AF is following on the good practices identified by the parent project to design its SEA/Sexual Harassment (SH) mitigation and response strategy, including the active linkage with organizations with GBV programming experience on the ground. The activities are coordinated with UNFPA, which, together with the Ministry of Gender, Children and Social Action (MGCSA), is in charge of the GBV Sub-Cluster in Mozambique. The GBV Sub-Cluster activates in humanitarian situations. It leads GBV programming to address GBV risks, including coordination, prevention and response with a multi-sectoral approach. Among the proposed mitigation and response activities carried out by the Sub-Cluster are integration and coordination of the complementary mapping of service providers for survivors of GBV in Sofala, Zambezia and Cabo Delgado provinces, and a needs assessment of services for survivors as well as capacity building for the government agencies. Under the project, an NGO specialized on GBV is being hired. The contracting of the NGO has taken longer than expected due to the humanitarian situation following the cyclones and the need to expand the TORs of this NGO to include the four new provinces of Sofala, Manica, Tete, and Cabo Delgado, and to ensure coordinated protection/collaboration with other entities for potential survivors of SEA, who

might be suffering additional risks because of the natural disasters. Coordination and capacity building are critical under the current circumstances for effective implementation and supervision. ANE is reviewing the technical and financial proposal, and it will ensure that the SEA Prevention and Response Action Plan is finalized before commencement of works. With the hiring of the NGO, the supervision costs will increase; however, such support to ANE is essential until enough capacity is built and coordination with other government entities working on the matter, such as the MGCSA, is systematized and consolidated.

14. **Expansion of the CRPT and its integration with RAMS.** With significant resources being diverted annually toward ad hoc emergency recovery needs, the parent project developed a CRPT. The objective of the CRPT is to identify vulnerable areas and protect road assets by designing resilient interventions to manage the resources in a more predictable and systematic way. The tool allows consideration of economic losses from extreme flooding and rainfall and the benefits of climate resilience in the assessment and prioritization. The analysis assessed flood risks based on (a) flood likelihood maps under various climate change scenarios and (b) vulnerability functions for bridges, culverts, and road surface. Recurrent cyclones and the devastation they bring emphasize the urgent need to adapt RAMS to changing climatic conditions and make it an integral part of preventing the loss of assets and planning the limited resources. The CRPT is currently limited to the two provinces of the parent project (Nampula and Zambezia). The proposed AF will finance the expansion of the CRPT to cover the entire country and will integrate the tool with RAMS, allowing for better flood disruption risk management.

F. Current Status of the Parent Project

15. **The IFRDP was approved on May 8, 2018, in the amount of US$185 million equivalent, including an US$150 million IDA grant and US$35 million in counterpart funding.** The project became effective on November 29, 2018. The PDO is to enhance road access in selected rural areas in support of livelihoods of local communities and to provide immediate response to an eligible crisis or emergency as needed. The project is on track to meet its PDO, and both the progress toward achievement of the PDO and the implementation progress are currently rated Satisfactory. The project is compliant with the legal covenants, including environmental and social safeguards, audit and financial management (FM), and other provisions of the legal documents under the project.

16. **To date, the project has disbursed US$35 million, which is 24 percent of the total IDA grant.** The majority of the disbursed amount was the reallocation to the CERC to address immediate disaster needs, following Cyclones Idai and Kenneth upon the activation of the CERC of the project through a Level 2 restructuring of the project.

17. **Detailed progress of the parent project by component is as follows:**

- **Component 1: Rehabilitation and Maintenance of Feeder Roads.** Consultancy services are under way for a feasibility study to identify feeder road segments using a multicriteria prioritization tool emphasizing resilience and to prepare detailed designs, packaging, and bidding documents. The bid packages for the prioritized roads in Zambezia and Nampula Province are expected to be prepared by November 2019 and the civil works worth US$70 million expected to commence by early 2020. The consultancy services also include the design of transport pilot that is part of Component 3: Pilot Rural Transport Services.

- **Component 2: Rehabilitation of Primary Road Network.** Bidding documents for the 70 km of roadways identified were prepared (rehabilitation of part of road N10 from Quelimane to Nicodala and part of road N1 from Nicodala to Namacurra in Zambezia Province) and the procurement process is ongoing. The bidding documents for this road section incorporated clauses related to sexual exploitation and abuse (SEA) and sexual harassment (SH) in the workplace prevention and response, including the requirement for development of a GBV action plan with a response and accountability framework and the requirement for bidders to submit a Code of Conduct (CoC) with their proposals. The Environmental and Social Management Plan (ESMP) for this road section includes the basis for the GBV action plan to be adopted by the contractor under the Contractor's Environmental and Social Management Plan (CESMP). Rehabilitation of these road sections are proposed under an Output and Performance-based Road Contract (OPRC) modality to ensure long-term sustainability of the road asset. The Client is expected to complete the procurement process and sign the contracts in the autumn of 2019. In parallel, the Client has also initiated the procurement of consultancy services for the technical supervision of the OPRC civil work contracts. A consultant to implement the Resettlement Action Plan (RAP) has been procured in late August 2019, with an expected contract completion date in March 2020. Terms of references for service provision for mitigation and response to SEA and SH in the workplace under the IFRDP have been prepared and shared with the United Nations Population Fund (UNFPA), which is the UN Agency in charge of leading the GBV-Sub-Cluster[4] in Mozambique.

- **Component 4: Capacity Building and Project Administration.** The Client has initiated procurement of the consultancy services to upgrade the existing Mozambique Road Management System to a comprehensive web and geographic information system-based RAMS to be used by ANE to maintain, prioritize, and manage the road network and assets in its control. In parallel, the Client is preparing terms of reference for road condition data collection. In terms of capacity-building activities, the Client's representatives participated in a performance-based contract training conducted by the International Road Federation. The Client has identified the GBV nongovernmental organization (NGO) to support in the mitigation and response to the risks of SEA and SH in the workplace that may result from the implementation of the infrastructure activities, as well as to complement the monitoring activities to be carried out by the supervision consultant. Given the natural disasters, the terms of references had to be extended to incorporate the affected areas. The SEA/SH mitigation and response strategy will be put into place before the commencement of construction works. ANE has a GRM in place, which will be improved with the help of the consultant, hired in August 2019. The consultant will identify weak areas in the GRM, recommend improvements and train ANE, both at the central and provincial levels on

[4] UNFPA is leading, in coordination with the Ministry of Gender, Children and Social Action, the GBV Sub-Cluster in Mozambique, which was activated after the natural disasters in Sofala, Cabo Delgado, Tete and Zambezia. The role of the GBV Sub-Cluster is to facilitate at the field level rapid implementation of GBV programming in an acute humanitarian emergency setting, including liaison and coordination with other organizations (coalition-building), training and sensitization, strategic planning, monitoring and evaluation. The members of the Sub-Cluster are also building capacity to lead the humanitarian response on GBV to ensure sustainability and accountability among actors. One of the main activities of the Sub-Cluster is to map available GBV response services on the referral pathway in each of the affected districts. In coordination with UNFPA, the Government has set up social service hubs that will serve as entry points for vulnerable community members to confidentially engage with social workers about child protection and GBV issues.

managing the GRM system. In addition, the TORS of the GBV NGO specifically require assessing the capacity of ANE to register and refer SEA specific cases to service providers and, through the mapping of services, identify entry points for survivors to place complaints in a confidential manner. The feedback from the GBV NGO will be reflected in the GRM, and this NGO will support ANE in GRM monitoring and implementation throughout the entire project duration.

- **Component 5: Contingent Emergency Response.** Following the declaration of emergency by the GoM in the aftermath of Cyclones Idai and Kenneth, the project underwent a Level 2 project restructuring to reallocate US$35 million from Component 1 to Component 5. This component finances emergency works to restore road connectivity. Emergency works included repairs/replacements to the drainage system, structures (bridges, drifts), and pavement. The emergency works financed out of the IFRDP followed a number of principles agreed between ANE and the World Bank, including the following: (a) emergency works form part of a long-term strategy, that is, all drainage and structural repairs follow proper design standards considering hydrological and topographical considerations; if the completion of these works cannot be fully funded, only those works that have a phased design should be considered for financing under the project; and (b) roads must be improved to a maintainable level.

Table 2. CERC Civil Works Implementation Plan (US$, millions)

Implementation Plan for CERC-funded Civil Works (Total: US$35 million) Actual and Planned Disbursements						
July 2019	August 2019	September 2019	October 2019	November 2019	December 2019	January 2020
4,377,648	4,227,488	2,761,966	5,411,029	5,411,029	8,116,544	4,705,515
Cumulative Total						35,011,219

II. DESCRIPTION OF ADDITIONAL FINANCING

18. **PDO and Results Framework.** The PDO will not change. The Results Framework and monitoring indicators are proposed to be revised to reflect the increased scope of the project in relation to Components 1 and 4 and the proposed new closing date. End target dates for most of the indicators, even for those components that remain unchanged, will be revised to reflect the proposed new closing date of December 31, 2025.

19. **Revised PDO indicators.** Rural accessibility index (percentage of rural population within 5 and 2 km of good condition roads) in the project areas was revised for both baseline and target values, reflecting the currently higher accessibility levels but the relatively small number of beneficiaries in the additional four provinces (from a baseline of 12 percent to 22 percent for within 5 km and from 7 percent to 12 percent for within 2 km, and a target of 52 percent to 45 percent for within 5 km and from 32 percent to 26 percent for within 2 km). The indicator on access to markets from land with high agriculture potential is proposed to be limited to the two original provinces of Nampula and Zambezia only. This is done to reflect the emergency nature of the project.

- **Revised intermediate results indicators.** The text of the indicator on lengths of unpaved feeder roads under performance-based contracts is revised to read 'lengths of unpaved feeder roads under area-based rehabilitation and maintenance contracts. This is to accurately reflect contracting arrangements under the project. The target value of this indicator is increased. The two indicators on grievances are proposed to be combined into one. Currently, the grievance related indicators are: 1) *Grievances registered related to delivery of project benefits that are addressed (Percentage)*; and 2) *Grievances responded and/or resolved within the stipulated service standards (Percentage)*. The revised combined indicator is proposed as "*Grievances registered that are responded / resolved within the stipulated service standards (percentage)"*. The target value is proposed to be increased from 90 percent to 100 percent, to ensure that every officially received and registered complaint is responded to.

- **New intermediate results indicators.** Pilot for routine maintenance through microenterprises designed, implemented, and evaluated and development of a Strategic Network Preservation Plan on rehabilitation and maintenance are the new indicators.

20. **Project components and costs.** The IFRDP will continue to have the same five components. Component 1: Rehabilitation and Maintenance of Feeder Roads and Component 4: Capacity Building and Project Administration will be scaled up to incorporate new activities as part of the proposed AF. No changes will be introduced to other components. The project will use the AF in the amount of US$35 million for Component 1, to replenish the amount that was reallocated toward CERC, triggered following the declaration of emergency by the GoM. The increased scope of the project and the proposed restructuring will be reflected in the project components as described in the following paragraphs.

21. **Component 1: Rehabilitation and Maintenance of Feeder Roads (Total cost: US$126.00 million; IDA: US$105.00 million equivalent; US$21.00 million counterpart financing).** Overall, the nature of civil works/interventions envisaged under this component will not change from the originally designed works under Component 1 of the parent project. The changes are related to the expansion of the geographic coverage of the project, as well as to reflect some of the newly proposed activities supporting the sustainability of public investments, specifically a pilot for routine maintenance through microenterprises. The parent project was limited to the two provinces of Zambezia and Nampula. With the proposed AF, the financing under this component will be extended to include rehabilitation and maintenance works, as well as consultancy services for prioritization of road network and design studies, supervision activities, in four additional provinces that were affected by Cyclones Idai and Kenneth: Sofala, Manica, Tete, and Cabo Delgado.

22. **Pilot for routine maintenance through microenterprises.** Component 1 will also finance design and implementation of a pilot for routine maintenance through microenterprises, including consultancy services to design the pilot as well as all operation-related expenses for services from two microenterprises in two provinces for at least two years. The pilot will be designed during the first year of implementation after the approval of the AF. Selection of provinces for the pilot will be done at the pilot design stage.

Box 1: Routine Maintenance through Microenterprises

There is significant evidence in Latin America that routine maintenance is more efficiently performed when it is done by local entrepreneurs (microenterprises or local maintenance teams), who can see the benefit of keeping a road in good condition and receive pressure from other users of rural transport. Routine maintenance is labor intensive and does not require advanced skills. It can generate employment opportunities for the rural poor, including women. Microenterprises typically consist of between 10 and 15 workers (usually people living along the road to be maintained), who use labor-based methods and hand tools in carrying out different activities aimed at improving and maintaining the standard of a stretch of road between 15 and 50 km, depending on topography and climate characteristics. Performance-based contracts between a microenterprise and a local community authority are used, in which payments are made based on the achievement of a set of performance indicators, rather than on the amount of inputs, greatly facilitating contract administration and motivating the microenterprise to improve their efficiency and effectiveness. Microenterprises generally have little capital and most of their earnings go toward paying salaries of the workers.

23. **Component 4: Capacity Building and Project Administration (Total cost: US$6.00 million; IDA US$5.00 million equivalent; US$1.00 million counterpart financing).** This component will be scaled up to include the following additional activity: consultancy services to expand the existing CRPT from two provinces of Nampula and Zambezia to cover the entire country. The expanded tool will need to allow for technical solutions to be integrated with RAMS and related training and capacity building of ANE and the Road Fund in using the tool. This component will also finance training and capacity building of various stakeholders in dissimilation and application of the nine design manuals that were developed under the recently closed Roads and Bridges Project. The component will also finance consultancy services to develop the Road Network Preservation Strategy and Action Plan (including road reclassification). Finally, this component will also finance additional consultants to be hired by ANE to support project implementation as described in the below para on implementation arrangements.

Table 3. Project Financing for AF (US$, millions)

Project Components	IDA Financing	Counterpart Financing	Total Financing
Component 1: Rehabilitation and Maintenance of Feeder Roads	105.00	21.00	126.00
- Prioritization and Detailed Designs	3.50	0.70	4.20
- Supervision	7.00	1.40	8.40
- Civil Works	58.00	11.60	69.60
- Routine Maintenance through Microenterprises Pilot	0.50	0.10	0.60
- Replenishment for CERC (Component 1 parent project)	35.00	7.00	42.00
- Contingencies	1.00	0.20	1.20
Component 2: Rehabilitation of Primary Road Network	0.00	0.00	0.00
Component 3: Pilot Rural Transport Services	0.00	0.00	0.00
Component 4: Capacity Building and Project Administration	5.00	1.00	6.00
- Climate Resilience Planning Tool and Capacity Building (inc. for design manuals)	0.40	0.08	0.48
- Road Network Preservation Strategy and Action Plan (inc. road reclassification)	1.00	0.20	1.20
- GBV Prevention and Management	1.00	0.20	1.20
- Operating Costs, Goods, Training, Audit of Project Accounts	2.60	0.52	3.12
Component 5: Contingent Emergency Response	0.00	0.00	0.00
Total Financing	110.00	22.00	132.00

24. **Implementation arrangements.** Implementation arrangements will remain the same. ANE and the Road Fund will continue to be responsible for day-to-day implementation of the project. ANE will hire additional staff to support with project implementation, including technical, environmental, and social oversight of civil works, and review and implementation of technical assistance activities. The following specialists will be hired: sr. transport specialist (international), road engineers, procurement specialists, and environmental and social specialists (local). These additional specialists will be paid from the operating costs of the project and will be hired on terms of references and qualifications, satisfactory to the World Bank.

25. **Closing date of the project.** The closing date of the project is proposed to be extended by 12 months to December 30, 2025, to account for the execution of the work following the cyclones.

III. KEY RISKS

26. With the allocation of the proposed AF, the overall risk rating of the project continues to be rated Substantial. Three risks are assessed as High: macroeconomic, climate and environmental and social; five risks are assessed as Substantial: political and governance, institutional capacity for implementation, counterpart financing and sustainability, fiduciary, and stakeholders.

- **Macroeconomic risk is assessed and rated as High.** The economic slowdown triggered by the debt crisis is contributing to macroeconomic risk as monetary and fiscal tightening continues; the business environment remains increasingly restrictive and private sector expectations weaken. Vulnerabilities in the financial sector have also grown with a notable deterioration in asset quality and the failure, and subsequent restructuring, of the fourth largest bank. Mozambique's budget has contended with reduced fiscal space since the onset of the crisis as external funding levels dropped and debt service costs increased. While currency appreciation has contributed to a reduction in debt levels, Mozambique remains in debt distress and debt restructuring is key to bring much-needed fiscal respite. This economic vulnerability could affect counterpart financing; the government contribution may not materialize on time. The legal agreements incorporate minimum counterpart contributions under flexible pari passu terms. Proposed counterpart funding is roughly equal to the taxes collected by the Government on the project plus the maintenance funds that it might spend on parts of the network under the project in normal circumstances.

- **Environmental and social.** The combined environmental and social risk, after mitigation measures, is rated High. Activities are expected to have a comparatively moderate impact on the biophysical environment. The project's civil works focus on rehabilitating or upgrading the existing roads in six provinces, and activities are not expected to have long-term negative environmental or social impacts. Potentially adverse environmental and social impacts are expected to relate mainly to construction activities during project implementation and will occur contemporaneously. The expected environmental and social impacts will be localized, and adequate mitigation measures will be in place. Given that the project will operate in cyclone environmentally degraded areas the focus of the safeguard instruments will be to avoid or mitigate further impacts. The potential adverse environmental impacts may include degradation of topography and physical features;

degradation of productive land due to soil erosion and compaction from construction vehicles and machinery; soil and water body contamination due to oil spills which could lead to decreased water quality, loss of vegetation, fauna disturbance, solid waste generation, dust, and noise emissions; and potential risks to the community health and safety and also occupational health and safety (OHS) risks to construction workers/artisans. Contractors will be required to prepare and adequately implement an OHS Plan in compliance with OHSAS 18001:2007 (now ISO 45001) and recruit OHSAS 18001:2007 certified personnel for this purpose.

- **The risk for GBV, specifically SEA and SH in the workplace, is considered High based on the World Bank GBV risk assessment tool and additional analysis.** The risk analysis considered context-related risk factors for SEA and project-related risks. According to the Demographic and Health Survey 2015, one-fourth of 15-year-old adolescents surveyed declared they were survivors of physical violence at one point in their lives; 6 percent of women declared themselves survivors of sexual violence (being more frequent in Zambezia District with 11 percent of prevalence); and 24 percent of women said they were survivors of physical, sexual, or emotional violence from their partners. The country has a high prevalence of child marriage (above regional average) and data from the Demographic and Health Survey 2011 show the existence of gender social norms that condone GBV. In this context, by bringing in expatriate workers or providing local workers with additional purchasing power in an area of high vulnerability (increased after the natural disasters), there can be additional risks for women and girls in the project area. Experience shows that sexual violence is common in humanitarian settings, when women and girls are more exposed as a consequence of the crisis, when, for instance, they are separated from their families/communities and/or carry out additional roles that expose them to risks such as foraging for food. Based on the risk level, the project will put into place measures to mitigate and respond to SEA/SH risks.

- The project will undertake the following specific measures to further mitigate the risks related to SEA and SH:

  (a) The implementing agency will incorporate the requirements for the SEA Prevention and Response Action Plan in the ESMPs to be reflected in the contractors' ESMPs. The contractors' action plans will include specific arrangements for the project by which SEA risks will be addressed, including an awareness raising strategy and a response and accountability framework.

  (b) The bidding documents will include specific requirements that minimize the use of expatriate workers and encourage workers to be hired locally—thereby minimizing labor influx. This approach was used successfully on the recently closed World Bank-financed project (Roads and Bridges Management and Maintenance Program, Phase II - RBMMP II), where local labor is estimated to account for 90 percent of the workforce.

  (c) Contractors will be required to submit 'CoCs' and a draft contract for workers along with their bids. The codes will set clear boundaries for acceptable and unacceptable behaviors of all individuals and companies (including the contractor, subcontractors, and their workforces) and specify sanctions, including for any incidents of GBV or SEA.

All project consulting firms will also be required to submit CoCs with their proposals. All workers will obtain a valid contract.

(d) ANE is currently procuring a GBV NGO, which will enhance service provision for SEA survivors (specifically the health sector) under Component 4; train project workers and local communities on GBV and SEA awareness, contents of the CoCs, outreach, and prevention; and provide case-specific support. The NGO will coordinate/complement its efforts with UNFPA, for instance the additional mapping of service providers, quality assessment and referrals of survivors in the additional Provinces where it has active presence.

(e) A Grievance Redress Mechanism (GRM), which has specific survivor-centered protocol for ethically recording and addressing SEA complaints will be implemented. This will include appropriate mechanisms for referral to enhanced service providers under Component 4.

(f) A Steering Committee will meet quarterly and include community representation and the NGO.

(g) Risk related to communities and workers health and safety will be addressed by the contractor through a robust CESMP which will include specific measures to minimize the number of work-related accidents during subproject implementation. All these mitigation measures will be reflected in the safeguards instruments for the project and are part of the Project Operations Manual (POM).

- **Political and governance risk is assessed Substantial.** The country remains susceptible to further outbreaks of political and social conflict, though a return to full-scale civil war is seen as unlikely. Governance indicators for Mozambique reflect a gradual decline of government effectiveness, control of corruption, the rule of law and voice and accountability over the past several years. Perceptions of corruption within the public service are given credence by civil society organizations, which have voiced concerns with regards to the absence of sufficient public accountability in the use of state revenues. Mitigation measures include supporting the project implementing entity to improve transparency and accountability in the project and sector by joining the Construction Sector Transparency Initiative (CoST), a global initiative improving transparency and accountability in public infrastructure. Discussions are underway with the CoST Secretariat on how to implement the Initiative under the IFRDP, including adoption of tools, standards and TA that can be applied to drive transparency and stakeholder involvement in planning and implementing infrastructure projects and promoting more robust accountability mechanisms.

- **Institutional capacity for implementation and sustainability is rated Substantial.** Provincial road sector institutions' capacity for managing workloads, efficiency, and quality is relatively inadequate, although hiring consultants and service providers to support provincial delegations will mitigate the risk. Responsibility for implementation of Component 1 will continue to be partially handed over to the provincial delegations of ANE in Zambezia and Nampula, and similar arrangements will be applied for the additional four provinces. The

provincial delegations of ANE will be responsible for procurement, supervision, and monitoring of rural roadworks under Component 1 with an oversight from the ANE central unit. All other procurement under the project will be handled by the ANE central unit. Training of ANE provincial delegations' staff will be ensured before handing over those responsibilities. This arrangement will promote decentralization and build capacity in local government entities, improving the long-term sustainability of the project. Inclusion of long-term maintenance under Component 1 (three years) and Component 2 (seven years) also helps reduce sustainability risks over the project life cycle. At the central level, ANE's capacity is proposed to be strengthened through hiring of the project management consultant.

- **Fiduciary risk.** The assessment of the fiduciary risk that is rated Substantial, includes the FM risk, which is rated Moderate, and the procurement risk, which is rated Substantial. The project implementing agency, the Road Fund, has been working to ensure compliance with FM requirements for World Bank-financed operations. The FM arrangements in place for the ongoing project will also apply for this operation, and changes in those arrangements are not expected. No changes are expected for procurement arrangements either. The procurement risk is assessed as Substantial for the following reasons:

  (a) The procurement of goods, works, non-consulting services, and consulting services under the proposed AF will be governed by the new Procurement Regulations for IPF Borrowers. While some staff in the ANE central unit in charge of procurement functions (*Unidade Gestora Executora das Aquisições*, UGEA) received training on the New Procurement Framework and continues on-the-job guidance from the World Bank staff, those are new concepts and ANE and UGEA need time and more guidance to advance their knowledge and practical skills. The proposed AF will envisage incremental funding to continue ANE's capacity building and

  (b) UGEA's filing system is not satisfactory. ANE and UGEA will hire a consultant with extensive experience in hard and electronic filing systems to organize all hard copies and introduce electronic filing and allocate office space to allow UGEA to maintain properly the records and have the files labeled and numbered in chronological order as per the consultant's recommendations.

- **Stakeholder risk is rated Substantial.** Local stakeholders, civil society, and local governments may seek changes in road selection and interventions under Component 1. Stakeholder engagement throughout the project implementation will mitigate the risk. The district road councils, chaired by the governors (usually represented by the district administrator) and on which all stakeholders have a seat, will be the natural platform to facilitate stakeholder engagement. Consultations were conducted in new provinces during project preparation. Consultation will continue throughout implementation of both Components 1 and 2.

- **Climate and disaster risk is rated High.** The World Bank Climate and Disaster Risk screening tool was used to complete the project climate screening. As the project is located in flood- and cyclone-prone areas, strong winds, extreme precipitation, and flooding are the primary

hazards that climate change poses to investments under this financing. Adaptation measures incorporated into the project design include the adoption of climate resilient construction designs for the rehabilitation of roads and bridges under Component 1, together with climate resilience technical assistance under Component 4.

- **Counterpart co-financing.** Counterpart co-financing risk is assessed as Substantial. The proposed AF will have a counterpart co-financing in the amount of 20 percent, which is the same arrangement as in the parent project. This amount represents tax obligations. The risk has been partially mitigated by the yearly project disbursement schedule, which will be reflected in the Financing Agreement as a covenant.

IV. APPRAISAL SUMMARY

A. Economic Analysis

27. This AF will finance road network recovery and rehabilitation efforts in four additional provinces that were affected by Cyclones Idai and Kenneth: Sofala, Manica, Tete, and Cabo Delgado. The initial PDNA identified 45 road sections as damaged and critical, of which the total length is about 3,600 km.[5] Similar to the parent project, the AF is only focused on non-primary road connectivity, including secondary, tertiary, vicinal, and non-classified roads. To select priority roads, the same principles as the parent project are applied: (a) criticality of road network; (b) current agricultural production; (c) agroclimatic potential; (d) poverty incidence; and (e) flood risk. While the last is given a weightage of 0.5, other criteria are equally weighted.

28. The project will finance the road segments based on the above criteria. Although the final list of roads to be rehabilitated needs to be updated with more accurate data and project readiness considered, the top nine ranked roads totaling nearly 900 km would likely cost about US$74 million (see the full list of priority roads in annex 1: Economic Analysis). Based on the traditional consumer surplus approach, which compares road rehabilitation and maintenance costs and savings of road user costs (RUC), such as vehicle operating costs and time costs, the average rate of return is estimated at about 18.0 percent with a wide variation from −4.9 percent[6] to 62.7 percent, highly depending on expected traffic and investment costs. Net present values (NPVs) are also estimated to vary significantly from negative US$21 million to US$58 million, with an average of US$3.9 million at a discount rate of 6 percent.

29. The project could benefit a large number of people along the road to be rehabilitated in the cyclone-affected areas. If the top nine priority roads are selected according to the preliminary ranking, it is estimated that about 60,000 and 150,000 people could benefit based on a 2 km and 5 km threshold, respectively. From the environment point of view, carbon dioxide emissions could also be reduced by about 304 tons over the 20-year project life. Gross emissions are estimated at about 3,542 tons and 3,239 tons without and with the project, respectively.

[5] These roads include roads beyond the network managed by ANE.
[6] The prioritization process is expected to select projects of highest economic internal rate of return among other multicriteria.

B. Technical

30. **Build Back Better Approach.** Much of the deterioration of the road network is attributed to environmental factors and exacerbated by poor drainage design and maintenance practice. Road designs under the proposed AF will follow climate-resilient design standards developed under a previous World Bank operation (Roads and Bridges Management and Maintenance Program Project, P083325). Nine comprehensive climate resilient manuals were developed: Geometric Design Manual, Site Investigations Manual, Pavement Design Manual, Rehabilitation Design Manual, Hydrology and Drainage Design Manual, Specification for bridge loads, Standard Specifications for Roads and Bridge Works, Standard Details for Roads and Bridges, and Guidelines for Performance Specifications. These design standards are sensitive to the topography, climate change risks, primarily flooding, and recurrent climatic events and drought, among other considerations of resilience. The practical effect of these standards can be seen from the emergency works designed and implemented in Gaza and completed in late 2018. The resilient build back better ensures that the replacement hydraulic structures account for frequent and much severe flood events, through wider openings, better rip-rap, higher bridge profile, higher vertical profile of the road, and more effective cross and side drainage structures. The civil works proposed in this operation will be designed using the resilient design and will be prepared to better withstand any future climatic event.

31. Other wider principles to safeguard the investments in the medium and long term are (a) an effective RAMS in place and functioning and (b) sufficient funding for road maintenance. Insufficient road maintenance is a major contributor to flood damage, undermining road infrastructure resilience to extreme conditions. These principles are an integral part of the parent project, which will continue to be emphasized through the proposed AF.

32. **Contract modality, payment, and duration.** For non-emergency works, roads to be rehabilitated under the proposed AF are those that are in very poor condition (post cyclone) and in need of rehabilitation or reconstruction. Similar to the parent project, civil works under Component 1: Rehabilitation and Maintenance of Feeder Roads will be organized in rehabilitation and maintenance contracts in the four additional provinces of Cabo Delgado, Manica, Sofala, and Tete. No widening, upgrading of surface type, or improvement of geometric characteristics is included in rehabilitation works. Reconstruction will include roadworks designed to replace sub-base, base, and surface layers that are in very poor condition with new ones and improvement of drainage structures. No widening, upgrading of surface type, or improvement of geometric characteristics is included in reconstruction works.

33. Typical construction period will be 12–18 months, followed by three-year maintenance period, including an initial 12 months of defect liability period. The works will be tendered as a National Competitive Bidding. The packaging will be done on an area-based approach. The rural road network is divided into ‘Rehabilitation and Maintenance Areas’, each area encompassing between 150 and 300 km of road, which can be effectively managed by a single contractor.

34. **Rehabilitation/reconstruction works.** The civil works will include reconstruction and/or rehabilitation of sections of feeder roads to a standard profile and condition which can be properly maintained under the Area-Based Maintenance System (ABMS). Contracts will be packaged to include several road sections in the same area. The works will also include improvement to the drainage

characteristics of the roads which with the application of regular routine maintenance will improve the overall flood resilience of the roads. These works include the following:

- Standardization of the road profile to a 5 m width and construction with appropriate side drains and meter drains. The pavement will be either earth or gravel depending on in situ material quality, traffic, and material availability.
- Repair and/or improvement of relief and small stream crossings using culverts and smaller structures along roads—where necessary replacement or construction of additional structures.
- Repair of existing larger structures including reinstatement of approaches and installation of appropriate protection works
- Construction of necessary additional medium-size structures.
- Clearing of verges and installation of signage.

35. **Maintenance.** Similar to the parent project, the maintenance part of contracts will use elements of the ABMS. The ABMS is a routine road maintenance system for low/medium trafficked rural gravel roads (5–90 vpd). The 'Maintenance Area Base Camp' is located centrally within each maintenance area which provides accommodation, offices, storage, and equipment workshop facilities. During the maintenance part of the rehabilitation and maintenance contracts, a contractor is permanently based within the maintenance area from where he provides the maintenance services throughout the three-year period. This is an essential part of the ABMS—the maintenance contractor is permanently established within the maintenance area from where he carries out the stipulated activities and is expected to react to any road-related issues expeditiously within his maintenance area.

36. **Typical ABMS maintenance activities.** The main activities can be broken into two main categories:

- **Equipment-intensive pavement activities.** The equipment activities use an agricultural tractor with towed grader to smooth the carriageway surface and to restore the road profile (using the existing surface material) and tyre drags for a dry season activity that retards the formation of corrugations, helping to keep the running surface smooth.
- **Labor-intensive drainage and verge maintenance activities.** These activities include clearing, cleaning, or repairing of side drains, drainage channels, structures, and culverts; verge clearing; patch gravelling pothole filling; and road furniture or signage maintenance.

37. The routine maintenance activities are carried out according to a schedule of work cycles which are determined for each road by considering the road type, condition, traffic usage, and terrain. The number of equipment-based cycles are stipulated for each road in the annual maintenance plan and are to be performed according to this schedule. The road condition depends on regular inputs either as tyre dragging or towed grading. The level of service measure for these equipment-based activities is the number of cycles performed. The number of labor-based activity cycles are planned for but will be scheduled by monitoring of the verge and drainage systems according to the agreed levels of service.

38. **Supervision**. A supervision consultant will be procured for each province. This will comprise the normal supervisory setup of project management and teams to oversee the works. Bearing in mind the quantity of structures, large numbers of smaller work sites and spread-out nature of works will require a relatively high level of monitoring with suitable support staff to monitor and control activities. Key staff will include a project coordinator, bridge structures engineer, materials engineer, social and environmental specialist and site engineers.

39. **Absorption capacity of the road construction industry.** Due to a significant increase in the project size, an analysis of the road construction industry in the four additional provinces was conducted to assess its absorption capacity. Overall, the analysis concluded that there is sufficient capacity in each of the provinces. Thus, for the restoration of some of the vital roads damaged by Cyclone Idai that hit the provinces of Sofala, Manica, Tete, and Zambezia, the public works sector mobilized about 36 local contractors, with experience and technical capacity demonstrated in previous contracts with ANE. In addition, competition was high, with around 30 contractors per bid with competitive prices. Out of these 36 contractors, two-thirds were of national representation and one-third were local companies, with only a fraction being companies of foreign origin. In addition, according to ANE estimates, in each province there are about 10 local contractors that do not have contracts, indicating adequate capacity to competitively absorb the future works.

C. Financial Management

40. The Road Fund will continue to have fiduciary responsibility for the implementation of the proposed AF. The recent review of the ongoing IFRDP FM arrangements concluded that the Road Fund has been working to ensure compliance with FM requirements of World Bank-financed operations. The first disbursement under this operation was on April 18, 2019. There are no outstanding unaudited interim financial reports (IFRs) or audit report under the project.

41. The FM and disbursement arrangements in place under the ongoing IFRDP will also apply for the proposed AF, and these arrangements are not proposed to be changed. The project funds, expenditures, and resources will be accounted for using the existing automated accounting software (Primavera), which is adequate as it can produce reliable financial reports required to monitor and manage the project progress effectively. Disbursement of IDA funds will be done on report-based procedures (IFRs). The proposed AF will make use of advances, direct payments, reimbursement, and special commitment methods for disbursements. The Road Fund will prepare quarterly IFRs and provide such reports to the World Bank within 45 days of the end of each calendar quarter. The project financial statements will be audited annually by the independent auditor (a private audit firm) in accordance with International Standards on Auditing as issued by the International Auditing and Assurance Standards Board within the International Federation of Accountants.

42. A Segregated Designated Account denominated in U.S. dollars will be opened at Bank of Mozambique and managed by the Road Fund.

43. The overall FM risk of the project is Moderate.

D. Procurement

44. **Procurement procedures**. The procurement of goods, works, non-consulting services, and consulting services for the proposed AF will be governed by the World Bank's Procurement Regulations for IPF Borrowers, dated July 2016, revised November 2017 and August 2018 under the New Procurement Framework and the provisions stipulated in the Financing Agreement. Further, the Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated October 15, 2006, and revised January 2011, will apply.

45. **National procurement procedures.** National open competitive procurement procedures may be used while approaching the national market. National open competitive procurement will observe the requirements stipulated in the Procurement Regulations for IPF Borrowers on National Procurement Procedures. Other national procurement arrangements (other than national open competitive procurement) that may be applied by the Recipient (such as limited/restricted competitive bidding, request for quotations/shopping, direct selection) shall be consistent with the World Bank's Core Procurement Principles and ensure that the World Bank's Anti-Corruption Guidelines and Sanctions Framework and contractual remedies set out in the Financing Agreement apply.

46. **Project Procurement Strategy for Development (PPSD).** The Recipient will update the PPSD, identifying optimum procurement strategies for meeting the development objectives of the project, based on which the Procurement Plan for the first 18 months will be prepared, setting the selection methods to be used by the Recipient in the procurement of goods, works, non-consulting services, and consulting services under the project. Given that the proposed AF is prepared under emergency response procedures, the deadline for updating the PPSD is deferred to the implementation. The Procurement Plan will be updated at least every 12 months, or as required, to reflect the actual project implementation needs. Each update shall require World Bank approval and will be publicly disclosed in accordance with the World Bank disclosure policy.

47. **Procurement capacity and implementation arrangements.** The overall procurement implementation arrangements of the project will remain the same under UGEA of ANE. The provincial delegations will be involved in the procurement of civil works and supervision consultant under Component 1, with oversight from the ANE central unit. Overall, the capacity of staff in the UGEA is satisfactory. There has been high turnover of ANE and UGEA senior managerial staff: two heads of ANE and two heads of UGEA have been replaced in less than three years. To date, the technical staff remain unchanged, with UGEA having sufficient technical expertise as well as physical resources to ensure that procurement under the proposed AF will be executed with adequate levels of transparency, efficiency, and fairness and considering all principles of value for money and fit for purpose. However, with the increased scope of the project, ANE will need to pay more attention to contract management.

48. **Record keeping.** The filing system is an issue that needs to be resolved. Files are not kept in a safe place that would prevent vandalism, theft, and breach of confidentiality of procurement processes.

49. **Review by the World Bank of procurement decisions.** Table 4 indicates the initial values for prior review by the World Bank. All activities estimated to cost below these amounts shall be treated as post review and will be reviewed by the World Bank during the implementation support missions under a post procurement review exercise. Direct contracting/single source will be subject to prior review only above

the amounts given in the below table. The World Bank may, from time to time, review the amounts based on the performance of the implementing agency.

Table 4. Prior Review Thresholds

Procurement Type	Prior Review (US$)
Works	10,000,000
Goods and Non-Consulting Services	2,000,000
Consultants (Firms)	1,000,000
Individual Consultants	300,000

Note: a. These thresholds are higher than those of the parent project due to the application of mandatory risk-based approach.

50. **POM.** The POM will be updated to conform with the requirements of the AF before effectiveness.

E. Environmental and Social (including Safeguards)

51. In accordance with the World Bank Guidelines for AFs, the proposed AF will continue to be governed by the earlier Environmental and Social Safeguard Policies as the proposed project activities do not warrant a change in project categorization or triggering new safeguards policies. The parent project was classified as environmental category 'B' due to the nature and scale of the investments which are similar to the ones being proposed under the AF. Hence, the environmental category will remain unchanged for the AF. Because the project activities in the four new provinces will focus on the rehabilitation/reconstruction of damaged roads and bridges, a preliminary assessment indicates that none of the proposed roads will affect the biodiversity or cultural heritage sites; does not pass through a conservation/protected area; or will result in economic or physical displacement of people. Although the GBV/SEA risks are considered high in cyclone-affected areas, the risk assessment on GBV remains the same as the parent project and the same adequate mitigation measures through increase in scope of the GBV/SEA service provider to cover the six provinces will be designed and implemented. The safeguards policies triggered for the AF are the same as those under the parent project: OP 4.01 (Environmental Assessment), OP 4.04 (Natural Habitats), OP 4.11 (Physical Cultural Resources), and OP 4.12 (Involuntary Resettlement). The inclusion of new project areas requires an update of the original safeguard instruments (including Environmental and Social Management Framework [ESMF] and Resettlement Policy Framework [RPF]) through an environmental and social baseline assessment and public consultations in each of the four new provinces. These documents have been updated, consulted upon in each province, and redisclosed in-country and through the World Bank website on September 9, 2019. Site-specific ESMPs and RAPs (as needed) will be prepared once targeted roads are selected. The gathered information, which also included gender and GBV/SEA risks in the new areas, community health and safety risks, and risks associated to labor influx, among others, is part of the addendum for existing safeguards instruments. In addition, a set of community consultation and stakeholders' engagement were carried out and the feedback gathered was subsequently incorporated in the final versions of the safeguard documents.

52. **The environmental and social risks of the AF are the same as those under the parent project and are maintained High.** Potential adverse environmental and social impacts brought about by the road rehabilitation investments are expected to be manageable with adequate use of the safeguard tools. As in the parent project, proposed investments in four new provinces would be located within the Mozambique national territory, the scope of the activities/works remains the same, and no works are expected on international roads and bridges. The IFRDP AF will not finance new road construction (greenfield, including village/city bypasses) or any high-risk investment from an environmental/social safeguards perspective.

53. **Environmental and social implementation arrangements.** Both the Road Fund and ANE have extensive experience in successfully implementing similar World Bank-financed projects through the implementation of ESMFs/ESIAs/ESMPs and RPFs/RAPs/Abbreviated Resettlement Action Plans. ANE's central monitoring unit is staffed with four environmental and social specialists, who are well-versed in both national regulations and World Bank safeguards requirements and will be responsible for the overall safeguards' implementation of the proposed AF. In addition, ANE has environmental, social, health, and safety (ESHS) focal points in their provincial offices, who will also be involved in day-to-day project implementation. ANE will ensure that site-specific ESMPs and RAPs for individual roads rehabilitated under the project are incorporated into the civil work contracts and supervision contracts and that reporting on safeguards implementation is timely and detailed enough to be useful for project monitoring and supervision. Site-specific ESMPs will include OHS plans and the requirement to hire certified OHS staff (see also above). Budget provisions for implementation of ESHS and capacity building is included the ESMFs.

Gender

54. **This AF will contribute to closing the gender gaps on employment in the construction sector.** Data show that women's employment participation was 69 percent in 2016 while men was 81 percent among low-income populations. In the middle-income population, the gap increases to 30 percent (46 percent for women and 76 percent for men). The female workforce participation rate in construction is about 3 percent in Mozambique. Data from the recently closed World Bank RBMMP II project illustrate that women constitute only about 10 percent of the total workforce of the contractor and very few are employed as skilled workers. The project will promote women's employment in road rehabilitation and maintenance in the geographical areas of intervention, and in collaboration with the Client, a Gender Action Plan will be prepared to address recruitment and retention barriers that women face. While this AF will not provide further funding for the component to pilot rural transport services under the parent project (Component 2), this component remains highly relevant to understand women's mobility barriers and inform the design of transport services that address their particular needs.

55. **Managing sexual exploitation and abuse risks.** Similar to the parent project, a World Bank GBV risk assessment[7] was conducted to evaluate risk factors in the proposed new project areas. The risk is assessed as High using the World Bank GBV risk assessment tool and additional context/project analysis. In addition to the risks identified for the parent project, additional risks for SEA can be present in the new

[7] This risk assessment considers context (including prevalence of different forms of GBV and child marriage, existence of a legal framework, care-seeking behaviors) and project-related risks (including labor influx and absorption capacity, supervision capacity, and poverty levels).

areas, derived from the humanitarian situation, including women and girls getting separated from their communities; protection systems, such as health services, broken down by the disasters; and destroyed livelihoods, which make them vulnerable to people with relatively more purchasing power (including construction workers).

56. **Mitigation measures.** The GoM is keen to take all necessary measures to address the risks of HIV/AIDs, SEA, and SH in the workplace. Following the parent project's mitigation and response strategy and the recommendations of the Good Practice Note Addressing Gender Based Violence in IPF involving Major Civil Works, measures will be put in place for the new interventions such as a complementary mapping of service providers (including analysis of the quality of services) for SEA survivors as needed; enhanced contractual obligations in the bidding documents, including the submission by the contractor of a CoC defining obligations on SEA (to be signed by all workers); regular training on the contents of the CoC; the development by the contractor of an SEA Prevention and Response Action Plan with a response and an accountability framework; and a GRM with different entry points to register SEA complaints and where confidentiality will be kept for survivors and rights respected at all times of the process.

57. The TOR for the NGO GBV were being prepared under the parent project, when the Cyclones Idai and Kenneth hit Mozambique. ANE has revised the TOR by increasing the scope to include four additional provinces of Sofala, Manica, Tete, and Cabo Delgado. The NGO was identified, and the procurement process is ongoing. The NGO will support the design, implementation, and coordination of the mitigation, response, and monitoring activities to cases of SEA that may be brought about through the project. The terms of references for the services of the GBV NGO emphasize the importance of coordinating and complementing project efforts with the activities of the GBV Sub-Cluster under the leadership of UNFPA, to ensure that its mitigation and response activities for GBV risks are well coordinated. The GBV Sub - Cluster's overall objective at the field level is to facilitate rapid implementation of GBV programming in an acute humanitarian emergency setting, including liaison and coordination with other clusters/organizations (coalition-building), training and sensitization, strategic planning, and monitoring and evaluation.

58. **The project will also learn from the experience of the Mozambique's Gender Coordination Group, which brings together most of the multilateral and bilateral donors as well as civil society organizations.** The project will actively coordinate with the development partners and their ongoing programs addressing SEA in Mozambique, such as the UNFPA - Spotlight Project, the United States Agency for International Development, and the Swedish International Development Cooperation Agency. The project will also consider the experience of the GBV initiative on community strategies to raise awareness on GBV, including SEA, which could also further inform design of the project reporting mechanisms.

59. **Governing frameworks.** The implementation of the project shall be undertaken in line with an overall situational analysis of GBV in Mozambique and the project areas and within the current national legal and policy framework, including the Law Nr. 29/2009 on Domestic Violence Committed against Women and the National Plan of Action for the Fight and Prevention of Violence against Women (2008–2012); provisions in the Constitution; the Law for the Prevention and Combat of Trafficking in Persons; the Multisectoral Mechanism on Integrated Response for Women Victims of Violence (*Mecanismo Multisectorial de Atendimiento Integrado A Mulher Vitima de Violencia*); and other additional relevant normative, policies, and programs.

60. This assessment will be complemented with a broader assessment through the ESMF and ESMPs to ensure adequate implementation and monitoring of mitigation measures take place throughout the life of the project.

Climate Change

61. **Mozambique has been exposed to high risks of climate change impacts and natural disaster.** The country has a long history of catastrophic flooding, which occurs almost annually during the rainy season, experiencing the highest impact of weather-related shocks in the past 20 years, including Cyclones Idai in March and Kenneth in April 2019, in terms of fatalities and economic losses. Although the number of tropical cyclones globally is expected to be reduced in the future, the number of most intense tropical cyclones (Category 4 and 5), associated with more rainfall, will increase in a warming climate.[8] Hydrological modeling indicates that some areas in the north will experience floods more frequently. The coastal areas were identified to be more vulnerable to sea-level rise and there is high confidence that extremes in sea level will increase with mean sea-level rise, which will exacerbate the impact of storm surge on coastal regions and raise flooding and landfall concerns. The low-lying city of Beira was inundated by Cyclones Idai and Kenneth, which interrupted the Beira trade corridor, damaging roads and bridges. This will be supported and rehabilitated by the AF (Component 1).

62. **The parent project incorporated climate resilience into the project design using an innovative 'decision making under uncertainty' (DMU) methodology.** The methodology uses a transport network model to estimate network-level climate adaptation co-benefits and is based on a robust decision-making framework that properly deals with a large range of plausible future scenarios. Traditional planning approaches do not account for the benefits of building climate resilience in the network and often lead to suboptimal investment decisions. The parent project piloted this innovative methodology to incorporate the benefits of flood disaster resilience into project prioritization and economic evaluation on two provinces of Nampula and Zambezia. Using a CRPT, flood risk is assessed based on flood likelihood maps under various climate change scenarios and on vulnerability functions for bridges, culverts, and road surfaces. The proposed AF will finance the expansion of the CRPT to cover the entire country and will integrate the tool with RAMS, allowing for better flood disruption risk management.

63. **Greenhouse gas emission reduction.** If the top nine priority roads are rehabilitated, carbon dioxide emissions are estimated to be reduced by about 304 tons over the 20-year project life. Gross emissions are estimated at about 3,542 tons and 3,239 tons without and with the project, respectively (the detailed analysis is described in annex 1).

Citizen Engagement

64. **To enhance project monitoring, transparency, and social accountability, the project will use and further deepen earlier initiatives undertaken under IDA-funded projects.** Already, smartphone-based geospatial applications are being used by agencies in low-capacity regions for monitoring of work sites and receiving citizens' feedback and grievances. The project will incorporate these mechanisms and

[8] https://news.un.org/en/story/2019/05/1039381.

provide training on different aspects of filing, receiving, and responding effectively to stakeholders' grievances.

65. **The project will continue supporting citizen engagement activities**, including, among others, (a) developing a grievance redress policy for the road sector; (b) developing detailed procedures for redress of grievances, including pinpointing grievance redressal roles and responsibilities among government officials; (c) designing a web-based grievance registration system; (d) creating a mechanism for providing feedback to complainants and monitoring the status of resolution of grievances; (e) undertaking campaigns for sensitizing the general public on the opportunity of registering grievances, including the use of billboards and radio broadcasting; and (f) providing support to the road sector for establishment of an institutional mechanism for the registration, processing, management, and resolution of grievances. The Results Framework contains the following citizen engagement indicators reflecting these efforts: (a) grievances registered and responded and/or resolved within the stipulated service standards (percentage), and (b) project-supported organization(s) publishing periodic reports on GRM and how issues were resolved (including resolution rates and percentage).

66. **The citizens' engagement component will be implemented through the following arrangements:** (a) building upon and empowering 'Project Liaison Committees', as described in annex 2; (b) establishing the use of a dedicated administrator, who will manage the tollfree number and web-based grievance registration system at the backend; (c) collaborating with the National Communication Institute of Mozambique (*Instituto Nacional de Comunicação de Moçambique*) for support on mobile communication regulatory aspects; (d) launching citizen-centric public relations campaigns; and (e) specifying up front, in construction companies' contracts, that the web-based grievance registration system needs to be applied to depict resolution of all citizens' issues. The project has earmarked about US$350,000 for this activity.

V. WORLD BANK GRIEVANCE REDRESS

67. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service.
For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VI SUMMARY TABLE OF CHANGES

	Changed	Not Changed
Results Framework	✓	
Components and Cost	✓	
Loan Closing Date(s)	✓	
Safeguard Policies Triggered	✓	
Implementing Agency		✓
Project's Development Objectives		✓
Cancellations Proposed		✓
Reallocation between Disbursement Categories		✓
Disbursements Arrangements		✓
EA category		✓
Legal Covenants		✓
Institutional Arrangements		✓
Financial Management		✓
Procurement		✓
Other Change(s)		✓

VII DETAILED CHANGE(S)

COMPONENTS

Current Component Name	Current Cost (US$, millions)	Action	Proposed Component Name	Proposed Cost (US$, millions)
Rehabilitation and Maintenance of Feeder Roads	95.00	Revised	Rehabilitation and Maintenance of Feeder Roads	221.00
Rehabilitation of Primary Road Network	80.00		Rehabilitation of Primary Road Network	80.00
Pilot Rural Transport Services	2.50		Pilot Rural Transport Services	2.50

Capacity Building and Project Administration	7.50	Revised	Capacity Building and Project Administration	13.50
Contingency Emergency Responce	0.00	Revised	Contingency Emergency Responce	0.00
TOTAL	**185.00**			**317.00**

LOAN CLOSING DATE(S)

Ln/Cr/Tf	Status	Original Closing	Current Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
IDA-D2490	Effective	31-Dec-2024	31-Dec-2024	31-Dec-2025	30-Apr-2026

Expected Disbursements (in US$)

Fiscal Year	Annual	Cumulative
2018	0.00	0.00
2019	35,000,000.00	35,000,000.00
2020	35,000,000.00	70,000,000.00
2021	40,000,000.00	110,000,000.00
2022	40,000,000.00	150,000,000.00
2023	40,000,000.00	190,000,000.00
2024	40,000,000.00	230,000,000.00
2025	30,000,000.00	260,000,000.00

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Latest ISR Rating	Current Rating
Political and Governance	Substantial	Substantial
Macroeconomic	High	High
Sector Strategies and Policies	Moderate	Moderate
Technical Design of Project or Program	Moderate	Moderate
Institutional Capacity for Implementation and Sustainability	Substantial	Substantial
Fiduciary	Substantial	Substantial

Environment and Social	High	High
Stakeholders	Substantial	Substantial
Other		High
Overall	Substantial	Substantial

COMPLIANCE

Change in Safeguard Policies Triggered

Yes

Safeguard Policies Triggered	Current	Proposed
Environmental Assessment OP/BP 4.01	Yes	Yes
Performance Standards for Private Sector Activities OP/BP 4.03	No	No
Natural Habitats OP/BP 4.04	Yes	Yes
Forests OP/BP 4.36	No	No
Pest Management OP 4.09	No	No
Physical Cultural Resources OP/BP 4.11	Yes	Yes
Indigenous Peoples OP/BP 4.10	No	No
Involuntary Resettlement OP/BP 4.12	Yes	Yes
Safety of Dams OP/BP 4.37	No	No
Projects on International Waterways OP/BP 7.50	No	No
Projects in Disputed Areas OP/BP 7.60	No	No

LEGAL COVENANTS – Additional Financing for Integrated Feeder Road Development Project (P171093)

Sections and Description
Notwithstanding the provision of Section I.A.2 above, the Recipient, through ANE, not later than three (3) months after the Effective Date, shall appoint and thereafter maintain throughout Project implementation, a senior transport specialist, four road engineers, four procurement specialists, and five environmental and social specialists, all under terms of reference acceptable to the Association and included in the Operations Manual.

Conditions

Type	Description
Effectiveness	The Recipient and the Project Implementation Entity have updated the Project Operations Manual in a manner satisfactory to the Association.
Effectiveness	The Subsidiary Agreement has been amended in a manner satisfactory to the Association and executed on behalf of the Recipient and the Project Implementing Entity.
Effectiveness	The Project Agreement has been executed between the Association and the Project Implementation Entity.
Effectiveness	The Cooperation Agreements between the Project Implementing Entity and ANE and INATTER respectively, have been amended and executed in a manner satisfactory to the Association.

VIII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: Mozambique

Additional Financing for Integrated Feeder Road Development Project

Project Development Objective(s)

The Project Development Objective is to enhance road access in selected rural areas in support of livelihoods of local communities and to provide immediate response to an eligible crisis or emergency as needed.

Project Development Objective Indicators by Objectives/ Outcomes

Indicator Name	DLI	Baseline	Intermediate Targets							End Target
			1	2	3	4	5	6	7	
Enhance road access in selected rural areas										
Rural accessibility (% of rural population within 5 kilometers of good condition roads) in the project areas (Percentage)		22.04	25.00	27.00	30.00	35.00	40.00			45.00
Action: This indicator has been Revised										
RAI (Rural Accessibility Index calculated as % of rural population within 2 km of good condition roads) in the project areas		12.00	15.00	18.00	20.00	23.00	23.00			26.00

Indicator Name	DLI	Baseline	Intermediate Targets							End Target
			1	2	3	4	5	6	7	
(Percentage)										
Action: This indicator has been Revised										
Road conditions measured as roads in good and fair condition as a share of total road network in project areas (Percentage)		40.00	0.00	0.00	40.00	55.00	80.00	80.00	80.00	80.00
Action: This indicator has been Revised										
Access to markets from land with high agriculture potential in Nampula and Zambezia provinces (Square kilometer(km2))		9,300.00	9,300.00	10,300.00	12,000.00	14,000.00	14,000.00	14,000.00	14,000.00	14,000.00
Action: This indicator has been Revised										

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	Intermediate Targets							End Target
			1	2	3	4	5	6	7	
Rehabilitation and Maintenance of Feeder Roads										

Indicator Name	DLI	Baseline	Intermediate Targets							End Target
			1	2	3	4	5	6	7	
Length of unpaved feeder roads under area-based rehabilitation and maintenance contracts (Kilometers)		0.00	0.00	0.00	800.00	1,200.00	2,000.00	2,200.00	2,400.00	2,400.00
Action: This indicator has been Revised										
Bridges, drifts, and culverts selected for rehabilitation or reconstruction on feeder roads in the project areas (Percentage)		0.00	0.00	0.00	0.00	40.00	50.00	65.00	85.00	100.00
Action: This indicator has been Revised										
Pilot for Routine Maintenance through Microenterprises designed, implemented, and evaluated (Text)		No pilot	No pilot	Pilot has been designed	Pilot is under first year implementation	Pilot is second year implementation	Pilot has been evaluated			Pilot has been evaluated
Action: This indicator is New										
Rehabilitation of Primary Road Network										
Roads Rehabilitated (Percentage)		0.00	0.00	0.00	20.00	30.00	50.00	60.00	80.00	100.00
Action: This indicator has been Revised										

Indicator Name	DLI	Baseline	Intermediate Targets							End Target
			1	2	3	4	5	6	7	
Roads Rehabilitated - rural (Percentage)		0.00	0.00	0.00	40.00	60.00	80.00	100.00	100.00	100.00
Action: This indicator has been Revised										
Roads rehabilitated - nonrural (Percentage)		0.00	0.00	0.00	50.00	50.00	50.00	50.00	50.00	100.00
Action: This indicator has been Revised										
Length of primary roads with road safety assessment (Kilometers)		0.00	0.00	0.00	30.00	70.00	70.00	70.00	70.00	70.00
Action: This indicator has been Revised										
Pilot Rural Transport Services										
Endorsement of PPP strategy for the road sector (Yes/No)		No	No	No	No	No	Yes	Yes	Yes	Yes
Action: This indicator has been Revised										
Launch of pilot for improved transport services (Yes/No)		No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Action: This indicator has been Revised										
Road asset management system		No	No	No	No	No	Yes	Yes	Yes	Yes

Indicator Name	DLI	Baseline	Intermediate Targets							End Target
			1	2	3	4	5	6	7	
used to inform annual implementation plan (Yes/No)										
Action: This indicator has been Revised										
Road condition data update (Yes/No)		No	No	No	No	Yes	Yes	Yes	Yes	Yes
Capacity Building and Project Administration										
Percent of women employed in feeder road rehabilitation and maintenance contracts under the project (Percentage)		0.00	0.00	0.00	5.00	15.00	20.00	20.00	20.00	20.00
Action: This indicator has been Revised										
Gender sensitive recruitment and communication guidelines developed for contractors and firms hired under the project. (Yes/No)		No								Yes
Action: This indicator has been Revised										
Awareness of the GRM among women in project area (Percentage)		0.00	0.00	0.00	60.00	95.00	95.00	95.00	95.00	95.00
Action: This indicator has been Revised										

Indicator Name	DLI	Baseline	Intermediate Targets							End Target
			1	2	3	4	5	6	7	
Grievances registered related to delivery of project benefits that are addressed (Percentage)		0.00	0.00	50.00	70.00	80.00	80.00	80.00	100.00	100.00
Action: This indicator has been Marked for Deletion										
Grievances registered that are responded / resolved within the stipulated service standards (percentage (Percentage)		0.00	30.00	60.00	100.00	100.00	100.00	100.00		100.00
Action: This indicator has been Revised										
Publishing periodic reports on GRM and how issues were resolved including resolution rates (Yes/No)		No	No	Yes	Yes	Yes	Yes	Yes		Yes
Action: This indicator has been Revised										
Geospatial Climate Resilience Tool used to inform annual implementation plan (Yes/No)		No	No	No	No	No	Yes	Yes		Yes
Action: This indicator has been Revised										

Indicator Name	DLI	Baseline	Intermediate Targets							End Target
			1	2	3	4	5	6	7	
Number of ANE/RF staff trained in the Geospatial Tool (Number)		0.00	4.00	6.00	8.00	8.00	8.00	8.00	8.00	8.00
Development of a Strategic Network Preservation Plan on Rehabilitation and Maintenance (Yes/No)		No	No	No	Yes	Yes	Yes			Yes
Action: This indicator is New										
Contingency Emergency Responce										
Rapid Response to Govt's request after declared emergency (Yes/No)		No								Yes
Action: This indicator has been Revised										

Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Rural accessibility (% of rural population within 5 kilometers of good condition roads) in the project areas	The percentage of the rural population living within 5 kilometers of a road in good condition in the project areas.	Annual	Gridded population and road condition datasets.		ANE

RAI (Rural Accessibility Index calculated as % of rural population within 2 km of good condition roads) in the project areas	The percentage of the population in the project area living within 2 kilometers of a road in good condition.	Annual	Gridded population and road condition datasets.		ANE
Road conditions measured as roads in good and fair condition as a share of total road network in project areas		Annual	ANE project implementation reports and road condition survey reports		ANE
Access to markets from land with high agriculture potential in Nampula and Zambezia provinces		Annual	Agriculture potential comes from SPAM model developed by IFPRI and commodity prices.		ANE

Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	**Definition/Description**	**Frequency**	**Datasource**	**Methodology for Data Collection**	**Responsibility for Data Collection**
Length of unpaved feeder roads under area-based rehabilitation and	Length of non-primary unpaved classified roads in	Annual	ANE Project Implementati		ANE

maintenance contracts	the ten selected districts.		on Reports		
Bridges, drifts, and culverts selected for rehabilitation or reconstruction on feeder roads in the project areas	End target number of cross-drainage structures will be identified in year one of project implementation. Target is expressed as the percentage of the project investment completed.	Yearly.	ANE project implementation reports.		ANE.
Pilot for Routine Maintenance through Microenterprises designed, implemented, and evaluated	The pilot will consist of creating two microenterprises in two difference provinces and run them for two years.	Yearly	ANE project implementation reports		ANE
Roads Rehabilitated	The number of kilometers of road to be rehabilitated will be determined in the first year of project implementation. The target is measured as the percentage of the rehabilitation program financed by the project.	Yearly.	ANE project implementation reports		ANE
Roads Rehabilitated - rural	The number of kilometers of road to be rehabilitated will be determined in the first year of project implementation. The target is expressed as a percentage of the rehabilitation program	Yearly.	ANE project implementation reports.		ANE.

	financed by the project.				
Roads rehabilitated - nonrural	The number of kilometers of road to be rehabilitated will be determined in the first year of project implementation. The target is expressed as a percentage of the rehabilitation program financed by the project.	Yearly.	ANE project implementation reports.		ANE.
Length of primary roads with road safety assessment	The project is piloting a new automated road safety assessment technology using image recognition.	Annual	ANE Project Implementation Reports		ANE
Endorsement of PPP strategy for the road sector	A PPP strategy to mainstream private sector financing in the road sector.	Annual	RF Implementation Reports		Road Fund
Launch of pilot for improved transport services	The pilot will incorporate actions to address some of the recommendations from the analysis of women's mobility barriers.	Annual	ANE Project Implementation Reports. .		ANE
Road asset management system used to inform annual implementation plan		Annual	Road Fund Implementation Reports		Road Fund
Road condition data update					
Percent of women employed in feeder road rehabilitation and maintenance	The indicator will be tracked by comparing the	Annual	ANE Project Implementati		ANE

contracts under the project	person-days worked by gender.		on Reports. Indic ator will be tracked using information provided by the contractor on a monthly basis.		
Gender sensitive recruitment and communication guidelines developed for contractors and firms hired under the project.		Achieveme nt of the indicator will be reported yearly.	ANE reports.		ANE
Awareness of the GRM among women in project area	The percentage of women in project communities who know how to report cases of sexual exploitation and abuse related to the project.	Annual	The project will conduct surveys to establish baseline data and measure progress.		ANE
Grievances registered related to delivery of project benefits that are addressed	The Project Operation Manual shall include incidence reporting and response protocol.	Annual	The report provide d by the project liaison committees and a newly developed		ANE

			citizen engagement system.		
Grievances registered that are responded / resolved within the stipulated service standards (percentage	The project shall adopt incident reporting and response protocol.	Annual	The report provided by the project liaison committees and a newly developed citizen engagement system.		ANE
Publishing periodic reports on GRM and how issues were resolved including resolution rates	The resolution rates will be published on the ANE website.	Annual	GRM reports		ANE
Geospatial Climate Resilience Tool used to inform annual implementation plan	This tool will upgraded / enhanced to include the entire country before it can be run to inform annual implementation plans.	Annual	Road Fund Implementation Reports.		Road Fund
Number of ANE/RF staff trained in the Geospatial Tool		Annual	RF annual report. 4 staff in ANE/RF HQ and 2 staff in each ANE/RF provincial delegation will be trained		Road Fund

Development of a Strategic Network Preservation Plan on Rehabilitation and Maintenance		Yearly	ANE project implementation reports		ANE
Rapid Response to Govt's request after declared emergency			Administrative Calendar	Administrative	ANE

Annex 1. Economic Analysis

Overall Selection Framework

1. This AF aims at facilitating road network recovery and rehabilitation in four additional provinces that were affected by Cyclones Idai and Kenneth: Sofala, Manica, Tete, and Cabo Delgado. The two consecutive cyclones damaged the road network in significantly large areas of the four AF provinces. The initial PDNA identified 45 road sections as damaged and critical, of which the total length is about 3,600 km. Particularly, about 2,600 km are considered to require urgent repairs (table 1.1). Enormous financial resources are estimated to be required for immediate repair works as well as resilience improvement works. Given the currently available resources, strategic prioritization or sequencing is a must.

2. Similar to the parent project, the AF is only focused on nonprimary road connectivity, including secondary, tertiary, vicinal, and non-classified roads. Five sections of the primary roads, of which the total length is about 400 km, will be excluded from the following prioritization framework.

Table 1.1. Length of Damaged Roads by Province

Province	Length (km)			Estimated Costs (US$, millions)	
	All Damaged	Immediate Needs		Immediate Works	Resilience Works
Manica	691	507		4.7	24.1
Sofala	1,345	955		19.1	124.2
Tete	1,203	913		12.4	109.8
Cabo Delgado	354	262		1.8	22.1
Total	**3,593**	**2,637**		**38.0**	**280.2**

3. To select priority roads in the provinces, the same principles as Component 1 of the parent project, which supports Nampula and Zambezia, are applied. The parent project selected its project areas based on the following socioeconomic and climatic characteristics: (a) criticality of road network; (b) current agricultural production; (c) agroclimatic potential of crop production; (d) poverty incidence; and (e) flood risk. While the criticality is measured by the difference in road user costs between the lowest cost route and the second-best route, the flood risk is measured by the potential flood damages to roads and structures.

4. The same criteria and weights are tentatively applied to select project roads in the additional four provinces: (a) criticality (0.125); (b) current agricultural production (0.125); (c) agricultural potential (0.125); (d) poverty (0.125); and (e) flood risk (0.5). The current ranking should be considered as tentative because some of the underlying data may not be accurate or not updated. Particularly, the criticality and flood risk indices should have been recalculated carefully given the recent cyclones. The final project roads will be determined during the project implementation once the underlying parameters are updated and the selection method is refined with the actual project needs and readiness considered.

5. The provisional list of priority roads is shown in table 1.2. The table only includes the top 15 priority roads, while the full list is attached to this annex. The total cost of the top 15 priority roads is already estimated at US$205 million, well above the currently available budget. The top nine priority roads would cost about US$74 million, close to the available budget. Notably, the required investment costs vary significantly among the road sections. Some roads were damaged worse than others. Depending on available resources, the project will finance priority roads with the ranking as well as project readiness taken into account.

Table 1.2. Summary of Top 15 Priority Roads

Prelim Rank	Province	Road	District	Investment (US$, millions)	Type	Road Length (km)	ADT	Priority Score (0 to 1)
1	Sofala	R564 Gorongosa-Piro	Piro	9.01	Tertiary	71	342	0.670
2	Tete	N303 Bene-Zumbo	Chifunde/Maravia/ Zumbo	34.28	Secondary	350	92	0.498
3	Sofala	N283:Caia / Marromeu	Marromeu	10.24	Secondary	95	236	0.436
4	Sofala	Crz N280/ Crz N1-Buzi/ Casa Nova	Buzi	0.72	Secondary	76	200	0.386
5	Sofala	R1001 Casa Banana-Inhaminga	Casa Banana/ Inhaminga	7.19	Vicinal	90	70	0.381
6	Sofala	N281-Guara Guara/ Buzi	Buzi	1.04	Secondary	13	141	0.375
7	Tete	R603 Daca- Furancungo	Chifunde/ Macanga	4.65	Tertiary	66	110	0.352
8	Manica	N261, Macossa sede/ Limite com sofala (Km 00+800)	Macossa	0.35	Secondary	45	187	0.331
9	Tete	R1051 Tete-Boroma	Cidade de Tete/ Marara	6.32	Vicinal	67	2553	0.318
10	Sofala	N282 Dondo - Matondo	Muaza/ Cheringoma	48.59	Secondary	200	131	0.310
11	Sofala	N280/281-Tica/ Nova Sofala	Nhamatanda/Buzi	0.21	Secondary	100	60	0.305
12	Manica	R441, Espungabera/ Rio Mossurize	Mossurize	6.52	Tertiary	110	70	0.295
13	Tete	N302 Matema - Furancungo-Vila Mualadzi	Moatize/ Chiuta/ Macanga/Chifunde	30.41	Secondary	290	265	0.292
14	Sofala	R565 Maringue / Chemba	Maríngue / Chemba	9.72	Tertiary	135	100	0.287
15	Tete	N322 Madamba-Mutarara	Moatize/ DOA/ Mutarara	36.55	Secondary	257	115	0.264

Economic Efficiency

6. The above multicriteria analysis (MCA) generally aims at balancing various socioeconomic benefits from road investment but may not ensure economic efficiency of investments. Detailed feasibility assessment needs to be carried out during the project implementation once the project roads are finally decided and detailed design and cost parameters are collected.

7. In the current assessment, a simplified cost-benefit analysis is carried out to broadly understand the economic viability of the project. The conventional consumer surplus approach is used, which compares road rehabilitation and maintenance costs and savings of RUC, such as vehicle operating costs and time costs. The underlying assumptions and parameters are largely generated from the Mozambique database but also rely on regional model data in Africa if country-specific data are not available. For simplicity purposes, the following assumptions are made:

- **Project life.** The reconstruction works are assumed to be implemented in the first 2 years, with a project life of following 20 years.

- **Investment costs.** The investment cost estimates follow the PDNA, which was carried out in April 2019. The cost is equally allocated to the first 2 years.

- **Maintenance costs.** Different maintenance activities are assumed depending on type of road (table 1.3). While primary roads are generally paved, secondary and tertiary roads are normally unpaved. The unit costs are based on recent experience in Mozambique.

Table 1.3. Maintenance Costs and Schedule

	Primary			Other Roads		
	Cost (US$ per km)	Frequency		Cost (US$ per km)	Frequency	
Periodic	8,500	4	years	571	4	years
Routine	1,500	1	years	300	1	years

- **Traffic.** Recent traffic count data are available at ANE. Using the nationwide data, the vehicle type composition is assumed depending on average daily traffic (ADT). Roads with heavy traffic (that is, greater ADT), such as primary roads, normally carry more heavy vehicles and trucks (table 1.4). In each category, traffic is assumed to grow linearly at an annual growth rate of 3 percent.

Table 1.4. Vehicle Type Composition

	Small Car	Light Goods Vehicle	Mini Bus	Medium Bus	Light Truck	Medium Truck	Heavy Truck
ADT > 200	0.246	0.154	0.155	0.028	0.197	0.093	0.123
ADT < 200	0.265	0.259	0.120	0.031	0.164	0.072	0.063

- **Road user benefit.** The project is expected to contribute to reducing RUC, which varies considerably across types of vehicles. Due to the project, RUC are expected to decline by 20–30 percent (table 1.5).

Table 1.5. Road-User Costs (US$/vehicle-km)

	Small Car	Light Goods Vehicle	Mini bus	Medium Bus	Light Truck	Medium Truck	Heavy truck
After project	0.10	0.23	0.20	0.50	0.23	0.35	0.55
Before project	0.13	0.31	0.26	0.71	0.31	0.46	0.72

8. Economic efficiency of investment is found to differ significantly across the long-listed roads (figure 1.4). While average Internal Rate of Return (IRR) is 56.6 percent among all 45 damaged roads, the median is 12.4 percent. NPVs at a discount rate of 6 percent vary from −US$36 million to US$107 million, with a mean of US$6.2 mission and a median of US$0.6 million.

9. The individual results for the top 15 priority roads are presented in table 1.2.[9] In some cases (for example, N280 and N261), investment efficiency is very high because of their relatively small investment requirements. On the other hand, investment efficiency can be low or even negative when investment requirements are large and traffic is limited, for instance, less than 100 vehicles per day, although, their socioeconomic importance is still considered to be high according to the MCA.

Figure 1.1. Distribution of IRR Estimates

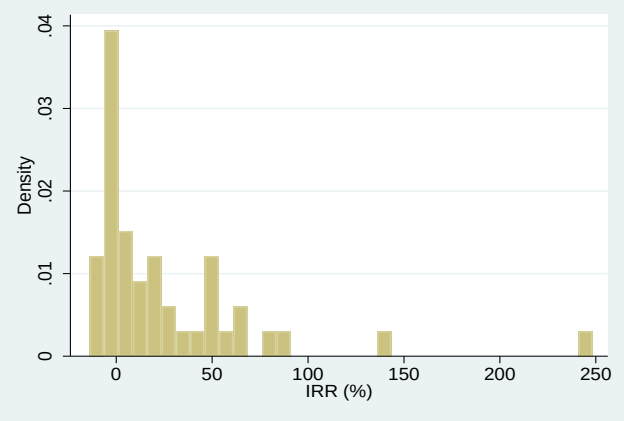


Table 1.6. Summary of Economic Efficiency

Prelim. Rank	Province	Road	District	Investment (US$, millions)	Type	Road Length (km)	ADT	5-km beneficiaries (thousand)	IRR (%)	NPV (6%) (US$, millions)
1	Sofala	R564 Gorongosa-Piro	Piro	9.01	Tertiary	71	342	10.9	6.8	0.6
2	Tete	N303 Bene-Zumbo	Chifunde/ Maravia/ Zumbo	34.28	Secondary	350	92	31.0	−4.1	−21.8
3	Sofala	N283:Caia / Marromeu	Marromeu	10.24	Secondary	95	236	26.1	4.4	−1.3
4	Sofala	Crz N280/Crz N1-Buzi/	Buzi	0.72	Secondary	76	200	20.2	45.7	4.3

[9] See the full results in table 1.9.

Prelim. Rank	Province	Road	District	Investment (US$, millions)	Type	Road Length (km)	ADT	5-km beneficiaries (thousand)	IRR (%)	NPV (6%) (US$, millions)
		Casa Nova								
5	Sofala	R1001 Casa Banana-Inhaminga	Casa Banana/ Inhaminga	7.19	Vicinal	90	70	13.7	−4.9	−4.8
6	Sofala	N281-Guara Guara/Buzi	Buzi	1.04	Secondary	13	141	3.4	1.3	−0.4
7	Tete	R603 Daca- Furancungo	Chifunde/ Macanga	4.65	Tertiary	66	110	13.1	0.0	−2.0
8	Manica	N261, Macossa sede/Limite com sofala (Km 00+800)	Macossa	0.35	Secondary	45	187	2.0	50.5	2.4
9	Tete	R1051 Tete-Boroma	Cidade de Tete/ Marara	6.32	Vicinal	67	2553	30.6	62.7	58.6
10	Sofala	N282 Dondo - Matondo	Muaza/ Cheringoma	48.59	Secondary	200	131	12.2	−7.5	−36.3
11	Sofala	N280/281-Tica/Nova Sofala	Nhamatanda/ Buzi	0.21	Secondary	100	60	41.8	48.7	1.4
12	Manica	R441, Espungabera/Rio Mossurize	Mossurize	6.52	Tertiary	110	70	58.6	−2.8	−3.8
13	Tete	N302 Matema - Furancungo-Vila Mualadzi	Moatize/Chiuta/ Macanga/ Chifunde	30.41	Secondary	290	265	67.5	6.0	−0.1
14	Sofala	R565 Maringue / Chemba	Maríngue / Chemba	9.72	Tertiary	135	100	23.3	−1.0	−4.8
15	Tete	N322 Madamba-Mutarara	Moatize/ DOA/ Mutarara	36.55	Secondary	257	115	103.3	−4.9	−24.4

Potential Beneficiaries

10. Project beneficiaries are defined by the number of populations who live within 2 km or 5 km distance from a project road to be improved. This follows a conventional global indicator in the road sector. Since some of the damaged roads have not been geo-referenced properly yet, the population distribution is assumed to be uniform in each district. Using district-level population density, the number of beneficiaries is calculated for each road.

11. If all 45 long-listed roads were rehabilitated, a total of 735,000 and 1.8 million people could benefit from the project based on the 2 km and 5 km thresholds, respectively. If the top nine priority roads are selected based on the abovementioned preliminary ranking (table 1.6), about 60,000 and 150,000 people could benefit from these roads being restored.

Emission Reductions

12. In theory, road improvement can generally help increase vehicle speed and enhance fuel efficiency, thus reducing carbon emissions. For instance, a Highway Development Model (HDM) for RUC model for Africa shows that carbon dioxide emission can be reduced by about 10 percent to 20 percent for most types of vehicles (table 1.7). Although the magnitude of reduction varies depending on not only vehicle type but also vehicle speed and road condition, this normal emission reduction is linearly applied to the above traffic forecasts by vehicle type.

13. If the top nine priority roads are rehabilitated, carbon dioxide emissions are estimated to be reduced by about 304 tons over the 20-year project life. Gross emissions are estimated at about 3,542 tons and 3,239 tons without and with the project, respectively (table 1.8). Other types of pollutants are also expected to be reduced, but the expected changes are relatively small. As far as carbon dioxide emissions are concerned, the social value of emission reduction is estimated at about US$9,100 when the World Bank's recommended social value of carbon, that is, US$30 per ton, is used.[10] On the other hand, if all 45 long-listed roads were rehabilitated, more emissions could be reduced—the net reduction would be about 1,600 tons.

Table 1.7. Normal Carbon Dioxide Emissions (g/km) by Vehicle Type

	Motor-cycle	Medium car	Pick-up	Light truck	Medium truck	Heavy truck	Articulated truck	Small bus	Medium bus	Large bus
Damaged	60.9	283.5	284.5	356.2	602.1	1,439.5	1,800.8	296.7	402.2	843.8
Recovered	75.5	221.4	235.6	358.9	599.1	1,279.8	1,592.4	310.5	432.7	765.0
Reduction (%)	24.0	−21.9	−17.2	0.8	−0.5	−11.1	−11.6	4.7	7.6	-9.3

Table 1.8. Estimated Emission Reduction

	Top 9 Roads	All 45 Roads
Emission (tons)		
Gross (without project)	3,542	19,506
Gross (with project)	3,239	17,852
Net change	304	1,654
Carbon price (US$ per ton)	30	30
Value of emission reduction (US$)	9,105	49,605

[10] World Bank. 2014. *Social Value of Carbon in Project Appraisal: Guidance Note to the World Bank Group Staff.*

Table 1.9. Full List of Damaged Roads in Sofala, Manica, Tete and Cabo Delgado

Province	Road	District	MT (1000)	US$ (1000)	Type	Road Length (km)	ADT	AG Prod. (US$, millions)	AG potential (US$, millions)	Poverty Headcount	Criticality (1–100)	Flood Risk (1–100)	Priority Score (0 to 1)	Prelim. Rank	5 km Benefits (1000)	IRR (%)	NPV (6%) (US$, millions)
Sofala	N6 Beira / Inchope	Beira/ Nhamatanda	510,455	7,976	Primary	135	2,353	13	770	0.38	11.32	9.15	—	—	254	81.4	107.8
Sofala	N280/281-Tica/Nova Sofala	Nhamatanda/ Buzi	13,455	210	Secondary	100	60	8	616	0.67	0.00	3.23	0.305	11	42	48.7	1.4
Sofala	N281-Guara Guara/ Buzi	Buzi	66,623	1,041	Secondary	13	141	1	160	0.66	0.00	5.10	0.375	6	3	1.3	−0.4
Sofala	Crz N280/Crz N1- Buzi/ Casa Nova	Buzi	45,976	718	Secondary	76	200	8	934	0.66	0.00	4.55	0.386	4	20	45.7	4.3
Sofala	N1 Save - Ripempe	Machanga/ Chibabava	331,645	5,182	Primary	55	708	3	362	0.69	18.03	5.91	—	—	9	19.0	7.9
Sofala	N282 Dondo - Matondo	Muaza/ Cheringoma	3,109,621	48,588	Secondary	200	131	11	4084	0.79	5.58	0.14	0.310	10	12	−7.5	−36.3
Sofala	N283:Caia / Marromeu	Marromeu	655,240	10,238	Secondary	95	236	52	2806	0.65	7.86	1.43	0.436	3	26	4.4	−1.3
Sofala	R1000 Ponte sobre o Rio Metuchira	Nhamatanda	678,824	10,607	Vicinal	30	70	7	371	0.67	0.00	0.00	0.120	35	21	−13.9	−9.1
Sofala	N283 Caia - Sena	Caia	70,955	1,109	Secondary	60	236	9	885	0.71	1.00	0.00	0.154	31	25	32.9	4.1
Sofala	N283 Caia - Chemba	Chemba/ Tambara	568,534	8,883	Secondary	100	65	4	843	0.82	0.00	0.00	0.153	32	16	−6.2	-6.3
Sofala	N283 Sena - Chemba	Sena	29,248	457	Secondary	40	65	6	590	0.71	0.00	2.00	0.240	20	17	12.4	0.3
Sofala	R565 Maringue / Chemba	Maríngue / Chemba	622,233	9,722	Tertiary	135	100	7	1457	0.82	0.00	2.00	0.287	14	23	−1.0	−4.8
Sofala	R529 Chemba- Tambara	Chemba/ Tambara	288,709	4,511	Tertiary	58	70	3	489	0.82	0.00	2.00	0.246	18	9	−4.7	−3.0
Sofala	N261 Nhamapaza- Macossa	Nhamapaza-Macossa	222,163	3,471	Secondary	47	69	2	574	0.77	0.00	2.00	0.240	19	7	−4.5	−2.3
Sofala	R564 Gorongosa- Piro	Piro	576,515	9,008	Tertiary	71	342	8	1850	0.82	0.00	8.75	0.670	1	11	6.8	0.6
Sofala	R1001 Casa Banana-Inhaminga	Casa Banana/ Inhaminga	460,320	7,193	Vicinal	90	70	3	1072	0.76	0.00	4.30	0.381	5	14	−4.9	−4.8
Sofala	R1002 Inhamitanga-Lacerdonia	Cheringoma/ Marromeu	24,224	379	Vicinal	47	100	7	899	0.70	0.00	0.47	0.165	29	8	27.6	1.1
Sofala	R1003 Crz N6- Savane	Beira	95,616	1,494	Vicinal	32	70	2	262	0.09	0.00	1.00	0.059	39	299	−0.9	−0.7
Sofala	N/C Crz R1003- Sengo	Beira	84,586	1,322	N/C	38	200	2	311	0.09	—	—	0.007	40	355	14.9	1.3
Sofala	N/C Crz N282-Maciamboboza	Buzi	19,586	306	N/C	38	200	4	467	0.66	—	—	0.113	37	10	51.8	2.2

Province	Road	District	MT (1000)	US$ (1000)	Type	Road Length (km)	ADT	AG Prod. (US$, millions)	AG potential (US$, millions)	Poverty Headcount	Criticality (1–100)	Flood Risk (1–100)	Priority Score (0 to 1)	Prelim. Rank	5 km Benefits (1000)	IRR (%)	NPV (6%) (US$, millions)
Manica	N6 Inchope- Chimoio	Gondola	3,750	59	Primary	88	2,756	14	2,339	0.67	3.00	0.00		—	53	1,423.7	88.4
Manica	N260, Cruz N6- Espungabera	Mossurize/ Sussundega	533,725	8,339	Secondary	109	864	8	758	0.74	6.60	0.83	0.236	21	39	30.9	27.5
Manica	NC Sussundenga/ Cadeado	Sussundenga	56,625	885	N/C	117	200	12	1,148	0.76			0.170	27	27	54.5	6.8
Manica	R968 Cruz. N6 / Chipindaumue	Gondola	61,200	956	Vicinal	45	70	7	1,196	0.67	0.00	0.00	0.144	34	27	6.2	0.0
Manica	R969 Cruz. N6 (Zonue)/ Cadeado -Rotanda	Manica	40,800	638	Vicinal	100	70	10	977	0.53	0.00	0.91	0.170	26	64	23.3	1.4
Manica	R520, Cruz. N1/Dombe	Sussundenga	33,300	520	Tertiary	55	91	6	540	0.76	0.00	0.50	0.163	30	13	21.9	1.0
Manica	R964, Moha/Rotanda	Sussundenga	330,000	5,156	Vicinal	35	101	4	343	0.76	3.24	0.00	0.147	33	8	−6.2	−3.7
Manica	N261, Macossa sede/ Limite com sofala (Km 00+800)	Macossa	22,300	348	Secondary	45	187	3	1,361	0.83	0.00	3.00	0.331	8	2	50.5	2.4
Manica	N261, Cruz. N7/Rio dos elefantes	Macossa	25,000	391	Secondary	45	187	3	1,361	0.83	0.00	0.00	0.167	28	2	46.1	2.4
Manica	R441, Espungabera /Rio Mossurize	Mossurize	417,150	6,518	Tertiary	110	70	27	2,416	0.72	0.00	1.00	0.295	12	59	−2.8	−3.8
Manica	N7, Guro/Km30	Guro	133,875	2,092	Primary	30	2,159	2	361	0.84	2.00	0.00	—	—	4	67.0	21.5
Tete	N303 Bene-Zumbo	Chifunde/ Maravia/ Zumbo	2,193,921	34,280	Secondary	350	92	7	3,346	0.80	0.00	4.82	0.498	2	31	−4.1	−21.8
Tete	N322 Madamba- Mutarara	Moatize/ DOA/ Mutarara	2,339,331	36,552	Secondary	257	115	9	688	0.73	1.00	2.07	0.264	15	103	−4.9	−24.4
Tete	N302 Matema - Furancungo- Vila Mualadzi	Moatize/ Chiuta/ Macanga/ Chifunde	1,946,000	30,406	Secondary	290	265	5	1,213	0.74	0.00	2.55	0.292	13	68	6.0	−0.1
Tete	R1051 Tete- Boroma	Cidade de Tete/ Marara	404,700	6,323	Vicinal	67	2,553	2	280	0.38	15.00	2.90	0.318	9	31	62.7	58.6
Tete	R603 Daca- Furancungo	Chifunde/ Macanga	297,540	4,649	Tertiary	66	110	4	712	0.75	0.00	3.96	0.352	7	13	0.0	−2.0
Tete	R609 Cruz (Bene) / Chifunde	Chifunde	1,275	20	Tertiary	76	70	4	1,841	0.76	0.00	1.00	0.229	23	12	248.4	1.5
Tete	NC-Zóbuè/Wiriamu	Moatize	83,631	1,307	N/C	29.5	50	2	389	0.63			0.099	38	11	−3.7	−0.8
Cabo Delgado	N 380 MACOMIA - OASSE (KM 10+000)	MACOMIA	61,450	960	Secondary	102	400	13	1,775	0.62	2.10	0.00	0.183	24	20	86.4	14.1
Cabo Delgado	R 760 MUXARA - MECUFI	MECUFI	244,000	3,813	Tertiary	35	691	5	125	0.67	0.00	0.18	0.117	36	18	18.6	5.5

Province	Road	District	MT (1000)	US$ (1000)	Type	Road Length (km)	ADT	AG Prod. (US$, millions)	AG potential (US$, millions)	Poverty Headcount	Criticality (1–100)	Flood Risk (1–100)	Priority Score (0 to 1)	Prelim. Rank	5 km Benefits (1000)	IRR (%)	NPV (6%) (US$, millions)
Cabo Delgado	N 1 PEMBA - METORO	Pemba	128,000	2,000	Primary	92	1,800	12	1,164	0.61	7.48	0.13	—	—	15	136.8	57.4
Cabo Delgado	R 767 CRZ N 380 UNGUIA - MELUCO	Meluco	480,400	7,506	Tertiary	56	43	3	1,501	0.69	0.00	2.00	0.257	16	3	−11.9	−6.3
Cabo Delgado	R 762 CRZ N 1 ALDEIA MUEPANE - METUGE SEDE	METUGE	150,200	2,347	Tertiary	23	496	4	243	0.55	0.00	3.00	0.253	17	13	14.3	2.1
Cabo Delgado	R 766 MACOMIA - MUCOJO	MACOMIA	415,400	6,491	Tertiary	46	100	6	800	0.62	0.00	2.00	0.229	22	9	−6.0	−4.6
Cabo Delgado	R767 19 Outubro- Quissanga	Quissanga	300,900	4,702	Tertiary	46	30	7	809	0.64	0.00	1.00	0.181	25	12	−13.3	−4.0

Annex 2: Prioritization and Selection of AF Project Roads

Introduction

1. Thoughtful and data-driven prioritization process is critical for rational development of the rural network, for optimization of scarce resources, and for addressing the most climatically prudent method to make the network resilient. This is not a one-time exercise but a continuous way of optimizing interventions to keep the rural network in the best condition possible in the funding envelope available.

The Road Prioritization Process

2. The economic analysis for additional funding for Component 1 will be carried out in the following two phases: (a) identify the priority roads in each province and (b) complete a cost-benefit analysis of road interventions in the priority list of roads.

3. Road interventions will be selected from a set of five alternatives in each selected province using a transport network model to estimate network-level climate adaptation co-benefits, with a large range of plausible future scenarios.

4. The prioritization of roads in each province will be based on two pillars: (a) socioeconomic criticality and (b) current and future flood risk to the roads. Socioeconomic criticality values will be composed of the following five attributes: (a) lack of network redundancies; (b) proximity to high agriculture potential areas; (c) proximity to high fishery potential areas; (d) current agricultural production; and (e) the district poverty rate. The second pillar, flood risk, is calculated using flood maps of current flood risk and future climate change scenarios combined with vulnerability functions for bridges, culverts, and road surfaces. The flood risk is calculated as expected annual damage to infrastructure using 10 different return periods and four climate scenarios (current, low, medium, and high climate change).

5. Additionally, five different investment options already identified in each of the selected provinces, based on structured interactions with stakeholders in the previous phase: (a) upgrade to surface treatment; (b) upgrade to gravel road; (c) rehabilitation of earth roads; (d) cleaning and repairing of bridges; and (e) replacement of culverts. Each of these solutions leads to four kinds of cost-savings: (a) reduction of flood risk for users; (b) reduction of flood risk for road agency (lower repair and construction costs after flood events); (c) reduction of RUCs due to improvement of road conditions; and (d) reduction of maintenance expenditure due to improvement of road conditions.

6. Main criteria are defined as the following three points of sustainable development (with more detailed sub criteria presented in brackets): (a) economic aspects (road rehabilitation costs, road maintenance costs, vehicle operation cost-savings, accident costs); (b) social aspects (agricultural production along each road, population served per kilometre of rehabilitated road, access to schools, health centres, markets, administration centres, and so on); and (c) environmental impact/risks (possibility of land degradation (erosion, risk of flooding, landslides), encroachment onto historical or protected areas (monuments, parks, reserves, and so on), disturbance to the natural environment (trees to be felled along each road and so on).

7. **Prioritization methodology.** Having defined the objectives, the main criteria, and sub criteria, the

consultant selected the Analytic Hierarchy Process (AHP) method for processing and comparing the data sets collected under the various defined criteria. This considers a methodology that takes into account sustainability and inputs from stakeholders and also encompasses the philosophy of MCA for decision making. The model utilizes the principle of pairwise comparisons among all criteria and sub criteria. Each criterion is compared with all other criteria to determine relative weights. The relative criteria weights to be used are developed through stakeholder participation in rating their judgment of the significance of each of the criteria. This is different from the parent project, which uses disaster resilience analysis with the decision making under uncertainty methodology. This methodology was found unsuitable for the AF, as the specific disaster has taken place and an inventory of damages already compiled.

8. The AHP methodology has a number of advantages: it provides a framework for dealing with multiple criteria decision making. It can be used to rank alternative options based on different criteria regardless of their unit of measurements, that is, economic, social, and environmental parameters can be used in their original units of measurement to synthesize the ranking of alternatives. It allows for inputs from stakeholders who are given an opportunity to express their preferences among the given criteria. It provides a scale to measure intangibles, that is, people's judgments can be measured and used to give weights to competing criteria. The AHP is able to handle both quantitative and qualitative data at the same time.

9. **Information and data collection.** The data or information for the sub criteria was obtained as follows:

- **Road rehabilitation costs.** Bills of quantities and estimate costs will be prepared for each road from the survey data.
- **Road maintenance costs.** Average maintenance costs will be obtained using theoretically derived costs and comparing with current provincial maintenance projects and adjusted for inflation.
- **Vehicle operation cost savings.** Calculations will be done using the HDM4 model. Expected vehicle volumes were estimated from surplus produce projections for each road. Produce data were obtained from the respective districts.
- **Accident costs.** Calculations will be done using statistical data for Mozambique and information from literature review.
- **Agricultural production along each road.** Information will be obtained from the respective districts.
- **Population served per kilometre of rehabilitated road.** Number of inhabitants within 5 km on either side of each road will be obtained from the respective districts. Calculations will then be made to get the required input measurement.
- **Access to schools, health centres, markets, administration centres, and so on.** Apart from the information recorded by the survey team, additional information will be also be obtained from the respective districts.

- **Possibility of land degradation (erosion, risk of flooding, and landslides).** Portions of road susceptible to erosion, flood risk, and/or landslides were noted and recorded by the survey team. The total lengths of such sections will be measured as input for this sub criterion.

- **Encroachment onto historical or protected areas (monuments, parks, reserves, and so on).** This information will be captured by the survey team and recorded as number of such sites on each road.

- **Disturbance to the natural environment (trees to be felled along each road and so on).** Number of trees to be felled from the road way will be physically counted on each road by the survey team.

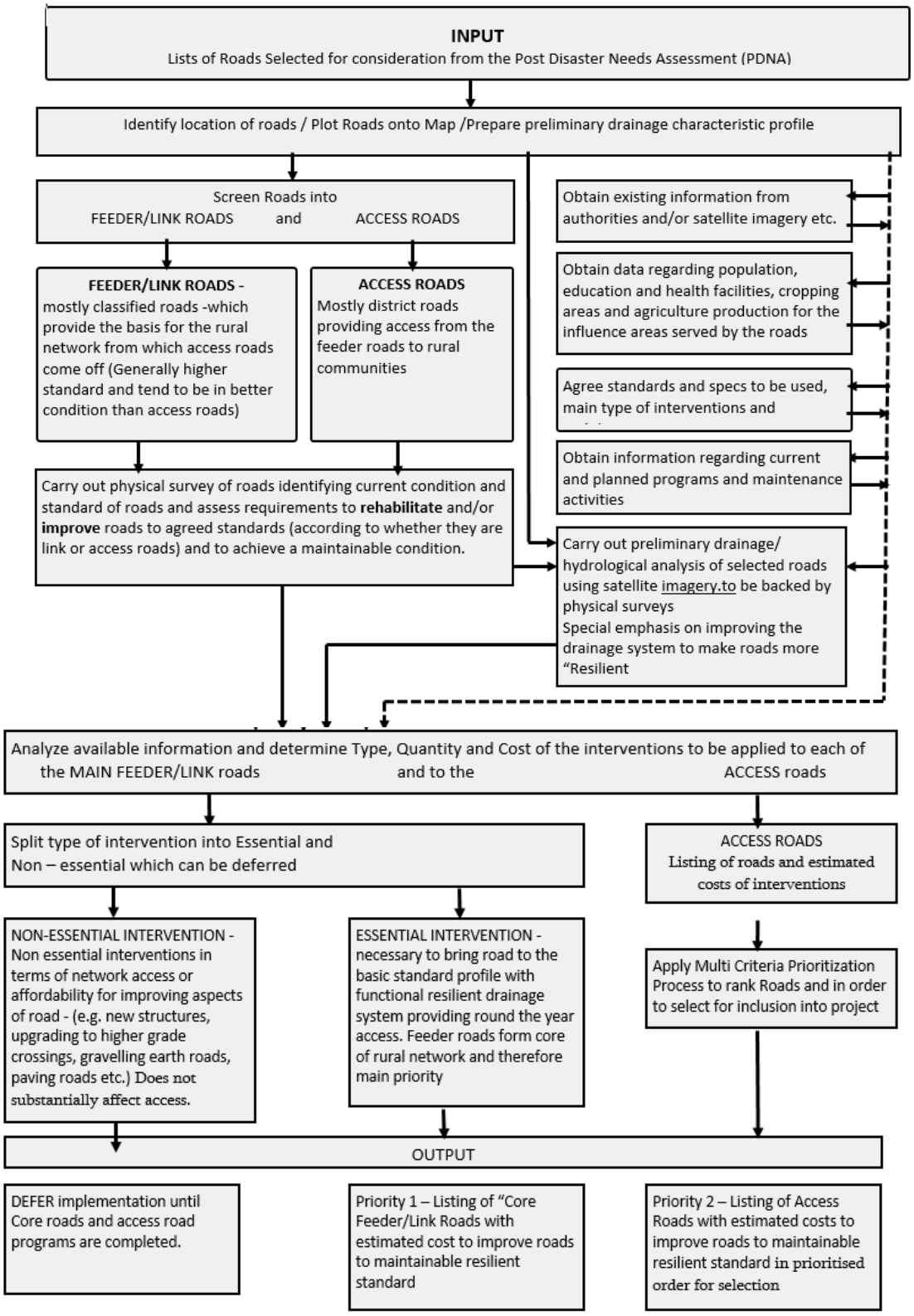
- **Stakeholder preferences ratings for the chosen criteria.** Questionnaires will be designed, printed, and issued to relevant stakeholders (district administration personnel, ANE provincial engineers, and community leaders) to rate the selected criteria.

10. **Data processing summaries and presentation.** Given that the district road network comprises roads of varying lengths from as little as 1 km to over 40 km, it was deemed necessary to combine or group some of these roads according to their locations. This will be done to avoid a scenario whereby the ranking process will be distorted if very short road sections are compared against very long sections. The grouping process will be carried out in liaison with the ANE provincial engineers.

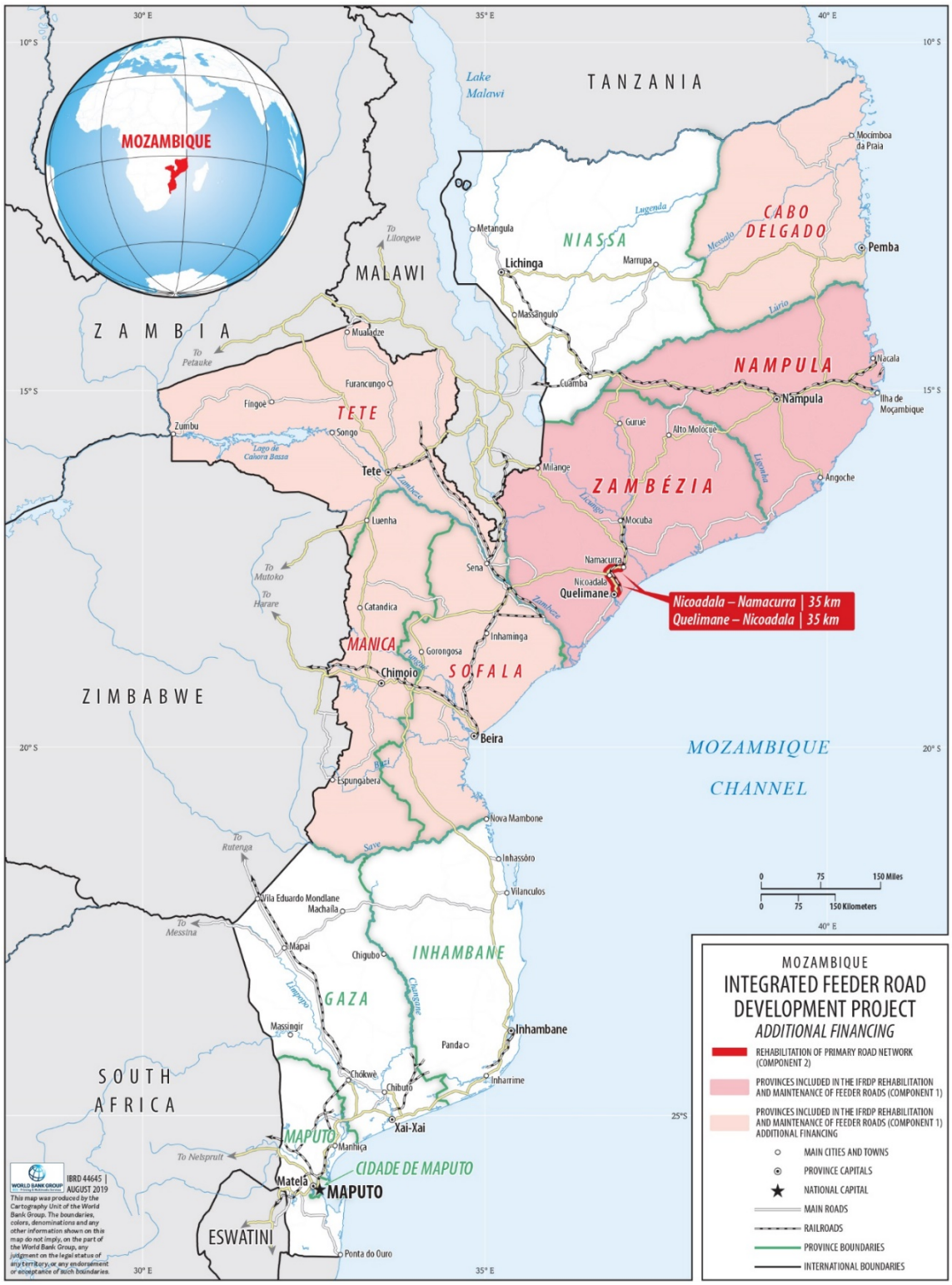
11. The data for each road group will be processed using Excel spreadsheets. A ranking score for each row will be calculated using the same spreadsheets and the results presented in tabular form with the highest ranked road in first position and the lowest ranked road in the final position.

12. These ranked lists then form the basis for preparing the rehabilitation and/or maintenance implementation programs in the four provinces.

Figure 2.1. Project Road Prioritization Process



Annex 3. Map


MOZAMBIQUE
TANZANIA
MALAWI
ZAMBIA
ZIMBABWE
SOUTH AFRICA
ESWATINI
Lake Malawi
MOZAMBIQUE CHANNEL
NIASSA
CABO DELGADO
NAMPULA
ZAMBÉZIA
TETE
MANICA
SOFALA
INHAMBANE
GAZA
MAPUTO
CIDADE DE MAPUTO
Mocimboa da Praia
Pemba
Lichinga
Metangula
Marrupa
Massangulo
Nacala
Nampula
Ilha de Moçambique
Cuamba
Gurue
Alto Molocue
Angoche
Milange
Mocuba
Namacurra
Nicoadala
Quelimane
Tete
Zumbu
Fingoe
Furancungo
Songo
Mualadze
Luenha
Sena
Catandica
Inhaminga
Gorongosa
Chimoio
Beira
Espungabera
Nova Mambone
Inhassoro
Vilanculos
Vila Eduardo Mondlane
Machaila
Mapai
Chigubo
Massingir
Panda
Inhambane
Inharrime
Chokwe
Chibuto
Xai-Xai
Manhiça
Matola
Ponta do Ouro
Nicoadala – Namacurra | 35 km
Quelimane – Nicoadala | 35 km
0 75 150 Miles
0 75 150 Kilometers
MOZAMBIQUE
INTEGRATED FEEDER ROAD DEVELOPMENT PROJECT
ADDITIONAL FINANCING
REHABILITATION OF PRIMARY ROAD NETWORK (COMPONENT 2)
PROVINCES INCLUDED IN THE IFRDP REHABILITATION AND MAINTENANCE OF FEEDER ROADS (COMPONENT 1)
PROVINCES INCLUDED IN THE IFRDP REHABILITATION AND MAINTENANCE OF FEEDER ROADS (COMPONENT 1) ADDITIONAL FINANCING
MAIN CITIES AND TOWNS
PROVINCE CAPITALS
NATIONAL CAPITAL
MAIN ROADS
RAILROADS
PROVINCE BOUNDARIES
INTERNATIONAL BOUNDARIES
IBRD 44645 | AUGUST 2019
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