

**PROJECT INFORMATION DOCUMENT (PID)
IDENTIFICATION/CONCEPT STAGE**

Report No.: PIDC68989

Project Name	Rwanda Pilot Program for Climate Resilience
Region	AFRICA
Country	Rwanda
Lending Instrument	IPF
Project ID	P160268
Borrower Name	Ministry of Finance and Economic Planning (MINECOFIN)
Implementing Agency	National Climate and Environment Fund (FONERWA)
Environment Category	C - Not Required
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Initiation Note Review Decision	The review did authorize the preparation to continue

I. Introduction and Context

Country Context

Rwanda is a small, hilly, landlocked country in East Africa with one of the highest population densities in Africa (440 people/km²). The country has developed rapidly with an average GDP growth rate of 7.2% in the past five years. Rwanda was ranked by the World Bank Doing Business Report (2014) as the most improved economy worldwide since 2005. Rwanda's collective vision for development is embodied in Vision 2020, which seeks to transform the country from a subsistence agriculture economy to a knowledge-based, middle-income economy by 2020. Poverty declined from 56.7% in 2005/06 to 44.9% in 2010/11 with significant reduction in rural areas where the rate fell from 61.9% to 48.7%. Rwanda has also prioritized attracting private investors to further drive development and growth. Rwanda's investment and enabling policy environment was ranked as the most competitive place to do business in East Africa and 3rd in Africa in 2014. Export revenues are dominated by minerals, tea and coffee, while services and agriculture contribute 81% of GDP. Tourism is growing and expected to double foreign earnings to over US\$ 600 million by 2020 (RDB). A significant drain on foreign exchange earnings arises from Rwanda's high dependence on diesel and heavy fuel oil for its electricity supply. Reducing Rwanda's reliance on fuel imports through investment in renewable energy sources would enhance energy access particularly to rural poor promoting off-farm employment. This is a significant climate resilience building measure and therefore a key tenet of the 2011 Government of Rwanda (GoR's) Green Growth and Climate Resilience Strategy (GGCRS).

Sectoral and Institutional Context

Although Rwanda had impressive growth between 2008 and 2013, poverty remains deep and pervasive (63.2% PPP headcount ration (below \$1.25/day) in 2011). Rwanda remains among Africa's poorest countries with Official Development Assistance (ODA) financing about 40% of the

annual budget. In 2012, ODA reached 12.5% of GDP, driven by severe need, but also by impressive increases in social indicators. In 2013, GDP per capita stood at US\$ 693 (\$1,332 measured at PPP). More than 90% of Rwanda's poor live in rural areas. Inadequate infrastructure, including the transport network, electricity grid (only 18% of the population has access to electricity) and water pipelines, is a major constraint on economic growth and hinders trade and the provision of basic amenities to the rapidly growing population.

Agriculture provides around 36% of GDP, 80% of employment and generates more than 45% of the country's export revenues (mostly tea and coffee). However, steep terrain and a lack of modern technology create serious constraints on agricultural development. There is limited potential for agricultural expansion in Rwanda (due to land shortages). Agricultural growth depends largely on intensification and diversification. Over-exploitation of land, a high dependence on biomass for household energy needs (80% of the population) and increasing urbanization (at 4.4% per year) create significant pressure on natural resources, notably land, water and forests. With Rwanda's population projected to rise to around 16 million by 2020 and 26 million by 2050, its small land area and high dependence on agriculture, significant challenges remain particularly around food security. More than 60% of households cultivate less than 0.7 ha and 30% cultivate less than 0.2 ha. More than 70% of the cultivated land surface has slopes greater than 10%. This results in high levels of erosion and surface run off into waterways. Annual soil loss through erosion translates into annual economic loss of US\$34 million, or almost 2% of GDP equivalent.

Climatic factors, exacerbated by a loss of forest and vegetative cover, and steep slopes are causing a variety of impacts that undermine Rwanda's economic growth. Rising temperatures and increasingly unpredictable rainfall patterns are combining with anthropogenic factors to create additional shocks and stresses on already perturbed ecosystems. Increased intense rainfall, flash floods, landslides exacerbated by erosion (caused by agricultural practices on steep slopes and deforestation for cooking) and a lack of adequate drainage have a significant impact on agricultural production (and hence food security), infrastructure and electricity generation. Rwanda has experienced a temperature increase of 1.4C since 1970, higher than the global average, and can expect an increase in temperature of up to 2.5C by the 2050s from 1970. Rainfall is highly variable in Rwanda but average annual rainfall may increase by up to 20% by the 2050s from 1970. The eastern and southeastern regions are most affected by seasonal droughts, while the northern and western regions experience intense rainfall, erosion, flooding and landslides. Extreme weather events already negatively impact the economy and the additional net economic costs of climate change (on top of existing climate variability) have been estimated to be equivalent to a loss of almost 1% of GDP each year by 2030. Climate change threats, unless adequately addressed, could significantly undermine progress toward Vision 2020 targets.

(i) Food security - Rwanda's high dependence on traditional rain-fed agriculture makes it highly vulnerable to changes in temperature and rainfall. Precipitation is the main source of water for production but it is unevenly distributed across regions and seasons, with about half of the precipitation occurring in one quarter of the year. The western half of the country receives an average of 1400 mm, while the eastern half receives less than 1000 mm. The total area under irrigation is very low with just over 25,590 ha in 2012 and the GoR has prioritized investment in irrigation infrastructure to increase agricultural productivity, reduce vulnerability to weather shocks and make rural households more resilient and adaptable to longer term shifts in seasonal rainfall and rising temperatures which will increase transpiration rates.

(ii) Energy security - Rwanda's reliance on hydropower production makes it highly vulnerable to changing hydrological conditions. Rwanda currently relies on hydropower for half of its electricity generation. Although diversification of energy sources is a high priority, the GoR continues to develop its hydropower sector as the least cost generation resource. Its overall potential is estimated at about 400 MW but the installed hydro capacity is currently 57.21 MW . In the past, poorly protected watershed areas, drought and erratic rains have affected Rwanda's hydroelectric power generation resulting in a need for additional diesel generation costing over \$65,000 per day and contributing to greenhouse gas emissions. This was demonstrated in 2004 when a combination of drought, over-utilization and poor management of the Rugezi-Burera-Ruhondo watershed led to a rapid draw down of water levels in Burera Lake critical to the functioning of Rwanda's two largest hydropower stations (Ntaruka and Mukungwa). The incidents were responsible for acute supply shortages and a national energy crisis. The GoR interventions through legislation as well as rehabilitation efforts of the upland Rugezi catchment led to recovery of the ecosystems and the achievements were internationally recognized in 2010 with the Green Globe Award.

(iii) Water security - Considering water demand is set to increase in the next 5-10 years, the efficient, productive, equitable and sustainable management of Rwanda's water resources is a national priority. Despite high rainfall in the western region (between 900 and 1800 mm per year) and the abundance of lakes, streams and watercourses, seasonal droughts occur in many parts of Eastern Rwanda. Rwanda's overall per capita fresh water availability is estimated at 670 m³. Rwanda has made good progress towards improving water resource management through the rehabilitation of watersheds and major catchments; rainwater harvesting and storm water management; climate change mitigation through catchment afforestation and energy efficiency. However, it needs to scale up these investments to meet the country's increasing water demand and to manage the challenge of adaptation and build resilience in the face of uncertain weather patterns.

(iv) Tourism, one of Rwanda's largest earners of foreign exchange, is dependent on the survival of gorillas in the Volcanoes National Park, and the preservation of the Nyungwe and Gishwati forests and Akagera National Park. These areas are biodiversity hotspots and are vulnerable to change in temperature and rainfall which could reduce viable habitat and allow the spread disease. The health of farm animals and humans is also at risk, particularly amongst those living below the poverty line, and as temperatures rise, diseases could spread to new areas, particularly higher altitudes.

Rwanda is a party to the United Nations Convention on Climate Change (UNFCCC), and recognizes the country's high vulnerability to climate change. As described above, due to the country's high dependence on rain-fed agriculture, increases in temperature and changes to rainfall patterns resulting in floods and droughts, have significant financial implications in form of reduced crop yields, negatively impacted livelihoods, and affected food security and export earnings. The steep, hilly topography described in the beginning of this section, makes Rwanda particularly susceptible to landslides. Flooding and storms are a safety risk and cause damage to houses, mines, industrial sites, and major infrastructure including pipelines, power lines, roads, and dams. Damages not only have a direct cost in repairs and reconstruction, but also a knock-on effect on the economy as a whole, particularly in critical services such as power and transport. The vision the GoR has for the country is to be a developed climate-resilient, low-carbon economy by 2050, and the underlying strategy is captured in several key national documents:

(i) The National Adaptation Program of Action (NAPA, 2006) articulates Rwanda's strategy to reduce urgent and immediate vulnerability to climate change. While the NAPA is based on

information from 2006, the outlined main climatic hazards including intense rainfall, flash flooding, landslides, drought and low flows, extreme temperatures and heat waves remain valid. Identified immediate priority actions include (i) Integrated Water Resources Management (IWRM); (ii) setting up an information system to early warning of hydro-agro meteorological system and rapid intervention mechanisms; (iii) promotion of non-agricultural income generating activities; (iv) promotion of intensive agro-pastoral activities; (v) introduction of species resisting to environmental conditions; and (v) development of firewood alternative sources of energy.

(ii) Rwanda's Green Growth and Climate Resilience Strategy (GGCRS) provides a process for mainstreaming climate resilience and low carbon development into key sectors of the economy. The strategy puts forward several programs of action for building climate resilience and promoting low carbon development pathways, which are (i) sustainable intensification of small scale farming, (ii) agricultural diversity of markets, (iii) sustainable land use management, (iv) IWRM, (v) low carbon energy grid, (vi) small-scale energy access in rural areas, (vii) disaster management and disease prevention, (viii) green industry and private sector development, (ix) climate compatible mining, (x) resilient transport systems, (xi) low carbon urban systems, (xii) ecotourism, conservation and Payment for Ecosystem Services, (xiii) sustainable forestry, agroforestry and biomass, and (xiv) climate data and projections.

(iii) More recently in 2015, Rwanda's Intended Nationally Determined Contribution (INDC) further anchored the country's goal of becoming a climate-resilient economy by emphasizing the strategic objectives to achieve energy security and a low carbon energy supply that supports the development of green industry and services, sustainable land use and water resource management. The priority adaptation actions are those identified in the GGCRS, are on-going and will be partially or fully achieved by 2050.

Relationship to CAS/CPS/CPF

This small grant supports efforts towards increasing Rwanda's resilience to climate change by building on its existing plans and strategies, particularly the Green Growth and Climate Resilience Strategy (GGCRS). The Country Partnership Strategy (CPS) for Rwanda, which was prepared before the call for new PPCR countries, highlights variable climatic conditions as a major risk to the country's growth and poverty reduction plans, and the importance of mainstreaming climate resilience and environmental sustainability into sector operations.

II. Project Development Objective(s)

Proposed Development Objective(s)

The proposed Project Development Objective (PDO) is to prepare a Strategic Program for Climate Resilience (SPCR) and associated investment plan, and to establish an enabling environment that allows for the mainstreaming of climate resilience into development planning and implementation.

Key Results

Key expected results include the following:

- (i) Preparation of the SPCR: Improved baseline information and enhanced understanding of key gaps in climate risks and resilience measures in order to support the development of the SPCR and inform policy and programs at national and sectoral levels.
- (ii) Identification of appropriate funding sources: Project proposals development under the SPCR tailored to specific funding sources.
- (iii) Institutional capacity & climate analytics: Technical capacity and climate risk models enhanced to allow for (i) better understanding and management of climate risks, (ii) better informed decision-making, and (iii) multi-sectoral decisions prioritizing long-term resilience.

III. Preliminary Description

Concept Description

This grant will provide Technical Assistance in three phases, represented as Components 1-3.

Component 1: Identification of a programmatic approach towards mainstreaming climate resilience, and preparation of the SPCR and accompanying strategic investment plan.

Identification of priority investment areas will include:

- (i) Analysis of existing knowledge on climate to better understand the vulnerability and potential gaps of the action areas identified in the GGCRS and INDC, and deepen the understanding of climate risks to other key economic sectors. Special attention will be given to gender, poverty, and sectors, sub-regions, communities, or natural resources that are at risk. The analysis will include an initial economic analysis based on existing local and representative international comparators.
- (ii) Detailed gap analysis of existing structures, policies, and coordination functions for each of the action areas identified in the GGCRS and INDC, by taking account of existing initiatives and programs financed by development partners. Proven models for intervention exist in many of these areas, but there is a need to improve the detailed understanding of the bio-physical impacts of climate (including future climate change), data and coordination systems across sectors, as well as assessment of the total financing gaps and associated economic and social returns. Specific focus will be given to watershed protection and management through comprehensive landscape interventions, and climate information, knowledge and disaster risk management systems to support the mainstreaming of climate change preparedness. Synergies with existing programs financed by the World Bank and other Development Partners, as well as CIF programs such as the Scaling-up Renewable Energy Program (SREP) and the Forest Investment Program (FIP) will be ensured.
- (iii) Stakeholder consultation to share key messages generated by the gap analyses, and agree on priority investment areas. Mapping of stakeholders (including identification of government ministries and agencies, development partners, civil society, research and academic institutions, beneficiaries, and private sector) will aid design of the process. A private sector round table to explore the potential role the private sector can play in climate risk mitigation and transfer in Rwanda (e.g., agriculture insurance for poor farmers).

Institutional analysis of current government structures to facilitate the mainstreaming of climate resilience will identify (i) cross-ministerial and sectoral institutional gaps and overlaps, (ii) resource needs, and (iii) communication gaps that may hinder awareness raising efforts; and clarify

institutional mandates for climate finance management. Finally, the analysis will identify capacity building needs, including initial efforts that can be conducted with PPCR preparation funds.

M&E analysis and design will integrate climate resilience indicators into the national M&E framework. Existing programmatic PPCR indicators will be taken into account.

Component 2. Identification of appropriate funding sources and packaging of investments

This will provide a facility to tailor proposed investments to the application requirements of specific financiers. It will be based on discussions with government and development partners to identify the most appropriate financing sources (e.g., national budget, climate/environment trust funds, MDBs, bilateral funding sources, private finance) and ways of parceling the investments.

Component 3. Initial capacity building and climate information systems investments

Based on the needs identified in the gap and institutional analysis, initial capacity building will support SPCR delivery. This may include (i) establishing institutional structures proposed under the GGCRS, such as the Technical Coordinating Committee, develop a communication strategy; (ii) building capacity for monitoring and evaluating national climate resilience indicators identified in key national strategies; (iii) building capacity for integrating international best practices in climate adaptation; and (iv) raising awareness in proposed investment areas by focusing on specific stakeholders including vulnerable communities and populations most affected by climate variability and change in the country, NGOs, civil society, and academia.

The existing knowledge base on climate impact and adaptation will be strengthened through impact modeling, vulnerability assessments and mapping in specific sectors. This will extend existing vulnerability analyses through modeling of future climate change, and economic analysis to strengthen investment rationales and detailed designs. Indicative priorities include: (i) climate impacts on agriculture including crop yields (especially strategic crops), crop suitability zones, livestock stress, and appropriate Integrated Pest Management (IPM) and agronomic practices; (ii) hydrological and water balance projections under future climate including indicative storage and infrastructure investment needs, and flood and landslide modeling (including potentially LIDAR survey of critical urban areas); and (iii) climate change impacts on hydropower, roads and other key infrastructure.

Meteo Rwanda (RMA) and the Rwanda Natural Resources Authority (RNRA) share national responsibilities for providing weather, climate and hydrological information services. They are already receiving support to modernize from the Bank's LAFREC project, RMA from a FONERWA grant supported by the UK Met Office, and RNRA from a Dutch-funded integrated water resources management program. This SPCR preparation grant will supplement these investments, providing complementary support to ensure RMA and RNRA can provide user-responsive information services across timescales (from historic observations to short-term forecasting and seasonal/decadal predictions).

Component 4. Project management

Technical coordination of the Phase 1 activities under the PPCR, financial management and procurement, M&E, and presentation/dissemination of the Phase 1 outcomes.

IV. Safeguard Policies that Might Apply

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

V. Financing (in USD Million)

Total Project Cost:	1.5	Total Bank Financing:	0
Financing Gap:	0		
Financing Source			Amount
Climate Investment Funds			1.5

VI. Contact point

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