

# Funding Proposal

---

## **FP073: Strengthening climate resilience of rural communities in Northern Rwanda**

Rwanda | Ministry of Environment (MoE) | Board decision B.19/12

16 March 2018





GREEN  
CLIMATE  
FUND



# Funding Proposal

Version 1.1

**The Green Climate Fund (GCF) is seeking high-quality funding proposals.**

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Project Title: Strengthening climate resilience of rural communities in Northern Rwanda

Country/Region: Rwanda, East Africa

Accredited Entity: MOE

Date of Submission: **Jan 2018 VERSION 8** – Revision following with GHG Methodology and revised emission savings

## Contents

Section A	PROJECT SUMMARY
Section B	FINANCING / COST INFORMATION
Section C	PROJECT DESCRIPTION - SUMMARY
Section D	RATIONALE FOR GCF INVOLVEMENT
Section E	EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA
Section F	APPRAISAL SUMMARY
Section G	RISK ASSESSMENT AND MANAGEMENT
Section H	RESULTS MONITORING AND REPORTING
Section I	ANNEXES ANNEX 1: PREPARATORY STUDIES ANNEX 2: WORKPLAN AND BUDGET ANNEX 3: LETTERS OF CO-FINANCING ANNEX 4: MAP OF TARGET AREA ANNEX 5: PROJECT IMPLEMENTATION MANUAL

### *Note to accredited entities on the use of the funding proposal template*

- Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in section F, accredited entities have discretion in how they wish to present the information. Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other project documents such as project appraisal document.
- The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

**Please submit the completed form to:** [fundingproposal@gcfund.org](mailto:fundingproposal@gcfund.org)

Please use the following name convention for the file name:  
"[FP]-[Agency Short Name]-[Date]-[Serial Number]"

<b>A.1. Brief Project / Project Information</b>		
<b>A.1.1. Project title</b>	<b>Strengthening climate resilience of rural communities in Northern Rwanda (SCRNRP)</b>	
A.1.2. Project or programme	<b>Project</b>	
<b>A.1.3. Country (ies) / region</b>	<b>Rwanda</b>	
<b>A.1.4. National designated authority (ies)</b>	<b>Rwanda Environment Management Authority (REMA)</b>	
<b>A.1.5. Accredited entity</b>	<b>Ministry of Environment (MOE)</b>	
A.1.5.a. Access modality	<input checked="" type="checkbox"/> Direct <input type="checkbox"/> International	
A.1.6. Executing entity / beneficiary	Executing Entity: FONERWA Beneficiary: Communities and Civil Society, District Authorities, National Ministries	
A.1.7. Project size category (Total investment, million USD)	<input type="checkbox"/> Micro ( $\leq 10$ ) <input checked="" type="checkbox"/> Small ( $10 < x \leq 50$ ) <input type="checkbox"/> Medium ( $50 < x \leq 250$ ) <input type="checkbox"/> Large ( $> 250$ )	
A.1.8. Mitigation / adaptation focus	<input type="checkbox"/> Mitigation <input type="checkbox"/> Adaptation <input checked="" type="checkbox"/> Cross-cutting	
A.1.9. Date of submission	31 July 2015 (Initial version) previously Rural Green Economy and climate Resilient Development Project.	
A.1.10. Project contact details	Contact person, position	Alex Mulisa
	Organization	FONERWA
	Email address	a.mulisa@fonerwa.org
	Telephone number	+250 788302107
	Mailing address	Fund Management Team for FONERWA REMA Building, Gasabo District Kigali City, Rwanda B.P 7436 Kacyiru

<b>A.1.11. Results areas (mark all that apply)</b>	
<u>Reduced emissions from:</u>	
<input checked="" type="checkbox"/>	Energy access and power generation (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
<input type="checkbox"/>	Low emission transport (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
<input checked="" type="checkbox"/>	Buildings, cities and industries and appliances (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
<input checked="" type="checkbox"/>	Forestry and land use (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)
<u>Increased resilience of:</u>	
<input checked="" type="checkbox"/>	Most vulnerable people and communities (E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)
<input checked="" type="checkbox"/>	Health and well-being, and food and water security (E.g. climate-resilient crops, efficient irrigation systems, etc.)
<input checked="" type="checkbox"/>	Infrastructure and built environment (E.g. sea walls, resilient road networks, etc.)
<input checked="" type="checkbox"/>	Ecosystem and ecosystem services (E.g. ecosystem conservation and management, ecotourism, etc.)

### A.2. Project Executive Summary (max 300 words)

Please provide a brief description of the proposed project, including the objectives and primary measurable benefits (see investment criteria in section E). The detailed description can be elaborated in section C.

The Government of Rwanda (GOR), through its accredited entity MOE, is submitting a proposal to the Green Climate Fund (GCF) to increase the resilience of vulnerable communities to climate change in Gicumbi District in Northern Rwanda. The project seeks a total of **USD 32,794,442** of GCF grant resources over six years. The project will restore and enhance ecosystem services in one of the sub-catchments of the degraded Muvumba watershed, increase the capacity of communities to renew and sustainably manage forest resources and support smallholders to adopt climate resilient agriculture. The project will also invest in climate resilient settlements for vulnerable families currently living in areas prone to landslides and floods and support community based adaptation planning and livelihoods diversification. Knowledge and capacity developed during implementation will be mainstreamed at the local and national level.

The project will specifically target the most vulnerable groups who have less resources to mitigate and adapt to climate change. This includes the extreme poor, as more than a quarter of households in the target area fall into this category and women headed households who tend to be poor and are particularly vulnerable to climate change. Many of the project's interventions target those who farm marginal land and are highly vulnerable to landslides, flooding and droughts. A key focus will be on developing the adaptive capacity of farmers and local institutions to ensure that the developed resilience becomes embedded within communities and local structures enabling them to continue adapting to future climate variability beyond the lifetime of the project.

The project comprises four interlinked outputs:

1. Sub-catchment B of the Muvumba watershed restored and small scale farmers supported to adopt climate resilient practices;
2. Communities supported to implement sustainable forest management and adopt fuel-efficient cooking methods;
3. Human settlements developed and/or modified to increase climate resilience; and
4. Successful adaptation and mitigation approaches communicated and mainstreamed at the national level.

There are two expected outcomes from the project, linked to both mitigation and adaptation:

1. improved management of land or forest areas contributing to emissions reductions (M9.0); and
2. strengthened adaptive capacity and reduced exposure to climate risks (A7.0).

The scalable project will make a significant contribution in taking forward the implementation of Rwanda's Green Growth and Climate Resilient Strategy (2011) as part of GoR's commitment to addressing the risks of climate change. The executing entity of the project will be the Rwanda National Climate Fund, FONERWA which is an agency of the accredited agency, MOE. FONERWA will manage the project on behalf of MOE.

The interventions have been analysed and demonstrate high effectiveness and efficiency (with high benefit to cost ratios for adaptation measures, and high cost-effectiveness for CO<sub>2</sub> reductions for mitigation measures). The project will reach at least 150,000 highly vulnerable beneficiaries, as well as providing wider benefits to more than 380,000 people through mainstreaming interventions.

### A.3. Project Milestone

Expected approval from accredited entity's Board (if applicable)	February 2018
Expected financial close (if applicable)	dd/mm/yyyy
Estimated implementation start and end date	Start: <u>1<sup>st</sup> May 2018</u> End: <u>31<sup>st</sup> April 2024</u>
Project lifespan	6 years

### B.1. Description of Financial Elements of the Project / Project

Please provide an integrated financial model in [Section I \(Annexes\)](#) that includes a projection covering the period from financial closing through final maturity of the proposed GCF financing with detailed assumptions and rationale; and a sensitivity analysis of critical elements of the project

**The Government of Rwanda is seeking to use GCF grant finance to support highly vulnerable communities in Northern Rwanda.** The target area is characterised by pervasive poverty and livelihood insecurity due to the high dependence of the local population on rainfed, subsistence agriculture which is already

significantly affected by rising temperatures and unpredictable rainfall patterns. The majority of the project interventions target climate change risks and impacts, and are targeted towards vulnerable small-holder farmers, technical assistance and public goods. As such, there is little scope for end users to contribute to the investment and there is limited potential to attract private sector finance. As an LDC, Rwanda’s domestic financing is not sufficient to cover project investments - Official Development Assistance still finances approximately 40% of the country’s annual budget. While GoR can provide co-financing, funding support from GCF is critical to enable this project to go ahead.

**MOE is requesting USD 32,794,442 from GCF as grant finance (excludes AE fee).** Public sector grant-financed activities will be executed directly by FONERWA and implemented by GoR agencies either at District or Sector level through a combination of grants and contracts with partner organisations and contractors. These investments are not-for-profit adaptation, mitigation, capacity building and mainstreaming interventions to mitigate emissions and build climate resilience of landscapes and communities through support for watershed protection, forest management, climate resilient agriculture and the construction of low carbon social housing for highly vulnerable households.

A full financial and economic analysis has been undertaken for each of the components and an economic analysis has been made of the overall project. See also the Economic and Financial Analysis provided in Section F.1. and in Annex 1 (Report No. 4).

*Description of how the choice of financial instrument(s) will overcome barriers and achieve project objectives, and leverage public and/or private finance*

**The financial instruments available to MOE to use in delivering the project are limited due to its accreditation status.** The Ministry of Environment (MOE) is accredited (direct access, national) for small projects (above USD10 million and up to USD 50 million) with fiduciary functions for: (i) Basic fiduciary standards; and (ii) Specialized fiduciary standard for project management. As such, direct grants are the only option as MINRENA’s current accreditation status does not allow on-granting and lending. However, while the accreditation status means a focus on direct grants, the project has been designed to maximise the use of these grants. For mitigation, grant elements have been tailored to address the incremental cost or the risk premium required to make investment viable, or to cover specific activities such as technical assistance. Mitigation components have also leveraged public and private co-finance. For adaptation, grant elements have been targeted to provide technical assistance, provide support for public goods, and create the enabling environment to address barriers, leveraging on public – and where possible – private finance.

**See Economic and Financial Analysis provided in Section F.1. and in Annex to the proposal**

*A breakdown of cost estimates for total project costs and GCF financing by sub-component in local and foreign currency and a currency hedging mechanism: for example, under the component of drilling activity for a geothermal exploration project, sub-components would include civil engineering works, drilling services, drilling equipment and inspection test.*

A breakdown of the total project costs and GCF financing by sub-component are shown below. A full detailed project costing, showing all subcomponents is presented in Annex 2. All costs are presented in USD. In line with advice from the GCF, the fee for the Accredited Entity (MOE) is not included in this total. The total project value, including GCF funding and co-financing, but excluding the AE fee, is within the accreditation level of MOE.

Component	Sub-component (if applicable)	Amount (for entire project)	Currency	Local currency	GCF funding amount	Currency of disbursement to recipient
Component 1 Watershed protection and climate resilient agriculture	Sub-component 1.1 Strengthen community based adaptation	570,728	Options	467,426,437	423,728	USD
	Sub-component 1.2 Reduce slope erosion to sustainable levels	2,443,221		2,000,998,100	2,443,221	
	Sub-component 1.3 Stabilise rivers, roadsides and steep slopes with protective forestry	1,518,154	Options	1,243,368,126	1,518,154	USD
	Sub-component 1.4 Integrate agro-forestry into farming systems on 9790 ha of the watershed	1,779,496	Options	1,457,406,985	1,779,496	USD
	Sub-component 1.5 Support 1800 smallholder crop-livestock farmers to adopt agro-ecological approaches to increase climate resilience	1,805,299	Options	1,478,540,000	1,805,299	USD
	Sub-component 1.6 Increase climate resilient farming practices with tea cooperatives in Mulindi (with planting for future climate change) - targets 5000 smallholders	2,045,235	Options	1,675,047,835	2,045,235	USD
	Sub-component 1.7 Integrate climate resilient practices into local extension services	461,846		378,251,685	461,846	USD
	Sub-component 1.8 Provide weather and climate services for tea and coffee farmers to increase productivity and reduce losses from weather and climate variability	600,406	Options	491,732,719	600,406	USD

	Sub-component 1.9 Increase capacity for pest monitoring, surveillance and IPM to address current and future climate change	606,964		497,103,329	606,964	USD
	Sub-component 1.10 Increase climate resilient practices with 1000 coffee growers to reduce susceptibility to climate change and protect slopes in the watershed (planting for future climate change)	727,184		595,563,358	727,184	USD
Component 2 Sustainable forest management	Sub-component 2.1 Increase forest productivity and sustainable forest management	1,128,336	<u>Options</u>	924,107,184	1,128,336	USD
	Sub-component 2.2 Strengthen forest management skills to sustain investments in forestry and watershed management	457,448	<u>Options</u>	374,649,912	457,448	USD
	Sub-component 2.3 Establish, restore and manage degraded woodlots across 297 ha of the watershed	766,418	<u>Options</u>	627,696,342	766,418	USD
	Sub-component 2.4 Strengthen community capacity to provide forest products and services	1,417,245	<u>Options</u>	1,160,723,655	1,417,245	USD
	Sub-component 2.5 Increase the use of biogas and efficient cookstoves to reduce deforestation of the watershed	1,151,579		943,143,379	1,151,579	USD
	Sub-component 2.6 Reduce the demand for fuelwood and GHG emissions at Mulindi tea factory through energy efficiency measures	347,195		284,352,705	241,231	USD
	Component 3 Climate resilient settlements	Sub-component 3.1 Manage surface water run-off from settlements to reduce gully formation, floods and landslides	2,431,136	<u>Options</u>	1,991,100,056	2,431,136
Sub-component 3.2 Increase rainwater capture and storage to counter inter-annual rainfall variability		2,116,346	<u>Options</u>	1,733,287,508	2,116,346	USD
Sub-component 3.3 Construct a green social housing development in Kabeza to reduce the number of vulnerable households living in high risk zones (100 houses + green infrastructure)		2,067,508	<u>Options</u>	1,693,288,885	2,003,121	USD
Sub-component 3.4 Construct a green social housing development in Kaniga to reduce the number of vulnerable households living in high risk zones (100 houses + green infrastructure)		2,671,544	<u>Options</u>	2,187,994,246	2,628,904	USD
Component 4 Knowledge transfer and mainstreaming	Sub-component 4.1 Communicate project results and lessons learned	832,500		681,817,500	832,500	USD
	Sub-component 4.2 Awareness building, promotion and advocacy to support replication and scale up in other districts	623,806		510,897,084	623,806	USD
	Sub-component 4.3 Increase capacity of local institutions and communities to sustain investments in watershed protection and climate resilient settlements	532,712		436,291,128	532,712	USD
	Sub-component 4.4 Mainstream climate resilient approaches into existing forestry programmes and practices to support scale up and replication	175,500		143,734,500	175,500	USD
	Sub-component 4.5 Mainstream approaches to climate resilient agriculture for smallholders into existing plans and programmes to support scale up and replication	152,500		124,897,500	152,500	USD
	Sub-component 4.6 Mainstream climate resilient approaches into existing agriculture extension programmes to support scale up and replication	635,463		520,443,810	635,463	USD
	Sub-component 4.7 Mainstream energy efficiency into the tea industry to support scale up and replication	291,528		238,761,294	291,528	USD
Project Management	Project execution costs	<b>2,797,137</b>	<u>Options</u>	2,290,854,875	2,797,137	USD
<b>Total project financing</b>		<b>33,154,432</b>		<b>27,153,480,136</b>	<b>32,794,442</b>	<b>USD</b>

\* Please expand the table if needed.

- a breakdown of cost/budget by expenditure type (project staff and consultants, travel, goods, works, services, etc.) and disbursement schedule in project confirmation (term sheet) as included in section I, Annexes.

A full detailed project cost breakdown, by expenditure type, and the disbursement schedule, is presented in Annex 2.

## B.2. Project Financing Information

	Financial Instrument	Amount	Currency	Tenor	Pricing
<b>(a) Total project financing</b>	<b>(a) = (b) + (c)</b>		<u>Options</u>		

<b>(b) GCF financing to recipient</b>	(i) Senior Loans	-	<a href="#">Options</a>
	(ii) Subordinated Loans	-	<a href="#">Options</a>
	(iii) Equity	-	<a href="#">Options</a>
	(iv) Guarantees	-	<a href="#">Options</a>
	(v) Reimbursable grants *	-	<a href="#">Options</a>
	(vi) Grants *	32,794,442	<a href="#">Options</a>

\* Please provide economic and financial justification in [section F.1](#) for the concessionality that GCF is expected to provide, particularly in the case of grants. Please specify difference in tenor and price between GCF financing and that of accredited entities. Please note that the level of concessionality should correspond to the level of the project's expected performance against the investment criteria indicated in [section E](#).

<b>Total requested (i+ii+iii+iv+v+vi)</b>	<b>32,794,442</b>	<a href="#">Options</a>
---	-------------------	-------------------------

<b>Financial Instrument</b>	<b>Amount</b>	<b>Currency</b>	<b>Name of Institution</b>	<b>Tenor</b>	<b>Pricing</b>	<b>Seniority</b>
<a href="#">Grant</a>	<a href="#">147,000</a>	<a href="#">USD</a>	<a href="#">FONERWA</a>			
<a href="#">Grant</a>	<a href="#">107,026</a>	<a href="#">USD</a>	<a href="#">Gicumbi District</a>			
<a href="#">Grant</a>	<a href="#">105,964</a>	<a href="#">USD</a>	<a href="#">TWF</a>			

**(c) Co-financing to recipient**

Lead financing institution: FONERWA  
 Total co-finance = USD 359,900  
 Note: There is an additional USD 2,858,483 contribution by communities in terms of labour provided (USD 1,318,831) and payment for subsidised biogas and efficient cookstoves (USD 1,539,652) but this has not been included in the budget

\* Please provide a confirmation letter or a letter of commitment in section I issued by the co-financing institution.

**(d) Financial terms between GCF and AE (if applicable)**

In cases where the accredited entity (AE) deploys the GCF financing directly to the recipient, (i.e. the GCF financing passes directly from the GCF to the recipient through the AE) or if the AE is the recipient itself, in the proposed financial instrument and terms as described in part (b), this subsection can be skipped.  
 If there is a financial arrangement between the GCF and the AE, which entails a financial instrument and/or financial terms separate from the ones described in part (b), please fill out the table below to specify the proposed instrument and terms between the GCF and the AE.

<b>Financial instrument</b>	<b>Amount</b>	<b>Currency</b>	<b>Tenor</b>	<b>Pricing</b>
<a href="#">Choose an item.</a>	.....	<a href="#">Options</a>	<a href="#">( ) years</a>	<a href="#">( ) %</a>

Please provide a justification for the difference in the financial instrument and/or terms between what is provided by the AE to the recipient and what is requested from the GCF to the AE.

**B.3. Financial Markets Overview (if applicable)**

How market price or expected commercial rate return was (non-concessional) determined? Please provide an overview of the size of total banking assets, debt capital markets and equity capital markets which could be tapped to finance the proposed project. Please provide an overview of market rates (i.e. 1-year T-Bill, 5-year government bond, 5-year corporate bond (specify credit rating) and 5-year syndicate loan. Provide examples or information on comparable transactions.

Not applicable.

**C.1. Strategic Context**

Please describe relevant national, sub-national, regional, global, political, and/or economic factors that help to contextualize the proposal, including existing national and sector policies and strategies.

**Social, economic and political context**

**Despite being among Africa's poorest countries, Rwanda has achieved impressive growth and poverty reduction over the last decade.** The 1994 genocide decimated Rwanda's fragile economic base, severely impoverished the population, particularly women, and temporarily stalled the country's ability to attract private and external investment. However, Rwanda has made substantial progress in stabilising and rehabilitating its economy

to pre-1994 levels. Although Rwanda is still dependent on aid with Official Development Assistance financing approximately 40% of the country's annual budget, Rwanda's economy has grown at 8% per year since 2001 with GDP per capita more than tripling from USD 211 in 2001 to USD 718 in 2014 and inflation has been reduced to single digits. Poverty has fallen from 44.9% in 2011 to 39.1% in 2014 and extreme poverty from 24.1% to 16.3%<sup>1</sup>. Inequality has reduced as well with the Gini coefficient dropping from 0.49 in 2011 to 0.45 in 2014 and the ratio of the wealthiest 10% to the poorest 10% dropping from 6.36 to 6.01 during the same period<sup>2</sup>. Rwanda is on course to achieve most of its 2015 MDG targets and the OECD has consistently rated Rwanda as one of the countries that uses aid most effectively.

**Although the economy is growing and poverty levels are falling, Rwanda faces significant challenges in adapting to climate change, meeting food demands and in developing sustainably.** As a small, hilly, landlocked country with the highest population density in Africa and a predominantly poor, rural population<sup>3</sup> highly dependent on rain-fed agriculture, climate change presents a major threat to Rwanda's development. The population of over 11 million people (half of which is under 19) is projected to rise to around 16 million by 2020, and 26 million by 2050 and this places increasing demands on natural resources.

**Much of Rwanda's economy depends directly upon its land, water and biodiversity resources.** The majority of the country's population directly depend on ecosystem goods and services to maintain food security, livelihood and health, especially marginalised groups such as women who often do not have equal access to other sources of sustenance. Agriculture provides around 33% of GDP and 72% of employment<sup>4</sup> and around 50% of power generation comes from (small-scale) hydropower. There is a very high dependence on biomass for fuel and rain-fed subsistence agriculture for livelihoods. However, most of Rwanda's landscape is dominated by steep terrain, more than 70% of the cultivated land surface has slopes greater than 10% which results in high levels of erosion and surface run off into waterways equivalent to an annual economic loss of almost 2% of GDP equivalent<sup>5</sup>. These are the underlying factors which make Rwanda's rural population so vulnerable to climate change.

### *Climate change context*

**Current climate variability and early climate change lead to major impacts in Rwanda.** Rwanda experiences high levels of climatic variability and natural hazards due to the influence of El Niño – Southern Oscillation (ENSO) events. It is particularly affected by heavy rainfall, frequent floods and landslides in the West and North, and periodic droughts in the East. Major floods occurred in 1997, 2001, 2006, 2007, 2008, 2009, 2011, 2013 and 2016 and these had major livelihood and economic impacts: the flood in 2007, for example, had direct economic costs equivalent to 1% of GDP<sup>6</sup>. Rwanda also experiences periodic droughts, with major events in 1998-2000, 2005-2006 and 2012-2013 and 2016-2017. These also have major impacts, for example, the drought in 2012 reduced GDP growth by 4% the following year<sup>7</sup>. Further analysis of Rwanda's climate variability is included in the Climate change assessment report in Annex 1.

**The climate of Rwanda is already changing and impacts are increasing.** Recent meteorological observations show that the temperature of Rwanda has increased strongly over recent decades, with higher warming than the global average (at 0.35°C per decade since the 1980s), and there are strong indications of increasing rainfall variability<sup>8</sup>. This is already affecting rural areas.

**The future economic cost of climate change in Rwanda will be large – estimated at an additional impact of 1% of GDP each year by 2030<sup>9</sup>.** Analysis of the global climate models – across the range of future representative concentration pathways RCPs<sup>10</sup> and climate models – shows further increases in temperatures and increases in the number of hot days. The changes in rainfall (and rainfall variability) are more uncertain, but an increase in heavy rainfall in Rwanda is projected as well as increases in rainfall variability. All of these changes are likely to exacerbate the impacts of current climate variability in Rwanda, as well as lead to new risks.

1 Poverty based on a total consumption level below RWF 159,375 (January 2014 prices), Extreme poverty based on a total consumption level below RWF 105,064 (January 2014 prices) – EICV 4 data

2 NISR (2014). EICV 4: Results of Integrated Household Living Conditions Survey. Aug 2015.

3 83% of the population still live in rural areas, Fourth population and housing census, Rwanda 2012. National Institute of Statistics, Rwanda

4 EICV 4

5 REMA (2009) State of Environment and Outlook Report 2009.

6 SEI (2009). The Economics of Climate Change in Rwanda. Report to the GoR and DFID.

7 MINAGRI (2013). Annual Report 2012-2013 Ministry of Agriculture and Animal Resource. Kigali.

8 GoR (2012). Republic of Rwanda. Second National Communication under the UNFCCC.

9 Stockholm Environment Institute (2009). Economics of climate change in Rwanda

10 Representative Concentration Pathways (RCPs) are four greenhouse gas concentration trajectories adopted by the IPCC for its fifth Assessment Report in 2014.

**Rwanda's sensitivity<sup>11</sup> to climate change was assessed as high and its adaptive capacity<sup>12</sup> low in a national study on climate vulnerability.** The rising rural population is increasing demands for settlement expansion and the provision of associated services, in particular water and energy. Climate change is expected to exacerbate existing stresses including poverty, land degradation, food insecurity, rising epidemics and natural disasters. Expected impacts of climate change include the high degradation of arable land (erosion) of forests. A national household baseline survey on household vulnerability to climate change found high levels of climate vulnerability<sup>13</sup> throughout Rwanda attributed to the high number of poor rural households dependent on rainfed agriculture, the hilly topography, low access to climate information, depletion of forest stocks and dependence on biomass for fuel, its high age dependency ratio<sup>14</sup> of 93.2% and its high dependency on fuel imports among others.

**Climatic factors, exacerbated by the loss of forest and vegetation cover, steep slopes and high dependence on traditional rain-fed agriculture, are causing a variety of impacts.** The high number of poor people engaged in subsistence agriculture makes Rwanda particularly susceptible to climate change. The area under agricultural production has been increasing over time at the expense of pastures, natural forests and fallows. Over-exploitation of land, a high dependence on biomass for household energy needs (98% of the population EICV4 table A.7) and increasing urbanisation (at 4.4% per year) create significant pressure on natural resources, notably land, water and forests. Land scarcity is a major constraint to raising agricultural productivity. The predicted variable rates of precipitation and rising temperatures are expected to adversely impact on agricultural productivity which is already constrained by over-cultivation, land degradation, insufficient investments in soil and water conservation, the topography, intense pressure on natural resources (due to high population density) and a lack of irrigation. Reducing the dependency of people on farming is difficult due to a lack of alternative livelihood options in rural areas, a limited skills base, inadequate infrastructure (transport, electricity etc.) and low usage of formal financial services.

#### ***Policy and institutional context***

**Environmental degradation and climate change have been recognised, at the highest political level, as major barriers to realising Rwanda's medium and long-term development aspirations.** The need to mainstream adequate responses to climate change is a consistent priority throughout national policies and strategies, and becoming a climate-resilient low-carbon economy is a national priority. 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. A major focus concerns the development implications of population pressure and a high reliance on natural resources in the current economy. It calls for increased contribution from forestry to the national economy, increased private sector participation within the sector, protection and enhancement of biodiversity and ecosystem services and reduction in fuelwood demand pressure on the forest resource. Rwanda's seven year, National Strategy for Transformation, 2017-2024, (NST1<sup>15</sup>) sets out the Rwanda's development targets and integrates a number of long-range global and regional commitments including: the Sustainable Development Goals (SDGs<sup>16</sup>); the Africa Union Agenda 2063 and its First 10-Year Implementation Plan 2014-2023; The East African Community (EAC) Vision 2050; and obligations from the COP 21 Paris Agreement on Climate Change. Increasing climate resilience in agriculture and human settlements and targeting public works schemes to areas most at risk from climate change are key areas of focus in the strategy. Sustainably exploiting natural resources and protecting the environment and reducing the dependence on fuel wood are also priorities.

**The Green Growth and Climate Resilience Strategy (GGCRS) provides the country's roadmap for becoming a climate resilient, low carbon economy by 2050.** The GGCRS developed in 2011 is central in directing the achievement of Rwanda's development targets through low carbon and climate resilient pathways and has high-level commitment from GoR. GGCRS' strategic objectives include the achievement of sustainable land use and water resource management and reduced vulnerability to climate change. The strategy contains 14 Programmes of Action towards its achievement, including Sustainable Land Use Management and Planning and Sustainable forestry, agroforestry and biomass energy. The GoR has successfully mainstreamed climate change into its national strategies and many of its sectoral strategies. Environment and climate change issues are also included in the

<sup>11</sup> the degree to which a system is adversely or beneficially affected by a given climate change exposure, typically shaped by natural and/or physical attributes of the system including topography, the capacity of different soil types to resist erosion, land cover type as well as human activities which affect the physical constitution of a system, such as tillage systems, water management, resource depletion and population pressure including historic and recent adaptation.

<sup>12</sup> 'the ability of a system to adjust to climate change (including climate variability and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences' (Parry et al, 2007 in the VI study, May 2015). The combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities (IPCC).

<sup>13</sup> According to the Intergovernmental Panel on Climate Change (IPCC) definition: vulnerability is the degree, to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes

<sup>14</sup> an EICV indicator; NISR defines ADR as the proportion (%) of people in Rwanda under 16 and over 64 years (dependent, not of working age), to those 16-64 years (economically productive ages).

<sup>15</sup> The strategy is still in the draft stage

<sup>16</sup> Goal 13. Take urgent action to combat climate change and its impacts; and Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable

Budget Call Circular (BCC). However, limited capacity to tackling climate change issues particularly in productive sectors such as agriculture reduces national capacity to adopt and implement the GGCRS.

**Rwanda's Intended Nationally Determined Contribution (INDC) includes a number of actions that will be supported by this project.** Specifically these include: mainstreaming agro ecology techniques (agro forestry, kitchen gardens, nutrient recycling, and water conservation); organic waste composting; mainstreaming sustainable pest management techniques ; improving soil conservation and land husbandry (terraces and agroforestry); increasing irrigation and water management including rainwater harvesting; afforestation through enhanced germplasm and technical practices in planting and post-planting processes; Improved Forest Management for degraded forest resources; and sustainable use of biomass fuels through the increased uptake of improved cookstoves and biogas.

**Rwanda's National Adaptation Plan of Action (NAPA) articulates Rwanda's strategy to reduce vulnerability to climate change particularly from the main climatic hazards including intense rainfall, flash flooding, landslides, drought and low flows, extreme temperatures and heat waves.** The six NAPA priorities are: 1) Integrated Water Resource Management; 2) Setting up information systems to early warning of hydro-agro meteorological system and rapid intervention mechanisms; 3) Promotion of non-agricultural income generating activities; 4) Promotion of intensive agro-pastoral activities; 5) Introduction of species resisting to environmental conditions; and 6) Development of firewood alternative sources of energy.

**Rwanda has identified Nationally Appropriate Mitigation Actions (NAMAs) across seven priority sectors: agriculture, buildings, energy, industry, land use, land change and forestry, transport, and waste.** Within this, increasing the basic productivity of Rwanda's forests is a priority. As land for afforestation is a very scarce resource in Rwanda, the NAMA has prioritised forest management for multiple purposes and advocates for the creation of new plantations to achieve a national tree/forest cover of 30%, with particular attention to steep slopes in order to combine protective and productive functions. Tea was also considered a high priority for NAMA development due to the historical importance of the sector and the economic potential for value addition, job creation and the potential emission reduction through the adoption of energy saving measures in tea processing. Within the Housing / Building Sector the NAMA highlights the use of efficient cookstoves, LED lighting and solar water heaters along with Off-Grid Solar PV Mini-Grids.

**Rwanda has closed 80% of its gender gap**—edging out many countries in the Global North, including the United Kingdom, Canada and the United States. Rwanda is the only country in sub-Saharan Africa to be in the top 10 of the Index<sup>17</sup>, with the next sub-Saharan African country, Burundi, ranking 12th. Since 2008, Rwanda has had a female-majority in Parliament, and remains today the country with the highest share of female parliamentarians in the world at 64% representation. In recent years, the GoR has made concerted efforts to connect gender equality and climate change considerations in tandem with poverty reduction and resilience-building efforts in national policies, plans and measures, from identifying gender as a cross-cutting issue to including specific goals and targets for women's involvement in climate change solutions. Rwanda has also made significant global commitments to recognising women's important roles in sustainable development and climate change adaptation, mitigation and resilience building, as well as furthering gender equality in policies across all sectors. This commitment is strengthened by a wide network of stakeholders in civil society and the private sector that consider gender a cross-cutting issue and an integral addition in sustainable development. A comprehensive list and description of policies, commitments, strategies, institutions, women's groups, and more with details on the inclusion of gender, or lack of, can be found in the Gender Analysis provide in Annex 1. See individual study reports under Annex 1 for specific details on all policies and strategies relevant to each component.

**Rwanda has a comprehensive and progressive institutional framework**, and has established agencies to work cross-sectorally to support natural resource management, notably REMA and the Rwanda Water and Forests Authority (RWFA) within the Ministry of Environment (MOE). In addition, a National Fund for Environment and Climate Change (FONERWA) has been established to address cross- sector financing needs. Rwanda also recognises the importance of engaging multiple stakeholders and has established mechanisms including regular cross-sectoral planning meetings and the Joint Action Development Forums (JADF), consultative platforms used for promoting cooperation between the private sector, civil society and the public sector.

## C.2. Project Objective against Baseline

Please fill out applicable sub-sections and provide additional information if necessary, as these requirements may vary depending on the nature of the project.

### Objectives

**The proposed project will increase the resilience of vulnerable communities to climate change in Gicumbi District in Northern Rwanda.** This will be achieved by restoring and enhancing ecosystem services of one of the sub-catchments of the Muvumba watershed, increasing the capacity of communities to renew and sustainably manage forest resources and supporting smallholders to adopt climate resilient agriculture. The project will also invest in green settlements for vulnerable families currently living in areas prone to landslides and floods and support community based adaptation planning and livelihoods diversification. Knowledge and capacity developed during implementation will be mainstreamed at the sector and national level. The proposed interventions will target nine sectors in Gicumbi<sup>18</sup> - Kaniga, Rubaya, Cyumba, Rushaki, Shangasha, Mukarange, Manyagi, Byumba<sup>19</sup> and Bwisige<sup>20</sup>. Most of this area falls into sub-catchment B of the Muvumba river catchment between 1446 and 2431 metres above sea level. A map of the target area is shown in Annex 4 and detailed maps of the watershed and sub-watersheds are included in the Watershed Protection Plan that was prepared as part of the design (see Annex 1).

**The project will specifically target the most vulnerable groups who have less resources to mitigate and adapt to climate change.** This includes the extreme poor, as more than a quarter of households in the target area fall into this category and women headed households (who tend to be poor and are particularly vulnerable to climate change). In particular, many of the project's interventions target those who farm on marginal land and who are highly vulnerable to landslides, flooding and droughts. A key focus will be on developing the adaptive capacity of farmers and local institutions to ensure that the developed resilience becomes embedded within communities enabling them to continue adapting to future climate variability beyond the lifetime of the project. Baseline conditions and existing investments are described for the four areas of intervention: 1) Watershed protection and climate resilient agriculture; 2) Sustainable forest management; 3) Climate resilient settlements; and 4) Knowledge development and transfer.

***Baseline 1: the degradation of the Muvumba watershed is being accelerated by climate change and local communities have low adaptive capacity***

**Gicumbi district is the source for the Muvumba and Nyabugogo river catchments and 60% of its land area is situated in the degraded Muvumba watershed.** Gicumbi extends north from Kigali to the Uganda border and has a population of 395,606<sup>21</sup> (or 22.9% of the total population of Northern Province) spread over 867 km<sup>2</sup> most of which (91.3%) live in rural areas<sup>22</sup>. The Muvumba River is trans-boundary with Uganda and located in the Buberuka Highlands of Rwanda. Originally forested with Afromontane rainforest, natural forest is now almost totally absent. The basin is on the boundary of the Albertine Rift Biodiversity Hot Spot which is one of the most important regions for biodiversity conservation in Africa. It contains more endemic species of vertebrate than any other region on mainland Africa. In particular, a significant portion of wetlands in the Muvumba (which play an important role in flood attenuation, ground water recharge, nutrient absorption and water purification) has been degraded or converted to agricultural use. As small-holder farming predominates, the local population is highly dependent on the ecosystem services provided by the Muvumba watershed which is also critical to the country's hydropower generation. Projected water demand up to 2040 shows that water requirements for all sectors will increase to 83% of the average renewable resources and the urgent need for increased storage infrastructure to cope with deficits during the dry season<sup>23</sup>.

**The target area is characterised by steep topography and shallow soils with limited integration of trees and shrubs within the landscape, with intense rainfall leading to high soil erosion and floods and landslides.** Current climate variability has a major impact on the area and it has some of the highest soil erosion rates in Rwanda. Soil erosion, deforestation and lack of water storage were ranked among the highest priorities by the Muvumba Catchment Task Force. Field and GIS analysis in the district estimate that the Gicumbi district experiences soil erosion rates between 150-300 tonnes/hectare/year. This leads to major economic damage, with the average revenue loss per plot of land estimated at between USD14-62 per hectare per year, equivalent to up to 5.2 million USD per year. The projected variability in rainfall combined with high levels of erosion and intense pressure from over-cultivation and deforestation causes extensive sedimentation and degradation of rivers, lakes and wetlands with more than 5000 tonnes of soil leaving the catchment every day<sup>24</sup> which impacts on downstream water abstraction and hydro-power potential. Soil sedimentation loading in Gicumbi is estimated to occur at a rate of 1.13 tonnes per hectare per year and (at a sediment load removal cost of USD 14 per tonne) results in an estimated total annual economic cost of USD 1.4 million per year. As well as the ongoing problem of soil erosion, the area experiences frequent floods and landslides during the rainy season. The mountainous topography and steep ravines

<sup>18</sup> The information gathering for this report was undertaken in Rwanda during October - November 2016 through a combination of interviews, site visits and literature reviews.

<sup>19</sup> Byumba is the District capital where the District administration is based and is included within the project area plus it also houses a campus of the University of Rwanda (UTAB).

<sup>20</sup> There are 21 sectors in Gicumbi hence these 10 sectors account for the northern half of the District but excluding the 2 western sectors of Miyove and Nyankenke.

<sup>21</sup> 4th Rwanda Population and Housing Census

<sup>22</sup> NISR, 2012

<sup>23</sup> Muvumba catchment plan, 2017

<sup>24</sup> Total Suspended Solids > 4000 mg/l in Water Quality Monitoring report, RWFA, 2016

(90% of the land comprises slopes between 25-55%) make the area prone to landslides that cause the destruction of physical infrastructure downhill and downstream.

**Climatic variability interacts with anthropogenic factors to accelerate watershed degradation.** Forest, land and water resources are under high pressure from a large population almost entirely reliant on agrarian livelihoods and on wood for fuel, with demand far exceeding supply. The poor quality of existing forest resources and the deforestation of upper catchments contributes to high rates of soil erosion lead to declining soil fertility, falling agricultural yields and increased food insecurity. Existing terraces are often in poor condition with insufficient incorporation of soil conservation measures and practices. River banks and roadsides lack tree cover and soil stabilization measures and are subject to erosion and landslides. Human population densities are very high in the watershed, especially around Byumba<sup>25</sup>, the Gicumbi district capital which exerts significant pressure on water and land resources resulting in the high rate of land and wetland degradation and pollution of water sources.

**The adverse impacts of rising temperatures and increasingly variable precipitation combined with the ongoing degradation of natural resources is most evident in rural communities.** Agricultural yields are very low, food insecurity affects 20%<sup>26</sup> of the households in the catchment and 44% of children in Gicumbi have chronic malnutrition. Poverty rates within Gicumbi are also very high compared to national levels, with 55.3% and 24.7% of the population living below the poverty line or in extreme poverty respectively (EICV 4) making it the second poorest district in Rwanda after Nyamasheke. The high levels of poverty limit the adaptive capacity of communities to invest in sustainable practices and take on other income-generating opportunities to supplement household and livelihood needs<sup>27</sup>. This particularly affects female-headed households, which make up 27% of households in Gicumbi,<sup>28</sup> as women have limited access to and control over resources compared to men because of cultural and social stigmas/barriers and traditional roles and responsibilities. There are also a large number of orphans as well as high morbidity and mortality among young children.

**Small-scale farmers are particularly vulnerable to climate variability.** Agriculture is the main occupation for 94.8% of the district's population. The main crops are tea (Gicumbi hosts one of the largest tea plantations in Rwanda), wheat, sorghum and maize and many households (66%) own farm animals, mostly cattle. The average size of land holding per household is approximately 0.7 ha and productivity levels are very low due to low soil fertility, a predominance of very shallow soils, especially on the slopes, resulting in limited soil moisture holding capacity, the limited use of inputs and mechanisation, erosion on steep slopes, a lack of irrigation and post-harvest facilities as well as under-developed agricultural value chains and a lack of private investment. Smallholders often lack the knowledge, inputs and technology to transition to more climate resilience farming systems that would help them to generate a marketable surplus for food, nutrition and income security. They have neither the financial nor physical access to quality feed for livestock<sup>29</sup> and have limited knowledge of improved feeding, fodder establishment and crop-livestock integration approaches. At the same time, extension services lack the technical capacity to effectively mainstream climate concerns into advice services. These two factors result in low crop and milk productivity, inefficient use of resources (time, space and money) and high GHG emissions per unit of meat produced. Numerically smallholders therefore contribute most to, and suffer most from, GHG emissions.

**Smallholders growing tea and coffee in Gicumbi are particularly at risk from climate change.** As perennial plants, tea and coffee play an important role in stabilising Rwanda's hilly topography and reducing soil erosion that would otherwise occur as a result of pre-planting tillage for annuals. However, both crops are highly sensitive to rising temperatures and changing rainfall patterns. Adverse impacts are already occurring, from heavy precipitation events and associated floods, landslides and soil erosion, as well as the impacts of periodic dry years reducing production. The Mulindi tea plantation has an output of over 15 million tonnes annually, which is over 20% of national production, all of which is produced by 4940 smallholder farmers. There are also 11,783 coffee farmers<sup>30</sup> in Gicumbi working on very small plots of land (0.1- 0.2 ha). As well as providing livelihoods for very large numbers of small-holder farmers, national tea and coffee production comprise 25% of all exports by value and generate around USD 60 and 62 million respectively in exports per year<sup>31</sup>. However, climate variability is already impacting on tea and coffee yields. The Mulindi tea plantation has suffered major losses in recent years, with production areas lost to landslides, major damage due to floods, and periodic droughts (dry conditions in 2013 reduced production by 22%). The estimated annual loss of production from climate variability at the Mulindi tea plantation (2300 ha) in Gicumbi over the last six years ranges from 2.0 to 3.3 million tonnes of green leaf per year, with an equivalent market loss of

<sup>25</sup> The sectors of Byumba, Rubaya, Cyumba, Munyangiro, Nyankenke have more than 500 people/km<sup>2</sup>.

<sup>26</sup> Water for Growth 2016

<sup>27</sup> National Institute of Statistics of the Republic of Rwanda. (2010). EICV3 District Profile: Gicumbi. Kigali, Rwanda

<sup>28</sup> National Institute of Statistics of the Republic of Rwanda. (2012). Rwanda 4th Population and Housing Census, 2012. Kigali, Rwanda

<sup>29</sup> The majority of smallholders rely on natural grasses to feed livestock, have little income for feeding supplements, lack access to disease/drought resilient forage seeds and have limited knowledge on improved feeding practices and/or fodder establishment techniques. This results in hours spent searching for animal fodder in the dry season.

<sup>30</sup> The Republic Of Rwanda. Ministry Of Agriculture And Animal Resources. Rwanda Coffee Development Strategy 2016 -2020

<sup>31</sup> NISR, 2014

USD2.5 - 4.1 million per year, directly reducing the incomes of smallholders. Similarly, dry years and rising temperatures are affecting coffee production, both in relation to the direct production but also from the increased prevalence of pests and diseases. Coffee is important for the national economy (providing over 10% of total exports by value) and supports the livelihoods of several hundred thousand small-holder farmers across the country (30% of which are women). As highlighted by recent studies globally and in East Africa (see introduction), these coffee livelihoods are at risk from climate change, with major parts of current production areas (~50%) expected to be unsuitable for Arabica production by 2050 (Davis et al , 2012; The Climate Institute, 2016<sup>32</sup>).

**Future climate projections indicate critical risks to smallholders involved in tea and coffee production.** In the short-term, early climate change will detrimentally affect the productivity and quality of tea and coffee in Rwanda. In the medium term, it poses a critical threat. Recent analysis has estimated that climate change is projected to cut the global area suitable for coffee production by as much as 50% by 2050<sup>33</sup> and analysis in East Africa has shown similar reductions in the areas suitable for growing tea<sup>34</sup>. These future effects of climate change on tea and coffee are particularly important because they are long-lived crops, much more so than cereals, and thus land-use under cultivation (and smallholder investment) is locked into longer cycles that will be exposed to major climate change. This issue is important because Rwanda is currently expanding the area under tea and coffee cultivation, as part of national agricultural growth and export expansion (in the ASIP-II<sup>35</sup>), and these new investments will be directly exposed to the climate of the future. Climate change will also lead to additional impacts from pests and disease including the Red spider mite (tea) which is an increasing problem, coffee leaf rust prevalence and coffee berry borer, which are correlated to temperature (with higher levels in warmer areas). Future climate change will affect range and incidence, and is likely to open up the risks of other pests and diseases. Given the lead in times and longevity of tea and coffee plants, the window of opportunity for making the tea and coffee sectors resilient is urgent, as decisions are being made now that will lock Rwanda into plans that last decades. Of particular importance is that Rwanda's comparative advantage is in the production of quality tea and coffee, which command higher prices, and thus lead to higher incomes to small-holders and greater national exports. This is exacerbated because the two sectors are dominated by smallholders – there are around 42,000 tea smallholders and 357,000 coffee small-holder farmers in Rwanda – thus those most affected by climate change will be those least likely to be able to adapt on their own.

#### Baseline investments

Project	Implementing organisation	Timeframe	Expected results
W4G	MOE/RWFA/IWR MD Embassy of the Kingdom of the Netherlands	2014-19	Integrated Water Resources Management Programme (35.4 million Euro) in four catchments across Rwanda including Muvumba. W4G prepared a catchment plan for Muvumba which this project will help to finance.
Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) Project	MINAGRI funded by the World Bank	2009 - 2017	Established to increase productivity and promote commercial farming on the hillsides of Rwanda. Land husbandry practices on hillsides depends on slope categories i.e. soil bunds on 6-16% slope, terraces on 16-40%, narrow-bench terraces on 40-60%, more than 60% slope afforestation. Includes Radical terracing and Agroforestry on 2,500 ha in Rushaki, Mukarange, Shangasha and Kaniga sectors. Terraces were constructed in conjunction with agro-forestry, fodder crops on the risers and other biological measures and farmed using compost, lime, moisture retention measures and other soil erosion control measures. The LWH Project has improved land-husbandry and productivity on 20,601 ha lands in 34 pilot watersheds which has resulted in a 79% and 84% reduction in sediment loads and soil erosion respectively. LWH is ending soon. This project will draw lessons from LWH.
Reducing vulnerability to climate change in North West Rwanda through community based adaptation	RWFA (funded by the Adaptation Fund) USD 10 million over 4 years	2014-18	Aims to increase the adaptive capacity of natural systems and rural communities living in exposed areas of North Western Rwanda to climate change impacts. This project operates in a different part of Rwanda but many of its successful interventions will be replicated in Gicumbi.

<sup>32</sup> [http://www.climateinstitute.org.au/verve/resources/TCI\\_A\\_Brewing\\_Storm\\_FINAL\\_WEB270916.pdf](http://www.climateinstitute.org.au/verve/resources/TCI_A_Brewing_Storm_FINAL_WEB270916.pdf).

<sup>33</sup> Bunn, C., Läderach, P., Ovalle Rivera, O., & Kirschke, D. 2014. A bitter cup: climate change profile of global production of Arabica and Robusta coffee. *Climatic Change*, 129, 89-101

Climate Institute (2016). *A Brewing Storm: The climate change risks to coffee*

<sup>34</sup> CIAT (2011) Future climate scenarios for Kenya's tea growing areas. International Center for Tropical Agriculture. CIAT Report.

<sup>35</sup> Agriculture Sector Investment Plan – Phase II

<p>The Gishwati Water and Land Management Project</p>	<p>MINAGRI and RWFA USD 25.7m over 3 years (funded by GoR)</p>	<p>2010-2013</p>	<p>In the degraded landscape of Gishwati in Rwanda's western province, the GWLM project worked closely with communities in northern Rwanda (Nyabihu and Rubavu districts) to rehabilitate hillsides and optimise land use. This mountainous area is affected by intense rainfall, erosion, poor soil fertility, landslides and flooding. The GWLM project undertook detailed site surveys, mapping and analyses to develop site-specific land husbandry interventions. Steep hillsides were protected with permanent vegetative cover and left for forest regeneration while graded terraces and cut off drains were constructed on slopes 0-16% with soil depths between 50-100cm to improve the flow of surface water and reduce erosion. These measures were combined with biological measures such as grasses, trees and herbaceous legumes planting. For slopes ranging from 16-40% and a soil depth of greater than 100cm, rangeland was developed with pasture grass (Kikuyu grass, Phalaris aquatica, etc), forage legumes and live fencing for livestock management. For 40 - 60% slopes with greater than 100 cm in soil depth, the potential for commercial tree growth is high so these areas were replanted with trees. In total, 2972 ha were restored. The project has ended.</p>
---	--	------------------	--

Note: The Muvumba catchment plan also proposes a flood early warning system in Mulindi in Gicumbi district to increase capacity to detect climate change patterns including disseminating information to prepare for foreseen extreme events and manage them better. It would also enable climate change risk to be incorporated into district development planning.

***Expected outcomes and impact that the project will aim to achieve in improving baseline scenario 1***

**Watershed restored and agricultural practices resilient to climate change**

- The aim is to restore ecosystem functions and services in the Muvumba watershed to reduce the risk of landslides and flooding and to enhance the resilience of small holder tea and coffee producers to climate change. Investments in protective forests and agro-forestry approaches and erosion control measures will improve the stability of hillsides and increase carbon sequestration with 17,895 ha of land or forests under improved and effective management. It will also improve the hydrological function of the watershed and build climate resilience by ensuring optimal flow rates, reducing sedimentation and related costs to downstream water infrastructure and fisheries and adsorb water during heavy rainfall events to buffer against floods and landslides. These essential ecosystem services are needed to support sustainable, resilient livelihoods.
- Increasing vegetative cover and enhancing soil conservation will reduce erosion, increase soil fertility and diversify and increase the productivity of the land and natural-resource-based livelihoods. 1,800 smallholder farmers will be supported to implement agro-ecological approaches to increase climate resilience. These vulnerable smallholders will see improvements in farm production, food security and income levels contributing to rural poverty reduction. Farmer promoters and government extension workers will also be supported to disseminate their knowledge via community meetings and further sensitisation using mass media such as radio will reach a total of 35,000 farmers by the end of the project. Support to small scale tea and coffee producers to adapt to climate change will increase resilience and avoid the conversion of land use to annual crops that exposes the slopes to tillage and soil erosion. In all, climate resilient agriculture will be rolled out over 4225 ha of land. Adaptation measures will increase production, deliver climate resilience, and lead to wider co-benefits to poor small-holder farmers. Adaptation planning with communities and investment in a community adaptation fund<sup>36</sup> will enable communities to finance diversified livelihoods in return for restricting agriculture in the most vulnerable lands and establishing protective forests. This will strengthen the linkage between watershed protection measures land and livelihood interventions to resilience, as well as helping to target vulnerable groups.

***Baseline 2: Productive forest resources are degraded and poorly managed***

**Forest productivity is around 25 – 33% of potential because silviculture practice is almost universally sub-optimal and affected by variable rainfall and low quality seed and seedlings.** Forests in Rwanda provide wood fuel, food, construction materials and medicinal herbs to local communities. Forests also support a series of economic activities in the agriculture, tourism and energy industries. Their ecological roles include acting as biodiversity repositories, groundwater and stream recharge, flood control and regulators of regional and

<sup>36</sup> Community grants for the CAF will be provided by FONERWA (no GCF finance will be used for the grants, GCF finance will only be used to provide the TA to support the set up and operation of the fund)

microclimates. Forest cover in the target area is characterised by small, disparate, scattered blocks of varying size across the hilly landscape. Shallow soils predominate, the available phosphorus levels are very low and soil moisture holding capacity is limited. As a result, many forest areas are subject to drought, despite the reasonable average rainfall<sup>37</sup>. The predominance of genetically degraded Eucalyptus species which are not well suited to Gicumbi's soil conditions increases vulnerability to pests, diseases and drought conditions. It also reduces the range of forests good and services available for livelihoods, household and economic opportunities, increasing vulnerability to climatic and other changes and shocks. Nursery management is poor and there is weak matching of species to site conditions, poor site preparation and establishment practice, late planting and little or no tending. This combined with the uneven rainfall distribution, has led to many stands showing signs of drought stress. Drought stress, combined with too densely spaced young plantations provides a repository for pest build up and attack. Adoption of agroforestry is low and where practiced often poor.

**Coppicing and harvesting is undertaken with axes and pangas, damaging stools and compromising regrowth.** Very few people (mostly men) are employed in wood processing and there is a lack of drying and storage facilities in Gicumbi. Most of the wood is sawn manually over pits (pit sawing) or using chainsaws leading to high wood wastage. Moreover, harvesting, especially within small private woodlots, is undertaken early, often after only 2-3 years of coppice regrowth, to meet immediate demand and provide capital. The declining revenue and income from forest resources in Gicumbi inevitably erodes the household asset base needed to cope with climate change.

**Projected climate change indicates that drought risk will increase in future because Gicumbi's forests are being over cut (legally and illegally) resulting in a sparsely covered degraded forest estate.** This is likely to continue because biomass in the form of firewood, charcoal and crop waste is the primary cooking fuel for over 98% of households, with 97% using firewood<sup>38</sup>, by far the most used energy source in rural areas. The vast majority of rural households use open fires which are inefficient and cause indoor pollution with an estimated 5,680 deaths a year in Rwanda related to household air pollution, and 94% of these are children.

**In Gicumbi, there is also a high demand for wood to fire the boilers of the Mulindi Tea Factory to dry tea.** Tea factories are heavy users of energy, using wood fuel to power the boilers for factory processes, and are the largest industrial source of greenhouse gas emissions in the country. Wood for the boilers is typically grown in large managed forests nearby (though often supplemented by additional suppliers) and 1 hectare of forest is needed to produce sufficient wood fuel for every 3 to 4 hectares of planted tea. Currently, the supply of eucalyptus from the factory's 280 Ha eucalyptus plantation to dry tea is inadequate and there is an urgent need to improve the efficiency of the drying process as well as improve the productivity of existing stands and expand and diversify forest resources over hilly terrain to cope with current and future demand for biomass and construction materials. A detailed technical audit and study<sup>39</sup> concluded that the factory performs well against best practice in the tea industry internationally, but that significant improvements can still be made, some making use of best practice in other sectors.

**Annual wood consumption by the factory is in the region of 12 - 14,200 m<sup>3</sup> per year, almost entirely from eucalyptus** and annual grid electricity consumption was 1,800 MWh over 2015-6, and 42 MWh generated on site. The factory has recently invested in various items of new plant that has brought the 'tea out to wood in' ratio down. The energy on site comprises steam generated from wood combustion, and electricity from either the grid or on site generation. Heat is provided by a steam system with 3 wood fired boilers. All 3 boilers have single stage combustion and none have any controls based on flue gas quality measurement (oxygen or CO). Wood logs are fed in manually to fill the furnace. Wood is brought to site as cord wood in nominal 1m lengths, and is stored in stacks externally for several months before being transferred to covered sheds. Lab analysis showed that the moisture content was around 30%<sup>40</sup> although it is possible to dry Eucalyptus below 20%. Reducing moisture from 30% to 20% would lead to an increase in NCV<sup>41</sup> of 17.8%. Aside from the 3 boilers, the other primary energy consuming item are generators which are used to provide continuity of supply due to frequent power outages from the grid which affects the processing lines. The main secondary energy using items are the 3 fluidised bed dryers and the larger electrical motors<sup>42</sup> associated with them, the physical withering machine and the CTC machines. The analysis highlights that: the total system efficiency is around 32%; boiler efficiency at high fire is around 75%; and the older dryers are 13% less efficient than the new one. The annual CO<sub>2</sub>E emissions from the factory are estimated to be 10,600 t<sup>43</sup>, equivalent to 2.7 kg CO<sub>2</sub>E /kg tea. Information and results gained from the energy audit show that there is room for significant reduction in GWP emissions, which could prove to be a model for the other factories in country.

37 Sustainable Forest Management: Feasibility Assessment Report. Prepared Feb 2017

38 NISR (2014). EICV 4: Results of Integrated Household Living Conditions Survey. Aug 2015.

39 Report 2c-Technical-PPF-MINIRENA-Mar-2017 Mulindi Tea Factory Energy Audit & Recommendations: Technical Report on Improving the Energy Efficiency and Reducing the Emissions from the Mulindi Tea Factory

40 Although this is acceptable for combustion, it reduces the net energy content due to loss of energy in the water vapour. The target should be 20%.

41 Net Calorific value - energy content with no allowance for recovery of latent heat in water content in combustion gases

42 The largest motor is 45 kW, and there are 17 motors rated at 15 kW or greater.

43 Comprises 10,000 t.p.a. thermal, plus 32 t from on site generation, plus 567 t from grid supplied electricity

Baseline investments

Project	Implementing organisation	Timeframe	Expected results
Project d'Appui à la Reforestation au Rwanda (PAREF Phase 2)	PAREF is funded by the Belgian Development Agency (BTC) and the Netherlands government and implemented by RWFA	2009-2016	Implementation of the National Forestry Policy in Rwanda to reverse degradation of forest resources and restore Rwanda's forestry cover to a target of 30% forest cover by 2018. PAREF covers all the districts of the Eastern, Western and Northern Provinces. 884.3 ha of forest plantation were completed in Gicumbi in 2014. This project has now ended but produced a number of technical manuals and guidelines which will be used by the project.
Forest plantation	MINERENA/IUCN, Gicumbi District	2017-2018	

**Expected outcomes and impact that the project will aim to achieve in improving baseline scenario 2**

**Increased productivity of forest resources and reduced deforestation**

- The project will assist forest owners and users to improve forest productivity and timber quality to support diversified sustainable livelihoods while at the same time introducing measures that will reduce the harvesting of wood for household cooking and Mulindi tea factory to reduce pressure on forest and wood resources, reducing vulnerabilities associated with deforestation and degraded forest cover.
- The project will increase the uptake of sustainable forest management practices on woodlots, forests and plantations to increase the volume of timber sustainably available for meeting fuelwood and other timber needs. 2261 ha of forest will be renewed with high quality plants and best practice establishment and 200 ha of trial plots will demonstrate best practice forest management. Improved forest planning, seed quality and availability and silviculture techniques will result in improved forest productivity and quality and minimise waste during harvesting and processing. Benefits will accrue not only in terms of products harvested but also to the public in terms of environmental services such as soil conservation, water catchment, carbon sequestration and biodiversity values emerging from the presence of forests. Proposed forestry interventions are expected to generate off-farm employment and increase incomes (for 26,760 women 24,552 men) with 37 new cooperatives active in managing tree nurseries and beekeeping.
- Forestry interventions will build social and economic resilience to climate change, as well as having a positive impact on climate change mitigation with 140,046<sup>44</sup> t CO<sub>2</sub>eq in reduced emissions over the project lifetime from the sustainable management of forests and conservation and enhancement of forest carbon stocks over the lifetime of the project.
- The project will also reduce the pressure on Gicumbi's forests from reducing biomass use in energy by introducing 23,400 tier 1 and 2 efficient stoves installed and operating across Gicumbi, 3900 tier 3 stoves, an additional 900 households and 40 large public buildings using biogas, and 5 wood chip producing facilities in operation. Improved efficiencies for tea processing at the Mulindi tea factory will lead to reduced greenhouse gas emissions of 59,261t CO<sub>2</sub>eq over the lifetime of the project.

**Baseline 3: Rural population living in houses and areas susceptible to landslides and flooding with limited access to water and other essential services**

**The return and unplanned resettlement of more than 3 million people from neighbouring countries to Rwanda following the 1994 genocide created an immediate impact on natural resources.** While most of the 2 million people displaced between 1990 and '94 were able to return to their previous homes, around 800,000 returnees who had fled during the earlier 1959 massacres were resettled on public and state owned land in settlements known as *imidugudu*.

**The scarcity of land, population growth and the increasing intensity of extreme weather events mean that significant numbers of people live in areas at risk from flooding and landslides.** Many areas of Rwanda are prone to localised landslides and floods due to the hilly topography and high annual precipitation rates. Around 40% of the country's population is exposed to landslide risk and an estimated 28% of Gicumbi's land area has moderate to high susceptibility to landslides<sup>45</sup>. There are around 281,250 people still living in high risk areas across Rwanda

<sup>44</sup> Includes reductions from Agroforestry 70,060 t CO<sub>2</sub>eq; Forestry 69,986t CO<sub>2</sub>eq

<sup>45</sup> MIDIMAR (2015). The National Risk Atlas of Rwanda. Ministry of Disaster Management and Refugee Affairs

(who are affected by landslides and floods) including 14,724 in Gicumbi district (one of the highest in the country). Households living on slopes are affected by landslides because people have been practicing intensive farming with no anti-erosion measures such as terracing or planting of trees and shrubs, therefore when the rains come there is nothing to prevent soil erosion. Households living in valleys or near lakes and rivers are also at risk from flooding which results in the loss of crops, trees, destruction of stables for animals, and damage to homes.

**The risks of landslides and floods are exacerbated by poorly constructed housing made using weak materials.** Around 60% of vulnerable houses in the country constructed with sundried bricks while 29% use wood and mud. This contributes to the large number of fatalities and injuries associated with landslides. Other key challenges for inhabitants of Gicumbi district include an inadequate water supply and poor sanitation, poor waste management and high unemployment rates (72% are engaged as small scale farmers). Only 9% of households in Gicumbi have access to electricity.

**Many households in the target area are unable to withstand climatic shocks.** The worst affected are the extreme poor households<sup>46</sup> that are landless and have no livestock or other assets to sell during a disaster. These households include the chronically ill, the elderly with no family support and people with disabilities. They rely on neighbours or the community and government to provide labour and materials to rebuild homes if destroyed. Others who are physically able to work but lack land, livestock or other assets<sup>47</sup> can provide labour during reconstruction but struggle to obtain the finances to rebuild homes, and rely on the government to provide roofing and housing materials when their houses are destroyed. Even those who have assets including land, shelter, some livestock and who are self-sufficient<sup>48</sup> cannot withstand continued climatic shocks as these will deplete the asset base. Women headed households (Rwanda has a high proportion of women headed households as a result of the 1994 genocide) are also considered highly vulnerable as they are often from poorer segments of Rwandan society, therefore have less assets and less alternative income opportunities to enable them to cope with climate shocks. Children are also at risk as they more easily get sick or hurt due to the instability of the home or land (landslides or flowing water or flooding), and are often pulled out of school as families struggle to get money to pay for damaged school materials.

**The GoR has a programme of support to help vulnerable and poor families to relocate to safe areas** where the GoR provides access to services and utilities (schools, water, electricity etc.). The Rwanda Housing Authority's Integrated Development Programme (IDP) provides housing for families whose dwellings or livelihoods have been impacted by slope destabilisation, soil erosion or other factors, many of which are either directly caused by, or exacerbated by, climate change. Under the IDP programme, the Rwanda Defence Force's Corps of Engineers build new houses in rural settlements on safe ground which are then donated to the poorest and most vulnerable families at risk. However, public resources are insufficient to fund the cost of moving everyone who needs to be relocated. Currently, each province has a 'model IDP village' with roads, four in one houses that maximise land with durable construction materials, water, electricity, a market, a school, cowsheds and playgrounds. The GoR is planning to construct two 'model villages' in each of Rwanda's thirty districts in the first phase of the programme.

**The increasing intensity of rainfall events results in flood and landslide damage to settlements in the rainy season.** Many settlements are located on top of hills and have inadequate drainage and water management, collection channels, rainwater harvesting and storage, and insufficient soil protection vegetation, leading to run-off of storm water and causing soil erosion. Run-off following intense precipitation is exacerbated by rapid discharge from roofs, roads and other hard surfaces causing gullies and landslides at the crest of the slope and flooding and siltation lower in the valley. A number of major gullies have opened up especially around Byumba.

**Conversely, many areas experience water shortages during the dry season.** Despite being among the districts with the highest rainfall in the country and with quite a dense hydrological network, many inhabitants have insufficient access to clean water and often experience water shortages during the dry season with only a small proportion of the population having access to piped water. Access to safe water varies between 40 – 50%. Women and children, who are primarily responsible for household water collection and spend a significant amount of time per day to complete this task, are especially impacted by water shortages as this significantly increases their work burden (especially given the steep slopes) and reduces time they have for livelihood opportunities and household tasks. Water demand from the Muvumba watershed is projected to almost quadruple by 2023 and water use in 2050 is expected be more than 10 times the demand in 2015. By 2023 there is expected to be shortage of water for 6 months of the year<sup>49</sup>. This calls for collective action to improve water storage and management to avert shortages in the future.

Baseline investments

<sup>46</sup> Ubudehe Category 1: Umutindi nyakujya

<sup>47</sup> Ubudehe Category 2: Umitindi

<sup>48</sup> Ubudehe Category 3: Umekene

<sup>49</sup> W4G (2016). Catchment plan summary for Muvumba watershed.

Project	Implementing organisation	Timeframe	Expected results
IDP	MINALOC/RHA	ongoing	Integrated Development Approach Model Village (IDP) whereby people living in high risk zones can relocate to villages with improved access to services and main transportation routes. The project will help to finance two IDP villages in Gicumbi.

***Expected outcomes and impact that the project will aim to achieve in improving baseline scenario 3***

**Reduced exposure of human settlements to flooding and landslides**

- Management of water around settlements will be improved to prevent the accumulation of water by reducing run-off and increase infiltration on ridges and the upper slope and increase water storage capacity to reduce the burden on women and girls from carrying water up very steep hills. This will prevent downhill and lowland flooding, siltation and silt damage as well as reduce sediment loads in water courses. This investment will result in an additional 10,000 gully plugs, 13,875 soak-away/infiltration ditches, 2120 houses installed with rainwater harvesting and storage systems and run-off control measures (vegetation, diversion ditches etc.) constructed along 100km of roads and pathways.
- 200 families will be relocated from high risk areas affected by landslides and flooding to two villages in Gicumbi: Kabeza and Kaniga. Currently, there are 43 existing dwellings in Kabeza that were constructed in 2008 by a government initiative with funding from UNDP/UNEP/REMA-PEI and Gicumbi District to demonstrate low carbon and climate resilient rural villages. The project will support the construction of 100 new houses in Kabeza and 100 new houses and community buildings in Kaniga. The settlements will include housing typologies and “green infrastructure” that utilise renewable energy, water and waste recycling strategies designed to work with the Rwandan topography to reduce emissions, increase resilience to climate change and protect the surrounding environment. As well as providing shelter and access to services for 200 vulnerable families, the expanded housing development will create 580 construction jobs over 2 years and avoid 4308 tonnes of carbon dioxide equivalent (t CO<sub>2</sub>eq) over the project lifetime.

***Baseline 4: Limited capacity to mainstream climate concerns into policies, plans and programmes***

**Access to accurate information and capacity to assess and mainstream climate risk into policies, plans and programmes is limited** which weakens Rwanda’s capacity to plan for and adapt to current and future climate change. While there is awareness of climate change issues across government at most levels, there is limited understanding of how best to manage climate risks and plan for future climate variability. Moreover, information and knowledge on climate change vulnerability, including future scenarios of climate change, are not routinely used in planning processes. Planners are often not aware of the potential long term impact of climate change and lack clear technical guidance to effectively build climate resilience into sector plans, budgets and programmes. Decision making tends to be driven by short term development goals rather than longer term climate considerations. Increased technical capacity is needed in order to take climate risks into account and guide GoR investments. There is also a lack of technical capacity at local and national level on climate change risks, vulnerabilities and impacts to support evidence informed policy and decision making.

***Expected outcomes and impact that the project will aim to achieve in improving baseline scenario 4***

**Successful adaptation and mitigation approaches communicated and mainstreamed at the national level**

- The project will generate a series of knowledge products to inform planning decisions and enhance evidence-based decision making processes. It will also build awareness of climate threats and risk-reduction processes and strengthen capacity to adopt rural resilience and adaptation measures in other districts.
- Knowledge and capacity building at the national level will increase understanding of climate risks and enhance technical competencies. This will improve planning and decision making in the management of watersheds and forest resources as well as in the agriculture sector especially with regard to tea and coffee production. Mainstreaming of Climate Resilient Agriculture (CRA) practices into rural extension programmes will increase the uptake of successful climate resilient approaches. This will strengthen adaptive capacity and reduce exposure to climate risks.
- Activities to communicate results and develop national capacity will also support the replication of adaption measures implemented in Gicumbi at the national level to boost resilience to climate change and increase agricultural productivity. The expected impacts on knowledge and technological transfer are large, through the increased productivity the interventions offer, as well as the climate information that will be generated.

This will improve decision-making and project interventions to increase capacity to assess, manage and monitor risks and will result in more comprehensive adaptation planning at the national level. In the agriculture sector, knowledge and transfer investments (including the promotion of an iterative climate risk management approach to develop a range of adaptation options) will help to expand and transform production using a climate resilient approach, and start early planning for long-term climate change.

1. The upfront investment costs needed to shift Rwanda toward more climate resilient green growth are a significant barrier for pursuing these development pathways. The total additional capital costs of shifting to climate resilient and low carbon development pathways outlined in the GGCRS are estimated to be in the region of USD 2.7 bn (cumulative to 2030) compared to business as usual across three key sectors (water, agriculture, energy)<sup>50</sup>. In order for Rwanda to be able proceed with the investments required to adapt to climate change and pursue green development pathways, additional sources of finance will be needed that are able to bear these larger capital requirements taking into account additional technical risks associated with the 'High' green growth scenario.
2. The high population density and the country's reliance on agriculture for livelihoods is a key barrier to the conservation and protection of natural resources that are critical for ensuring climate resilience. Reducing pressure on natural resources is a tall order when a significant part of the population largely lacks other assets. Unsustainable farming practices on steep slopes and deforestation have resulted in extensive erosion, declining agricultural productivity and siltation of water resources compromising the ecosystem services critical for Rwanda's food and energy security.
3. At the same time, pervasive poverty means that communities don't have the means to invest in long term solutions to climate threats. Instead, day-to-day survival leads them to deplete and degrade the natural resource base at a rate faster than it is being replenished. These families need short to medium term livelihood support if they are to turn part of their land over to agro-forestry and switch to efficient cooking methods.
4. Lack of technical know-how that cuts across the proposed areas of intervention including: sustainable forest management, climate resilient agriculture, climate risk mitigation, and in technologies used in sustainable low carbon building and in reducing the carbon footprint of cookstoves and tea factories. These skills are either absent or not widely available in Rwanda and limits its capacity to adopt new technologies and practices that support low carbon, climate resilient development. Currently, farmers are not able to make informed choices to optimise crop planning and varietal selection because they lack knowledge about climate resilient production systems and practices. At the community level there is also low awareness of climate change issues and a low capacity to adopt risk reduction and adaptation measures.
5. Traditional gender roles and patriarchal attitudes towards women in rural Rwanda mean that women have limited control over assets and decision making at the household and community level. This weakens their adaptive capacity and makes them more vulnerable to shocks and stresses linked to climate change. Women's involvement in certain livelihoods is also limited by gender relations which limits the ability of women to take up certain off-farm livelihoods.
6. Inadequate support for farmers switching to different crops and land management for example, for farmers switching to tea production (under District Land Use Plans) there is no support for the first 3 years before it is productive; for coffee farmers it is 5 years before there is a harvest; families who implement radical terracing lose income for 1 year.
7. Low levels of financial literacy among poorer categories of people restricts their ability to save and access loans from formal financial services for IGAs. Savings would also help to mitigate people against shocks from climate change. Improving access to loans is also important for people trying to move into productive off-farm income opportunities.
8. Climate change considerations are not systematically integrated in policy development and investment decisions. There is limited coordination of climate data which means that key decision makers in the public and private sector often don't have access to climate data that might be useful in guiding investment, policy and local planning decisions. Financial resources, knowledge and capacity building are needed so that GoR can create an enabling framework for investment in LCCR development. This requires a well-informed public sector, civil society and private sector with better access to relevant data and analysis.

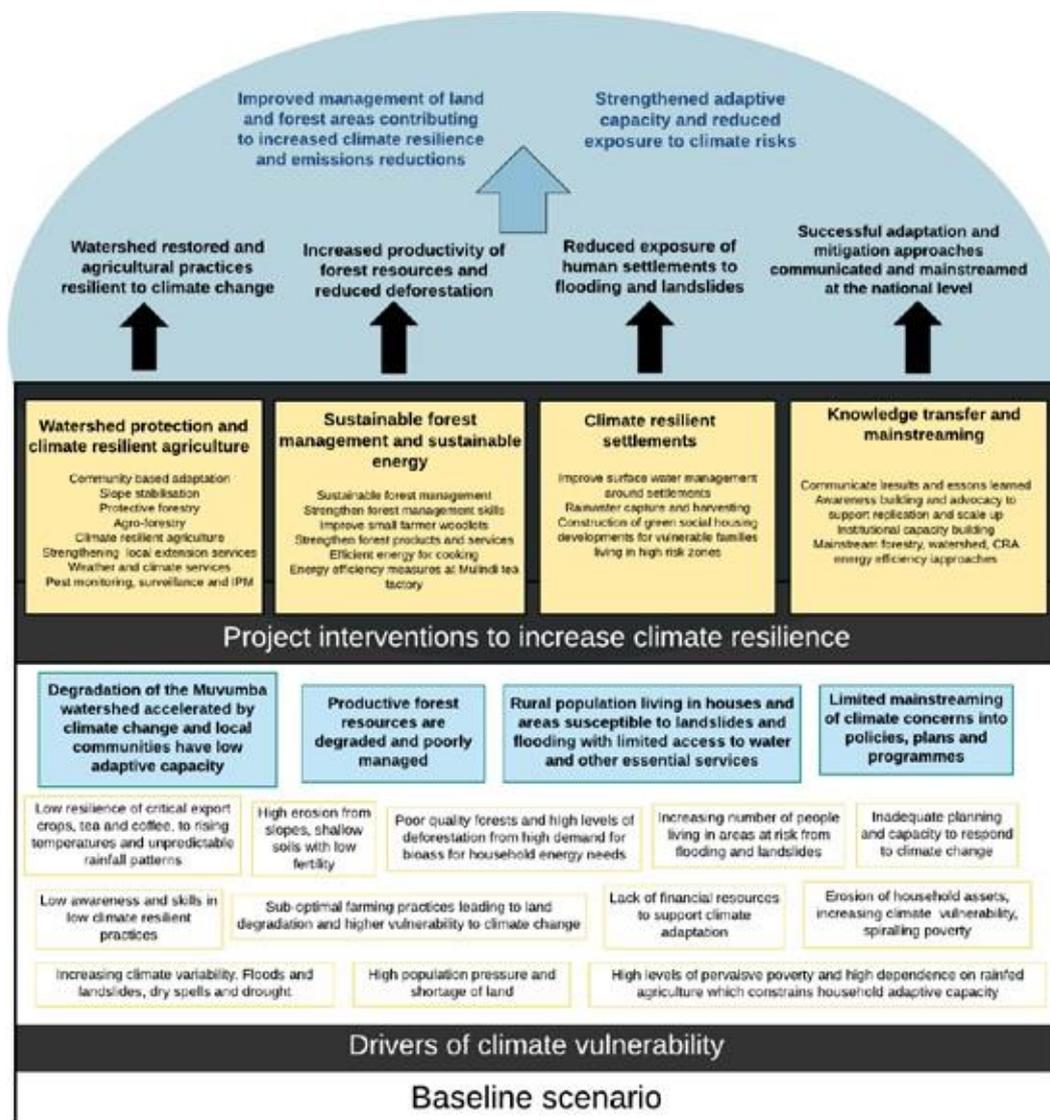
### C.3. Project Description

Describe the main activities and the planned measures of the project according to each of its components.

Provide information on how the activities are linked to objectives, outputs and outcomes that the project intends to achieve. The objectives, outputs and outcomes should be consistent with the information reported in the logic framework in section H.

### C.3.1 Summary of proposed interventions

**The project will increase the resilience of vulnerable communities to climate change in Gicumbi District in Northern Rwanda.** The project will restore and enhance ecosystem services in a major sub-catchment of the Muvumba watershed, increase the capacity of communities to renew and sustainably manage forest resources and support smallholders to adopt climate resilient agriculture. The project will also invest in green settlements for vulnerable families currently living in areas prone to climate related disasters and support community based adaptation planning and livelihoods diversification. These investments will lead to enhanced resilience to climate change impacts and will make a major (and long-lasting) contribution to delivering Rwanda's Green Growth and Climate Resilience Strategy (GGCRS, 2011). Knowledge and capacity developed during implementation will be mainstreamed at the sector and national level. A theory of change, shown in Figure 2, captures the key areas of intervention, the main drivers of climate vulnerability and GHG emissions and the expected outcomes and impacts.



#### Key Assumptions

- External factors**
- District managers commit to including project targets in AAPs and minipos.
  - Communities supportive and adopt improved practices.
  - Forest owners and workers commit to forest renewal and local practice.
  - Subsidies are sufficient to motivate households to invest in rainwater harvesting and efficient energy for cooking.
  - Tea factory owner and managers support and invest in efficiency measures.
- Programme implementation**
- The TA team recruited has the skills and the relevant contextual understanding to implement project.
  - Funds disbursed in timely manner at all levels.
  - Project monitors its progress and makes changes as needed.
  - Suitably qualified service providers are available and procured in a timely manner.
- Causality**
- Technologies and approaches applied successfully, yield positive results and stimulate demand.
  - Policy makers and planners receptive and responsive to mainstreaming approach and monitor and adopt new approaches.

#### Risks

- Low capacity of farmers and communities to invest in adaptation actions where public benefits dominate jeopardises project objectives.
- 4 years is insufficient time to prove adaptation benefits.
- High costs of improved cooking technologies deter households from investing.
- Operational targets for each component not included in District In-High Framework. Project activities then become deprioritised by District staff and activities are not delivered to timeliness, and capacity to manage the activities is not developed.
- Contracted service providers maintain FAJ and do not follow best practice. This would severely impact on the adaptation and mitigation potential because many of the results depend on the uptake of improved technologies and approaches. This would also compromise the project's value for money.

### Figure 2: Theory of change

The project will focus on one of Rwanda's most climate vulnerable districts, Gicumbi. Interventions will particularly target poor, climate vulnerable households located in nine sectors of Gicumbi district (Rubaya, Cyumba, Kaniga, Mukarange, Rushaki and Shangasha, Manyagiro, Byumba, and Bwisige) where around 248,907 people (63% of the district's population) live. There are three underlying principles to the project: 1) supporting climate resilient and sustainable rural livelihoods; 2) developing practical approaches that are cost effective, technologically viable and transferable to other areas of Rwanda; and 3) increasing knowledge and understanding of climate risk among key decision makers in government and business leaders.

The project comprises four interlinked components: (1) watershed protection and climate resilient agriculture; (2) sustainable forest management and more efficient use of wood for fuel; (3) climate resilient settlements; and 4) Knowledge transfer and mainstreaming. The corresponding project outputs are:

1. Sub-catchment B of the Muvumba watershed restored and small scale tea and coffee farmers supported to adopt climate resilient practices;
2. Communities supported to implement sustainable forest management and adopt fuel-efficient cooking methods;
3. Human settlements developed and/or modified to increase climate resilience; and
4. Successful adaptation and mitigation approaches communicated and mainstreamed at the national level.

There are two expected outcomes from the project, linked to both mitigation and adaptation: 1) improved management of land or forest areas contributing to emissions reductions (M9.0); and 2) strengthened adaptive capacity and reduced exposure to climate risks (A7.0).

#### *C.3.1.1 Main activities under each component*

### **Component 1: Watershed protection and climate resilient agriculture (USD 12.6 million)**

**The component will improve the stability of the watershed to support climate resilient livelihoods and reduce risks of climate variability, including flooding and landslides.** The watershed has become degraded from the effects of flooding, erosion, over-cultivation and human encroachment. This component will support the implementation of the Muvumba Catchment Plan (2017) in sub-catchment B. Specifically, it will address the climate risks by promoting appropriate land use and agricultural practices to minimise erosion and restore ecosystem services within a landscape-wide suite of activities. The component includes ten sub-components:

- 1.1 Strengthen community based adaptation
- 1.2 Reduce slope erosion to sustainable levels
- 1.3 Stabilise rivers, roadsides and steep slopes with protective forestry
- 1.4 Integrate agro-forestry into farming systems on 9790 ha of the watershed
- 1.5 Support 1800 smallholder crop-livestock farmers to adopt agro-ecological approaches to increase climate resilience
- 1.6 Increase climate resilient farming practices with tea cooperatives in Mulindi (with planting for future climate change) - targets 5000 smallholders
- 1.7 Integrate climate resilient practices into local extension services
- 1.8 Provide weather and climate services for tea and coffee farmers to increase productivity and reduce losses from weather and climate variability
- 1.9 Increase capacity for pest monitoring, surveillance and IPM to address current and future climate change
- 1.10 Increase climate resilient practices with 1000 coffee growers to reduce susceptibility to climate change and protect slopes in the watershed (planting for future climate change)

**Soil and water conservation measures will be promoted to reduce climate vulnerability,** improve soil and water quality and increase the range and quality of the goods and services available for livelihood and economic use including support for small-scale farmers to adopt more climate resilient practices to sustain agricultural livelihoods. As well as enhancing adaptation to current climate variability and future climate change, the interventions will support mitigation through tree planting and soil improvements as well as provide significant livelihood, poverty alleviation and biodiversity benefits.

The component will be implemented by a team of staff recruited to the project and based in Gicumbi District Headquarters. All interventions will be delivered at the local level but will also be supported by the relevant sector government agencies and research institutions such as:

- Rwanda Water and Forests Authority (RWFA) – for watershed management activities (1.1-1.4);
- National Agriculture Export Development Board (NAEB) – for tea and coffee interventions (1.6-1.9)
- Rwanda Agriculture Board – for climate resilient agriculture interventions (1.6-1.9); and
- Rwanda METEO – for climate and weather services (1.7).

The implementation arrangements are explained in detail in Section C.7.

### Sub-component 1.1: Strengthen community based adaptation (USD 0.6 million)

**This sub-component will increase the understanding by local stakeholders of the impacts of climate change and the value of conserving and protecting steep slopes and riparian buffer zones** as well as the benefits of productive agro-forestry, forestry and climate resilient farming practices to build support for proposed interventions. Empowering farmers through participatory engagement to make informed decisions will ensure interventions are appropriate to local conditions and will develop local capacities. Where possible, the project will engage with communities through existing cooperatives and community groups and build the capacities of rural communities for community-based decision-making. At the same time, the project will integrate both scientific and local knowledge into community planning processes through linking communities to experts. The approach will be to raise farmers' awareness of the benefits of soil and water conservation measures, help communities better understand the climate threats which affect them and support them in taking appropriate steps to plan for and enhance their climate resilience. This participatory approach will empower local communities by building their capacity to assess their own needs. The evolving nature of adaptation (as future climate trends are uncertain), means that local communities need to learn about risks, evaluate response options, and adapt accordingly checking and rectifying possible mal-adaptation and exchanging information. The Government's role is to create the right conditions for adaptive action.

**The project will support local people to identify specific areas for investment in improvements** that promote integrated land and water management. The participation of local communities in these initial assessments will foster ownership of the findings and planned interventions. It will also ensure that any interventions are appropriate to local conditions and provide an opportunity for dialogue, consensus building and capacity development on climate adaptation. The project will support the development of local adaptation plans to increase resilience as well as to rehabilitate and protect the watershed and enhance the productivity of agriculture and forestry. The plans will incorporate soil conservation and enrichment measures including agro-forestry and will make special provisions for climate change impacts on vulnerable groups. Activities planned under this sub-component include:

- Selection of target areas and target groups for support
- Awareness raising of climate change issues
- Training of project staff and community volunteers in gender sensitive adaptation planning
- Community based survey of project area and prioritisation of interventions with communities, water and agricultural experts and other stakeholders
- Community meetings and planning workshops
- Development of local adaptation plans with zonation of land for agriculture, pasture, perennial crops/grasses etc. (based on District Land Use Plans and sub-catchment plans) with community and agricultural experts
- Development of Community Adaptation Facility

Many of the watershed protection measures proposed are not new in themselves and several have been advocated and implemented in Rwanda previously. Uptake and adoption, however, is often patchy and many communities and individuals perceive them as costly with most of the benefits being of a public good nature. To enhance uptake of the proposed watershed protection measures, the project will provide grants (financed 100% by FONERWA) for either community-level or household investments providing public goods. The community grants will:

- provide an incentive for investment and participation in project activities yielding public goods;
- instil community ownership in project activities and, through community members active participation; and
- support efforts to build awareness and understanding of the benefits of the project interventions.

The grants made through the CAF will be funded by FONERWA and will not use any finance provided by GCF. FONERWA has rigorous procedures in place to manage competitive calls for proposals, screening of proposals, conduct due diligence of fund recipients and for monitoring and evaluation of projects under implementation. Concepts are reviewed by the fund's secretariat and full proposals by external reviewers before passing through a review by the Fund Technical Committee. Final funding decisions are made by the Board which has representation from GoR, private sector, civil society and development partners. The fund will be capitalised with USD 147,000 from FONERWA. FONERWA is the executing entity for the proposed project so the CAF will be managed as part of the project but will use the established fund management machinery and expertise of FONERWA to ensure the funds are managed in a transparent and accountable manner in accordance with the FONERWA Law and its policies and procedures.

### Sub-component 1.2: Reduce slope erosion to sustainable levels (USD 2.4million)

**This sub-component will support the rehabilitation of the watershed and promote soil conservation and stabilisation measures to reduce erosion and land degradation.** The interventions in each area will take into account climatic information (rainfall variability etc.), soil type (pH, nutrient levels and texture), plant species and competitive ability, aspect and topography (slope stability and angle) as well as an assessment of the local surface

erosion. Intervention measures will be based on local priorities, needs, knowledge and capacities so that the interactions between future and current climate hazards and development can be managed effectively.

The work will entail:

- Consultation with the Rwanda Agricultural Board (RAB) and district agronomists, land officers on zoning of land for agriculture, pasture, perennial crops/grasses etc. with community and agricultural experts;
- Awareness campaign on erosion control and improved soil management practices;
- Introducing erosion control measures on 1250ha (850ha of progressive terraces and biological control measures and 400ha of radical terraces);
- Capacity building of local authorities to support the committees and maintain records of functionality and utilisation of infrastructure;
- Matching crops and permanent vegetation (grasses, shrubs etc.) to soils and farming methods to the terrain; and
- Re-planting of steep slopes with perennial grasses and shrubs, wattling, brush layering.

**Where slopes are less than 55°, the project will invest in terracing<sup>51</sup> and agro-forestry** (see 1.4 below) as well the use of cover crops<sup>52</sup> as these have proved to be cost effective in reducing soil erosion. Moreover use of leguminous cover crops<sup>53</sup> (green manure) will improve the nutrient levels in the soil and enhance growth of the main crop. This is in line with the measures proposed in the Muvumba catchment plan to enhance soil fertility (through short-rotation nitrogen fixing or phosphorus mobilizing shrubs and herbs, to develop a large biomass during a short period 6-12 months).

**Where slopes are greater than 55°, the project will work with communities to phase out tillage systems and restore permanent vegetative cover and and green manures<sup>54</sup> to reduce erosion.** The project will support farmers cultivating these marginal lands to transition into alternative livelihoods via paid work for planting and maintaining perennial cover and alternative employment and enterprise development through the community adaptation interventions (see 1.1 above). Where grass cover alone is insufficient to prevent erosion, filter strips or wattling or brush layering will be installed to break the slope into short segments and dissipate the flow of water over the surface. Restoring soil cover will involve matching crops and permanent vegetation (grasses, shrubs etc.) to soils and farming methods to the terrain. As well as physical erosion control measures (contour trenches, construction of terraces etc.), the project will emphasise biological measures reduce erosion and improve soil fertility including:

- planting on raised bunds along the contours (but slightly sloping to allow drainage) and planting hedges of grass or bushes<sup>55</sup> every 10 metres, with the cultivation of large ridges covered with pulses or sweet potatoes every 5 metres (on slopes 16-40°);
- the use of cover crops to provide a physical barrier to runoff as well as to increase soil organic matter, enhance soil structure, improve the nutrient and water holding capacity of the soil, enhance the soil macrofauna habitat and raise households incomes;
- mulching (to reduce run-off and increase infiltration), intercropping (on slopes between 6 and 16° to make the most of the space available by selecting plants and cropping formations that maximise light, moisture and soil nutrients), and crop rotation to give soils a chance to recover nutrients and restore productivity;
- planting of fodder grasses on bunds/ridges to increase stability and provide fodder for harvesting and food for animals;
- use of improved vegetated fallows;
- conversion from annual to perennial crops; and
- the introduction of permanent, perennial vegetation in small strips at appropriate intervals along the contour to prevent further erosion and conserve rain water.

The project will support farmers to assess the appropriate land preparation (contours, contour trenches, ridges, percolation ditches etc.) required before seedling planting. Fast growing herbaceous species and woody varieties will be included along with grasses and legumes. A mix of species will be promoted to ensure a continuous even protection along the slope. Specialists will be consulted to ensure the seed mix is appropriate to site conditions and application rates for fertilisers (organic and inorganic) are correct.

<sup>51</sup> terraces on 16-40%, narrow-bench terraces on 40-60%

<sup>52</sup> Cover crops are fast growing plants that quickly cover the soil surface. They are usually seeded between rows of crops or after harvest to reduce the velocity of rainfall falling on bare soil so reducing runoff. The root growth from the cover crop also increases the porosity of the soil improving drainage and also enhances soil micro-fauna. Cover crops are ploughed back into the soil increasing the water content and organic matter and can used as mulch to improve water retention. Cover crops have also been used to control weeds, pests and diseases.

<sup>53</sup> Species that have been used in Rwanda include: non edible cover crops such as centro, stylo, puero and mucuna, edible cover crops such as groundnuts, cowpea, soya beans, melon and fluted pumpkin and grasses such as carpet grass and giant star grass.

<sup>54</sup> Grass species that are commonly used for erosion control in Rwanda include: Kikuyu grass (*umucaca*), *Tefrozia* as shrubs, *Desmodium*, *Triflorium*, *Mukuna* etc.

<sup>55</sup> Big shrubs including *Calliandra* and *Leucaena* species will be used to stabilize terrace risers

This sub-component will draw on significant in-country experience in erosion control. Rwanda's topography, demographics and climate variability have contributed to extensive land degradation and low soil fertility. This has created a pressing need to tackle widespread erosion, declining soil fertility and land degradation. As a result, Rwanda has over the years, developed significant experience and expertise in land husbandry techniques that reduce erosion, improve soil water infiltration, and holding capacity on degraded hillsides enhancing the productive capacity of land and soil.

This has been supported with sizeable investments from the Government and development partners that have further developed Rwanda's capacity in this area. Interventions have typically comprised a suite of land husbandry techniques including: radical and progressive terraces, check dams, soils/water detention trenches, cut off drains, waterways, tree belts, contour belts, grass strips, contour bunds, planting of fodder grasses on bunds/ridges, use of permanent, perennial vegetation on contours, and agro-forestry and intercropping. These investments have yielded positive results not only in terms of agricultural yields but also on critical ecosystem services within watersheds upon which the productivity of farming systems depends. Several countries have already learned from Rwanda's experiences. The GoR has hosted study tours from eight countries that are also tackling erosion and land degradation on hilly landscapes. These include: Kenya, Burundi, Ethiopia, São Tomé and Príncipe, Uganda, Malawi, India and DRC. Technical expertise has gradually increased in physical and biological erosion control measures especially around terracing, infiltration ditches and drainage channels combined with agro-forestry and other biological measures that improve vegetative cover, reduce raindrop impact and reduce runoff. Interventions to improve land husbandry on hillsides have become increasingly site specific and informed by detailed site surveys that categorise land units (by slope, soil type, soil depth etc.) and prescribe optimum land use/management regimes. These approaches encompass an integrated landscape approach that considers livelihoods as interconnected with ecosystems. As a result, engagement with farming communities has intensified as the support of private landowners is crucial to ensuring that investments in erosion control and water management are sustainable in the long-term.

### **Sub-component 1.3: Stabilise rivers, roadsides and steep slopes with protective forestry (USD 1.5 million)**

**This sub-component will establish protective forest on 1375 ha to stabilise slopes and reduce erosion.** The Land Use Planning Guidelines by MINIRENA/RNRA of 2016, recommend that there should be no cultivation on slopes beyond 55%. On slopes steeper than 55%, the guidelines advise that land 'should be used for perennial/permanent crops (e.g. grass, tea, bananas and trees)'. The Prime Ministerial Order 2010 provides for a 10m buffer on large rivers in Rwanda while the Prime Ministerial Order 2011 provides for a 22m buffer on main roads and a 12m buffer on district roads in Rwanda.

**Protective forests<sup>56</sup> include deep rooted species that can protect the slopes from slippage.** They help to stabilise soils and slopes disrupted by road building, as well protect river banks from high seasonal water flows. An important element of protective forests is that they can also protect livelihoods, not only from stabilising soil but also from non-timber forest products, and as a safety net in times of need. For example a protective forest on a road reserve can be contracted out to the local community and used to support the poorer members of the community, they can be harvested in time of need and enhance resilience to shocks including those caused by climate change. A detailed survey and series of studies<sup>57</sup> was carried out as part of the preparatory work to identify target areas for protective forests, these are included in Annex 1. This sub-component will establish protective forest on 1375 ha comprising:

- 350 ha of steep slopes where plots are greater than 2ha
- 140 ha at Mulindi tea estate which is vulnerable to landslides
- 885 ha on rivers, roadsides and steep slopes (on small plots <2ha)

**Protective forest will be established on steep slopes** (managed under single or small group selection system) to retain permanent cover and avoid clear-felling. For plots sizes greater than 2ha, it is proposed to promote the planting of species that can be harvested for timber as well as other uses. Where plot sizes are smaller (<2ha), smaller woodlots will be established on steep slopes with a focus on species that provide smallholders with a wide range of (non-timber) benefits including fruits, fodder etc. The range of species proposed for the establishment and management of protective forest will provide a wide range of direct and indirect use goods and services. Tree planting will be in line with the accepted spacing in forest plantations in Rwanda which is 2.5m x 2.5m. Wherever indigenous or native species remain on the land, these shall be kept. Protective forest and other soil stabilisation

<sup>56</sup> A protective forest can be defined as the long-term establishment of forests on areas particularly sensitive lands to erosion or landslides, and area established primarily for provision of ecosystem services

<sup>57</sup> 1) Watershed Protection Plan and 2) Sustainable Forest Management: Feasibility Assessment Report. Both these studies were part of the preparatory studies completed on behalf of the Ministry of Environment Rwanda and funded through the Project Preparation Facility of the Green Climate Fund.

measures will also be established in the immediate areas around the Mulindi tea plantation that are at highest risk of landslides.

**The project will also invest in protective forestry on buffer zones along rivers and roads.** Riparian degradation is a contributing factor to vulnerability to flooding in Gicumbi. Riparian damage from cultivation, livestock and fuel-wood collection is prevalent on most of the major rivers banks throughout the project area. The project will support the regeneration of grasses, shrubs and tree species to restore riparian ecosystem services. Protective forests on statutory river reservations consist of native/indigenous or exotic tree/shrub species along riversides, streams, drainage channels and gullies. These interventions will link into soil and water conservation measures within agroforestry systems to reduce vulnerability to soil erosion and landslides, and to reduce sedimentation and flooding risk, whilst also providing a wider range of forest goods and services for household and economic use.

**All forest types, including protective forests, will be established and managed according to best practice guidelines and standards.** The design predicates that protective forests will be managed under single or small group selection systems to retain permanent cover and avoid clear-felling to reduce run-off and soil erosion risk and sustain forest benefits. Exact use will need to be determined with the owners, user groups and other key stakeholders on a case by case basis but a guiding table of protection and protective forest species and use is provided in the PPF SFM Feasibility Study Report.

#### Sub-component 1.4: Integrate agro-forestry into farming systems on 9790 ha of the watershed (USD 1.8 million)

**This sub-component will establish agro-forestry on 9790ha.** A form of climate resilient agriculture, agroforestry<sup>58</sup> reduces soil erosion and increases organic matter, soil fertility and soil water holding capacity, thereby enhancing climate resilience and productivity. Agroforestry and nursery bed establishment reduces deforestation which increases soil erosion, reducing soil quality and ability to retain moisture. It has additional benefits from providing new income streams, while reducing GHG as well as helping to diversify diet and nutrition sources. However, up-front costs and information are barriers to uptake which this component will address through the CAF (under 1.1). Five agroforestry technologies or practices are proposed: (i) Contour hedgerows on terraces; (ii) Boundary planting; (iii) Trees scattered in crops; (iv) Home gardens; and (v) Fodder banks. Trees and shrubs will be planted in rows along contour lines; for boundary demarcation, controlling livestock encroachment into fields and onto vulnerable slopes; and within crops and home gardens. Within the farm landscape, trees and shrubs will be planted to stabilise terraces and ditches and reduce soil erosion and storm water run-off as well as providing a range of goods and services for households and farmers, including nitrogen fixation (improving soil fertility), fodder, bean stakes, poles, timber, and medicinal products. Species selection for agroforestry systems will aim to enhance the ecosystem benefits, and the lives and livelihoods of women and men in the surrounding/impacted communities (through food crops, poles, timber, bean poles, bee forage and fodder crops). Specific investments will include:

- Planting trees/shrubs on existing radical terraces (non-fruit trees) 3700 ha
- Planting trees/shrubs on progressive terraces (non-fruit trees) 1351 ha
- Boundary Planting (non-fruit trees) 450 ha
- Planting trees and shrubs within crops (non-fruit trees) 901 ha
- Establishing fodder banks with napier grasses 2937 ha
- Planting trees in home gardens (fruit trees) 450 ha

**The project will also support Farmer Field Schools to promote soil and water conservation within agroforestry systems through the use of infiltration ditches and mulching.** Contour drainage ditches will be dug along the contours of hills to prevent water from running down the slope and causing erosion. These infiltration ditches drain excess water out of the field, are relatively cheap, simple to build and can be used to divert or retain water, aiding farm water management and reducing soil erosion. More details and analysis are included in the watershed protection plan<sup>59</sup> carried out as part of the preparatory work, these are included in Annex 1.

#### Sub-component 1.5: Support 1800 smallholder crop-livestock farmers to adopt agro-ecological approaches to increase climate resilience (USD 1.8 million)

<sup>58</sup> Agro-forestry (species that are commonly used for erosion control in Rwanda include: *Alinus*, *Datura*, *Caliandra Leucena*, French Cameroon, *citeria*, and *tribusacum*).

<sup>59</sup> 1) Watershed Protection Plan. This study was part of the preparatory studies completed on behalf of the Ministry of Environment Rwanda and funded through the Project Preparation Facility of the Green Climate Fund.

**This sub-component will support 1800 smallholders to adopt agro-ecological approaches<sup>60</sup> to increase climate resilience.** Using agro-ecological approaches including Integrated Soil Fertility Management (ISFM) has a number of benefits for small-holders. ISFM practices, such as compost making and manure management, help to increase soil moisture and water retention in soil, reducing crop vulnerability to short dry spells. ISFM is highly appropriate for smallholder farmers because: (a) it reduces reliance on imported fertiliser increasing farm profitability; (b) it provides opportunities to use locally available nutrient sources more efficiently; (c) combining inorganic and organic sources increases productivity and maintains soil quality; and (d) it balances crop nutrient needs with protecting the environment. ISFM also reduces dependence on oil imports and GHG emissions from farming. The focus will be on techniques which increase soil fertility, reduce soil erosion and maintain moisture content of the soil making farmers more resilient to prolonged dry seasons, improving crop productivity and ultimately household nutrition and farmer income. This includes:

1. Climate resilient vegetable production techniques including (ISFM practices);
2. Fodder crop establishment and conservation; and
3. Zero-grazing systems and improved feeding practices for dairy households to ensure efficient manure production and management, increasing soil quality and water retention properties, improving crop resilience to dry spells.

Climate resilient vegetable production techniques, such as kitchen gardens, mandala and double-dug beds utilise waste-water and natural contours and use mulching techniques for moisture retention and soil fertility. Water is also conserved through cover crops and the utilization of waste water. This means kitchen gardens are productive outside of the traditional growing seasons increasing farmer resilience to drought and improving household nutrition. This will be supported by the rainwater harvesting interventions under 3.2 which will enable farmers to water plants into the dry season, increasing the length of time their land is productive. Fodder crop establishment and conservation will also be promoted to reduce over-grazing and over-stocking which leads to unprotected land which is susceptible to soil erosion and has a reduced water-holding capacity. Zero-grazing systems and improved feeding practices for dairy households will also be supported to ensure efficient manure production and management, increase soil quality and water retention properties, and improve crop resilience to dry spells.

**The project will work through the existing GoR extension programmes including the *Twigire Muhinzi*** which uses Farmer Promoters to spread the use of improved farming practices. In total, 300 Farmer Promoters across 9 target sectors will receive training on agro-ecological practices which will enable the project to reach 1,800 smallholder farmers with climate-resilient approaches and technologies. The project will deliver ten days of intensive training in the topics outlined above. Facilitators will empower Farmer Promoters to carry out their roles, helping them to develop training schedules, co-facilitating training to demonstrate good training practices for replication and providing feedback on observed trainings. The project will also utilise these trained technicians to establish 9 community demonstration sites (1 per sector) modelling best practice adoption of climate resilient approaches and technologies involving 1800 farmers. Training sessions will be delivered to approximately 60 farmer groups with an average of 30 members. Farmers will also receive limited inputs to support with the implementation of the trained techniques. Knowledge transfer will be ensured through practical “on farm” training suited to those with low or no literacy and further supported through three field visits for 3 representatives from each group to sites already implementing best practice climate resilient agricultural techniques. Farmers will be trained in techniques and technologies which will enable them to intensify production in a manner adapted to the effects of climate change as outlined above. Farmers will be motivated to provide peer-support as sustainable community based resource. These vulnerable smallholders will see improvements in farm production, food security and income levels contributing to climate resilience and poverty reduction. Farmer promoters and government extension workers will also be supported to disseminate their knowledge via community meetings and further sensitisation using mass media such as radio will reach a total of 35,000 farmers by the end of the project.

**The most vulnerable smallholder farmers will be identified and supported with additional agricultural and animal health inputs.** This will include the provision of 240 cows and the establishment of 36 tree nursery beds with 37,500 seedlings each (1,200,000 trees will be planted in total) to enable the local community to access fruit, fodder and timber saplings for use on-farm, this will include drought resilient seedlings. The project will also facilitate community replication of imported disease/drought resilient forage species to enable ongoing access to the inputs which will facilitate farmers to adopt the promoted approaches and implement climate-resilient crop-livestock long-term. The specific activities will include:

- Building capacity of farmer promoters in climate resilient techniques for smallholder farmers;
- Supporting smallholder farmers to adopt climate resilient techniques;
- Establishing on-farm and community demonstration sites to inform subsequent scale up and field visits to showcase climate- resilient management techniques; and

<sup>60</sup> One of the GGCRS targets

- Distribution of disease/drought resilient forage species and animal health inputs.

Rwanda has successfully implemented a zero grazing policy across the country to reduce erosion associated with open grazing. In line with this policy, the project includes provision for cow sheds and cultivation of fodder crops so that cows can be kept away from steep slopes.

#### **Sub-component 1.6: Increase climate resilient farming practices with tea cooperatives in Mulindi (USD 2 million)**

**This sub-component introduces climate resilient agriculture to 4900 smallholder tea growers to address the current weather-related risks** – and start preparing for future climate change - at the Mulindi tea estate. This sub-component includes targeted interventions to invest in options for tea that reduce both current and future impacts. There is one of Rwanda's largest tea plantations at Mulindi (In Gicumbi district), and this has been included in the project for a series of interventions. The Mulindi plantation is comprised entirely of smallholder farmers, organised into two local co-operatives, (COOPTH and COOTHEVM). The tea they produce is processed by a factory in the plantation, which is run by a joint charitable company (Mulindi Factory Company Limited) supported by The Wood Foundation and The Gatsby Foundation, working under a shared ownership model with the two local co-operatives (all shares held in the factory will be transferred to the two cooperatives (the small-holders) at nil consideration in the future).

**A series of targeted low-regret adaptation interventions are proposed to reduce the exposure of smallholder tea growers to current climate variability and shocks**, by enhancing water management, reducing soil erosion and flooding and reducing landslide risks in high risk zones. However, the project goes beyond this and aims to make the plantation 'climate-resilient' to future climate change using iterative climate risk management concepts. Investments include:

- Improved water management (culverts) and small-scale 'green' irrigation to enhance resilience to flooding and droughts
- Planting grass strips (napier grass) to reduce erosion and enhance soil stabilisation around the 1874 ha tea estate
- Establishing tree belts on 50 ha to reduce flooding and landslide risks
- Introducing shade trees in tree estate (inter-cropping) in lower (more vulnerable) areas (25 ha)
- Upslope tea planting at higher elevation (50 hectares) to ensure climate resilient expansion of tea
- Planting new resilient tea clones

The design is supported by a detailed feasibility study and an analysis of the current and future climate risks<sup>61</sup> (see Annex 1). The analysis has used an iterative climate risk management approach to develop a portfolio of adaptation options that will build the climate resilience of the tea growers in Gicumbi. The interventions identified meet the GCF criteria, align strongly with existing policies and have high national ownership. They will also provide key lessons for the scale-up of climate resilience of Rwanda's tea industry, which is critical to the country's economy. Tea provides 30% of Rwanda's foreign exchange reserves and around 12% of exports by value. It is dominated by smallholders (42 000 farmers), of which 37% are women, all of whom are vulnerable to climate change.

**The first set of activities will introduce low cost low regret adaptation around the plantation, with grass strips, tree belts and culverts to reduce flooding, soil erosion and landslides.** These respond to the increasing impacts that have occurred in recent years, including the complete loss of 10 hectares of plantation due to landslides as well as a loss of annual production in 20 hectares due to floods. These impacts will become more common as climate change is projected to increase heavy precipitation events in the area. These interventions will reduce high flows and flood risks, stabilise soil to reduce landslide risk, reduce soil erosion and downstream sediment loading, as well as having wider ecosystem service and GHG reduction benefits. These interventions are community level, plantation-wide interventions (which individual farmers cannot implement) and provide wider ecosystem service and public goods benefits. Small-scale 'green' irrigation will also be installed in an area of the plantation that has been particularly subject to rainfall variability (low or intermittent rain), noting again that this is projected to increase under climate change. It will implement hillside gravity based irrigation and solar pumped drip irrigation, with the additional aim to learn lessons on potential applicability and cost-effectiveness for the tea sector nationally. Complementing this, a selection of the existing plantation (25 hectares) will be selected for planting shade trees (intercropping in tea). This responds to data analysis at Mulindi that shows tea productivity is reduced by higher maximum temperatures, noting that temperatures will increase under climate change.

**The second set of activities aims to make the tea plantation climate-resilient**, i.e. looking at more transformational investments for the tea sector. There are plans to expand the Mulindi plantation, converting existing land into tea production (which increases small-holder incomes). The project will therefore provide the marginal green investment – on top of the existing baseline investment for expansion by The Wood Foundation – to make this climate resilient. This will serve as the first example of climate resilient tea expansion in Rwanda. This is

<sup>61</sup> 1) Tea (and Coffee) Resilience study report; 2) Current and Future Climate Change Assessment; and 3) Technical Analysis report.

critical as Government of Rwanda is currently embarking on a major tea expansion policy, aiming to double the land under tea production to deliver growth and increase exports. This expansion is focused on rural small-holder production (to enhance rural incomes) and focuses on mountain tea, grown at higher elevation where the climate and slower growth lead to enhanced quality (colour or flavour), which produces a higher value product which allows access to higher value markets through single supplier value chains (maximising small-holder incomes). However, tea is a long-lived crop and planting out and maturation of new plantations takes time: new plantations will therefore be exposed to future climate change. This necessitates that expansion areas are sited in climatic zones that will produce high quality mountain tea in the future (under a warmer climate) rather than located in sites that historically have been suitable. GCF funding will provide the additional (marginal) finance for climate resilient expansion of 50 ha at Mulindi, funding climate risk screening, slope planting guidance, as well as incremental climate resilient activities such as mulching for the seedlings and young plants to address the increasing risks of heavy precipitation. Alongside this, it will invest in new tea clones that are more resilient for the new plantation areas, addressing the risk of increasing rainfall variability.

**The expansion of cultivation of tea (and coffee) to higher areas is a key transformative adaptation strategy for coping with climate change.** The project will ensure that the areas for expansion are chosen carefully (full site feasibility is included) to ensure they are not in areas of existing forest or sensitive environmental areas. Indeed, a priority of the higher elevation siting is to target steep slopes, targeting areas of current marginal agricultural production. The planting of tea plantations (or coffee trees) on slopes increases soil stability, reduces soil erosion and enhances water management by reducing high run-off and flood risks downstream. Research plots show that these new plantations will actually improve water management and reduce downstream water sedimentation levels, thus improving water quality and quantity. Furthermore, all the new plantations will include additional measures to enhance water management, with areas of protective forests and surrounding tree belts, as well as water conservation techniques for the crops themselves, such as mulching. Overall, the up-slope planting will lead to positive outcomes for protection of water and improvement of water catchment management.

#### **Sub-component 1.7: Integrate climate resilient practices into local extension services (USD 0.5 million)**

**This sub-component will strengthen the capacity of local extension services to support tea and coffee farmers to adopt CRA.** It includes:

- Farmer field schools (FFS) with Mulindi tea cooperatives (2 coops, 40 ToT, reaches 4900 farmers)
- Farmer Field Schools – with 2500 Coffee farmers in Gicumbi/Watershed

Tea and coffee extension services already existing nationally and in the district, using the farmer field school model. However, to date, these have not adequately covered the effects of current climate variability and future climate change, nor provided training on climate resilient agriculture. This means that local farmers are not addressing current risks of exposure to reducing losses from climate variability and they are not prepared for the changing risks from climate change. This sub-component will address this deficit, by integrating climate resilience into the farmer field school curriculum, and developing new demo plots (field sites or field schools) that demonstrate the use of climate resilient agriculture for these crops. This activity will target 50 tea farmer schools that currently exist for the two tea co-operatives. This will provide the training to allow farmers to introduce field interventions (complementing the community interventions introduced in sub-component 1.6).

**The project will also support similar capacity strengthening for 2500 smallholders growing coffee through existing farmer field schools and scaleable demo plots,** recognising the similarities and vulnerabilities of these farmers. There are 11,783 smallholder farmers growing coffee in Gicumbi which is part of a large national coffee sector that is entirely smallholder based (of which 30% are women), yet still provides 12% of national exports by value. Coffee is also highly vulnerable to climate change (even more so than tea) and the projected changes could dramatically impact on Rwanda's coffee sector and the livelihoods of vulnerable smallholders. In line with this, the project will undertake some participatory surveys to take stock of current farmer knowledge, then invest in farmer field schools supported by demo plots. See Annex 1 for more details <sup>62</sup>.

#### **Sub-component 1.8: Provide weather and climate services for tea and coffee farmers to increase productivity and reduce losses from weather and climate variability (USD 0.6 million)**

**This sub-component will develop new weather and climate services (W&CS) for the tea and coffee sectors, with these interventions being developed in Gicumbi.** These services provide critical information to farmers, improving productivity and reducing losses from weather and climate variability, and have extremely high benefit to

<sup>62</sup> Tea (and Coffee) Resilience study report; 2) Current and Future Climate Change Assessment; and 3) Technical Analysis report.

cost ratios<sup>63</sup>. They include short-term forecasting (daily up to weekly) to help farmers (and government) with farm management activities (planting, ongoing management, harvesting, and post-harvest activities) as well as climate services, i.e. monthly, seasonal and multi-year climate forecasting (through to climate change), and include the supporting infrastructure and activities (climate data sets and monitoring, forecasting and prediction, information systems and dissemination). In Rwanda, a recent project has developed climate services for agriculture, but this is focused on cereal crops. This component therefore aims to build on this initiative and develop similar services for the tea and coffee sectors. It includes

- Developing the weather and climate metrics of relevance for tea and coffee and including in data sets;
- Undertaking participatory consultation on W&CS with tea and coffee farmers in Gicumbi;
- Developing the farmer field school curriculum to include W&CS;
- Building the capacity and monitoring infrastructure for met services to collect and process relevant information; and
- Developing the ICT and approaches for dissemination for farmers and government.

**While tea and coffee are perennial crops, there are many parts of the annual farming cycle that would benefit from better weather information.** For tea, understanding daily weather is important (such as for fertiliser application) and long-term data analysis at Mulindi<sup>64</sup> has identified the key metrics that affect productivity, which would allow targeted weather products. Likewise, for coffee, there are critical parts of the production cycle where weather forecasting is critical, such as the period when coffee beans are dried (naturally). In both cases, better seasonal forecasting has the potential to allow farmers to implement anticipatory measures to address projected dry spells or droughts, helping to reduce losses and protect livelihoods.

**The project will develop new targeted weather and climate services for small-holders.** It will use a participatory based approach with tea and coffee farmers in Gicumbi, combined with long-term climate data analysis and map-room development, as well as capacity building and ICT development in the met service to develop and disseminate weather and climate services. This will provide the information on the current variables of interest and impacts of concern, to allow the development of targeted W&CS to improve productivity and build climate resilience, including a variety of products such as SMS to farmers. The services will also be incorporated into a farmer field school curriculum, and will be rolled out to the farmers in the district (see component 1.6 above).

#### **Sub-component 1.9: Increase capacity for pest monitoring, surveillance and IPM to address current and future climate change (USD 0.6 million)**

**This sub-component targets the key climate relevant pests and diseases for the coffee and tea sectors, and develops and demonstrates new IPM approaches in Gicumbi** to address the urgent need to develop integrated pest management, as climate risks are increasing. Pests and diseases are already a major problem for both the tea and coffee sector in Rwanda, reducing productivity, and in years with major outbreaks, causing significant economic damage. The climate is a major factor in the range and prevalence of these. Detailed analysis has found a clear relationship with warmer temperatures and major coffee diseases (notably coffee leaf rust<sup>65</sup>). Similarly, red spider mite has been increasing in Rwanda, and increases significantly when the onset of the rainy season is delayed. Future climate change will increase these risks and add new ones. Evidence from other East African countries is showing the range of key pests is increasing under climate change, notably with the coffee berry borer<sup>66</sup>, which is now spreading in Rwanda. The project will address these issues through:

- Surveillance and monitoring of targeted climate sensitive pests and diseases; and
- Developing IPM with pest and disease controls.

The project will develop surveillance and monitoring of the key climate sensitive pests and diseases for tea and coffee, using survey information and GIS and statistical software to enable surveillance and forecasting. This will provide the necessary information to then develop the IPM response and build the resilience for small-holder farmers, including the introduction of IPM demonstrations in Gicumbi. See Annex 1 for more details <sup>67</sup>.

<sup>63</sup> Recent reviews report the benefit to cost ratios of W&CS as 2:1 to 36:1: Clements (2013). The Value of Climate Services Across Economic and Public Sectors. Report to the United States Agency for International Development (USAID). Prepared by Engility/International Resources Group (IRG). Available at [http://www.climate-services.org/sites/default/files/CCRD-Climate-Services-Value-Report\\_FINAL.pdf](http://www.climate-services.org/sites/default/files/CCRD-Climate-Services-Value-Report_FINAL.pdf)

<sup>64</sup> IGC (2016). Index Based Insurance for Rwandan Tea. A study of basis risk. Patrick McSharry, Tom Swartz, John Spray. Report to IGC Rwanda.

<sup>65</sup> Joseph Bigirimana, Kiarie Njoroge, Daphrose Gahakwa and Noah A. Phiri (2012). Incidence and severity of coffee leaf rust and other coffee pests and diseases in Rwanda. African Journal of Agricultural Research Vol. 7(26), pp. 3847-3852, 10 July, 2012.

<sup>66</sup> Jaramillo J, Chabi-Olaye A, Kamonjo C, Jaramillo A, Vega FE, et al. (2009) Thermal Tolerance of the Coffee Berry Borer *Hypothenemus hampei*: Predictions of Climate Change Impact on a Tropical Insect Pest. PLoS ONE 4(8): e6487. doi:10.1371/journal.pone.0006487

<sup>67</sup> Tea (and Coffee) Resilience study report; 2) Current and Future Climate Change Assessment; and 3) Technical Analysis report.

**Sub-component 1.10: Increase climate resilient practices to reduce susceptibility to climate change and protect slopes in the watershed (USD 0.7 million)**

**This sub-component will invest in climate resilient coffee development in Gicumbi.** The project will work with the current national expansion programme for coffee, and provide the additional (marginal) finance to support a planned 35 ha expansion area climate resilient in Gicumbi. The project will provide the technical assistance (climate risk screening, slope planting guidance) to identify suitable higher elevation sites for growing coffee under climate change, demonstrating the required agro-ecological shift and transformative adaptation that will be needed under climate change. It will also introduce new resilient coffee varieties that have been developed in Rwanda (with scale up of RABC15, which is resistant to major pests and diseases, as well as a further set of demonstration plots with varieties developed by RAB under a previous breeding programme) at scale. The project will also introduce successional agroforestry for coffee, which helps soil to improve at the same time as enhancing adaptation. This approach introduces a series of interventions that enhance resilience and provide wider ecosystem service benefits as the plantations develop, starting with mulching and cover crops and shifting over time to shade trees. As well as improving rural incomes, this will provide a template for a paradigm shift for the Rwandan coffee sector. See Annex 1 for more details. Activities will include:

- develop new climate resilient coffee in Gicumbi (35 ha);
- Introducing resilient coffee varieties for this development; and
- Introducing succession climate resilient agriculture - 35 ha Gicumbi.

**For Rwanda's coffee sector to survive, there is a need to transform the sector to make it climate resilient.**

This is important as the Government is expanding coffee production, particularly for higher quality specialty coffee, as a way of increasing the incomes of rural farmers while also delivering national growth and exports. As with tea, it is critical that the siting of new expansion areas is made with the current rather than past climate in mind.

**Arabica coffee requires very specific climate conditions over the growing cycle and it is a highly climate sensitive crop.** Almost all Rwandan production is Arabica coffee and the country is targeting the production of specialty coffee which fetches a higher price. Exposure to high temperatures (30°C and above) causes a range of physiological problems that lead to the direct damage of the plants and leads to losses in productivity and quality of the annual crop. To address these issues Arabica coffee is grown at higher elevations as these higher areas are cooler. Higher cooler areas are especially effective in producing specialty coffee (often called mountain coffee) because the slower growth leads to enhanced flavour. However, future temperatures are projected to increase by as much as 2.5°C over the next 30–40 years<sup>68</sup>. This will change the climate of Rwanda and it will alter the areas where Arabica coffee can be grown as lower elevation areas will start to exceed the temperature thresholds for the crop. These lower areas will therefore not be suitable for growing coffee (due to climate change). This is already happening at the lower margins of coffee production areas in many countries globally, including in Rwanda.

**Planting coffee on slopes is a well-established practice.** While there are some short-term adaptation measures that can reduce short-term risks, due to the physiological temperature thresholds, there is no other alternative other than to start growing coffee at higher, cooler elevations, i.e. higher up the slopes in Rwanda. It also has additional benefits as the coffee trees enhance soil conservation, therefore reducing soil erosion and flood/landslide risks. This is particularly important given the projections for Rwanda indicate climate change will also increase heavy precipitation in the country (thus coffee slope planting is a win-win option). Planting coffee higher up the slopes provides a way to maintain the high value coffee industry in Rwanda under a warming climate, addressing the impacts that climate change will have by reducing (current) production areas of Arabica. Moreover, slope planting at higher elevation is possible in Rwanda because it has higher suitable areas to expand into. Many other coffee producing countries do not have any suitable higher areas and their production will fall. This means that Rwanda could gain a comparative advantage<sup>69</sup> for adapting the coffee sector under climate change: taking advantage of this opportunity is therefore critical. Coffee also has an additional advantage, because coffee grows well on steep hillsides, protecting them against soil erosion and providing a lower cost alternative to more expensive terracing options<sup>70</sup>. Coffee can therefore help with watershed management.

**Component 2: Sustainable forest management and sustainable energy (USD 5.3 million)**

<sup>68</sup> Rwanda's 2nd National Communication

<sup>69</sup> Bunn, C., Läderach, P., Ovalle Rivera, O., & Kirschke, D. 2014. A bitter cup: climate change profile of global production of Arabica and Robusta coffee. *Climatic Change*, 129, 89-101.

<sup>70</sup> Clay, D (2017). Challenge to Sustainable Growth in Rwanda's Coffee Sector

**This component will assist forest owners and users to improve forest productivity and reduce deforestation to create a wide range of forest products.** The activities focus on reducing vulnerability to environmental and climate change threats, improving economic opportunities from this sector and increasing local capacity for sustainable development outcomes. These interventions, are intrinsically linked with the watershed management activities and will be implemented together across the whole target area although watershed protection works will be more concentrated to the West and South and forest productivity works to the East. The component comprises six sub-components:

- 2.1 Increase forest productivity and sustainable forest management
- 2.2 Strengthen forest management skills to sustain investments in forestry and watershed management
- 2.3 Establish, restore and manage degraded woodlots across 297 ha of the watershed
- 2.4 Strengthen community capacity to provide forest products and services
- 2.5 Increase the use of biogas and efficient cookstoves to reduce deforestation of the watershed
- 2.6 Reduce the demand for fuelwood and GHG emissions at Mulindi tea factory through energy efficiency measures

It will demonstrate and roll out best practice, the principles and processes which are replicable across the whole country. A detailed Sustainable Forest Management - Feasibility Assessment Report along with detailed forest management models and a capacity development plan are included in Annex 1.

The component will be implemented by a team of staff recruited to the project and based in Gicumbi District Headquarters. All interventions will be delivered at the local level but will also be supported by the relevant sector government agencies and research institutions such as:

- Rwanda Water and Forests Authority (RWFA) – for forestry activities;
- National Agriculture Export Development Board (NAEB) – for tea and coffee interventions;
- UTAB which is part of the University of Rwanda and the Tumbo College of Technology – for forestry and efficient cooking energy activities; and
- National Industrial Research Development Agency (NIRDA) – for energy efficiency measures at Mulindi tea factory.

The implementation arrangements are explained in detail in Section C.7.

#### **Sub-component 2.1: Increase forest productivity and sustainable forest management (USD 1 million)**

**This sub-component aims to increase forest productivity and the uptake of sustainable forest management practices to increase the volume of timber sustainably available for meeting fuelwood and other timber needs.** The interventions strive for high quality forest stands on a small targeted area. The design has recommended a full (phased) replacement of forest stands / plots with high-quality, site-suitable species, hybrids or varieties, raised, planted, established and managed to professional best practice standards, supported by significant training and capacity development and institutional strengthening to ensure standards are maintained. *Eucalyptus* does not tolerate sub-optimal practice, therefore *Eucalyptus* plantations are only recommended for plantation owners interested in and having sites suited for commercial production (usually larger sized blocks and/or consolidated smaller plots into larger blocks where owners can organise and operate together). Other woodlots, plantations and forestry interventions will be directed towards: timber species less vulnerable to sub-optimal practice (such as *Pinus* spp) and / or; appropriate species for the production of other goods and services, with a particular focus on household, livelihoods and ecosystem protection benefits. As it is proposed to fully transform current forestry practice, a range of demonstrations and trials, as part of the roll-out process, is required to:

- demonstrate to and raise awareness targeting interventions amongst stakeholders of what can be achieved;
- build capacity in and commitment to the use of new material and practices;
- test the performance and suitability of these changes, and, combined with further specific site assessment for matching to the introduced species and varieties; and
- inform ongoing management and scale-up.

**The interventions will demonstrate and roll-out best practice across forest management and operational processes,** transforming the quality and productivity of the forest estate. To enable the uptake and maintenance of improved practices, and to facilitate sustainability in the application within and beyond the project area, the design includes: a coherent hierarchy of skills building; application of user-focused reference manuals and clear national standards for all aspects of plantation development; and capacity building to ensure standards are observed. A series of targeted interventions are proposed:

- Support the diversification and access to sources of high quality seed and plant material;
- Demonstration /trial forestry plots; and
- Roll-out renewal of forests.

The demonstration plots are an important and integral part of the phased roll-out of forest renewal.

**The project will support the provision of nationally available sources of high quality seed and plant material.** This will entail importing high quality seed and plant material (there is a lack of available high quality seed and plant material in Rwanda) and the use of more drought tolerant species to support forest renewal. To demonstrate and raise awareness amongst stakeholders in nursery best practice and produce high quality seedlings for forest renewal, a number of demonstration nurseries will be established. This intervention will target the district owned nursery, Karambo in Nyaruvumu village and the Mulindi Tea Factory land. The investment will also support (through TA) the strengthening of the National Tree Seed Centre based in Butare which holds national responsibility for implementing the recently developed National Trees Seed Strategy. Seeds stands (each 15ha) for *Pinus* and *Eucalyptus* will be established and managed within the target areas to demonstrate and build community best practice.

**The new species and varieties and best practices will be tested on demonstration/ trial forestry plots.** The import and use of new species and varieties is not without some risk, as they are untested in Rwanda. There is also limited understanding as to what productivity gains are achievable through the use of such material, and application of best practice. Four initial demonstration forestry plots have been identified: Murehe public forest in Manyagiro (6.5ha); Gashogobe forest in Kaniga close to Mulindi Tea Factory (11 ha); Kirwa public forest in Mukarange (14ha); and Rwaranda forest in Rushaki close to Mulindi Tea Factory (8.5 ha).

**Forest renewal will be rolled out over 2261 ha of the watershed.** This will begin with an assessment of the demonstrations and trials and site assessments to match target sites with appropriate species and varieties where there is good potential for optimal growth and provision of forest goods and services. The renewal of forests will comprise three roll out models: *Eucalyptus* (52% of the project forest area), pine (21%) and protective forest (27%). Currently, *Eucalyptus* accounts for 88% of the project forest area. The current forest estate comprises 94-97% *Eucalyptus* and *Pinus* species. If fully implemented the forest renewal design reduces this to 73%, increasing the use of other (largely native) species to 27%.

**The use of *Eucalyptus* and *Pinus* will be restricted to public and private forests where production is a main objective.** This reflects the need to reduce the fuelwood demand and supply deficit, currently estimated at over 2 million tonnes, and timber for other uses. The urgency of increasing timber and wood supply combined with the existing extreme land and population pressure, high demand for woody biomass and the fact that, if well grown, *Eucalyptus* and *Pinus* are faster growing than native species means that they are important genera. Renewal of *Eucalyptus* plantations (with a 8 year coppice rotation length) will therefore only be recommended for plantation owners interested in and sites suited for commercial production - larger or consolidated smaller plots where owners can organise and operate together >2ha. The PPF SFM Feasibility Study Report contains guides to species choice for exotic and native species for different objectives and site types to aid decision making on a forest by forest basis. *Eucalyptus* species have higher productivity potential than other feasible forest species but the productivity potential is highly dependent on planting high quality seed and/or source material and rigorous and timely ground preparation, planting and maintenance operations. Where *Eucalyptus* and *Pinus* are retained the design predicates careful species to site matching to i) ensure species suitability and productivity, ii) increase intra- and inter- forest type diversity and iii) avoid deleterious landscape / watershed effects such as water loss and soil deterioration. *Pinus* plantations, are less vulnerable to sub-optimal practice than *Eucalyptus* and provide a greater range of timber products. Renewal interventions will establish *Pinus* plantations (with a 24 year rotation length). Further detailed analysis is included in the Sustainable Forest Management - Feasibility Assessment Report and the forest management models in Annex 1.

#### **Sub-component 2.2: Strengthen forest management skills to sustain investments in forestry and watershed management (USD 0.5 million)**

**This sub-component will ensure that the necessary capacities and capabilities are developed for the long term maintenance, sustainability and scale up of the forestry and watershed interventions.** It is based on a capacity needs assessment and development plan<sup>71</sup> attached at Annex 1. Capacity strengthening of individuals, households, organisations and institutions is integral to their ability to capture, benefit from and sustain the interventions and the associated mitigation, adaptation, health and economic benefits and, by so doing, provide lessons, knowledge and skills for the informing of policies and plans for replication, scale up and adoption nationally. This sub-component includes a comprehensive and extensive suite of capacity strengthening approaches and activities to ensure skills and management competency, raise awareness and build ownership of new species, practices and techniques to support and improve the livelihoods of women and men for a more positive outcome. This will enable and support the adoption and replication of new management and technical approaches and techniques, most notably the full renewal of the forest estate using new species, varieties and hybrids not previously used in Rwanda. The target groups for capacity strengthening activities will comprise: seed

<sup>71</sup> A detailed Sustainable Forest Management - Feasibility Assessment Report along with detailed forest management models and a capacity development plan are included in Annex 1.

stand owners, NTSC, National & District Authority staff, Mulindi Tea Factory, private forest owners; tree nursery, tree growers, cooperatives. Capacity development activities will comprise a mixture of training, awareness and capacity development interventions to target women and men comprising:

- technical skills training for 18 sector technicians,
- training of forestry core groups (90 participants trained in total), and
- Learning exchange visits (for 117 participants).

**Technical skills training for forestry technicians will entail the application of best practice standards and guidelines.** It will cover topics including: seed collection, seedling raising, forestry, agroforestry and watershed management best practice approaches and techniques. The training will target mostly district staff but will include provision to support the participation of staff from MOE and RWFA. This will also involve capacity support to improve site assessment, species to site matching, quality control and management planning as well as the application of charcoal regulations and green charcoal standards. Training of forestry core groups will include capacity building of seed stand owners, NTSC, National & District Authority staff, Mulindi Tea Factory, private forest owners; tree nursery, tree growers and bee keeping associations, cooperatives, and contractors. Learning exchange visits will include farmer to farmer and regional country visits, the use of demonstration nurseries, forest and agroforestry plots and the energy demonstration centre (above). This activity will also provide resources for staff from MOE and RWFA to participate in visits to observe best practice.

**Sub-component 2.3: Establish, restore and manage degraded woodlots across 297 ha of the watershed (USD 0.8 million)**

**This sub-component will establish, restore and manage degraded woodlots with alternative species.** It targets 297 ha (approximately 5% of Gicumbi's woodlots). Small woodlot and other private forest owners currently harvest sub-optimally at very short rotation lengths. This is primarily due to pressing needs to release cashflow to meet other needs. As such these stakeholders require support to bridge the financing gap between establishment and optimal revenue streams. It is therefore proposed that the project covers the cost of improved woodlot management to facilitate best practice until improved revenue streams from higher productivity are captured. For small woodlots (<2ha), the project will support farmers to enhance and diversify tree production by providing high quality germoplasm and training to enable smallholders to develop and implement improved management plans. For more details, refer to the Watershed protection Plan (annex 1).

**Sub-component 2.4: Strengthen community capacity to provide forest products and services (USD 1.4 million)**

**This sub-component aims to support income generation from forestry.** Interventions were developed following a detailed analysis of forest products and services (tree nurseries, woodlots, bee keeping) and access to finance in Gicumbi<sup>72</sup> (see Annex 1). It comprises a series of targeted interventions aimed at supporting livelihoods around forest products and services for poor households living in the target areas. These include:

- Establishing community tree nurseries and capacity support;
- Establishing woodlot cooperatives;
- Strengthening bee keeping operations; and
- Increased access to finance.

**The project will establish community tree nurseries and support the organisation, coordination and management of tree nurseries** for local economic development. There is large demand for high quality seedlings for both the project interventions and from other projects. However, there are few private nurseries in the target area and those that do exist are mostly informal and temporary. Providing organisational and management support will provide local communities with an additional source of income and diversify out of subsistence farming. The project will train 3960 people over 5 years.

**Small woodlot owners will be supported to form cooperatives.** This is intended to facilitate the aggregation and coordination of disparate and scattered woodlots and owners to provide economies of scale in operations, improve coherent forest management across the landscape and increase the potential for access to and provision of a wider range of product markets and improve planning and marketing opportunities for owners. This is because the majority of the woodland in the project area is comprised of disparate blocks with multiple owners. Alongside the best practice technical support, owners will be supported to coordinate and manage their forest resources and access new and higher value markets. The project will train 1080 people over 18 months.

**Bee keeping operations will be strengthened to support livelihood diversification.** Bee keeping is an important local economic activity but is hampered by low productivity of honey and limited production of other

<sup>72</sup> Business Development: Tree Nurseries, Woodlots and Bee Keeping. Part of the GCF preparatory studies.

products. The project will sensitise 405 beekeepers on best practice and target capacity support to bee keeping cooperatives and provide modern hives. This will include training to support bee keepers in the use of higher yielding hives as well as techniques, production, packaging and marketing of higher value products and exploration of wider market opportunities. The project will also invest in a community-based honey processing and packaging facility.

**Increased access to finance for vulnerable groups will be facilitated to support the adoption of forest enterprises.** Accessing financial services, credit in particular, is challenging for many cooperatives and is a key brake on the development of forest products and services. The project will assess the financing needs of forest cooperatives and enterprises and work with formal and informal financial institutions to enhance the provision of more accessible and appropriate financial services and products to support cooperatives to increase their participation in forest based services and products. This will link into the CAF<sup>73</sup> and other locally available funding including the LODA community fund.

#### **Sub-component 2.5: Increase the use of biogas and efficient cookstoves to reduce deforestation of the watershed (USD 1 million)**

**This sub-component will reduce the harvesting of wood for household cooking and energy use to reduce pressure on forest and wood resources,** reducing vulnerabilities associated with deforestation and degraded forest cover. It comprises a series of targeted interventions aimed at reducing household demand for biomass in the target areas. These are based on extensive consultations and a review of existing work in this area in Rwanda conducted as part of the preparatory studies (see the Energy Analysis and Action Plan Gicumbi District in Annex 1). Activities will include:

- increasing the use of biogas by households engaged in dairy activities; and
- promotion and provision of cleaner cookstoves and fuels.

**The proposed interventions build on the experience of previous Government programmes** implemented by Practical Action Consultants (2011/12) and SNV 2013/1429 under MININFRA and later EWSA/EDCL. These two programmes were successful in introducing the Canarumwe and Tekavabu stoves in rural areas. Standards for the production and installation of the stoves were developed by the Practical Action programme and adapted by the Rwandan Bureau of Standards. There are a number of small companies supplying the market so the stoves can be sourced locally. Tier 1 and 2 improved Cook Stoves are already locally made in Gicumbi District and use a ceramic liner of standard dimensions. These are either installed in the household's kitchen (Canarumwe model) or the liner is fixed in a metal cladding and insulation materials (Tehavuba portable model). These improved stoves have thermal efficiencies of 20 – 305% and because the technicians who install the stoves also improve ventilation in the household cooking area, there are measureable benefits through reduced indoor pollution. Tier 3 Gasifier stoves are made out of metal and produced in more advanced metal workshops currently located in the urban areas but with a potential to be made in Gicumbi as well. The GCF investment will therefore draw on the existing expertise and supply chain in country to scale up the uptake of these stoves.

**The project will support the subsidised provision of biogas within the project area** and contribute to the achievement of the SE4ALL target of 10% of rural households having access to biogas. The project will target dairy households and encourage them to invest in digesters as well as institutions (e.g. boarding schools, slaughterhouses etc.) that could switch to biogas. Although there are relatively few large institutions within the project area, their use of wood as a cooking fuel is significant. The project will provide a subsidy towards the investment costs which will be performance based and only be provided by the district authorities after completion of the digester according to the quality standards. Training will also be provided to increase business/ technical skills among biogas enterprises/ technicians.

**The adoption of cleaner cookstoves and fuels will be promoted and subsidised** to reduce the pressure on wood resources, greenhouse gas emissions and indoor air pollution. The project will promote the efficient use of biomass for cooking and improve access to alternative fuels by strengthening the capacity of existing service providers to promote efficient stoves for rural households. These stoves include Tier 1 and 2 efficient stoves as well as Tier 3 and 4 gasifier stoves. Tier 1 and 2 efficient stoves provide an efficiency saving of 23% compared to the 3 stone fire traditional cooking method while Tier 3 and 4 gasifier stoves<sup>74</sup> can reach higher efficiencies of 40 - 50% and substantially reduce air pollution. The work will include:

<sup>73</sup>Community grants for the CAF will be provided by FONERWA (no GCF finance will be used for the grants, GCF finance will only be used to provide the TA to support the set up and operation of the fund)

<sup>74</sup>Tier 3: Gasifier stoves with natural draft are made out of metal and produced in more advanced metal workshops initially in the urban areas but with a potential to be made in Gicumbi as well. Estimated costs are Rwf 12,500 – 20,000 per stove and they will be targeted to the higher incomes in the rural areas. These stoves have to be adapted to the available fuel: wood chips, broken branches and/or pellets.

- providing technical and market advice, conducting market campaigns and linking potential customers to distributors and micro finance organisations;
- promotional activities in field to promote clean energy options;
- establishing, training and equipping production groups to produce the clay liners for the Canarumwe/Tekavuba stoves in areas where there are suitable soils and some pottery experience and to serve neighbouring areas;
- training technicians to install Canarumwe type stoves, in household kitchens;
- supporting service providers (local producers and distributors) to arrange awareness campaigns and demonstrations in local markets etc.; and
- the production of wood chips and pellets to increase the uptake and the efficiency of gasifier stoves.

**The project will work with the district authorities and local manufacturers to test these stoves on the market through an intensive promotion campaign.** Some of the work will be contracted out or managed in collaboration with the university in Gicumbi (UTAB) which already has departments for renewable energy, agriculture and forestry. The project will also stimulate collaboration between UTAB and the District as well as cooperation between UTAB and the Tumbo College of Technology in neighbouring Rulindo which has a strong renewable energy focus. It will include provision of demonstration equipment and information materials on access to clean energy; hiring and training of technical staff to support field promotions and promotional activities in the field to increase the uptake of clean energy options. Wood chipping and pelleting machinery are needed to make gasifier stoves more effective and user friendly. The project will invest in buildings, some simple machinery and support to a local cooperative to manage the production and the sale of the pellets. The approach will be based on an existing facility operated by Inyenyeri in western Rwanda (Gisenyi).

**The project will also assess the needs of key institutions in the district for improved cookstoves and the potential efficiency savings that could be achieved and provide 100 stoves to institutions.** A MININFRA survey of public institutions in 2010<sup>75</sup> study revealed that most of the boarding schools and health facilities that prepare meals, use the Muvero type stove made out of metal (80%) or built-in stoves made out of brick. Many of these stoves were found to be in poor condition as the metal corroded or the stoves were damaged. It is estimated that an institutional stove with a pan capacity of 150 litres, requires 200 m<sup>3</sup> of fuel wood per year. An improved stove that is in good condition and well managed can reduce the amount of fuel by 50% and more. That would result in a savings of 100 m<sup>3</sup> of firewood per newly installed stove. Further information can be found in the detailed 72 page study report (energy analysis and action plan) in one of the annexes to the FP.

**Sub-component 2.6: Reduce the demand for fuelwood and GHG emissions at Mulindi tea factory through energy efficiency measures (USD 0.3 million)**

**This sub-component will support a series of energy efficiency improvements<sup>76</sup> at the Mulindi factory,** with co-financing for the capital costs of energy efficiency equipment provided from The Wood Foundation / Mulindi Factory Company Limited (Tier 1) plus some grant support to demonstrate a series of advanced energy efficiency and PV options (Tier 2). Improving the energy efficiency of tea factories has the potential to reduce GHG emissions, reduce the pressure on wood fuel production, and lead to operational cost savings in factories, but it has not happened to date in Rwanda due a series of policy, institutional and information barriers. This project will address these barriers, focusing on the tea factory in Gicumbi which is run by a joint charitable company (Mulindi Factory Company Limited) supported by The Wood Foundation and The Gatsby Foundation, working under a shared ownership model with two local co-operatives of smallholder farmers, (COOPTHÉ and COOTHEVM). Under this model, all the shares in the factory will be transferred to the local smallholders in the next few years.

<sup>75</sup> Survey of Institutional Cook Stoves and Biogas Technology, MININFRA July 2010

<sup>76</sup> A further option would be to convert the system to operating on wood chip, which would allow for under fed stokers and retorts to be installed. This involves significant additional costs for the chipper and wood store, but also operationally to chip the wood. It is not considered further for these reasons.

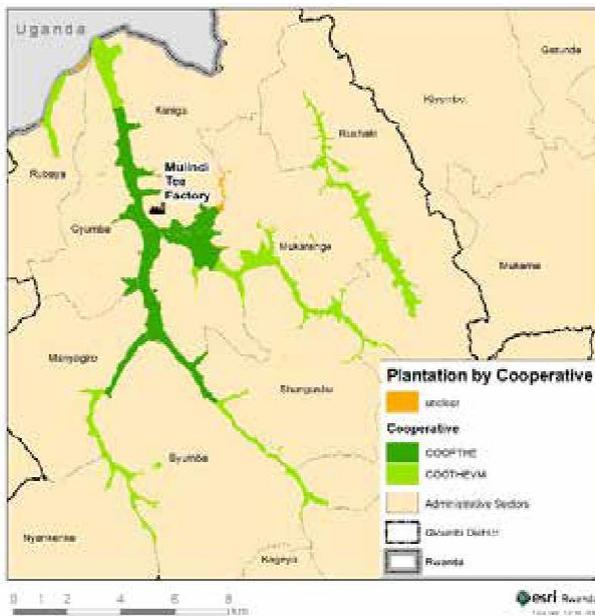


Figure 1. The Mulindi tea factory and plantation.

**As part of the technical audit (described in the baseline situation in section C10, a series of efficiency measures was proposed.** These do not require significant modifications to the system and equipment, and will provide potential savings of around 35% leading to reduced emissions of around 4,600 t CO<sub>2</sub>e per annum as well increasing the ratio of tea produced to energy consumed to 600 kg tea/m<sup>3</sup> wood. The Tier 1 improvements comprise: improved fuel drying<sup>77</sup> (cost USD40,000, fuel saving 18%), improvements to boiler controls<sup>78</sup> (USD25,000, saving 7% of boiler fuel), insulation<sup>79</sup> (USD6,000, fuel saving 10%), condensate utilisation, dryer performance (USD10,500, saving 5% of dryer fuel), USD4,500, and installing a VSD<sup>80</sup> to the boiler (saving 25% of boiler electricity). However, there are other options that can be introduced to further improve energy efficiency, and these are particularly important as Rwanda is embarking on a tea expansion programme that will see another 10 factories built in the next few years. It is critical to ensure that these new factories include best practice energy efficiency, to reduce future emissions and wood fuel demand. A series of additional Tier 2 (advanced) energy efficiency technologies are therefore proposed at Mulindi, to address risk perceptions and encourage uptake. These Tier 2 measures include dryer efficiency improvements, trough efficiency improvements and a Tea Factory PV Roof. More details on the feasibility analysis and proposed measures are included in the Annex report.

### Component 3: Climate resilient settlements (USD 9.3 million)

**Component 3 interventions will reduce the exposure of human settlements in the watershed to flooding and landslides, build climate resilience and support highly vulnerable households living in exposed areas to relocate to green social housing developments.** Currently, there are significant numbers of households in Gicumbi living in houses and areas susceptible to landslides and flooding with limited access to water and other essential services. This sub-component includes investments in improved surface-water management to reduce the risk of climate-related disasters and increase the capacity of communities to capture and store rainwater to address high levels of climate variability and emerging climate change. This will support the integrated approach to managing land and water within the sub-catchment in line with the the Muvumba Catchment Plan (2017) and complement activities under components 1 and 2. Specifically, it will improve access to adequate water supply through measures that are consistent with water availability and sustainability. Furthermore, rain water harvesting as an adaptation measure will capture and manage rain water to further reduce floods and serve as a disaster risk management strategy. This component will also invest in the construction of low carbon social housing and infrastructure in two locations (Kabeza and Kaniga) for extremely poor families currently living in areas where there

<sup>77</sup> Install ventilated drying floor to wood stores.

<sup>78</sup> To retrofit automatic oxygen trim providing control according to O<sub>2</sub> levels in the stack

<sup>79</sup> The smoke box doors and the entire back end should be insulated to reduce shell losses

<sup>80</sup> Variable Speed Drive, adjusts electrical motor speed by inverter technology. VSDs are standard practice now on most process engineering installations.

is a high risk of flooding and landslides. In the sectors where these villages are located (Rubaya and Kaniga), there are 172 and 228 households respectively currently living in high risk zones<sup>81</sup>. There are 3 sub-components:

- 3.1 Manage surface water run-off from settlements to reduce gully formation, floods and landslides;
- 3.2 Increase rainwater capture and storage to counter inter-annual rainfall variability; and
- 3.3 Construct a green social housing development in Kabeza to reduce the number of vulnerable households living in high risk zones;
- 3.4 Construct a green social housing development in Kaniga to reduce the number of vulnerable households living in high risk zones.

The interventions will target the most climate vulnerable households in Gicumbi.

The component will be implemented by a team of staff recruited to the project and based in Gicumbi District Headquarters. All interventions will be delivered at the local level but will also be supported by the relevant sector government agencies and research institutions such as:

- the Rwanda Water and Forests Authority (RWFA) – for rainwater harvesting and surface water management activities;
- the Rwanda Housing Authority (RHA) – for housing development activities

The implementation arrangements are explained in detail in Section C.7.

### **Sub-component 3.1: Manage surface water run-off from settlements to reduce gully formation, floods and landslides (USD 2.4 million)**

**This sub-component will comprise a range of measures to improve the management of surface water around climate vulnerable human settlements in Gicumbi.** It will entail an integrated approach to:

- reduce run-off and increase infiltration on the ridge and the upper slope to reduce climate related risks; and
- reduce downhill and lowland flooding, siltation and silt damage as well as sediment loads in water courses.

Many settlements in the project area are located at the top of slopes and ridges, where run-off following intense precipitation is exacerbated by rapid discharge from roofs, roads and other hard surfaces causing gullies and landslides at the crest of the slope and flooding and siltation lower in the valley. These risks will increase under climate change, as the climate projections show increases in heavy precipitation intensity. A detailed GIS analysis and ground truthing to collect data were carried out as part of the watershed protection plan<sup>82</sup> showed that a number of major gullies have opened up around Byumba (see Annex 1).

**Measures to improve local drainage and storm-water management will include: check dams, diversion ditches water breaks, soak-away/infiltration pits, spate irrigation<sup>83</sup>, ridges, contour bunds** etc. These structures are important for reducing the flooding of downstream, low-lying areas. Trees and shrub will also be planted particularly along pathways and access roads, and along drainage channels to stabilize soils, reduce run-off and improve infiltration. They will provide the additional benefit of providing a range of NTFP goods and services. In gullies, vegetation will be planted in strips across the gully to slow the velocity of water, trap silt, and prevent further erosion and check dams and wattles installed where necessary. Specific slope-treatment measures above the gully area and in the eroded area between the branch gullies may also be required, such as retention and infiltration ditches, terraces, wattles, fascines and staking to reduce the rate and amount of surface run-off and divert surface water away from critical planted areas. Specific investments will include:

- Soft drains (5000 m)
- Soak-away pits (21,324 soak away pits - 1 per HH for 60% HH)
- Check dams/ gully plugs (10,000)
- Footpath runoff control (100km)
- Soil erosion/infiltration ditches (62.5ha ditches with 222 ditches /ha)

**All work will be contracted through the cash for work schemes** used elsewhere in Rwanda which increase employment opportunities and target the poorest households. Support will also be provided to establish cell watershed management committees and provide training for committees on surface water management techniques and rainwater harvesting (see below under 3.2).

<sup>81</sup> Data collected by Gicumbi district, 2017

<sup>82</sup> Watershed Protection Plan (2016). Part of the preparatory studies completed on behalf of the Ministry of Environment Rwanda and funded through the Project Preparation Facility of the Green Climate Fund.

<sup>83</sup> Spate irrigation involves techniques in which flood water is used for supplemental irrigation of crops grown in low-lying lands, sometimes far from the source of runoff.

**Sub-component 3.2: Increase rainwater capture and storage to counter inter-annual rainfall variability (USD 2 million)**

**This sub-component will invest in small-scale water collection and storage structures** at the household and community level in upland areas to increase water conservation and reduce run-off and erosion during heavy rainfall. This will address the high levels of inter-annual rainfall variability in the district, and the periodic extremes (dry spells and droughts), which mean that communities often experience insufficient water availability. Water storage is a key strategy for climate change adaptation as using harvested rainwater will enable farming households to diversify the cropping systems, introduce new vegetables and perennial crops, and increase household incomes. Rainfall harvesting enables households to manage their own water supply for drinking water, domestic use, irrigation and other income generating activities. It also provides an increased level of drought protection and allows more flexibility in market timing for farmers who produce market crops. Storing the water in ponds, tanks and cisterns for local use, will also improve local supplies and reduce water collection burdens. Rain water harvesting also reduces the burden on women and girls from collecting and carrying water.

**Three methods of rainwater harvesting will be promoted: 1) roof top harvesting, 2) underground cisterns and 3) communal ponds.** Roof top harvesting will entail using a subsidy scheme to assist women and men in settlements and on steep slopes to acquire and set up, use and maintain rainwater harvesting facilities. Each tank will be shared between two households and splashguards will be used to prevent overshooting of rainwater. The project will also support the construction of 30 underground cisterns and a network of 90 ponds to absorb storm water overflows and provide supplemental irrigation and water for livestock during the dry season (which will increase agricultural productivity). The additional water points for livestock watering will hence support the increased use of biogas. Ponds will be made cost-effective by using local materials and community labour.

**The design, materials, siting and installation of this water infra-structure will take the prevailing and projected weather conditions into account.** The villages where these structures will be installed will be located in safe zones and in accordance with *immidugudu* controls and regulations. Moreover, the project will ensure that the design and construction of ponds, tanks and drainage systems is such that the structures can withstand heavy rainfall and other climatic extremes. This will include building in redundancies to ensure that the water infrastructure can continue to operate effectively under changing climatic conditions. In order to prevent siltation of run-off channels into the ponds which may affect the storage capacity the project will ensure that silt traps<sup>84</sup> and filters<sup>85</sup> are used to minimise the risk of siltation. In addition, the construction of the ponds will be closely linked into erosion and flood control measures (contour trenches, bunding, progressive terracing, ridges, pits, perennial cover of steep slopes and riparian buffer zones, agro-forestry, check dams, tree planting on gully banks, drainage channels etc.) to maximise their effectiveness as water storage facilities.

**To ensure the sustainability of the small-scale infrastructures introduced by the project (ponds, water breaks etc.), the project will establish a variety of committees** at the sector and cell level to select the sites, manage and maintain the structures. The role of the committees will be to follow up, monitor, maintain and rehabilitate the small-scale infrastructure after the end of the project. The project will establish effective arrangements to ensure continuing support to community management by competent external organisations, this will most likely be local government. The project will initially determine the demand from users for infrastructure interventions and ensure that households and communities are fully informed of the likely life cycle costs (operation, maintenance and eventual rehabilitation) of their services. The project will ensure that user participation is addressed, together with user contributions to capital and recurrent costs, choice of technology and participation in monitoring. The project will also develop a functioning management and maintenance system comprising tools, supply chains, transport, equipment, training and individuals/institutions with clear responsibilities. Support will be provided to enhance the long-term technical, financial, and managerial capacity of the Committees to ensure the effective operation and management of the structures. This will include: support to enhance decision making, technical support for maintenance and repair, means for cost sharing of recurrent costs<sup>86</sup>, support to supply chain and service providers (in the form of registration and licensing, training and technical assistance, access to capital, and financial and administrative services etc.) and support for coping with ongoing climate trends and shocks including the preparation of contingency plans. The project will also identify adequate sources of funding for operation and maintenance costs, define the roles and responsibilities of different players, and in particular build the capacity of local government. The project will develop both technical as well as management skills and support committees to develop a mechanism for cost sharing to ensure investments are financially sustainable. The precise

<sup>84</sup> this is a small pit used to catch sediment carried by the water. It prevents the pond from becoming clogged. The size of the trap will depend on the amount of runoff (heavier runoff means a bigger trap) and the amount of sediment it carries. If there is a lot of sediment, a two-chamber trap will be installed - one to catch soil and sand and the second one to trap finer silt. The silt trap will be located at least 3 meters away from the pond to prevent water from overflowing during heavy rains.

<sup>85</sup> a filter mesh is used to trap leaves and other debris.

<sup>86</sup> Recognising that rural communities may not be able to afford the full costs of operating and maintaining structures.

mechanism will be developed with committees during implementation but is likely to include a mix of user payments and external sources of funding primarily from the district annual budget. Part of the process will include working closely with communities and district officials to assess the need for external finance to cover maintenance costs and to ensure that these costs are quantified and included in the district's annual action plan and budget. Finally, the project will build the capacity of local authorities to maintain records of functionality and utilisation of infrastructure with data generated through community and household monitoring and surveys at one year, three years, five years and ten years after implementation.

**Sub-component 3.3: Construct green social housing development in Kabeza to reduce the number of vulnerable households living in high risk zones (USD 2 million)**

**The project will invest in 200 new homes and infrastructure for vulnerable families currently living in areas at risk from flooding and landslides.** This intervention targets the poorest and most vulnerable households out of the 14,724 currently living in high risk areas (at risk from landslides and floods) with limited assets and without adequate access to safe water and poor sanitation. Masterplans have been developed for two rural sites in northern Gicumbi: Kabeza and Kaniga (these are included in Annex 1 along with topographical and geotechnical surveys of both sites as well as carbon savings calculations, options analysis, delivery and cost plan, green infrastructure plan). The project will support the construction of 100 new houses in Kabeza and 100 new houses in Kaniga (see sub-component 3.4). The settlements will include “green infrastructure” that utilises renewable energy, water and waste recycling strategies designed to work with the Rwandan topography to reduce emissions, increase resilience to climate change and protect the surrounding environment.

**Kabeza is a remote rural village on top of a hill, 7km from the border town of Gatuna, close to a well maintained and recently upgraded murram road.** The village is part of the GoR's Integrated Development Project (IDP) 'model village' which was initiated under the rural settlement policy in 2010 to upgrade rural settlements into integrated villages, to increase economic opportunities (by clustering houses around improved infrastructure, services and amenities) and to provide housing for climate vulnerable families living in high risk areas who are affected by landslides and floods. Currently, there are 43 existing dwellings in Kabeza that were constructed in 2008 by a government initiative with funding from UNDP/UNEP/REMA-PEI and Gicumbi District to demonstrate low carbon and climate resilient rural villages. The project will invest in the construction of an additional 100 homes and water and energy infrastructure for vulnerable families in line with the masterplan, building typologies and green infrastructure plan developed as part of this design. The new homes will be built on an adjacent site to the existing houses which slopes at a constant gradient of 12-20% and is facing north-east with views towards Rubaya town. The site is zoned as rural in the District Land Use and Zoning Plan and has no electrical grid connection and no municipal water supply.

**The households in this village have already adopted a variety of green technologies including biogas, indoor solar lighting and climate adaptation measures including rainwater harvesting.** A modified IDP masterplan (see Annex 1) has been developed for the site which improves on the green infrastructure in the village to promote enhanced climate resilience with gentle sloping, 'soft landscaping' to adsorb water, reduce soil erosion, improve storm water management and irrigate surrounding agriculture, all forms of adaptation to help address the increasing risks of heavy precipitation from climate change. Each dwelling will include rainwater harvesting to cater for 9 months of water supply and reduce vulnerability to changing weather patterns. During the 3 month dry season a communal rainwater collection system will be constructed to collect water from the soft landscaping system via a sand-bed water filter and underground water tanks. A communal biogas chamber (to supply gas for cooking), cow sheds and two cows per household have also been included in the design. The masterplan also includes landscape terraces shared between two houses, the top terrace for trees, the lower for beehives, a wormery and compost and remaining terraces for food production.

**The housing typologies and “green infrastructure” (that utilises renewable resources, water and waste recycling strategies) at both sites are designed to work with the Rwandan topography and climate** to integrate slope stability and storm water management, reduce emissions, increase resilience to climate change and protect the surrounding environment. The existing house design currently used by Rwanda Housing Authority (RHA) in its IDP has been modified to be more efficient in terms of energy and land use. The proposed typology reconfigures the dwelling plot and existing four in one house design to adapt to the sloping topography (up to 20% slope), reducing the need for costly and carbon intensive cut and fill and extensive site levelling and retaining structures. This design is more efficient in terms of energy and land use (making more land available for residential units) and improves slope stability reducing the risk of landslides and flooding. The housing typologies have also been adapted to allow for expansion in the roof space into a future mezzanine that offer the potential for two additional rooms. To reduce the embodied carbon associated with the IDP, the designs incorporate the use of soil stabilised brick structural piers (in place of high carbon structural concrete). The new design also has improved roof geometry for rainwater harvesting and an internal bathroom connected to a communal biogas chamber. Biogas will

enable households to cook without being reliant on fuelwood (either bought at high cost or illegally sourced from felling eucalyptus) and there will be improved ventilation in kitchens to deal with smoke from cooking.

**Each house will have a kitchen garden and composting point to support household production of nutritious vegetables and fruit.** To provide new off-farm skills and to bring construction costs down, the beneficiaries will be trained in low carbon construction techniques (Compressed Earth Blocks and Timber Roofing) and supervised by qualified staff during the construction phase to guarantee quality and structural stability (under component 4). Where possible, the beneficiaries will provide the labour for the construction of their own houses. An incremental, self-build model of construction will be used to build the capacity of local people in construction techniques that use sustainable building materials and 'green building typologies and technologies'. Local people will also be engaged in climate resilient landscaping as well as the construction of biogas plants and waste recycling structures. As well as providing shelter and access to services for 200 vulnerable families, the expanded housing development will create 580 construction jobs over 2 years and avoid 4308 t CO<sub>2</sub>eq over the project lifetime from the use of biogas.

**The development of the site will be undertaken by the Rwanda Housing Authority (RHA).** Throughout the construction period, RHA will act as the developer. The land where the settlement is being constructed belongs to the District of Gicumbi, who will donate the land to the IDP programme. Land title will pass from the District to the individual householders at the point of occupation. Technical assistance to support the construction of these houses would be needed (including provision of training in construction skills) and is proposed under a wider call down TA facility from FONERWA. Funding of the base infrastructure will be provided by MINIFRA as per the PM Order no.<sup>87</sup> which provides for the "full financing of basic infrastructure required, to and within the housing project area for housing project targeting low income beneficiaries".

**FONERWA and the District of Gicumbi will together oversee the allocation of the social housing according to the criteria described in the Cooperation Agreement between the FONERWA and the District.** The selection process is described in detail in the PIM and in the Cooperation Agreement between the Executing Entity (FONERWA) and Gicumbi District (attached as an Annex to the PIM). The Cooperation Agreement includes detailed provisions for the section of households for social housing. The housing will be allocated to poor and vulnerable people relocated from high risk zones. Responsibility for assigning houses to people/families lies jointly between the FONERWA Project Management Unit and the District of Gicumbi and the project expects that in excess of 50% of the available housing will be allocated to female headed households. The process for allocating the houses will include:

- Ensuring that affected community members are aware of the grievance mechanism
- Encouraging households which believe there has been inequity in the allocation of houses to raise the issue directly with the PMU in FONERWA

The District will undertake to allocate the houses to deserving households relocated from climate vulnerable areas (high risk zones) using the following criteria:

- a) Households assessed as extremely poor (in *ubudehe* category 1) which are female headed households and containing young children under 10 will be given the first priority;
- b) Extremely poor female headed households will be given the second priority;
- c) Other extremely poor households will be given the third priority; and
- d) Vulnerable households (in *ubudehe* category 2) will be given the fourth priority.

Where there are more qualifying households than houses available, the communities will select the beneficiary households in accordance with level of vulnerability. The District will provide details of the households which have been allocated houses in the Kabeza and Kaniga settlements upon request from FONERWA.

**A detailed cost breakdown of the development of climate resilient settlements has been provided** in an ancillary sheet on the budget in Annex 2. This provides the cost per household and the cost per beneficiary. Excluding the works supervision which covers both the housing and the communal green infrastructure, the cost per unit (for a 4 room house plus a kitchen and bathroom) is USD 11,562 in Kabeza. This compares to the current cost of an IDP house which is USD 9300. Although the cost is higher, there are considerable design benefits. The housing typology is more efficient in terms of energy and land use. It can be built on slopes up to 20% and it does not require cut and fill which improves slope stability and reduces the risk of landslides and flooding. It also uses local materials reducing the for imported, high carbon materials such as cement and steel which ultimately reduces construction costs. The new design also has improved roof geometry for rainwater harvesting and allows for incremental expansion into the roof space providing a further 2 bedrooms. Each house includes a garden kitchen and composting point and an internal bathroom connected to a communal biogas chamber. Biogas will enable

<sup>87</sup> Draft Prime Minister instructions n° ... of... determining the conditions and procedures for obtaining government support for affordable housing projects

households to cook without being reliant on fuelwood (either bought at high cost or illegally sourced from felling eucalyptus) and there will be improved ventilation in kitchens to deal with smoke from cooking. The cost per unit is therefore very reasonable considering the quality of building and hence we believe the intervention is scalable across the IDP programme as a social housing model but also beyond as an affordable home purchase in line and even lower than existing house prices for similar properties.

**Sub-component 3.4: Construct green social housing development in Kaniga to reduce the number of vulnerable households living in high risk zones (USD 2.7 million)**

**This sub-component includes the same activities as sub-component 3.3 at a different site.** In Kaniga, the project will invest in 100 new homes and green infrastructure for vulnerable families currently living in areas at risk from flooding and landslides. The housing typology is the same as for the Kabeza site.

**Kaniga is located near the Mulindi Tea Factory.** The site is well situated below a loop road that follows the natural ridge with an existing low density strip development of houses and only 2km from the Mulindi tea factory and 6km to the border post of Gatuna. Much of the site is currently used for agriculture. A good proportion of the site is at a reasonable gradient below 20 % and is suitable for development<sup>88</sup>. There is a mains electricity overhead connection available along the main road as well as a municipal water supply line. The site is defined as Urban sub core residential in the District land use and zoning plan but is a typical rural site, commonly found across the country, that has reasonable access and topography. The masterplan is arranged around winding roads and green infrastructure to minimise cut and fill and optimise access and land use efficiency (see Annex 1). The settlement was planned at over 14 units per hectare - with 100 houses. The development of the site will also be undertaken by the Rwanda Housing Authority (RHA) following the same process outlined in 3.4 above.

**Component 4: Knowledge transfer and mainstreaming (USD 3.2 million)**

**This component will ensure that climate resilience and green growth knowledge and learning from the project are effectively communicated and mainstreamed to promote the replication of effective adaptation strategies at the district and national level.** These activities will include a range of activities to raise awareness, build capacity and share project results, as well as mainstreaming to create the enabling environment for replication:

- 4.1 Communicate project results and lessons learned;
- 4.2 Awareness building, promotion and advocacy to support replication and scale up in other districts;
- 4.3 Increase capacity of local institutions and communities to sustain investments in watershed protection and climate resilient settlements;
- 4.4 Mainstream climate resilient approaches into existing forestry programmes and practices to support scale up and replication;
- 4.5 Mainstream approaches to climate resilient agriculture for smallholders into existing plans and programmes to support scale up and replication;
- 4.6 Mainstream climate resilient approaches into existing agriculture extension programmes to support scale up and replication; and
- 4.7 Mainstream energy efficiency into the tea industry to support scale up and replication.

**Sub-component 4.1: Communicate project results and lessons learned (USD 0.8 million)**

**This sub-component will analyse the results of the project and produce a range of knowledge products** including policy briefs and case studies to demonstrate the benefits of the project interventions. During the inception stage, the project will develop effective communications and knowledge management strategies and invest specifically in disseminating information. This will include the production of briefing notes for policy makers and the use of intervention sites to showcase best practice. Activities will include:

- Preparation of briefing notes for local and national decision makers
- Develop a communication strategy
- Develop a knowledge management strategy
- Farmer-to-farmer fora (cross visits, community meetings etc.)
- Development of participatory videos
- Competitions to reward innovative approaches to adaptation
- Media articles in newspapers, journals, newsletters, radio
- Website
- Forum and upkeep of website

<sup>88</sup> There is a fairly flat plateau in the centre of the site and the gradient increases dramatically towards the valley to over 20% gradient. There are two steep natural amphitheatres either side of the plateau. (Masterplan Kaniga, 2017).

- Develop and disseminate knowledge products
- Workshops to share results and lessons learned
- An ex-post cost benefit analysis
- Development and dissemination of knowledge products

**The additional value generated by the approaches to increase climate resilience will be assessed with a cost benefit analysis.** This will determine the value added by the project compared with existing approaches and practices so that scaling up can be justified. Peer-to-peer learning where community representatives meet other community representatives from areas where successful interventions have taken place will be used to support replication elsewhere. Dialogue and learning at workshops will ensure horizontal scaling up and the project will use a website, site visits, and the media to:

- broadly advertise project results and foster replication and scaling up of successful interventions,
- provide updates on the progress and project activities,
- disseminate case studies and emerging information from the project participants, and
- communicate lessons learned from project activities.

#### **Sub-component 4.2: Awareness building, promotion and advocacy to support replication and scale up in other districts (USD 0.6 million)**

**This intervention will build awareness and understanding of best practice approaches** successfully implemented by the project to support the adoption and replication of successful approaches and technologies at scale. It will target other district authorities, and cooperatives and will highlight benefits of successful approach and communicate lessons learned. This will include building awareness of all project interventions including: watershed protection; sustainable forest management; good CRA practice; IPM; and climate risks to settlements and measures to increase resilience. This will be achieved through national and local workshops and the production of guidelines, posters and leaflets. For example, to build awareness and understanding of green construction materials, technologies and approaches to low carbon, climate resilient settlement development, the project will finance workshops, study visits to the sites, and district meetings to present and discuss the low carbon construction technologies and design and highlight benefits.

#### **Sub-component 4.3 Increase capacity of local institutions and communities to sustain investments in watershed protection and climate resilient settlements (USD 0.5 million)**

**This sub-component will develop local capacity to plan for climate change and to increase resilience** through watershed protection. It will also develop capacity in the green building technologies and settlement design and maintenance to ensure that human settlements are more resilient to climate change. This will include:

- Capacity building of local institutions to plan and implement climate resilient land and water management regimes and scale up effective adaptation strategies in integrated Development Programme model villages at the community level
- Building capacity in watershed protection approaches
- Building capacity in sustainable forest management approaches
- Building capacity in green construction technologies (CEB, timber roof construction; house construction, operation and maintenance of biogas digesters, sand bed water filters, water harvesting)

**Enhancing capacities for planning, coordination and implementation at the local level is critical to ensure effective climate adaptation.** The project will target the training towards key staff in the local authority at District, Sector and Cell levels as local authorities currently have limited capacity to support project beneficiaries. At the District level this will include: Agronomist Officers, Environment Officers, Co-operative Officers, Infrastructure Officers, Land Officers, Forestry Officers and RAB CIP Officers as well as the contracted CIP service providers who organise seed and fertiliser distribution and provide extension advice. A capacity building programme will use project site visits as a training tool. At the sector level, the training will target the Agronomist Officer who covers many of the above functions dealing with aspects of rural infrastructure, lands adjudication/title registration, forestry and environmental management (responding to the respective four designated officers at District level) in addition to the 'primary' focus on agriculture, livestock and horticulture. Forestry Officers deployed at Sector level by MINAGRI and MINRENA respectively will also be included in this training. At the Cell level, the training will target the Social Development Officers (better known as the Integrated Development Programme Officers or 'IDPs') as this is the main salaried post concerned with agricultural and development issues. Training will also target relevant staff from local and national NGOs.

**Training will also be organised at the national level to build capacity up through a series of workshops to promote best practices.** Training will be delivered by project staff supported by technical specialists. The expected result of the training is an increased understanding of climate change hazards, an improved understanding of how Government can best support communities to increase their adaptive capacity to future climate variability and an enhanced capacity to support community adaptation. Training manuals, guidelines and other materials will be

developed and posted on the project website to help ensure the quality of any scaling up by describing the individual steps involved in the process and describing tried and tested approaches and tools. It is expected that the training will contribute to scaling up these approaches in other areas of the country beyond the end of the project.

Activities planned under this output include:

- Training needs assessment
- Training workshops and short courses for Government and NGO staff in gender sensitive adaptation planning
- Preparation of training and awareness materials
- Evaluation and revision of training materials

**Training will also target local communities so that they develop skills and expertise** in the range of interventions including forestry, agro-forestry, green construction etc. For example, the project will develop local capacity in low carbon home construction in Kabeza and Kaniga, including training for thin bed Compressed Earth Blocks masonry construction; timber roof construction; house construction, operation and maintenance of biogas digesters, sand bed water filters, and rain water harvesting. This will include the production of technical manuals and case studies to explain the green materials and design.

#### **Sub-component 4.4: Mainstream climate resilient approaches into existing forestry plans and programmes to support scale up and replication (USD 0.2 million)**

**This sub-component will support RWFA to integrate good forest management practices into existing national planning.** Activities will include:

- An Initial analysis of barriers to uptake, identification of entry points and appraise mainstreaming options
- Mainstreaming support for integration of new approaches and technologies into plans and programmes
- Mobilising funding for scale up and mainstreaming
- Assessing and evaluating the mainstreaming actions

It will draw on the lessons learned during implementation of forest renewal and management interventions as well as experience from supporting nursery development and investments in forest products and services. It will also link in closely to the activities under 4.3 building on the strengthened capacity to mainstream best practice into annual planning and programming across the sector.

#### **Sub-component 4.5: Mainstream climate resilient agriculture approaches into existing plans and programmes to support scale up and replication (USD 0.1 million)**

**This sub-component will mainstream evidence generated by the project into policies and plans at the national level** to create an enabling environment so farmers are empowered to implement adaptation measures. Project results and lessons learned will be synthesised to provide an evidence base to inform the scale up of climate resilient approaches in small-holder farming systems. This will be used to develop policy briefs, guidelines and other communication materials (under 4.1) highlighting key issues and examples of good practice and with a focus on approaches deemed most suitable for smallholder farmers. This will build key stakeholders' awareness and influence strategies, policies and programme development as well as planning and budgeting processes. The agro-ecological approaches and techniques rolled out to 1800 smallholder farmers under 1.5 will be disseminated via improved extension training materials along with practical and theoretical training with Provincial level technicians. Capacity building activities, including technical assistance and field visits will also provide an opportunity to share lessons learned during project implementation with key stakeholders. The activities will include:

- Developing extension training materials that incorporate climate resilient approaches; and
- Delivering training to extension staff.

#### **Sub-component 4.6: Mainstream climate resilient agriculture approaches (for tea and coffee) into existing extension programmes to support scale up and replication (USD 0.6 million)**

**This sub-component will take the lessons from the Gicumbi tea and coffee interventions and mainstream them into national strategy and programmes,** to ensure that the project has a transformational effect. It will:

- Mainstream climate resilient resilience into the tea and coffee extension services and FFS curriculum;
- Mainstream climate resilient planning into national tea sector development;
- Mainstream weather and climate services and IPM into the national extension curriculum; and
- Disseminate information through national workshops.

**The intervention will integrate climate resilient agriculture into the national farmer field school (FFS) programme for tea,** extending the curriculum to include climate information and climate resilient agriculture advice for smallholder farmers. This will be targeted at 12 existing tea co-operatives (8 000 tea farmers), developing the curriculum with climate risk assessments (technical assistance) to provide information on climatic risks, and using

farmer field school demo plots of climate resilient agriculture (new training for trainers and climate resilient demo plots out of grass strips and tree belts), to raise farmer awareness and encourage the uptake of climate resilient interventions. This will disseminate the knowledge and information from the project and enable replication at scale.

**Lessons from the project will also be mainstreamed into the existing extension programme for coffee** to improve understanding of climate change and increase the uptake of low regret climate resilient agriculture (mulching and shade trees), using the existing curriculum and field school demo plots (of climate resilient interventions) to again deliver the Gicumbi lessons at scale. This will be prioritised towards those coffee farmers with the highest risks, targeting 5000 coffee farmers (particularly women).

**A related intervention will be to create the enabling environment for the future climate resilient development of the tea sector nationally.** This will mainstream climate risk information for planned new developments (technical assistance) into the national tea development strategy, helping government to ensure planned sites are suitable for tea under future climate change and ensuring the right smallholder farmers are encouraged into production. It will also provide information, through the national investor portal, to inform new tea investors. This information is critical, because the development of new plantations involves irreversible land-use change (and the risks of lock-in) and involve extremely long-term investment cycles (30 years) and it is critical that these one-off early siting decisions are made to ensure that sector development is resilient for the future under climate change, rather than today.

**The sub-component will also mainstream weather and climate services and Integrated Pest Management into the tea and coffee extension services programme,** scaling-up the interventions in Gicumbi. This will ensure that this information is included in the FFS curriculum and it will provide the IT support to provide national SMS information for farmers (for weather and climate, and pest monitoring and surveillance) to disseminate the intervention at scale. Finally, to ensure these activities are mainstreamed into national development planning and disseminated to relevant actors in the tea and coffee sectors, national and province level workshops and dissemination activities will be undertaken.

#### **Sub-component 4.7: Mainstream energy efficiency into the tea industry to support scale up and replication (USD 0.3 million)**

**This sub-component will promote the uptake of energy efficiency in the industrial tea sector in Rwanda,** using the lessons from the Mulindi tea factory, to ensure green growth is mainstreamed in current and future tea sector development policy. As highlighted earlier, tea factories are the largest industrial source of greenhouse gas emissions in Rwanda, and the Nationally Appropriate Mitigation Actions (NAMA) analysis identified the reduction of GHG emissions from the tea sector as a national priority. The project (technical assistance) will assess the potential for energy efficiency in the industry and hold a national workshop (under 4.1) to promote energy efficiency in existing tea factories, using the Mulindi tea factory as a best practice example. It will then introduce a mainstreaming programme into national tea strategy and programmes, using technical assistance to provide advice on energy use and options in tea factories on energy efficiency, to encourage the uptake of Tier 1 (good practice) energy efficiency improvements across the industry. As part of this programme, there will be capacity building and training for national experts. These activities will address the current information barriers which have prevented uptake of these measures to date. Assuming that factories take up and implement this advice (using their own financing to implement the measures), with a 50% uptake of measures, the subsequent carbon savings are large, estimated at 47072 tonnes of CO<sub>2</sub> over the project period.

**The sub-component will also introduce new energy efficiency standards** (with the provision of technical assistance) for the planned expansion of the tea sector, which aims for a doubling of production in Rwanda, to ensure that low carbon development is mainstreamed into the sector's development plans. These standards will be based on the lessons from Mulindi, including the advanced energy efficiency options, and also provide case study material from the site.

## **C.4. Background Information on the Executing Entity**

*Describe the quality of the management team, overall strategy and financial profile of the Sponsor (Executing Entity) and how it will support the project in terms of equity investment, management, operations, production and marketing.*

### **The management team**

**The Ministry of Environment, MOE, is the project sponsor and FONERWA is the executing entity.** MOE will be accountable for the overall management of the project and will assume an oversight role while FONERWA will be responsible for the delivery of all project outputs.

### **Overall strategy and financial profile of the Executing Entity**

**FONERWA was established by the GoR in 2012 as a national basket fund for climate and environment (FONERWA) to mobilise and manage the flow of climate funds across various sectors of the Rwanda economy.** FONERWA is now the primary vehicle through which additional environment and climate change finance is channelled, programmed, disbursed and monitored in Rwanda. The FONERWA Law formed the primary basis for the design of the fund. Initial seed capitalisation of GBP 22.5 million was provided to FONERWA in 2012 by the UK's International Climate Fund (ICF) and GoR has contributed USD 4.3 million demonstrating its commitment to supporting LCCR growth. FONERWA has also served as the financing channel for the GCF readiness support funds for the NDA support and the strategic framework. FONERWA has a well-established operating system requiring project developers to clearly demonstrate aims, objectives, methods and anticipated results and monitoring systems, value for money, stakeholder engagement, and addressing gender and equity issues as cross cutting issues. To date, FONERWA has financed projects valued at USD 40 million and has played a key role in attracting climate finance. Since 2013, FONERWA has leveraged over USD 3 million in private sector finance into LCCR projects including hydropower, off-grid solar power, sustainable buildings, and biogas projects.

**The Governance structure of FONERWA has been developed to allow oversight and GoR control of its projects.** The Prime Ministers Order (PMO) sets out the governance arrangements and gives powers to FONERWA's Fund Management Committee to provide overall oversight of the fund. The PMO also makes provision for the internal rules and procedures that guide the functioning of other levels including FONERWA's Fund Technical Committee as well as the participation and roles of development partners, private sector and NGOs in decisions that are taken at each level. This project has been designed under the guidance of MOE and endorsed by a specially convened Ministerial group. As such, it aligns to the Governments' drive to accelerate real, tangible development through climate resilient investments on the ground.

**FONERWA provides the necessary and appropriate institutional arrangements to meet the criteria of international climate funds.** It maintains high standards of fiduciary management, aligned with GoR best practice and systems, including environment and social safeguards. It channels finances on a competitive basis to Government agencies, Districts, CSOs and the private sector using a range of financial instruments (grants, loans etc.). Delivering GCF project interventions through a capable national institution such as FONERWA with high levels of accountability will further strengthen country ownership.

*Further details on the management team, financial profile of FONERWA and the implementation arrangements are provided in the Project Implementation Manual at Annex 5 and Section C.7.*

### C.5. Market Overview (if applicable)

*Describe the market for the product(s) or services including the historical data and forecasts. Describe the competitive environment including the list of competitors with market shares and customer base and key differentiating factors (if applicable). Provide pricing structures, price controls, subsidies available and government involvement (if any).*

na

### C.6. Regulation, Taxation and Insurance (if applicable)

*Provide details of government licenses or permits required for implementing and operating the project, the issuing authority, and the date of issue or expected date of issue. Describe applicable taxes and foreign exchange regulations. Provide details on insurance policies related to project.*

**Government permits:** A number of permits will be required and will be secured by the project team under FONERWA. The District Authority will provide the Construction Permit and authorisation for land use change for the housing developments as well as permits to harvest forest and transport forest products. An EIA certificate is also required and has already been provided by RDB. Approval is also required for irrigation works and for works using the surface waters (e.g. rainwater harvesting) and will be obtained from the Minister in charge of water resources. The Rwanda Agriculture Board (RAB), in collaboration with Agriculture and Livestock Inspection and Certification Services/MINAGRI will provide permits to import forest plant material and seeds. There are also comprehensive regulations governing all phases of the procurement process including publication of opportunities and notification of award decisions prior to contract execution. These regulations along with a comprehensive list of permits required can be found in Annex 4 of the legal study (accessed via the link in Annex 1). Section 3 of the PIM (also accessed via the link) also includes coverage of and makes provision for all of the regulations applying to the project in order to comply with the Rwandan regulatory framework and meet MOE's obligations under the AMA and any future FAA.

**Foreign exchange regulations:** Exchange control is administered by the Bank of Rwanda and is governed by Exchange Control. Both the current account and capital account have been liberalised. All residents and non-residents are free to bring in and take out capital with minimal restriction.

**Taxation and insurance:** As a Government institution, MOE is required to follow the Rwandan constitution<sup>89</sup> and abide by the national regulatory and tax framework. As the recipient of the GCF grant, MOE will therefore be liable for taxes on goods and services in accordance with national law. For VAT, under Law no 37/2012 of 09/11/2012 goods and services will be zero-rated since they are for a project funded by a partner that has a signed agreement with the Government of Rwanda.

In the design, any other tax liabilities will be borne by the government and have been built into project financing plans and audit accounts and records of tax payments will be used to monitor the ongoing compliance with national tax laws. The PMU will check that all necessary insurance cover is in place prior to signing contracts with service providers.

### C.7. Institutional / Implementation Arrangements

*Please describe in detail the governance structure of the project, including but not limited to the organization structure, roles and responsibilities of the project management unit, steering committee, executing entities and so on, as well as the flow of funds structure. Also describe which of these structures already in place and which are still pending. For the pending ones, please specify the requirements to establish them.*

#### Arrangements for External Financing

MOE is the Accredited Entity as per the Accreditation Master Agreement (AMA) signed with the GCF in June 2016. As the designated Party in the AMA, MOE will sign the Funded Activity Agreement (FAA) related to this project. As Per Article 30 of the Ministerial Order N°001/16/10/Tc of 26/01/2016 Relating To Financial Regulations, all External Financing Agreements with the Government of Rwanda must be signed by the Minister of Finance and therefore MINECOFIN will be a co-signatory party of the FAA.

Funds received by MOE under the FAA will be paid directly into a project bank account under the management of MOE.

#### Implementation arrangements between AE, Executing Entity (EE), Gicumbi district and implementing partners

MOE in its role as the Accredited Entity has the overall responsibility and oversight for the project including project implementation and supervision, financial management, and project monitoring and reporting. It is responsible for:

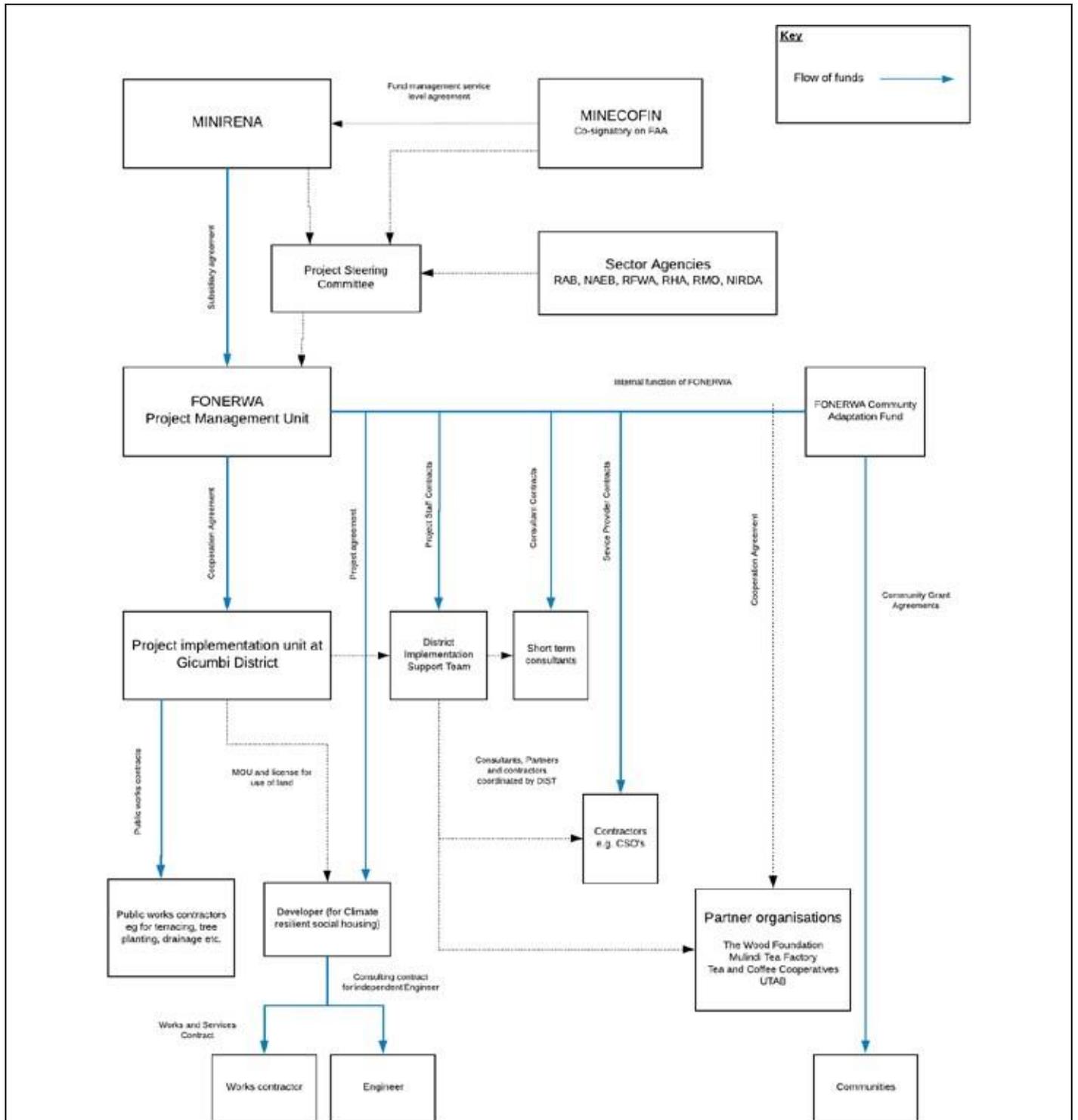
1. Liaising with MINECOFIN on the External Funding arrangements;
2. Receiving funds from GCF, distributing funds to the Executing Entity;
3. Chairing the Project Steering Committee;
4. Accounting for funds under its disposition;
5. Preparing project lifecycle plans and budgets;
6. Preparing annual plans and budgets;
7. Receiving and reviewing quarterly financial and progress reports from all entities which have received funds under the GCRDP;
8. Carrying out due diligence on all entities which receive funds under the GCRDP;
9. Managing fiduciary and project risks; and
10. Providing reports to the GCF on all the above.

MOE will sign a Fund management service level agreement with MINECOFIN to enable it to manage GCF requirements under AMA, FAA and Rwanda law. MOE will perform a Quality Assurance role to ensure work done under the project is delivered to the appropriate quality standards and that procedures are appropriately implemented within the project. The quality assurance process typically deals with three competing dimensions of a project: time available to complete a project; cost/available budget; and scope of work. Quality Assurance (QA) will be achieved through a three-stage process: 1) Develop a Quality Assurance Plan (to be updated annually); 2) Collect data; and 3) Analyse Project Quality. More detail is provided in the PIM. As the QA function will be carried out by MOE, the costs will not be part of the project budget. These will be covered by the AE Fee.

The Executing Entity of the project, FONERWA, will have overall responsibility for implementation of the Project. MOE will conclude a Subsidiary Agreement with FONERWA for the implementation of project activities. The agreement will set out the obligations of the Executing Entity in implementing the project activities. An internal rules and procedures document will be developed as part of the implementation tools for the operationalization of an autonomous FONERWA under the new law. This will be endorsed by the Board of Directors of FONERWA following their appointment. FONERWA will appoint a Legal Advisor to i) draft and negotiate contracts for MOE; ii) work with Procurement Unit; iii) monitor compliance; ii) to advise on implementation; iii) to comment on project contracts at all levels and iv) to report on legal aspects of the project.

The implementation and contractual arrangements between MOE, FONERWA, Gicumbi District and implementing partners as well as the flow of funds is shown in Figure 3.

<sup>89</sup> Article 81 of the constitution of the Republic of Rwanda stipulates that no exemption from or reduction of tax may be granted unless authorised by law.



**Figure 3: Implementation arrangements, contractual arrangements and the flow of funds**

Note: GCF Proceeds will not be used for sub-grants, only for “goods, services and works” as to be determined in the FAA

MOE will be the recipient of bank transfers from the GCF. An account for GCF funds already exists in the National Bank of Rwanda under MOE as the recipient and user of the PPF funds. The Minister of Finance will sign the Fund management service level agreement in reference to the FAA to ensure that the Ministry of Finance is informed of and acknowledges external funds flowing to the country.

FONERWA will be responsible for:

1. Planning the project activities;
2. Receiving funds from the Accredited Entity;

3. Disbursing grant funds to implementing entities and other service providers, after due diligence;
4. Establishing and staffing the Project Management Unit in FONERWA;
5. Funding and contracting (in conjunction with the District authorities) the staffing of a district-based Project Implementation Unit;
6. Accounting for funds under its disposition, receiving reports from implementing entities and other service providers to which funds have been disbursed;
7. Preparing annual workplans and budgets;
8. Organising oversight and audit (internal, financial, procurement);
9. Managing the provision of funding and payment of contractors and consultants engaged under the Project;
10. Providing support to the District (including training and coaching for District officers engaged in the implementation of the project, including the payment of allowances at the authorised Government of Rwanda rates);
11. Managing the provision of funding and payment of contractors engaged under the Project; and
12. Financing community grants and managing a Community Adaptation Fund (the grant award mechanism is described in Annex 1 of the PIM).

**The main implementing entity within Local Government level will be Gicumbi District**, which will be responsible for delivering the core activities for all components. The activities will be integrated into the Single Action Plan and will be reported on at the District Management Meetings, chaired by the Executive Secretary. The contractual arrangements between FONERWA and the District will be managed through a Cooperation Agreement provided in the PIM. Gicumbi District will be responsible for:

11. Ensuring that project activities to be delivered during the next financial year are incorporated into the District Single Action Plan and *Imihigo* agreements;
12. Ensuring that activities to be funded by the District (see co-financing sheet in Annex 2 – project budget) are incorporated into the District budget and Procurement Plans as necessary;
13. Ensuring that the key heads of department take ownership of and implement the agreed activities;
14. Participating in the recruitment of staff for the Project Implementation Unit;
15. Providing office accommodation for the Project Implementation Unit;
16. Ensuring that all expropriation and land acquisition costs, livelihoods restoration and associated costs are incorporated into District plans and budget;
17. Timely approval of permits for forestry activities, tree felling and construction works at Kaniga and Kabeza;
18. Timely approval of other permits that may be required in the execution of this Project
19. Convening Community Coordination Committees under the chairmanship of the Sector Executive Secretary and with volunteer participation from NGOs, civil society and representatives of womens' organizations and organising meetings with the population at the sites where the project activities are to be performed before implementation
20. Participating in training events related to gender responsiveness which will be organised by FONERWA
21. Ensuring female headed households are prioritised in the allocation criteria for social housing;
22. Ensuring women are provided with training under the projects, which may include women-only training events;
23. Ensuring women are able to apply for and access work opportunities on an equal basis to men (such as house building etc).

### Proposed governance structure of the project

**The governance arrangements for the project at the national level are designed to build upon the institutional structure of MOE (the accredited entity) and FONERWA (the executing entity).** An inter-ministerial Project Steering Committee (PSC) chaired by the Permanent Secretary will be established by MOE to serve as the project's coordination and decision-making body. The PSC will ensure the project delivers its outputs and achieves its outcomes. The Committee will meet on a quarterly basis to review project progress and evaluations, facilitate implementation (ensuring the necessary resources and support are provided in a timely manner) and provide guidance to the PMU. The Steering Committee will also facilitate effective coordination between the key stakeholders at the national and district levels and ensure the project aligns with Government strategies and programs. The Steering Committee will reflect the multi-sectoral nature of the project, and will include senior-level representatives from GoR and partner organisations. The PSC will be chaired by the Permanent Secretary, MOE (or the Director of Finance, MOE) with representatives from: MININFRA, Rwanda Housing Authority, REG, REMA, RWFA, MINALOC, Rwanda Development Board, MINAGRI, RAB, NAEB, MINECOFIN, FONERWA, Vice Mayor of Economic Affairs, Gicumbi District. The PSC meeting minutes shall be taken in the format prescribed in the PIM.

### Project Management Unit

**FONERWA will establish a Project Management Unit (PMU) which will be housed internally within FONERWA.** The PMU will be responsible for delivering the project and will be ultimately responsible for the timely delivery of inputs and outputs and for coordination of project activities. The PMU will use FONERWA's financial and management systems to administer the GCF funds and draw down on the technical assistance available through its call down list of consultants and the climate change unit in REMA. This will maximise efficiencies of existing processes but importantly ensure strong fiduciary standards are adhered to and robust monitoring and evaluation is carried out, in accordance with existing FONERWA requirements. The PMU will comprise a number of technical specialists – providing either full time or part time inputs including:

24. Team Leader
25. Strategic Advisor
26. Financial Management Specialist
27. Procurement Officer

28. Accountant
29. Legal Advisor
30. Internal Auditor
31. Communications Specialist
32. Office Manager/ admin assistant for Kigali

Terms of reference for these posts are provided in the PIM.

**The Team Leader will ensure the efficient disbursement and use of GCF funds and the timely delivery of project inputs and outputs.** S(he) will also coordinate all project activities and will coordinate Steering Committee meetings, technical assistance and contractors by assisting in recruiting and contracting of project personnel and consultant services, sub-contracting and procuring equipment in accordance with Government guidance and procedures. S(he) will prepare quarterly progress reports, work plans and budgets which will be reviewed by the Steering Committee. All reporting will be in accordance with the project sponsor's (MOE) rules and regulations with support from the Monitoring and Evaluation Specialist (district based –see below) and the Finance Manager. The Financial Management and Procurement Specialists will be responsible for contracts, procurement, book-keeping and day to day financial aspects of project implementation.

In addition to the above arrangements, responsibility for export promotion of tea and coffee lies with the Province Zone Coordination Office, who must also participate in the management of the tea and coffee interventions. Capacity to implement a major new project within Local Government is limited: staff are fully engaged on their existing activities. For this reason a Project Implementation Unit (PIU) based in Gicumbi and staffed with specialists will be appointed to support the District in the implementation of the project. The specialists will be contracted to FONERWA, however they will be dedicated to work in and for the District and the District management will be fully involved in the recruitment of the contracted specialists. The role of the PIU is to support the District in (i) technical implementation of the project (ii) capacity building and (ii) administrative support activities including M&E data collection and lesson learning. Eight positions (comprising full time and part time positions) are proposed:

33. Watershed protection and agriculture specialist
34. Forest management specialist
35. Infrastructure specialist
36. Climate resilient agriculture specialist
37. An M&E specialist
38. Social safeguards specialist (including gender)
39. Environmental safeguards specialist
40. Trainer (capacity building specialist, to work with communities and District staff to ensure that sustainable capacity is instituted at all levels and that lessons learned are captured and reflected in on-going plans)
41. Administrator for Gicumbi office

The PIU team will be recruited in the first 6 months of the project and will be retained until the end of the project (however, not all of the posts will be full time and not all will be required until the end of the project). ToRs for the PIU and its organisational diagram are provided in the PIM.

**Local entities will identify, prepare, and/or supervise activities supported by and compatible with the project.** Many activities supported by the project will require full engagement with communities, for example, construction of terraces and settlements and community members will be provided with employment opportunities and training. Whilst procurement of project activities will be carried out primarily by central or District Implementation Teams, the communities will be heavily involved in the selection and oversight of activity execution. Further, some activities will be carried out at the local level by community based organisations and their members, for which community-based procurement procedures will be used. Community-based organisations will also be involved in monitoring and evaluation of project activities, in line with the philosophy of the project to promote participatory M&E and engaging the direct beneficiaries to ensure, for example, that: women have an equal opportunity to benefit from livelihood activities; and opportunities for house purchase are fairly applied.

**It is therefore expected that the specialists in the Project Implementation Unit will engage extensively at the community level** and the Unit will have a budget to facilitate working in the communities. In order to ensure that there are multiple ways for the communities to engage with the project sector-specific Community Consultation Committee (CCC) is proposed to be established in each sector where the project is being implemented. The CCC will provide a platform for sector and community leaders to engage with farmers and other community members for each site. Activities would cover

42. Planning and M&E of project activities at community level;
43. Community discussions, community consultations;
44. Mobilising community participation and facilitating communication;
45. Output evaluation, lesson learning; and
46. An independent point of entry for the grievance process.

The CCC will be chaired by the Sector Executive Secretary and Secretary will be the Sector Governance Officer. Membership will include Community representatives and representatives from CSOs and NGOs, Church Groups; Sector & Cell Representatives from the Woman's Forum; Sector and Cell Representatives for people with disabilities/marginalised groups. Meetings will be every quarter, attended by the Project Implementation Unit Team and will as much as possible align with and involve the Joint Action Development Forum as applicable. The project will pay facilitation for people attending.

**The construction and supervision methodology with key contractual agreements**

**The activities and funding will be programmed through the PMU but will largely be managed and implemented through relevant partner organisations.** The PMU will manage a small proportion of the services provision directly, such as technical advice and capacity building provision. The main partners in implementation are expected to include but are not limited to: The Wood Foundation, Rwanda Housing Association, Rwanda Agricultural Board, National Agricultural Export Development Board, Send A Cow Rwanda and the University of Technology and Arts of Byumba. Additional partners may be identified during the inception phase. The following Ministries/agencies through their Special Project Implementation Units (SPIUs) will also be involved in supporting the different work streams and integrating the results from project interventions into policy and planning decisions:

47. MINAGRI, RAB and NAEB – low regret resilient tea options and other agricultural interventions;
48. REMA and Rwanda Meteo – climate and weather service;
49. RWFA – sustainable forest management; and
50. MININFRA, Rwanda Housing Authority and REG – low carbon settlements.

SPIUs are specific implementing entities established within Ministries to deliver projects. As such they have structure that is dedicated to delivering projects for which the ministry is responsible. These SPIUs will be the first opportunity to engage Ministries in project delivery and enhanced ownership and sustainability.

**To increase uptake and replication of the project interventions the PMU will ensure that results are communicated through Sector Working Groups (SWGs).** The SWGs provide a forum for dialogue that includes development partners who intervene in the sector as determined by the GoR division of labour modality, ownership and accountability around the development agenda by a multi-stakeholder group at the sector level. These groups build synergies in policy formulation, implementation and undertake biannual joint sector reviews as a part of high level monitoring of implementation that feeds into the EDPRS2 results framework. The project will regularly report results to the SWGs and provide inputs as a measure for continuous improvement of project delivery.

**Gicumbi district office will oversee and coordinate the implementation of project activities in Gicumbi.** The Vice Mayor (Economic Affairs) will oversee interventions with assistance from the senior management team including the Executive Secretary and Director of Planning while district technical staff will provide technical support where needed and report on progress. In addition, the District Joint Action Development Forum (JADF) will support and assist local stakeholder engagement with the project. JADFs bring together Central and Local Government institutions, Development Partners, Civil Society and the Private Sector involved in district development and play an important role in implementing the Government's Decentralised Governance and Service Delivery Policy in decentralising budgets, decision making and interventions to the district level. The project targets will be integrated into the annual District performance contract (*Imihigo*) which focuses on key indicators that are closely monitored and reported regularly in national forums including those presided over by the President of the Republic and/or the Prime Minister. The contractual agreements between the PMU and the partner organisations and any due diligence and credit analysis (if required) will be undertaken during the inception phase.

**C.8. Timetable of Project Implementation**

Please provide a project implementation timetable in [section I \(Annexes\)](#). The table below is for illustrative purposes. If the table format below is used, please refer to the activities as numbered in Section H. In the case of outputs, please mark when all the required activities will be completed. Detailed workplans for each component are provided in Annex 2.

## D.1. Value Added for GCF Involvement

*Please specify why the GCF involvement is critical for the project, in consideration of other alternatives.*

**Rwanda is one of the most vulnerable countries in the world to climate change.** The expected impacts on climate change in Rwanda are well documented in the national communications to UNFCCC, the Stockholm study and the recent climate vulnerability analysis. High levels of poverty, a shortage of land and rapid population growth combined with Rwanda's hilly topography are creating huge pressures on its natural resources. Climate change impacts will combine with these anthropogenic factors to significantly damage Rwanda's growth and development with implications for economic and social stability in the country as well as the region. Urgent action is needed to deliver the national strategies that have been developed by the Government.

**As one of the poorest countries in the world, Rwanda does not have the necessary financial resources to adopt the programmes of action needed to deliver national priorities for green growth and climate resilience set out in the EDPRS II, the GGCRS and the NAPA.** There is high potential to shift Rwanda to LCCR development pathway but this will require a substantial investment of resources. As a least developed country, Rwanda needs external financing to fund the additional net economic costs of climate change, and deliver its vision of a low carbon route to development. Climate change is already affecting large numbers of vulnerable households throughout Rwanda particularly those dependent on rain-fed agriculture. The upfront investment costs needed to shift Rwanda toward more climate resilient green growth are a significant barrier for pursuing these development pathways. A GCF contribution is therefore crucial to build on the progress Rwanda has made so far and take this project forward. Whilst National Budget contributions currently facilitate a step by step delivery of LCCR development, GCF funding will enable the immediate roll out of proposed interventions, thereby i) enabling rapid delivery of climate resilience; and ii) providing immediate information with which to inform the wider national development agenda. The GoR has received financial assistance in the past from a variety of climate funds (LDCF, Adaptation Fund etc.) and bilateral agencies (DFID, KfW etc.) but the ongoing and projected need for funding exceeds the capability of these funds many of which have introduced country caps due to a shortage of funds. For example, a study by the Stockholm Environment Institute (SEI) financed by DFID on economics of climate change projected that Rwanda will need between USD 50 – 300 million per year up to 2030 to address current and future impacts of climate change on economic growth. The projected amount refers to additional resources beyond the current levels of development aid and as such happens to be exactly what climate finance must be available to address.

**Rwanda needs GCF support now to avoid the predicted higher costs of adapting to climate change in the future.** Failing to act now will result in higher costs downstream from damage caused by extreme weather events and the additional costs of supporting higher numbers of poor households affected by lower agricultural production associated with erratic rainfall patterns and rising temperatures. For example, without effective intervention now, Rwanda's planned expansion of the tea sector will take place without adequate consideration of climate risk. GCF is mandated to support developing countries in limiting their greenhouse gas emissions and adapting to the impacts of climate change. If the needs of Rwanda are taken into account considering its lack of financial resources and that it is particularly vulnerable to the adverse effects of climate change, there is a strong case for GCF support. Supporting the proposed project will demonstrate the fund's commitment to enabling developing countries, such as Rwanda, that have demonstrated high levels of commitment, ownership, capability and fiduciary management to manage their own LCCR growth agenda. Evidence has already been presented by the Adaptation Fund showing that direct finance through countries like Rwanda is more cost effective than channelling funds through multilateral agencies with quicker start up times and lower transaction costs, the underlying rationale for direct access of climate finance by developing countries. With robust systems already in place and a strong track record in resource management, the fund can minimise its risk and maximise the impact of its funding.

**The proposed interventions have been designed with significant stakeholder participation and designed in a cost effective way to ensure sustainability of outcomes.** Supporting climate resilient tea production and forest services and products will ensure that some of the most vulnerable households in the district participate and benefit from the project. The innovative approaches put forward will also showcase what is possible and the knowledge management component will facilitate effective lesson learning and communication of results to maximise the uptake of successful approaches. Directly financing MOE (and hence FONERWA) also means that expertise developed during the project is internalised to a national institution that can gain the capacity to promote uptake more widely and is already mandated to coordinate climate finance at the national level. The proposed interventions are well aligned with GCF funding priorities and meet the investment criteria as set out in Section E.

## D.2. Exit Strategy

*Please explain how the project sustainability will be ensured in the long run, after the project is implemented with support from the GCF and other sources, taking into consideration the long-term financial viability demonstrated in E.6.3. This should include a description of strategies for longer term maintenance of physical assets (if applicable).*

**As previously outlined, the project aligns to national and sectoral development strategies with high level commitment, ensuring sustainability is built into the design.** These include the National Strategy for Transformation, and the National Strategy for Climate Change and Low Carbon Development (the Green Growth and Climate Resilience Strategy GGCRS), as well as sector strategies including the Programme for Transformation of Agriculture (Phase IV), the National Forest Policy, National Disaster Management Policy (MIDIMAR, 2012, Energy Sector Strategic Plan, and the Urbanisation and Rural Settlement Sector Strategic Plan (2012 – 2017). There is high level of GoR commitment to the project objectives which builds in sustainability to the project design and ensures ownership beyond the end of GCF funding. The inclusion of mainstreaming interventions ensure that successful climate actions embed into current and future sector plans and continue beyond the end of the project further strengthening the sustainability.

**The project will embed deliverables in local performance contracts, budgets, procurement and development plans to create commitment to project goals at the district, sector and cell level.** This will ensure project participants (district authorities, local communities, contractors etc.) have a shared vision of outcomes and are committed to delivery timelines and objectives. The use of local performance contracts is widespread and accepted throughout Rwanda and has been shown to be an effective means of delivering development targets. Moreover, integrating the deliverables within district budgets, procurement and development plans ensures that resources are properly allocated and administered within existing systems and structures. At the community level, the project will establish tripartite contracts between the project, the communities and the district/sector authorities to define roles, responsibilities and set objectives at the local level.

**The financial structure of the project and the individual interventions have been designed to ensure long-term sustainability (see Section E6.1 and E6.3).** Interventions has been chosen that will have financial viability in the long run beyond the Fund intervention period, and in cases where demonstration interventions have been selected, separate activities will ensure their continued uptake. The project also has focused available finance towards barriers to adaptation and mitigation, to enhance the enabling environment, and thus ensure longer-term impact. For example, under component 3, the cost per housing unit (for a 4 room house plus a kitchen and bathroom) is USD 11,562 in Kabeza<sup>90</sup>. This compares to the current cost of an IDP house which is USD 9300. Although the cost is higher, there are considerable design benefits (set out in section C1). The cost per unit is therefore very reasonable considering the quality of building which means this approach is scalable across the IDP programme as a social housing model but also beyond as an affordable home purchase in line and even lower than existing house prices for similar properties. A detailed cost breakdown of the development of climate resilient settlements has been provided in an ancillary sheet on the budget in Annex 2.

**The strong emphasis on local capacity building will create the skills and expertise needed to shift to adapt to climate change and adopt low carbon development.** Equipping rural communities with skills in climate resilient agriculture, forestry and forest enterprises, land husbandry etc. along with providing opportunities to use these skills in paid permanent employment will enable them to reduce their dependency on farming and provide a long-term solution to the over-cultivation of marginal lands in the target areas which exacerbates and contributes to climate vulnerability. By partnering with cooperatives and local communities, the project will create new economic opportunities for climate vulnerable households around key sectors that can grow and flourish in Gicumbi and establish a foothold for climate resilient livelihoods.

**Adopting a participatory approach will root ownership of the interventions firmly in local communities.** The project will be based on principles of local empowerment and implemented by grassroots organisations such as farmer groups, community based organisations and local NGOs with the support of local government. The success of the project will depend on the ownership and implementation by the District authority. Engaging communities in the design and implementation of the project and creating local employment and enterprise development, will empower and build capacity of local people to adapt to climate change risks. Local communities have been widely consulted during the design exercise and will continue to play a significant role as the interventions evolve. A stakeholder engagement strategy will be developed during the inception phase and opportunities identified where local people can play a leadership role in implementation. The project will establish community-based structures to ensure the ongoing operation and maintenance of physical assets. To ensure the sustainability of the small-scale infrastructure introduced by the project (water harvesting facilities, biogas, reed beds etc.), the project will establish a variety of committees at the sector and cell level to manage and maintain the structures. The role of the committees will be to follow up, monitor, maintain and rehabilitate the small-scale infrastructure after the end of the project (see 3.3 in Section C.3).

<sup>90</sup> Excludes the cost of works supervision which covers both the housing and the communal green infrastructure.

In this section, the accredited entity is expected to provide a brief description of the expected performance of the proposed project against each of the Fund's six investment criteria. Activity-specific sub-criteria and indicative assessment factors, which can be found in the Fund's Investment Framework, should be addressed where relevant and applicable. This section should tie into any request for concessionality made in section B.2.

## E.1. Impact Potential

Potential of the project to contribute to the achievement of the Fund's objectives and result areas

### E.1.1. Mitigation / adaptation impact potential

Specify the mitigation and/or adaptation impact, taking into account the relevant and applicable sub-criteria and assessment factors in the Fund's investment framework. When applicable, specify the degree to which the project avoids lock-in of long-lived, high emission or climate-vulnerable infrastructure.

**The project will have a significant impact on adaptive capacity and resilience among vulnerable groups as well as increased awareness of climate threats and risk-reduction processes.** The main adaptation benefits will accrue to vulnerable communities primarily engaged in agriculture on Gicumibi's slopes, achieved through improved soil and water management, forestry and agroforestry which reduce erosion and the reduced vulnerability to catastrophic events affecting production systems. Creation of new/green economic opportunities will enable 75,000 people dependent on rain-fed cultivation of marginal lands to transition to diversified, climate resilient livelihoods. Moreover, the agriculture interventions have a high impact potential through the targeting of highly vulnerable small-holder farmers reaching 1800 smallholders, 4900 tea farmers and 2500 coffee farmers in Gicumbi, as well as 8000 tea farmers and 5000 coffee farmers nationally. By including support for integrating the use of climate and weather information into decision-making by farmers, the project will also build resilience and enable farmers to better plan planting and application of inputs. This will increase the resilience of the agriculture sector, including Rwanda's major source of exports tea and coffee (which represent 25% of all exports by value) and thus contribute to national development objectives and climate resilient growth. In all an estimated 150,000 people will be direct beneficiaries of the project.

**Mitigation interventions target high emission sectors and so also have high impact potential.** Investments in forestry, efficient technologies for cooking, and increased efficiencies in tea factories will result in significant reductions in emissions, as well as delivering wider ecosystem services benefits. The most significant impact will be achieved through improvements to the operating system of tea factories across Rwanda, with energy efficiency avoiding up to 70,105 tCO<sub>2</sub>e over the course of the project. The tea sector (factories) is identified as the key priority in the NAMA for reducing current industrial emissions and the cost-effectiveness of options to reduce emissions is extremely high. The support for biogas and improved cookstoves also has high impact potential, given the widespread use of inefficient cooking methods using wood and charcoal, with expected emission reductions of 59,261 tCO<sub>2</sub>e over the 6 year period in Gicumbi. The forestry and agro-forestry will also result in a significant reduction in emissions (70,060 t CO<sub>2</sub>eq from agroforestry and 69,986 t CO<sub>2</sub>eq from forestry) over the project period. However, all of these interventions will generate additional emission savings (after year 6) as a result of these interventions, thus the total emission benefits of the project is much larger than this.

In all cases, the cost-effectiveness of these interventions is high, as presented in Section E6.1.

### E.1.2. Key impact potential indicator

Provide specific numerical values for the indicators below.

GCF core indicators	Expected tonnes of carbon dioxide equivalent (t CO <sub>2</sub> eq) to be reduced or avoided (Mitigation only)	Annual	45,620 t CO <sub>2</sub> eq (annual savings, averaged over the 6 years of project)
		Lifetime	273,720 tCO <sub>2</sub> eq over the project lifetime (6 years)
	<ul style="list-style-type: none"> <li>Expected total number of direct and indirect beneficiaries, disaggregated by gender (reduced vulnerability or increased resilience);</li> <li>Number of beneficiaries relative to total population, disaggregated by gender (adaptation only)</li> </ul>	Total	150,000 direct beneficiaries (incl. 78,450 women) and 381,465 indirect beneficiaries <sup>91</sup>
		Percentage (%)	96% (incl. 52.3% women) of the population living in the 9 target sectors (150,000 / 156,008)

<sup>91</sup> Indirect beneficiaries include: a) farmers outside the target area using weather and climate services to increase productivity and reduce losses from weather and climate variability; b) farmers outside the target area using IPM surveillance information to reduce pest and disease attack; c) Farmers adopting CRA after farmer to farmer cross visits and viewing participatory videos; d) Policy makers and practitioners participating in workshops; g) GoR and NGOs trained in climate resilient forestry, watershed management and green settlements; e) People benefiting from climate resilience plans adopted and implemented; f) People benefiting from forestry mainstreaming and new investments. The figure does not include g) Individuals employed in forest processing and forest product enterprises beyond the target area; h) the wider population outside the target area in relation to their reduced exposure to soil erosion, landslide, flooding and watercourse siltation;

**Other relevant indicators**

The climate impacts of the Project will be measured using the following Fund-level impact indicators and end of project targets:

- M3.1 Tonnes of carbon dioxide equivalent reduced as a result of Fund- funded projects (expected 133,674t CO<sub>2</sub>eq over the project lifetime)
- M4.1 Tonnes of carbon dioxide equivalent (t CO<sub>2</sub>eq) reduced or avoided (including increased removals) as a result of Fund-funded projects– forest and land-use sub-indicator (expected 140,046t CO<sub>2</sub>eq over the project lifetime)
- A1.2 number of males and females benefitting from the adoption of diversified, climate-resilient livelihood options (expected 150,000 of which 78,450 will be women)

*Describe the detailed methodology used for calculating the indicators above. Describe how the project indicator values compare to the appropriate benchmarks (i.e. the indicator values for a similar project in a comparable context).*

The carbon savings have been estimated relative to baseline emissions. This has drawn on previous estimates in the second national communication of Rwanda (2012) and IPCC guidelines and emission factors, with global warming potential (GWP) taken from IPCC AR5 (2013). The emission reductions are presented as below. Note that emission benefits during the project period (6 years) have been annualised for the indicator reported above.

Activity	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	tCO <sub>2</sub> e (over project 6yr lifetime)
<b>Cooking energy (1)</b>							
<i>No. units Installed and operating (cumulative)</i>							
Biogas domestic		90	240	420	660	900	
Biogas institutional			1	2	2	2	
Stoves Tier 1+Tier 2		1950	5850	11700	17550	23400	
Stoves Tier 3		390	975	1755	2730	3900	
Stoves institutional		8	24	40	40	40	
CO <sub>2</sub> e savings							
Biogas domestic		485	1292	2262	3554	4847	12439
Biogas institutional		0	50	100	100	100	350
Stoves Tier 1+Tier 2		794	2382	4764	7147	9529	24616
Stoves Tier 3		276	690	1243	1933	2762	6905
Stoves institutional		787	2361	3934	3934	3934	14951
<b>TOTAL tCO<sub>2</sub>e</b>		<b>2342</b>	<b>6776</b>	<b>12303</b>	<b>16668</b>	<b>21172</b>	<b>59261</b>
<b>Agroforestry (2)</b>							
<i>Hectares (Cumulative)</i>	1468	3916	6363	7832	8811	9790	
<b>TOTAL tCO<sub>2</sub>e</b>	<b>2695</b>	<b>7186</b>	<b>11677</b>	<b>14371</b>	<b>16168</b>	<b>17964</b>	<b>70060</b>
<b>Tea factory energy efficiency (3)</b>							
Mulindi tea factory							
Baseline tCO <sub>2</sub> e	10600	10600	10600	10600	10600	10600	
Energy efficiency							
Tier 1 CO <sub>2</sub> e savings		4175	4175	4175	4175	4175	20877
Tier 2 CO <sub>2</sub> e savings		431	431	431	431	431	2156
<b>TOTAL tCO<sub>2</sub>e</b>		<b>4607</b>	<b>4607</b>	<b>4607</b>	<b>4607</b>	<b>4607</b>	<b>23033</b>
National tea factories							
Tier 1 CO <sub>2</sub> e uptake			11768	11768	11768	11768	47072
<b>TOTAL tCO<sub>2</sub>e</b>		<b>4607</b>	<b>16375</b>	<b>16375</b>	<b>16375</b>	<b>16375</b>	<b>70105</b>
<b>IDP Village (4)</b>							
Biogas (community)							
<b>TOTAL tCO<sub>2</sub>e</b>			<b>1077</b>	<b>1077</b>	<b>1077</b>	<b>1077</b>	<b>4308</b>
<b>Forestry (5)</b>							
<b>TOTAL tCO<sub>2</sub>e</b>	<b>15,102</b>	<b>13,799</b>	<b>11,904</b>	<b>10,209</b>	<b>9,523</b>	<b>9,449</b>	<b>69,986</b>
<b>TOTAL</b>	<b>17,797</b>	<b>27,934</b>	<b>47,808</b>	<b>54,335</b>	<b>59,810</b>	<b>66,037</b>	<b>273,720</b>

The methodology for producing these estimates is detailed below.

(1) Household and Cooking Energy carbon saving calculation methodology. The methodology for estimating emission reductions for improved cookstoves and biogas is based on:

- Quantity of wood saved per year in tonnes of wood. Tier 1 models save 23% fire wood per year; Tier 3 gasifier models save 40%, relative to current baseline of energy use in cooking. Estimated from national inventory analysis and existing cookstove programme data.

- Multiplied by the fraction of non-renewable biomass saved by the project activity (savings from sustainably which is set at the UNFCCC default value or Rwanda of 98%<sup>92</sup>) times by Emissions factor (EF) for the substitution of non-renewable biomass by similar consumers (81.6 tCO<sub>2</sub>/TJ) .
- Plus the Net Calorific Value (NCV) of the non-renewable woody biomass percentage (IPCC default NCV of 0.015 TJ/tonne for wood fuel).
- Emission reductions for domestic biogas are based on 5.385 tCO<sub>2</sub>e/digester/year, based on data from the Hivos carbon programme 2010 (the Rwanda national biomass programme), relative to baseline emissions from energy use in cooking, with institutional biogas leading to savings 10 times the carbon emissions of a domestic digester.

(2) Net sequestration from agroforestry (agroforestry introduced in current areas of low quality agricultural production) is taken as 0.5tC per ha per year<sup>93</sup> and converted to tCO<sub>2</sub>e.

(3) Tea factory emission factor methodology. A detailed energy audit was undertaken at the Mulindi tea factory to estimate current baseline emissions (included as a separate technical document in supporting information). In summary this found:

- Annual firewood consumption is 14200 m<sup>3</sup> (Eucalyptus)
- Annual electricity consumption of grid electricity is 1860000 kWh (98% of electricity consumed).
- Annual diesel for genset of 10954 litres. Equivalent genset power 42173 kWh and genset efficiency 0.35 on site.
- Diesel generation emissions are based on 74,100 kg CO<sub>2</sub>E / TJ fuel burned (IPCC 2006), with a generation efficiency of 35% for grid (IPCC 2006). Site generation efficiency is assumed to be 36%.
- Grid composition is assumed to be 60% hydro / methane, and 40% diesel generation (national data). The factory uses 1.86 GWh p.a., of which 98% is from the grid. Emissions associated are 567 tonnes CO<sub>2</sub>E.
- Wood fuel analysis (DETS) including wood moisture was derived from a laboratory analyses (see technical annex).
- The baseline CO<sub>2</sub>E emissions from the Mulindi plant are 10,000 tonnes per annum. thermal, plus 32 t from on-site generation, plus 567 t from grid supplied electricity. Total annual baseline emissions are 10,600 t.

An analysis was made of the energy efficiency savings possible from a set of options, based on figures above, a factory audit and literature estimates. In summary this found the potential energy efficiency improvements were:

- Tier 1. Wood drying, 18% of boiler wood. Boiler efficiency – controls, 7% of boiler wood. Insulation - boiler, mains, dryer, 10% of boiler wood. Condensate / hot well 8% of boiler wood. VSD to boiler ID fan, 25% of boiler power.
- Tier 2. Dryer efficiency improvement, 5% of 2 dryers wood. Trough efficiency improvement, 20% of fan power. PV to roof, 6% of bought in electricity..
- For wood fuel savings, the current Mulindi wood forest plantation only provides enough for 50% of factory demand, hence the marginal reduction is assumed to come from non-renewable biomass (see cookstoves above).

The mainstreaming programme, provides capacity building and training to other tea factory owners in Rwanda, to encourage the uptake of Tier 1 (good practice) energy efficiency improvements across the industry. The method for deriving these benefits was:

- National emissions were estimated based on emission per unit of tea produced at Mulindi, scaled up based on national production (National Agricultural Export Board data) which reports that Mulundi produces 15% of national production (made tea).
- It is assumed that the provision of capacity and training leads to the uptake of Tier 1 (no regret) measures in other factories at the national level. Efficiency measures and efficiency improvements are assumed to deliver similar benefits to the analysis at Mulindi. It is assumed that the rate of uptake is 50%.

(4) IDP village methodology. The IDP houses have community biogas fitted. The methodological assumptions for estimating emissions benefits are the same as used for domestic biogas in (1) above.

(5) Forest Carbon sequestration and Agroforestry calculation methodology. Total Carbon sequestration in tCO<sub>2</sub> eq was calculated by the following method:

- Forecasting of forest stand growth, giving incremental volume of timber by area:
  - For existing crops prior to their conversion during implementation, using average *Eucalyptus* Mean Annual Increment (MAI) of 6.5m<sup>3</sup>/ha;
  - For renewed forest areas, during implementation:
    - *Eucalyptus* based on conservative MAI of *E. grandis*;
    - Pine based on conservative MAI of *Pinus caribaea*;
    - Protection forest based on conservative MAI of *Markhamia lutea* and *Maesopsis emenii*;
- Conversion of volume to tonnes of wood, based on wood density factors of 0.56 for *Eucalyptus*, 0.59 for *Pinus* and 0.43 for protection forest species;
- Conversion of tonnes wood to tCO<sub>2</sub> eq based on DECC/DEFRA<sup>94</sup> factors, and adjusted for wood moisture content, assumed to be 15%.

Thus the equations used are:

- Total tCO<sub>2</sub> eq =  $\sum$ (Existing *Eucalyptus* tCO<sub>2</sub> eq + Renewed *Eucalyptus* tCO<sub>2</sub> eq + Renewed Pine tCO<sub>2</sub> eq + Renewed Protection forest tCO<sub>2</sub> eq);
- Existing forest tCO<sub>2</sub> eq =  $\sum$ Ha Existing *Eucalyptus* x (MAI x CF<sub>1</sub> x CF<sub>2</sub>);
- Renewed forest tCO<sub>2</sub> eq =  $\sum$ ( (Ha renewed *Eucalyptus* x (MAI x CF<sub>1</sub> x CF<sub>2</sub>) + (Ha renewed Pine x (MAI x CF<sub>1</sub> x CF<sub>2</sub>) + (Ha renewed Protection x (MAI x CF<sub>1</sub> x CF<sub>2</sub>)).

Where,

CF<sub>1</sub> = Conversion Factor from volume to tonnes wood and,

CF<sub>2</sub> = Conversion Factor from Tonnes wood to tCO<sub>2</sub> eq.

<sup>92</sup> <https://cdm.unfccc.int/DNA/INRB/index.html>.

<sup>93</sup> Montagnini, F (ed) 2006 *Environmental Services of Agroforestry Systems* Yale University Press.

<sup>94</sup> 2012 Guidelines to DEFRA / DECC's GHG Conversion Factors. The 2012 Methodology Paper for Emission Factors.

However, many of these interventions (notably forestry) will produce much larger lifetime emissions, thus the total emissions reductions from the investments are larger than shown above. Using the same methods, it is estimated that the total Cooking energy (1) savings are 150,263 tCO<sub>2e</sub>, the total agroforestry savings (2) are 107,785 tCO<sub>2e</sub>, the total tea factory energy emissions savings (3) will be 163,746 tCO<sub>2e</sub>, the total IDP Village (4) emission savings will be 10,769 tCO<sub>2e</sub> and total Forest Carbon sequestration (lifetime) will be 431,681 tCO<sub>2e</sub>. The total lifetime emissions are shown below.

Overall project	tCO <sub>2e</sub> (over lifetime emissions)
Lifetime emission reductions	864,244

*Describe how the project's indicator values compare to the appropriate benchmarks (i.e. the indicator values for a similar project in a comparable context).*

A Project M&E team will be established during the inception phase to fully design the methodology and put in place best practices in data collection/measurement, analysis and reporting and systems for verification (MRV). Baselines for project level impact indicators will be calculated in the inception phase for early monitoring purposes; they will be linked to all projects/interventions. Population and socio-economic data exists for all intervention areas.

## E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyze impact beyond a one-off project investment

### E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)

*Describe how the proposed project expected contributions to global low-carbon and/or climate-resilient development pathways could be scaled-up and replicated including a description of the steps necessary to accomplish it.*

**The climate vulnerabilities and low adaptive capacity observed in Gicumbi are to varying degrees typical to other districts in Rwanda increasing the transferability of successful project interventions.** Along with Gicumbi there are 10 other districts (one third of the districts in Rwanda) that are considered to be high risk for flooding and landslides<sup>95</sup>. Proposed interventions to reduce risks from flooding and landslides, improve land management and reduce dependency on rain-fed cultivation will therefore have strong potential for replication and scale up in other districts across Rwanda. Channelling funds through Rwanda's national climate fund will strengthen its capacity to coordinate climate finance and oversee climate compatible development in Rwanda while maximising opportunities for further scale and replication.

**Channelling the funds through Rwanda's climate finance architecture FONERWA also means that there is significant potential to scale up, replicate and sustain the results.** Through FONERWA the project will create linkages and synergies with existing and planned climate relevant investments and actions for the efficient delivery of integrated results, institutional embedding of approaches and multiplier effects. By channelling funds through a competent national institution, GCF will enhance existing institutional capacity and facilitate improved coordination of development interventions around climate adaptation and mitigation. For example, FONERWA already coordinates a series of demand driven investments into climate adaptation and mitigation around the country and has a knowledge management platform that ensures cross learning and information sharing.

**There is strong potential to cost effectively scale up, replicate and sustain the results of the project interventions beyond project completion.** Much of the existing funding on adaptation has been targeted towards existing types of development projects, which while beneficial, will not deliver the paradigm shift which is the goal of the GCF. This proposed investments are all scalable across Rwanda. The project has deliberately targeted investments towards the key institutions that are driving the development of the respective sectors and each component includes mainstreaming activities that will support the national scale up of successful approaches. The investment in building capacity and mainstreaming will support the ongoing replication of adaptation and mitigation strategies country-wide and is expected to make a lasting contribution to delivering the Green Growth and Climate Resilience Strategy. As the national climate fund, FONERWA is also uniquely placed to support scale up and replication at the national level through its existing portfolio of climate projects and the pipeline of projects that are under development. Importantly, the mainstreaming approach adopted will ensure that the components feed into national and sector development plans, such that the interventions and information is embedded into policy and will deliver the paradigm shift.

**Forestry and watersheds:** Forest coverage and woodlots in Gicumbi district are similar to those in other parts of the country and the best practice forest management methods, efficient cooking technology and the associated income generating activities linked to forest resources can easily be scaled up. The investments in forest renewal in Gicumbi are expected to demonstrate what best practice can achieve and combined with the capacity building and mainstreaming investments in component 4, this is expected to create an irreversible shift to improved forest management in other parts of Rwanda.

**Tea and coffee:** these are Rwanda's most important cash crops and support thousands of smallholders across the country. The proposed project is timely because production of tea is currently being scaled up across the country. The interventions have been designed to address key barriers to adaptation, including information and market failures, and build capacity at the national level, and will therefore ensure that the available resources deliver at scale. In addition to the 7,440 farmers benefitting directly, an estimated 357,735 indirect beneficiaries will also be reached through the mainstreaming which will cover the entire tea and coffee sectors. The move towards climate resilient export crops creates a paradigm shift, and has the potential for a transformative effect, moving towards a climate resilient export crop market in the country. Scaling up the tea drying efficiency measures across all 15 tea factories in Rwanda is expected to have a huge impact on GHG emissions because the baseline emissions in the tea sector – from energy use in tea factories - are expected to increase significantly. Supporting the key institutions, NAEB and RAB during this expansion phase will enable many of the innovative approaches to be incorporated into sector planning. Partnering with The Wood Foundation, as the biggest producer of tea in Rwanda, also enables successful approaches to be easily absorbed, replicated and scaled up in other tea estates owned by the Foundation influencing a significant amount of tea production in Rwanda. The proposed hand over to cooperatives which is built into The Wood Foundation's philanthropic plan also creates additional opportunities to embed good practice in climate resilient tea production into local structures. This investment therefore has the potential to have wide reaching impact across agricultural planning and policy making.

**Settlements:** The technologies being promoted for sustainable building materials production are simple and easily transferable and therefore have strong potential to continue beyond the end of the project. Extensive deposits of clay have been mapped across Rwanda which means that the compressed earth block technology could be replicated across the country to meet the high demand for building materials. The housing typologies and green infrastructure are designed for the typical sloping topography of Rwanda and the approaches to low carbon, climate resilient construction are simple and can be easily replicated and scaled up country-wide. The improved surface water management and storage can also be applied in other parts of the country and will be promoted and mainstreamed under component 4.

A full Theory of Change which illustrates the inter-locking roles of the four components is provided in Section C.

### E.2.2. Potential for knowledge and learning

*Describe how the project contributes to the creation or strengthening of knowledge, collective learning processes, or institutions.*

**Channelling funds directly through MOE which is mandated to coordinate climate projects nationally and partner GoR agencies at the sector and local levels significantly increases the potential for knowledge and capacity development.** With FONERWA already funding over 20 projects (listed in Annex 3), Rwanda is well positioned in grappling with the practical challenges of fostering such knowledge development. The GCF investment has the potential to accelerate this process by supporting the provision of high quality and very practical information and lessons on how to achieve GGCR development in a developing country. By being deliberately multi-sectoral and multi-disciplinary, providing coordination and demanding complementarity, the project will generate knowledge and understanding across multiple areas with multiple stakeholders which can be shared with other countries through organised knowledge exchange partnerships such as south – south cooperation and inter Africa dialogues.

**The project includes measures to transfer and mainstream the knowledge generated and lessons learned and ensure that the necessary capacity is developed within local and national institutions.** For example, the nursery and forest management demonstration sites are all located along roads and easily accessible. These will be used, i) as focal centres for training and capacity development and ii) as visit sites to show, and inform, other forestry stakeholders (including key decision makers are forestry staff and professionals) improvements resulting through best practice. Monitoring systems will also include bi-annual documentation of changes in water quality, soil erosion reduction and landslides control to enable a systematic evaluation of success factors and challenges to inform replication and scale up. The GCF investment will support a range of other activities to support learning and knowledge development including:

- analysis and communication of the results of project interventions;
- production of knowledge products including (policy briefs, guidelines, extension materials etc.);
- farmer-to-farmer fora;
- gender-sensitive monitoring and evaluation system; and

- o awareness building of new approaches and technologies with farmers as well as local planners and policy makers at the national level.

These measures will strengthen the knowledge and capacity base for climate action and facilitate dialogue for an effective climate response at the national level. The proposed investment in knowledge development, communication and uptake means there is real potential to create new markets in low carbon industries and for this project to be transformational.

**Awareness building will also ensure that knowledge and information are shared widely, building wider support for climate adaptation and mitigation.** The strong emphasis on monitoring, evaluation and lesson learning will also provide for continuous feedback on impacts and results at the community level. Moreover, the communication of knowledge products will support lesson learning and sharing of best practices as well as the mainstreaming and replication of successful approaches. The integrated approach will maximise learning and provide for a holistic understanding of factors influencing people's capabilities to adapt and mitigate climate change. The fact that the project is consciously and deliberately designed to address interlinked sectors, vulnerabilities and development priorities reduces the risks associated with narrow interventions which can fail to address underlying barriers or related issues undermining delivery of results. Thus by seeking to address not only direct climate related threats but the array of factors influencing these, the integrated design itself provides a greater assurance of the sustainable delivery of benefits and impact.

### E.2.3. Contribution to the creation of an enabling environment

*Describe how proposed measures will create conditions that are conducive to effective and sustained participation of private and public sector actors in low-carbon and/or resilient development that go beyond the program. Describe how the proposal contributes to innovation, market development and transformation. Examples include: introducing and demonstrating a new market or a new technology in a country or a region; and using innovative funding scheme such as initial public offerings and/or bond markets for projects*

**The GCF investment will strengthen the technical capacity of key government agencies, local NGOs, cooperatives and other key stakeholders** to support new climate-resilient approaches and technologies and respond to climate change. Strengthening sectoral and local government agencies will raise awareness and understanding of climate issues and provide a strong foundation for more informed policy making for increasing climate resilience. The project also targets barriers to the uptake of climate resilient approaches. There is a strong emphasis on ensuring the participation of multiple stakeholders including the Gicumbi district authority and civil society as well as the local community. The investments will increase the climate resilience of rural communities through an integrated watershed approach. Working closely with the district authority will ensure that planning and development at the local level takes account of climate change during and beyond project activities. Building capacity at the local level in enterprises such as nursery development, efficient cookstoves, biogas digesters etc. will foster the integration of climate-resilient approaches and technologies into key areas of the local economy creating new markets and livelihood opportunities. Additionally, partnering with sectoral institutions in project delivery will facilitate the uptake and mainstreaming of climate analysis and successful approaches at the national level. The Wood Foundation will be a critical partner in taking forward successful innovative approaches beyond project completion because they have a long-term presence in-country and the financial and technical resources to do so.

**In terms of innovation and market development, the GCF investment will support the uptake of climate resilient technologies.** This includes the roll out of 11 green technologies to enhance low-emission development in the construction and tea sectors which have strong potential to significantly reduce GHG emissions. Resilience interventions such as rain water harvesting, climate resilient agriculture and the FONERWA managed community adaptation fund<sup>96</sup> are also innovative and include measures not used before in Rwanda.

### E.2.4. Contribution to regulatory framework and policies

*Describe how the project strengthens the national / local regulatory or legal frameworks to systematically drive investment in low-emission technologies or activities, promote development of additional low-emission policies, and/or improve climate-responsive planning and development.*

**The Project supports the implementation and operationalisation of several key national policies and strategies, including the GCRS, the NAPA and the NAMA.** These are discussed in section C.1. A detailed review of national strategies and policies is also included in the preparatory study reports in Annex 1. Rwanda has a comprehensive, coordinated and progressive legislative framework but there are areas for improvement particularly in generating and managing knowledge and information relevant to new and emerging areas such as climate change and green economy. Operating at the higher echelons of government and co-located with the regulatory agency REMA, FONERWA is well placed to facilitate high level policy discussions, communicate the results of such studies and foster dialogue around mainstreaming climate change considerations into policies and

<sup>96</sup> Community grants for the CAF will be provided by FONERWA (no GCF finance will be used for the grants, GCF finance will only be used to provide the TA to support the set up and operation of the fund)

regulatory frameworks to drive investment in low-emission technologies and activities and improve climate-responsive planning and development.

**Within the Environment and Natural Resources Sector improved provision of climate information and analysis will enhance the oversight of natural resources in Rwanda (water, lands, forests, nature reserves and biodiversity, mines and wetlands).** This will help to ensure that existing policies on climate adaptation and mitigation are adequately integrated in planning, implementation and monitoring across all sectors of the national economy. For example, whereas afforestation and reforestation efforts have been successful and follow policy direction, deforestation remains a challenge due in part to limited investments in alternatives to fuelwood use. The GCF investments in alternative energy options will provide cost effective low carbon solutions compatible with Rwanda's green economy aspiration. This will create opportunities for strengthening the implementation of existing policy and regulatory framework particularly in ensuring enabling conditions for enforcement of existing laws as well as developing new ones to spur innovation in low carbon development areas. At the same time, the use of best practice guidelines and standards should also facilitate their uptake and enforcement via the institutional and contractual conditions used in forestry management. By promulgating and promoting best practices within forestry and defining guidelines on where and how forestry should be practised, all relevant regulations and policies will be consolidated in a way that facilitates and supports their observance.

### E.3. Sustainable Development Potential

#### Wider benefits and priorities

#### E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

**The Project is expected to deliver a wide range of co-benefits.**

**Economic co-benefits:** the promotion of ecosystem based approaches to mitigate and adapt to climate change will enable target households to address current climate threats to rain-fed agricultural production and improve food security. The investments in rural industries, agriculture and forestry will directly benefit more than 86,000 people and includes a strong emphasis on financial and environmental sustainability to secure long-term livelihood opportunities for local communities. The interventions have a positive benefit to cost ratio (>1) and a highly positive net present value, demonstrating the economic rate of return is high (see Section E.6.3). For those components that involve market sectors (settlements, tea energy efficiency, energy), the return on investment is high and demonstrates their financial viability in the long-term. Other economic co-benefits include:

- Increased range of forest goods creating new potential market opportunities, including timber processing factories;
- Increase in value of tree nursery seedlings;
- Increased household incomes from new livelihood opportunities;
- Time savings due to improved access to water and energy;
- Reduced losses in productivity due to illness and reduced health care costs;
- Sustained productivity and export revenues from a climate resilient tea and coffee sector; and
- Reduced loss and damage costs associated with impacts, response and rehabilitation costs from extreme weather events under current and future climate change.

**Environmental co-benefits:** Proposed interventions to restore degraded habitats and improve the management of natural resources are expected to generate a wide range of environmental benefits. The project will promote a number of climate –resilient technologies and approaches that are expected to enhance ecosystem services and agricultural productivity, and reduce GHG emissions, including soil and water conservation and restoration of degraded watersheds (through reforestation, agro-forestry, erosion control, promotion of efficient cookstoves etc.). With around 18,000ha under improved management by the end of the project, these investments will reduce erosion on steep slopes, improve soil stability and fertility leading to increased agricultural productivity and reduced siltation of Gicumbi's rivers and other water bodies. This will build resilience to extreme weather events such as flooding and landslides and the effects of variable rainfall on crop production and human settlements. The focus on climate resilient agriculture also ensures that the project activities align to sustainable development principles. Other environmental co-benefits include:

- Increased forest ecosystem types with increased productivity and diversity of forest products (including NTFPs) which will reduce pressure on other forest and land area resources for the provision of timber and wood products;
- Increased forest and agro-forestry cover;
- Improved soil quality, water retention capacity and increased agricultural productivity;
- Improved biodiversity and preservation of ecosystem services in critical watersheds; and
- Reduced emissions from reforestation, energy efficiency in the industrial tea sector and the use of efficient cookstoves.

**Social co-benefits including gender-sensitive development impact:** Proposed interventions target some of the poorest and most vulnerable households in Rwanda and are expected to generate significant social benefits for local communities. The increased water and energy security resulting from improved watershed management and

the adoption of efficient cooking technologies are expected to disproportionately benefit women and children as they are generally responsible for cooking and collecting water and fuel-wood. This will lead to improved health (from reduced indoor air pollution, as well as from clean and reliable water sources) and well being as well as creating more time for economically productive activities. The increase in protection forest types will also expand and widen the range of forest goods and services, including NTFP's of benefit to women, and open up potential new value chain and business opportunities for a wider range of groups than currently engage in forest product utilisation and processing. This will help to correct the prevailing inequalities in climate change vulnerability and risks that exist between men and women particularly in rural Rwanda and ensure that that benefits are distributed equitably. Other social and gender co-benefits include:

- Increased productive and adaptive capacity of individuals, households and communities;
- Reduced impact of climate-related shocks on food security of target households with improved nutrition from climate resilient agriculture;
- Strengthened, climate resilient livelihoods and off-farm employment opportunities with associated increased skills within the rural workforce and a reduced dependency on rainfed agriculture leading to reduced poverty levels;
- Reduced health problems associated with indoor pollution from cooking; and
- Reduced number of deaths, injuries, livestock losses and damage to housing from extreme weather events.

We have estimated environmental and social co-benefits in the economic analysis, with the valuation of market and non-market benefits. These indicate the project will deliver high net benefits in these areas, estimated at USD50 million (present value of benefits, 10% discount rate). These benefits arise from the combination of reduced loss and damage due extreme climate events, reduced soil erosion and siltation, GHG emission reductions, and social and health improvements due to reduced air pollution and improved water. The value excludes a number of important additional benefits from enhanced ecosystem services (for which quantification was not possible), which would increase these benefits further.

## E.4. Needs of the Recipient

### Vulnerability and financing needs of the beneficiary country and population

#### E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

*Describe the scale and intensity of vulnerability of the country and beneficiary groups, and elaborate how the project addresses the issue (e.g. the level of exposure to climate risks for beneficiary country and groups, overall income level, etc).*

**The vulnerability and financing needs of Gicumbi and its population are evidenced by the recently prepared national climate vulnerability Index.** The study indicates the scale and intensity of vulnerability of Rwanda based on a comprehensive analysis using 37 vulnerability indicators along with baseline data from a national survey<sup>97</sup> of household vulnerability. It reinforced earlier studies that found that the Northern Province where the target district is located is exposed to high intensity precipitation events and (along with the Western province) is the most sensitive to soil erosion and landslides due to its mountainous topography and steep ravines. MIDIMAR data show that six sectors of Gicumbi were affected by landslide and flooding events between 2011 and 2012 alone. In 2013, there were 3 deaths and 52 houses destroyed or damaged by landslides. The targeted sectors include some of the most affected by landslides and flooding (Byumba, Rubaya, Cyumba, Kaniga and Mukarange).

**Poverty levels in Gicumbi are very high compared to national levels, with 55.3% and 24.7% of the population living below the poverty line or in extreme poverty respectively (EICV4).** The project specifically targets Gicumbi as one of the poorest and most vulnerable districts, where there is heavy dependence on rain fed, subsistence agriculture (with 72% of the district's population engaged as small scale farmers) and where there are limited employment opportunities which locks households into perpetual poverty, high morbidity and mortality among young children and food insecurity (44 % of children in Gicumbi have chronic malnutrition). The high levels of poverty, topography, deforestation and land use patterns combine to make the people of Gicumbi highly vulnerable to climate variability and extreme weather events. The poorest groups are most affected by climate change, particularly women and women headed households as they have limited resources and abilities to cope with disaster and climate change impacts. The project includes interventions to restore ecosystem services, strengthen climate resilient farming for smallholders as well as open up new employment opportunities in forest services and products to increase household incomes and strengthen livelihoods so that vulnerable communities can be more resilient to climate change. Efforts to reduce soil erosion and improve soil fertility and water availability will have a direct impact on smallholder production, enhancing food security for the district's poorest and most vulnerable inhabitants.

<sup>97</sup> sample size 1500 across all 30 Districts

**A recent risk assessment by MIDIMAR also confirmed that the country is highly prone to drought, landslide, flood and windstorms<sup>98</sup>.** Because of its geographical features (the relief is hilly and mountainous with an average altitude of 1,700 meters) and climatic profile, Rwanda is one of the sub-Saharan African countries most prone to disasters and especially localised landslides and floods. National data from 2012 shows there were 72 deaths, 122 injuries, 2,580 ha of crops and 3,176 houses damaged or destroyed due to landslides, floods, fire, heavy rains, heavy rains and winds, thunderstorms and lightning<sup>99</sup>. The cost of the disaster response and recovery in 2011 was more than Rwf 515,520,000 (USD 730,000). According to a MIDIMAR study in 2012, the main cause of flooding across the thirty districts is climate change which results in heavy rain and flash flooding through overflowing of Rwanda's rivers. Around 40% of the country's population is estimated to be exposed to landslide at moderate to very high slope susceptibility with 14% of the exposed population being children aged <20 years and elderly aged >64 years. In all, over 1.6 million poor Rwandans (about 15% of the total population) are estimated to be exposed to landslides<sup>100</sup>. In terms of infrastructure, 43% of Rwanda's health facilities, 25% of its schools, 553 kilometres of paved national roads (45% of the total) and 691 kilometres (39% of the total) of unpaved national roads are exposed to landslides with the economic cost of damaged houses due to landslide estimated to be in excess of Rwf 9.2 billion. Moreover, with four major water basins experiencing absolute water scarcity, Rwanda is classified as a water scarce country undergoing high water stress. Around 40% of Rwanda's land is classified as being under a "very high risk" of erosion and approximately 37% requires soil retention measures before cultivation, only 23% of the land is not prone to erosion. With over a half of Rwanda's power deriving from hydropower generation, and installed hydropower generation capacity set to increase from 95.93 MW in 2014 to 141.97 MW by 2018<sup>101</sup>, reducing erosion and protecting the country's watersheds is critical to national energy and food security.

#### E.4.2. Financial, economic, social and institutional needs

*Describe how the project addresses the following needs:*

- *Economic and social development level of the country and the affected population*
- *Absence of alternative sources of financing (e.g. fiscal or balance of payment gap that prevents from addressing the needs of the country; and lack of depth and history in the local capital market)*
- *Need for strengthening institutions and implementation capacity.*

Section c.1 provides a detailed overview of the economic and social development level of the country which has been summarised below.

**Rwanda is one of Africa's poorest countries with Official Development Assistance (ODA) financing approximately 40% of the country's annual budget.** The country is small, hilly, and landlocked and has the highest population density in Africa<sup>102</sup>. Agriculture provides around 33% of GDP, 72% of employment (EICV 4) and generates more than 45% of the country's export revenues (mostly from tea and coffee). Rwanda has a high dependence on imported diesel and heavy fuel oil for its electricity supply and has a small<sup>103</sup> and its uncompetitive industrial sector is constrained by a lack of locally available raw materials and high transport costs as a result of being landlocked. With around 83% of the population still living in rural areas<sup>104</sup> and more than 70% of the population engaged in rain-fed, subsistence agriculture and a high dependence on biomass for fuel, there are increasing pressures on natural resources (especially considering that more than 70% of the cultivated land surface has slopes greater than 10% which results in high levels of erosion and surface run off into waterways). The project investments will benefit more than 86,000 people living in climate vulnerable areas that currently depend on rainfed farms with low soil fertility.

**Rwanda lacks the financial resources to adequately address climate threats and support low carbon growth.** The total additional capital costs of shifting to climate resilient and low carbon development pathways outlined in the GGCRS have been estimated to be around USD 2.7 bn (cumulative to 2030) compared to business as usual across three key sectors (water, agriculture, energy)<sup>105</sup>. Funding for the implementation of LCCR development activities in Rwanda is mobilised from four principle sources:

- 1) internal public investment resources,
- 2) external development partner resources,
- 3) international climate finance and
- 4) non-public sector resources (e.g. NGOs, private sector).

<sup>98</sup> MIDIMAR (2015). The National Risk Atlas of Rwanda. Ministry of Disaster Management and Refugee Affairs.

<sup>99</sup> REMA (2015). Baseline climate change vulnerability index for Rwanda, May 2015.

<sup>100</sup> MIDIMAR 2015

<sup>101</sup> Vulnerability index report, May 2015.

<sup>102</sup> 415 people/km<sup>2</sup>, NISR 2012

<sup>103</sup> Manufactured products include cement, agricultural products, small-scale beverages including beer, soap, furniture, shoes, plastic goods, textiles, and cigarettes.

<sup>104</sup> Fourth population and housing census, Rwanda 2012. National Institute of Statistics, Rwanda

<sup>105</sup> Policy Brief: Costing the Green Growth and Climate Resilience Strategy. AFDB

The fiscal balance for Rwanda is inadequate to finance the additional costs of shifting to climate resilient and low carbon development pathways outlined in the GGCRS. In the medium term, total revenue and grants are projected to rise in nominal terms from Rwf 1,462.5 billion (23.1% of GDP) in 2015/16 to Rwf 1,578.3 billion in 2016/17 and to RWF 1,774.4 billion in 2017/18 while total expenditure and Net Lending projected at RWF 1,741.1 billion (27.5 percent of GDP) in 2015/16 is programmed to rise in nominal terms to RWF 1,856.9 billion (26.2% of GDP) in 2016/17 and to Rwf 2,099.7 billion (26.3% of GDP) in 2017/18. Foreign reserves coverage at the end of 2014 was only expected to cover around 4.7 months of imports in 2015<sup>106</sup>. The BNR and MINECOFIN Rwanda have limited experience of capital bond markets although a regular bond issuance program was initiated in 2014. The total Public and Publicly guaranteed debt stood at 30.4% of GDP as of end December 2014. Rwanda therefore requires ongoing support from donors to plug its fiscal gap. This project will make a direct contribution to Rwanda's funding gap and will contribute to delivering the GGCRS.

**Certain agencies including the Districts and MOE receive relatively low levels of budget support and the limited availability of private funds highlights the need for additional external finance.** Strong alliances among ministries of finance and economic planning and environment ministries/agencies have improved mainstreaming of Climate Compatible Development (CCD) into planning and budgeting but further mainstreaming efforts to tap into District and Ministries' budget requests, as well as encouraging private sector and green investments, are important steps towards sustainably financing LCCR growth in Rwanda. Moreover, attracting private investment and engaging the private sector in climate resilient low carbon projects is challenging due to high interest rates and risk adverse financial institutions unwillingness to finance investments in areas with limited or absent historical demonstration of viability. Other constraints include high transport costs, a small domestic market, inadequate infrastructure, ambiguous tax rules, and a lack of skills in the workforce. Given the relatively new technologies and practices required within the low carbon sector, many cooperatives and other local private sector agents will require new skills and knowledge to be able to establish and deliver these goods and services. The technical assistance services that will be provided have been specifically designed to address these needs. GCF can play a crucial role in helping Rwanda to overcome these financial limitations and achieve its goal of climate resilience low carbon growth.

**Rwanda has demonstrated success in terms of its institutional capacity to absorb and manage climate finance but ownership and coordination of climate activities across sectors needs to be improved.** Rwanda's good progress towards high fiduciary management standards, its commitment to service delivery and its strong track record of effective and efficient budget execution demonstrate it is at an advanced stage of climate finance readiness. The establishment of the FONERWA provides a robust structure for channelling, programming, disbursing and monitoring additional environment and climate change finance to Government agencies, Districts, CSOs and the private sector. The fund has also established a concessional lending facility for eligible private sector applicants with the Rwanda Development Bank (BRD), a move that is considered ground-breaking in the Rwandan context, as national financial institutions view environment and climate investments high risk in nature, offering limited financing options. Despite these advances, low institutional capacity coupled with financial constraints both at the national and sub-national levels results in a limited capability to implement national policies and plans. For example, implementing and financing Rwanda's GGCRS (adopted in 2011) and the green economy concepts of EDPRS III is proving challenging due to its crosscutting nature and because responsibility for implementing its 14 projects of action is shared among diverse sectors with often competing interests, complicating issues of ownership, monitoring and coordination. The lack of a clear, costed implementation plan means that sector and district planners face difficulties in translating high-level objectives into practical, costed activities<sup>107</sup>. This project includes significant investments to increase awareness, understanding and institutional capacity of measures needed to increase climate resilience.

**Public agencies require additional funding, technical support and capacity development in order to capture the opportunities and adjust to low carbon and climate resilient development trajectories.** Many of the existing and planned operations follow proven approaches for which knowledge, systems and skills are already present. Transformation to new and alternative technologies, practices and interventions will require individual staff, institutional and management systems development and support as it becomes the new business as usual. Awareness of climate threats and related strategies, approaches and technologies remains patchy below the highest levels, particularly in Districts. Effective mechanisms are needed to ensure good communication and flow of information on climate change issues between national-level technical ministries/agencies and institutions and organisations at District and sub-District levels. Financial and human capacities are overstretched which impedes the translation of climate resilient and low carbon concepts and activities endorsed nationally into

106 IMF (2015) Rwanda: Letter of Intent, Memorandum of Economic and Financial Policies, and Technical Memorandum of Understanding April 30, 2015

107 Caldwell, D. (2015) High fiduciary standards and Rwanda's access to climate finance. Blog posted on [http://cdkn.org/2015/05/fiduciary-standards-and-access-to-climate-finance/?loclang=en\\_gb](http://cdkn.org/2015/05/fiduciary-standards-and-access-to-climate-finance/?loclang=en_gb)

sector and District budgeting and planning. This project will provide the finance, capacity development, technical advisory and importantly a long-term approach in order to meet these needs.

**Targeted approaches are required to build capacity for CCD planning, budgeting, mainstreaming and proposal development at national and sub-national levels.** A coordinated, and systematic approach to capacity building, planning and resource mobilisation is required within and across sectors and districts. The proposed measures to increase institutional capacity at the district level and collaboration with RHA, RWFA, NAEB and RAB will address some of these capacity shortcomings that exist at the district (Gicumbi) and sector level. In addition to the capacity building and awareness raising interventions will increase understanding of climate threats within key government agencies.

**The proposed interventions are ‘people’ focused not just to address adaptation needs but also to capacitate local communities to be the engines of climate sensitive rural growth.** At the community level, rural households are familiar with and experts in their existing livelihood strategies but lack the financial means, information, knowledge and skills to adopt new practices and technologies to adapt activities to respond to climate threats and/or to diversify into alternative and new income generating and employment options. As a key component of this project, supporting climate adaptation of agricultural activities through improved soil and water conservation will address inherent vulnerabilities common to the majority of rural households in Rwanda.

## E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or project

### E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

*Please describe how the project contributes to country’s identified priorities for low-emission and climate-resilient development, and the degree to which the activity is supported by a country’s enabling policy and institutional framework, or includes policy or institutional changes.*

**Rwanda’s commitment to tackling climate change is recognised worldwide and there is strong ownership of the development and green growth agenda.** Rwanda has established a strong and effective policy framework to deal with climate change (see Section C1 for all the relevant policies and strategies). All the necessary policies and legal frameworks are in place including a national climate fund that can absorb, disburse and monitor interventions to tackle climate change. There is high-level ownership and commitment to adapting to the effects of climate change and Rwandan institutions, particularly MINRENA, have good experience from implementing a number of projects that support adaptation. In terms of mitigation, the Government has enshrined low carbon growth in its policy framework across Government and has made significant efforts to build awareness at the local level. Tree planting is widespread and efforts to replant areas deforested after the genocide against the Tutsis, generate small woodlots and agroforestry have increased cover.

#### NAPA

**The planned interventions are closely aligned with Rwanda’s national priorities for low-emission and climate-resilient development.** The project will make a significant contribution to achieving national climate compatible development priorities as it is closely aligned with national strategies and policies. The National Adaptation Plan of Action (NAPA) submitted to the UNFCCC in 2007 articulates Rwanda’s strategy to reduce vulnerability to climate change particularly from the main climatic hazards including intense rainfall, flash flooding, landslides, drought and low flows, extreme temperatures and heat waves. The NAPA comprises six priority adaptation options to climate change, four of which are included in this project: 1) promotion of “non-agricultural income generating activities” which is considered critical to strengthen resilience of rural communities to climate threats; 2) Integrated Water Resource Management via the watershed protection and sustainable forest management interventions; 3) introduction of species tolerant to climatic variability; and 4) development of alternative sources of energy to firewood.

#### NAMAs

**Rwanda submitted its NAMA to the UNFCCC in June 2015<sup>108</sup>.** The GoR established an institutional, legal and policy framework for Nationally Appropriate Mitigation Actions (NAMAs) in May 2014. A series of NAMAs have been identified across seven priority sectors: agriculture, buildings, energy, industry, land use, land change and forestry, transport, and waste to address sustainable development in the context of mitigating GHG emissions beyond “business as usual” (BAU) via technology-know how transfer, capacity building, and finance. The most relevant sectors to this proposed project are 1) land use, land use change, and forestry (LULUCF), 2) industry

(including tea and coffee) and 3) buildings. The NAMAs for each of these are presented in the following paragraphs.

**The most pressing challenge in land use, land use change, and forestry (LULUCF) is the current and continuing deficit in the national wood balance.** The alternative scenarios put forward in the NAMA aim at increasing the basic productivity of Rwanda's forests and increasing the supply of wood through improved forest management and agro-forestry programs (see Table 1). The proposed project includes provision for all six shortlisted scenarios:

1. agro-forestry,
2. improved management of forests,
3. new forest plantations,
4. forestry-business (saw-wood, wood products industries)
5. improved cook stoves, and
6. efficient charcoal production.

It is estimated that improved forest management for multiple purposes carried out on 50% of the existing plantations (including a 10% increase in plantation area between 2009 and 2020) will increase productivity of approximately 440,000 tons by 2030. The combined sequestration potential for the NAMA period of 2016 – 2030 is approximately 4,000,000 tCO<sub>2e</sub>.

**Table 1: Shortlisted Alternative Scenarios identified for land use, land use change, and forestry (LULUCF)**

Shortlisted Alternative Scenarios	Mitigation Potential	Challenge	Cost	Data Available	Total Score	Policy Alignment
Agro-Forestry (soil, erosion, seedlings, fertilizer)	High	Low	High	Med	5	Direct
Improved Management of Forests	High	Med	Med	Med	5	Direct
New Forest Plantations (+Corporate Social Responsibility)	Med	Low	Med	Med	5	Indirect
Forestry-Business (Saw wood, wood products industries)	Med	Med	High	Low	3	Indirect
Improved Cook Stoves	Med	Med	Low	High	6	Direct
Efficient Charcoal Production	Med	Med	Med	Med	4	Direct

**Proposed capacity needs identified during the NAMA process will be addressed by the planned interventions.** As land for afforestation is a very scarce resource in Rwanda, the NAMA has prioritised forest management that encompasses multiple purposes and advocates for the creation of new plantations to achieve a national tree/forest cover of 30% as envisioned in forestry policy papers, with particular attention to steep slopes in order to combine protective and productive functions. The NAMA calls for capacity building in forest management, personnel, inspection and information systems at MOE, RWFA, MINAGRI, and district extension services as well as capacity building in promoting wood products industry (biomass pellets and charcoal) for new technology, equipment, and service. These are specific objectives of the project.

**The tea and coffee sectors were selected for NAMA development under the industry section of the NAMA report.** The selected NAMA scenario for these sectors is considered to be a high priority with moderate mitigation potential and moderate cost. The overall objective is to improve the downstream activities in the tea and/or coffee sub-sector by improving the existing tea drying and processing. Specifically, the NAMA focuses on:

- Energy efficiency improvements,
- Installation of new equipment and technologies for drying, roasting packaging,
- Establish an energy efficiency standards for all new factories
- Promote energy management, auditing and reporting and national best practice sharing
- Promote international eco-labelling
- Improvements of water efficiency, and
- Improvements in working conditions.

The first NAMA applicable alternative emission scenario for energy efficiency improvements in the coffee and tea production is expected to lead to a GHG emission reduction potential of 146,000 tCO<sub>2e</sub> during the 2016- 2030 period. Tea was considered a high priority for NAMA development due to the historical importance of the sector and the economic potential for value addition in the downstream sections which involves building industrial capacity for processing and packaging of high quality tea.

**Adoption of energy measures in tea processing are estimated to result in a potential emission reduction of 146,300 tons CO<sub>2e</sub> for the period 2016-2030 and savings in energy costs between 15-20%.** Capacity needs include: support for preparation of a NAMA design and documentation; pilot programs in the tea plants to demonstrate the potential measures; awareness creation with financial institutions to offer commercial lending rates to participating industries; establishing an insurance scheme to reduce risks for financial institutions in availing energy efficient technologies; bringing together a wider community of equipment suppliers, academic

institutions, owners and buyers to make energy efficiency available and affordable to all factories. The proposed NAMA activities are expected to result in reduced consumption of carbon intensive fuels (fossil fuel based electricity and heavy fuel oil) and lower consumption of woodfuels as well as improved quantity and quality of tea due to improved drying allowing the industry to seek for higher price at international auctions. Improvements in the tea sectors will also increase employment opportunities and income generation. Proposed GCF supported interventions are therefore highly relevant to NAMA priorities for the tea sector.

**The first NAMA applicable alternative emission scenario for the Housing / Building Sector is focused on householder energy use through efficient cookstoves, LED lighting and water heaters.** Efficient cook stoves have the highest mitigation potential of 2 tCO<sub>2</sub>e/year per cookstove, which can lead to millions of tCO<sub>2</sub>e of annual GHG emission reductions a year by 2030. Efficient lights may not have a large impact but is expected to lead to annual GHG emission reductions of up to 50,000 tCO<sub>2</sub>e per year 2030. The most notable co-benefits of the alternatives are lower resource demand for wood and charcoal and electricity, and potential lower net household cost of energy.

**The Green Growth and Climate Resilient Strategy (GGCRS) is central to achieving the government key development target of becoming a developed climate-resilient, low-carbon economy by 2050.** The planned interventions will contribute to a number of priority areas under the NST including: connecting rural communities to economic opportunity through improved infrastructure; integrated approach to land use and human settlements; increased agricultural productivity; enabling graduation from extreme poverty. Moreover, the proposed project will also help to deliver against two of the 'Big Wins' agro-forestry and irrigation and five programmes of action in the GGCRS including supporting: integrated approaches to sustainable land use planning and management as well as integrated water resource management and planning; sustainable forestry, agroforestry and biomass energy; and disaster management and disease prevention. Addressing the risks of climate change on export crops (and specifically tea and coffee) was also specifically highlighted as a priority in the strategy.

**Planned interventions will benefit from the existence of strong policy and institutional frameworks to address climate change issues.** The introduction of comprehensive climate legislation in Rwanda created a critical enabling environment for the development and implementation of progressive institutional arrangements, policies and strategies for addressing climate threats and low carbon growth. Strong political will and ownership exists at the highest levels including the Office of the President and there are active climate champions across national government. To ensure the necessary broad partnership and institutional responsibility (especially between donors and the GoR) required to take forward national climate priorities, the GoR implemented a series of innovative institutional arrangements to improve coordination. These include the Sector Wide Approach (SWAp) Secretariat in MOE as well as the Natural Resources Sector Working Group and Environment and Climate Change Sub-Sector Working Group, which serve as multi-stakeholder forums to discuss environment and CCD issues. Rwanda's national climate and environment fund, FONERWA, plays a coordinating role for CCD projects (including mainstreaming projects that require coordination across several ministries).

#### E.5.2. Capacity of accredited entities and executing entities to deliver

*Please describe experience and track record of the accredited entity and executing entities with respect to the activities that they are expected to undertake in the proposed project.*

**Rwanda has strong capacity to implement a GCF-funded project and consistently delivers results against targets set out in its national strategies.** The GoR is well known for the efficient and effective use of external funds, due to the high levels of good governance, the OECD rated Rwanda as one of the countries that uses aid most effectively and Rwanda is on course to achieve most of its 2015 MDG targets. The Government of Rwanda has demonstrated comprehensive country ownership of, and capacity to implement, a funded project.

**Rwanda has also established strong institutional frameworks and the accredited entity MOE has a reliable track record for implementing climate change projects.** MOE's solid track record is most recently demonstrated through its current management of USD 10 million from the Adaptation Fund to implement the Reducing Vulnerability to Climate Change in North West Rwanda through Community Based Adaptation Project. The project operates in 2 districts, Nyabihu and Musanze, covering approximately 400km<sup>2</sup> and extending across 8 administrative sectors. Initiated in 2013, this project is mid-way in its implementation and is very well regarded through its successful delivery of early results. MOE also oversees a number of other climate projects including: an early warning system project (funded by LDCF), the Landscape Approach to Forest Restoration and Conservation (LAFREC) project (funded by GEF/World Bank), and the "Building resilience of communities living in degraded forests, savannahs and wetlands of Rwanda through an ecosystem management approach" project (funded by LDCF). MOE is the Ministry responsible for ensuring sustainable management and rational use of natural resources. It is responsible for the development of policies, strategies and projects as well as the formulation of regulations and mobilising resources for the development of the sector. The Ministry is also

responsible for monitoring and evaluation the implementation of environment, climate change and natural resources management at the national level.

**As the national climate and environment fund, FONERWA (the nominated executing entity) already manages a significant portfolio of climate finance and is therefore well equipped to implement the project.** The Environment and Climate Change Fund, FONERWA, was established by the GoR in 2012 as a response to the low public resource allocations directly available to address environment and climate concerns. FONERWA is now the primary vehicle through which additional environment and climate change finance is channelled, programmed, disbursed and monitored in Rwanda. The FONERWA Law formed the primary basis for the design of the fund. Initial seed capitalisation of GBP 22.5 million was provided to FONERWA in 2012 by the UK's International Climate Fund (ICF). Domestic counterpart funding was critical to securing this bilateral support and so far, the government has contributed USD 3.7 million demonstrating its commitment to supporting LCCR growth. FONERWA provides the necessary and appropriate institutional arrangements to meet the criteria of international climate funds. It maintains high standards of fiduciary management, aligned with GoR best practice and systems, including environment and social safeguards. It channels finances on a competitive basis to Government agencies, Districts, CSOs and the private sector using a range of financial instruments (grants, loans etc.). Delivering GCF project interventions through a capable national institution such as FONERWA with high levels of accountability will therefore further strengthen country ownership.

**The GoR has invested heavily in training projects targeting technical personnel in the relevant ministries and other relevant institutions including the private sector.** This was to address historic shortfalls in capacity have arisen due to a shortage of qualified and experienced people (with good problem solving, analytical, language and literacy skills) following the genocide against the Tutsi. The GoR is continually developing the capacity of its technical personnel in its line ministries. The Strategic Capacity Building Initiative has played a key role in strengthening capacity and UNDP is continuing to support capacity development in MOE, REMA and RWFA. For continuous development under different sectors, the National Capacity Building Secretariat (NCBS) was established for capacity creation, utilisation and retention; this has yielded results under the different sectors and especially in watershed management. The GoR is also increasingly working in partnership with technical service providers from the private sector. The GCF funding will ensure that the project relies on existing capacity while creating opportunities to draw from the lessons to develop further technical and overall management capacity to scale up investments for transformation.

### E.5.3. Engagement with NDAs, civil society organizations and other relevant stakeholders

*Please provide a full description of the steps taken to ensure country ownership, including the engagement with NDAs on the funding proposal and the no-objection letter. Please also specify the multi-stakeholder engagement plan and the consultations that were conducted when this proposal was developed.*

**Country ownership is rooted in high-level GoR commitment to delivering national priorities set out in the NST and the GGCRS and is evidenced by the nomination of a national institution, FONERWA, as the executing entity.** The initiation of the proposed project was guided by a stakeholder dialogue led by the Ministers of Environment (MOE) and Agriculture and Animal Husbandry (MINAGRI) along with Directors General from Rwanda Environment Management Authority (REMA), National Industrial Research Development Agency (NIRDA), Rwanda Housing Authority (RHA) and representatives from the Ministry of Local Government (MINALOC), Rwanda Water and Forests Authority (RWFA) and the private sector. There has been close consultation with the NDA throughout the project design from the concept stage through to the full proposal development. FONERWA routinely works closely with NDA and particularly had on-going consultations with REMA's climate change unit, responsible for preparing national communications and representation at international climate change negotiations which has been instrumental in supporting the analysis of climate threats and vulnerability baseline included in this proposal. As such, the design is based on a thorough understanding of the threat and the vulnerability level and provides a comprehensive evidence base for action (see Annex 1). As FONERWA will be the executing entity, there will continue to be close collaboration with the NDA throughout the project cycle.

**This proposal has been developed in consultation with a wide variety of stakeholders at the national, sectoral and local levels and includes provision for their future engagement in accordance with GCF's environmental and social safeguards and stakeholder consultation guidelines.** Multiple and extensive site visits have been made by the design team which was inter-disciplinary and included technical specialists in sustainable building design and master-planning, forestry, gender, environment, climate change, economics, water resources and agriculture as well as local communities and Gicumbi district authority. The initial field visits were carried out following guidance and consultation with the Governor of Northern Province where Gicumbi District is located along with the Mayor of Gicumbi District and various other leading staff of the District including the Executive Secretary of the District who provides oversight over the technical aspects at the District level. The design team also visited the Kabeza, Kaniga, the Mulindi Tea plantation, multiple forestry sites and held

discussions with communities as well as community leaders. The list of stakeholders consulted during the design phase is attached to each of the study reports in the Annexes. Particular attention was given to gender equality (through a gender analysis) so that women and men can participate in the project and benefit from proposed interventions. Multi-stakeholder processes involving non-governmental organisations and gender and youth interest groups are firmly established within national and sub-national planning processes, including the development and implementation of NST (through the sector working groups) and District Development Plans (through the Joint Action Forums). Further engagement has been undertaken as part of the Gicumbi DDP revision exercise, including the incorporation of GGCRS into the DDP development template, during early 2015.

**Further stakeholder engagement will be undertaken during implementation.** The design will develop a detailed plan to communicate and consult with stakeholders throughout the lifetime of the project, including field surveys, business round table discussions, workshops, structured interviews and focus group discussions with vulnerable groups and other stakeholders. Stakeholders will be involved in M&E processes to enable the project, through FONERWA, to have downward accountability to the communities and rural institutions in the areas where the project is being implemented – not as beneficiaries, but as actors and leaders in their own development. A Communication Strategy targeting stakeholders at different levels will be developed and progress against project deliverables will be communicated on a regular basis, with the Communication Strategy underpinning a participatory, two-way process of communication with stakeholders.

## E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the project

### E.6.1. Cost-effectiveness and efficiency

*Describe how the financial structure is adequate and reasonable in order to achieve the proposal's objectives, including addressing existing bottlenecks and/or barriers; providing the least concessionality; and without crowding out private and other public investment.*

**Given the IE accreditation status, the financial structure of the project is limited to grants.** However, the high level of concessionality and the grant modality applied (delivered through direct access mechanisms) is in line with GCF guidance (published B\_10\_06), as the project is in a LIE, targets vulnerable communities, and primarily invests in public projects that are non-revenue generating or uses small grants for technical assistance.

The project has also developed a disaggregated approach for the detailed financial structuring, recognising that different barriers exist across the various interventions areas, and so GCF finance needs to be tailored to address the specific market failures (the presence of externalities, public goods characteristic, information asymmetry and misaligned incentives) as well as policy failures and behavioural barriers, in each case.

**All interventions have been designed to maximise the use of GCF grant finance and comply with the principles set out in Annex III to decision B.05/07.** In line with GCF guidance (B\_10\_06) grant elements have been tailored to i) the incremental cost or the risk premium required to make investments viable, i.e. to meet the additional costs of green investment, provide longer-term finance or to create incentives for behavioural change (so far as is required to make activities financially viable, or to overcome risk perceptions) ii) for demonstration effect, i.e. where there is clear demonstration effect in relation to new technology, approach or market, which if needed, is then further supported by TA to ensure scale-up iii) to cover technical assistance, or iv) to meet the additional costs of climate action that would otherwise not be available, particularly for resilience (adaptation) activities for vulnerable groups. In all cases, the interventions have been designed to address barriers and create the enabling environment for mitigation and adaptation, to leverage on existing public and private finance, and to ensure there is no distortion or displacement of existing public or private sector funds.

For the **watershed protection** interventions, the focus is to address the underlying market failures in relation to the loss and degradation of ecosystems, especially from climate change, by investing in information, public goods and ecosystem-based adaptation (non-market), targeting highly vulnerable and very poor communities to address impacts of soil erosion and poor watershed management (which increases the risks of floods and landslides). The financing recognises that these investments are non-revenue generating, and while some direct grants are used (protective forests, where there are major ecosystem service benefits), for other interventions the focus is on technical assistance (farmer field schools) and community incentives to increase adoption, combined with investment in awareness raising and market development to include non-timber forest products and other income streams to help the uptake and sustainability of investments.

For **climate resilient agriculture**, the project focuses on supporting adaptation to climate change impacts and targets highly vulnerable smallholder and subsistence farmers. The project is financing some interventions of climate resilient agriculture in these sectors, recognising the longer paybacks on these projects, the fact they often involve information barriers and opportunity costs, and that the target beneficiaries are constrained in terms

of access to finance including capital. Alongside this, the project is providing information (climate risk information) to help address the larger scale investment needs in the industry, especially for the siting of new tea plantations, providing technical assistance to encourage climate resilient planning and thus leveraging private sector finance.

For the **sustainable forestry** component, the project is implementing high quality demonstration pilots, and providing technical assistance to the Government and forest owners to advance the take up of good practice, so as to transform the forestry sector in the district. However, it is recognised that the longer paybacks on forestry projects and the constrained availability of long term capital (especially as many forests and woodlots are small-scale) requires additional incentives, and thus an additional financial instrument has been included with the introduction of performance based grants. These interventions are also strengthened as the project is investing in public goods and provision of non-market benefits (ecosystem services).

For the **energy (biomass)** interventions, the underlying technologies have a high financial IRR, and the main barriers are around awareness and behavioural change. The project is therefore investing in local capacity (trained staff and demonstration pilots) and financing awareness raising, promotion and market development with technical assistance/capacity building for installers. There is also some direct grant support to introduce low carbon technologies in public institutions that are large biomass users (schools, clinics). Again, all these interventions have high non-market benefits, through the reduced pressure on biomass and thus deforestation, as well as providing health benefits from lower indoor air pollution.

For the **tea factory energy efficiency** component, the grant finance is targeted to address information failures and risk perception around the use of financially viable (no and low-regret) energy efficient measures and technologies. It is therefore focused on an initial demonstration. GCF grant is used to provide technical assistance to help introduce basic energy efficiency measures, with co-financing from the factory for the equipment, but also a grant for the incremental costs of more advanced technologies for demonstration. The national scale-up is achieved through a similar programme of technical assistance for mainstreaming, to build the enabling environment for leveraging private sector investment for capital and equipment costs from the tea factories.

There is also investment in capacity building across the project at the district level, which will bring about large benefits in terms of greater effectiveness and efficiency of public interventions for mitigation and adaptation.

*Please describe the efficiency and effectiveness, taking into account the total project financing and the mitigation/ adaptation impact that the project aims to achieve, and explain how this compares to an appropriate benchmark. For mitigation, please make a reference to E.6.5 (core indicator for the cost per tCO<sub>2</sub>e).*

**The project has been designed to maximise the efficiency and effectiveness of the interventions above.** For mitigation, the project analysis has assessed the core indicator of cost per tCO<sub>2</sub>e as the key benchmark. This has been assessed using two alternative methods. First, the analysis has assessed the cost (GCF finance only) per tCO<sub>2</sub>e for the lifetime emission reductions that the investment achieves (column 1). This provides a simple assessment; however, it does not fully capture cost-effectiveness. To address this, the assessment has quantified the marginal abatement cost, expressed as the cost (financial present value) per tCO<sub>2</sub>e over the lifetime of the investment (GCF and co-finance, 10% discount rate) (column 2). This marginal abatement cost analysis shows that many of the project investments are no- or low-regret measures, leading to cost savings, and demonstrates the high cost-effectiveness of the investments.

**The cost-effectiveness for the overall project – for the relevant mitigation components – is extremely high**, and a marginal abatement cost (present value, 10% DR) has estimated the cost-effectiveness at - USD3.4/tCO<sub>2</sub>e, demonstrating the very high effectiveness and efficiency.

**For adaptation, the effectiveness and efficiency of the interventions is demonstrated through the economic assessment, set out in Section E6.3 and Section F1.** This has assessed the overall net present value of investments and the benefit to cost ratio (BCR) of individual interventions (using a 10% discount rate, but with sensitivity analysis). The latter provides a key metric showing the benefits that arise for every USD 1 invested. The analysis shows that all interventions all have BCRs above 1, hence they represent good value for money. For climate resilient tea and coffee, the BCR is 2.0, for the forestry programme the BCR is 1.3 (excluding wider ecosystem service benefits) and for watershed protection it is 2.8.

**For all mitigation and adaptation components, the interventions have been designed to be highly effective, with a theory of change informing each intervention, linking inputs to outputs to outcomes.** The programme has been structured to deliver at scale by maximising the number of beneficiaries reached and GHG emission reductions achieved. The programme will ensure that the quality, quantity and price of inputs are appropriate to achieve the desired outputs, thereby delivering efficiency. The procurement approach - and the commercial and management arrangements – will also ensure the highest value for money for goods and

services within the programme. Unit costs will be benchmarked against market norms, and technical assistance will be sourced through transparent and competitive procurement processes.

### E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

*Please provide the co-financing ratio (total amount of co-financing divided by the Fund's investment in the project) and/or the potential to catalyze indirect/long-term low emission investment. Please make a reference to E.6.5 (core indicator for the expected volume of finance to be leveraged).*

**The focus of the project is on one of Rwanda's poorest districts, which is primarily rural in nature.** Most of the interventions are targeted at helping the most vulnerable to address climate change impacts and supporting non-market sectors (especially in relation to ecosystem services) or provision of public goods. These are challenging for private sector co-financing. Even when markets do exist in Rwanda, co-financing is limited by low income levels and access to finance. It is also highlighted that the accreditation status of MOE, which is for direct grant finance only, limits the more obvious routes for co-financing and leveraging (i.e. through concessionary loans or blending). Nonetheless, the proposal has sought to maximise the level of co-finance and leveraging. This involves partnering with existing Government programmes to maximise the impact and influence of GCF investment. The co-financing ratio (total amount of co-financing divided by the Fund's investment in the project/programme) is as follows.

- For the tea energy efficiency pilot at the Mulindi factory, the factory is providing the finance for the Tier 1 energy efficiency measures (co-finance), with the GCF finance providing technical assistance.

There are also a number of interventions in the project that are focused on adaptation or operate in non-market sectors, where co-financing or in-kind contributions have been secured. These are not mitigation activities, and in line with GCF guidance, these are not included as formal co-finance. These are set out below.

- For the ecosystem and watershed component, the rain harvesting tanks include a co-financing component, with a 15% household co-financing contribution from Ubudehe category 3 and a 40% contribution for Ubudehe category 4. The co-finance ratio is 0.2 and 0.7 respectively.
- The Government of Rwanda is providing the cost of land purchase for the rural green village site.
- The climate resilient tea and coffee component leverages on public finance from an existing FONERWA project grant on tea and coffee, which has a value of USD2 million. There is also a large (USD>1million) in-kind co-financing stream from The Wood Foundation at the Mulindi plantation, for up-slope planting for climate resilient planning.
- For climate resilient tea and coffee – and watershed protection - the project interventions are focused on technical assistance and pilots, and there is in-kind co-financing from farmers and local communities in the form of labour for implementation of climate resilient and ecosystem protection based interventions.

*Please make a reference to E.6.5 (core indicator for the expected volume of finance to be leveraged).*

The total expected volume of direct finance to be leveraged is estimated to be USD 359,990 (formal co-finance, of which USD 105,964 is mitigation targeted) giving a co-financing ratio (total amount of co-financing divided by the Fund's investment in the project on mitigation) of 0.003. A breakdown is provided below of the formal co-finance for mitigation only.

Sub-component	Co-finance USD
Tea factory energy efficiency	105,964

In addition to the above, there would also be in-kind labour contributions from the community towards forestry interventions (USD 1,318,831) and a financial contribution toward the cost of cookstoves by households USD 1,539,652). The USD 2,858,483 in co-financing from the communities had to be excluded from the calculations as it was not practical to obtain letters of commitment from community members.

### E.6.3. Financial viability

*Please specify the expected economic and financial rate of return with and without the Fund's support, based on the analysis conducted in F.1.*

**A full economic appraisal has been undertaken for all sub-components**, using a social cost-benefit analysis (CBA), which adopts a social welfare maximisation perspective (see Economic and financial analysis in Annex 1). The analysis has valued all costs and benefits including, where possible, non-market benefits. The central analysis has been undertaken using a 10% discount rate, but with a sensitivity of 5 and 13%, the latter being the recommended (social) discount rate used by the Government of Rwanda. The results are shown below. These show the benefit to cost ratio of individual interventions (present value of benefits/present value of costs) and the overall net present value, calculated as total discounted benefits minus total discounted costs, using a 10% discount rate.

**All interventions have a positive benefit to cost ratio (>1) and a highly positive net present value, demonstrating the economic rate of return is high and that the project has a strong economic viability.**

GCF fund support is needed, however, as many of the economic benefits are in non-market sectors (i.e. environmental and social benefits).

Sub-component	Benefit to Cost ratio (10% DR)
Energy (biomass)	6.5
Forests	1.3
Ecosystems	2.8
Climate resilient tea and coffee	2.0
Energy efficiency industry (tea)	8.2

Even at a 13% discount rate, the project still has a high overall net positive present value, although the lower discount rate affects longer-lived investments, notably reducing the BCR of forestry to 1.

**A financial analysis has also been undertaken.** This is only relevant for those components that involve market sectors. The financial analysis assesses the return on investment and adopts a different perspective to the CBA, maximising towards the individual, excluding societal costs and benefits (such as environmental benefits, carbon savings, etc.) and including taxes and charges (which are excluded in the economic appraisal). It is undertaken from the point of view of the investor and uses the internal rate of return (IRR) as a metric to evaluate projected cash flows and assess the feasibility of a project or investment. The IRR is the rate at which the NPV is zero, and it is compared with the financial discount rate to assess whether project generates a sufficient return on investment to be financially viable or profitable: a higher IRR means a more financially attractive investment.

**The analysis shows that the financial rate of return for project investments (GCF finance and co-finance) is high, demonstrating the financial viability.** Note that a financial IRR cannot be calculated for the project as a whole, due to the combination of mitigation and adaptation components.. For the climate resilient production of tea and coffee, the interventions are financially viable, but target subsistence farmers and thus there is support needed (in the form of awareness and technical assistance) to encourage adoption. For the energy efficiency measures in tea factories and biomass (cook stoves and biomass) there investments are financially viable without GCF support, but require awareness raising and technical assistance (from GCF finance) to encourage adoption.

Sub-component	Financial Internal rate of return (IRR)
Energy	14 – 61% <sup>1</sup>
Forestry	12 – 16% <sup>2</sup>
Tea climate resilient agriculture	25% <sup>3</sup>
Coffee climate resilient agriculture	22%
Tea energy efficiency	49%

<sup>1</sup> Values for individual options vary: tier 1 and 2 improved cook stoves (61%), improved large (public building) cook-stoves (42%), small scale biogas (%), large scale biogas 14%.

<sup>2</sup> Values are for pine (12%) and eucalyptus (16%).

<sup>3</sup> Average for climate resilient interventions, though some sub options are higher (e.g. water management (27%) and grass strips (216%)).

*Please describe financial viability in the long run beyond the Fund intervention.*

**The high underlying IRR for market orientated interventions demonstrates their financial viability in the long-term.** The national mainstreaming activities in relation to dissemination and awareness will ensure their continued uptake beyond the Fund intervention. For the climate resilient tea and coffee production and sustainable forest management and watershed components, the project has focused on addressing current barriers to adaptation and will invest in creating the enabling environment for future adaptation (including public and private adaptation).

*Please describe the GCF's financial exit strategy in case of private sector operations (e.g. IPOs, trade sales, etc.).*

As mentioned earlier, scale up, replication and exit will also be ensured through partnering with organisations such as The Wood Foundation that have the market outreach and capacity to do this as well as partnering with public agencies such as RHA that have the mandate to expand and scale up in other parts of the country.

#### E.6.4. Application of best practices

*Please explain how best available technologies and practices are considered and applied. If applicable, specify the innovations/modifications/adjustments that are made based on industry best practices.*

Rwanda has in the recent past benefited from a proliferation of new technologies and increasing the uptake of these through the success factors seen to date will be a targeted in this project. These include:

- off grid solar technologies and market enhancing approaches that facilitate penetration of the technologies in rural areas enabled by growth and spread of ICT;
- technologies to produce soil stabilised compressed earth blocks;
- rainwater harvesting retrofitted with cleaning facilities to improve access to safe water for rural populations; and

- biogas and efficient cookstoves to reduce deforestation and solar water heaters to reduce energy consumption.

The innovations and market enabling conditions that have facilitated penetration of these technologies particularly in rural communities include the introduction of the telephone scratch card usage, loan schemes for purchases of rain water harvesting units for rural poor as well as the well thought out payment plans that have been introduced in accelerating home solar water heaters. In some instances, tax incentives have been applied to promote adoption of new technologies such as water heaters.

**Watersheds:** While Rwanda is committed to restore 2,000,000 ha of its degraded lands and forests by 2030, the national Restoration Opportunities Assessment report shows that there is already best practices on watershed management including small scale water harvesting for household usage<sup>109</sup>, agriculture and agroforestry on smallholder lands. There is a need however to implement a wide scale watershed management practices and techniques building on these best practices. A number of agencies are working with national and district authorities to pilot forest and landscape restoration in different sectors of Gicumbi and develop technical packages adapted to each landscape. The packages includes tailored agroforestry technologies as well as water management on steep slopes and these together with other best practices will be scaled up in the project areas. In addition to this RWFA<sup>110</sup> over a long period has developed agroforestry tools and modules used by farmer field schools and these will be used in this program. The Integrated Water Resources Management (IWRM) department at the ministry of natural resources also developed a series of tools in water resources management that will be used during this program. The current Water for Growth project operating in Muvumba and Nyabugogo catchments both covering Gicumbi district have established watershed management committees and these will also serve for the GCF funded project as a governance and capacity building structure.

**Tea and coffee:** The investment has focused on energy efficiency best practice technology for tea factories, as these are large industrial users of energy. The component is linked to Rwanda's NAMA, which identified tea factories as the major industrial source of emissions. The study design phase, which undertook detailed energy audits and options assessment, identified a large number of good practice retrofit options for the current factories in Rwanda that can reduce energy use, generate cost savings and reduce emission. These will be used to produce best practice guidance. There are also a number of more advanced energy efficiency options that will be demonstrated at the Mulindi factory, with the most promising being included in this best practice guidance. The component will also use these lessons, and review of international best practice, to draw up new guidance on energy efficiency standards for new tea factories (a further ten major plants are proposed, as part of the national development plan, and industrial blocks for two sites have already been progressed). The combined effect of tackling both current and new industrial plants in the project will have a transformational impact on the sector, reducing wood fuel use (and wood requirements) as well as greenhouse gas emissions. Alongside this, the component is undertaking climate resilient pilots for tea and coffee production, demonstrating the use of climate resilient agriculture and climate risk information for siting of new areas, to help transform the planned expansion of these cash crops in Rwanda. The information on climate resilient agriculture will also be integrated into the Government Farmer Field School programmes for these crops, ensuring best practice is disseminated at scale at national level.

**Forestry:** The entire intervention is premised on application of best practice. RWFA already hold excellent best practice guidelines developed under the Support Project to the Development of the Forestry Sector (PAREF Be2) project (the Tree Plantation, Establishment and Management and Tree Harvesting Techniques manuals annexed to this report) and the project prescribes demonstrating the productivity and performance gains possible through their application, developing national capacity in their best practice approaches, methods and techniques before using them as the template for roll-out improved forest management and forest renewal across the project area. The techniques described are based on the accumulated experience of plantation forestry in East and Southern Africa, and standard forestry plantation practices which have enabled productive plantation forestry to be undertaken on the challenging sites normally available for tree planting. These best practices have been successful across the region and are well articulated in the recently published PAREF guidelines and the guidelines from the Sawlog Promotion Grant Scheme in Uganda and, if implemented in a timely and effective manner, will have a transformational effect on the survival and productivity of plantations in Gicumbi.

**Climate resilient settlements:** The project will adopt and improve on the successful IDP model village concept (a national policy) to house socially disadvantaged social groups living in high risk zones from flooding and landslides. The proposed modifications to the IDP model apply green design, structural and environmental best practice, landscaping houses into the hillsides in a way that reduces the use for cut and fill as well as building resilience and sustainability through enhanced water management and storage as well as biogas. The kitchen

<sup>109</sup>Forest Landscape Restoration's opportunities assessment for Rwanda

<sup>110</sup>Rwanda Water and Forests Authority (RWFA)

garden model has been successful throughout Rwanda and is currently being scaled up through RAB to enhance food and nutritional security. Rwanda already has developed policies and statutory guidance that promote best practice urban design. The innovative approaches and technologies proposed in this project have been selected on the basis of several years of international and Rwandan experience in low carbon technologies by Light Earth Designs, Modulus and other key stakeholders such as RHA. The proposals, meet or exceed Rwanda building regulations - and meet or exceed European standards (EN or equivalent standard). The design team has the strongest background in sustainable design as well as engineering innovation (through the Cambridge University Centre for Natural Material Innovation). The practice partners have been previously awarded (as partners of FCB studios and Light Earth Designs) several sustainability awards including the Queens Award for Innovation and the Holicim award for sustainability. The best practice application on this project combines innovative research, writing and thinking on Green infrastructure with sustainable urban design practice (and parallel green city work with GGGI - and the Roadmap for Secondary Green cities guidance), extensive housing and urban design experience in Rwanda (Rwanda pilot green city design for GGGI) and worldwide (using knowledge and principles from green certification methods such as LEED (neighbourhood design) and BREEAM and use of UK based data and guidance such as University of Bath Inventory of Carbon and Energy). Services design has been undertaken by CIBSE qualified and LEED certified professionals. Material and engineering knowledge is underpinned by cutting edge doctoral thesis work undertaken by qualified structural engineers and architects under the auspices of the Cambridge University Centre for Natural Material Innovation. The material proposals capitalise on academic research as well as strong engagement over a long period with DFID, GIZ, Rwanda Government supported Rubengera Technical Secondary School. Underpinning all of this is experience over a 5 year period in the Rwanda context - with green building, urban and housing projects of national importance.

#### E.6.5. Key efficiency and effectiveness indicators

<p><i>GCF core indicators</i></p>	<p>Estimated cost per t CO<sub>2</sub> eq, defined as total investment cost / expected lifetime emission reductions (mitigation only)</p>									
	<p>The estimated cost per t CO<sub>2</sub>eq is presented below. As this is a cross cutting project (adaptation and mitigation) the analysis has been calculated for the total project and mitigation investments only (forestry, energy efficiency, biomass reduction). The analysis shows the estimated cost-effectiveness for full lifetime of the investments is USD 7.6 / tCO<sub>2</sub>eq (mitigation, lifetime)<sup>111</sup>, showing a high cost-effectiveness.</p> <table border="0"> <tr> <td>(a) Total project financing (not incl. Fees)</td> <td>USD 33,154,432 (total) USD 6,574,920 (mitigation components)</td> </tr> <tr> <td>(b) Requested GCF amount (not incl. Fees)</td> <td>USD 32,794,442 (total) USD 6,574,920 (mitigation components)</td> </tr> <tr> <td>(c) Expected lifetime emission reductions overtime</td> <td>864,244 tCO<sub>2</sub>eq (lifetime reductions)</td> </tr> <tr> <td>(d) <b>Estimated cost per tCO<sub>2</sub>eq (d = a / c)</b></td> <td>USD 7.6 / tCO<sub>2</sub>eq</td> </tr> <tr> <td>(e) <b>Estimated GCF cost per tCO<sub>2</sub>eq removed (e = b / c)</b></td> <td>USD 7.6 / tCO<sub>2</sub>eq</td> </tr> </table> <p><b>The analysis has also undertaken a full marginal abatement cost analysis</b>, which has assessed the financial present value cost per tonne of CO<sub>2</sub>eq. This is considered a more accurate metric for assessing the cost-effectiveness of the project. These values were presented in Section E.6.1. Cost-effectiveness and efficiency. The results show that the overall project cost-effectiveness, for the mitigation components, is <b>USD-3.4/tCO<sub>2</sub>eq</b> (as the financial present value, 10% discount rate).</p> <p><i>Describe the detailed methodology used for calculating the indicators (d) and (e) above.</i></p> <p>The method used for estimating emissions was set out in E.1.2. and the method for estimating the metric was set out in Section E6.1</p> <p><i>Please describe how the indicator values compare to the appropriate benchmarks established in a comparable context.</i></p> <p>The metrics above – and the full marginal abatement costs analysis in Section E.6.1– show that the individual investments comprise of no- and low-regret measures (many leading to actual cost</p>	(a) Total project financing (not incl. Fees)	USD 33,154,432 (total) USD 6,574,920 (mitigation components)	(b) Requested GCF amount (not incl. Fees)	USD 32,794,442 (total) USD 6,574,920 (mitigation components)	(c) Expected lifetime emission reductions overtime	864,244 tCO <sub>2</sub> eq (lifetime reductions)	(d) <b>Estimated cost per tCO<sub>2</sub>eq (d = a / c)</b>	USD 7.6 / tCO <sub>2</sub> eq	(e) <b>Estimated GCF cost per tCO<sub>2</sub>eq removed (e = b / c)</b>
(a) Total project financing (not incl. Fees)	USD 33,154,432 (total) USD 6,574,920 (mitigation components)									
(b) Requested GCF amount (not incl. Fees)	USD 32,794,442 (total) USD 6,574,920 (mitigation components)									
(c) Expected lifetime emission reductions overtime	864,244 tCO <sub>2</sub> eq (lifetime reductions)									
(d) <b>Estimated cost per tCO<sub>2</sub>eq (d = a / c)</b>	USD 7.6 / tCO <sub>2</sub> eq									
(e) <b>Estimated GCF cost per tCO<sub>2</sub>eq removed (e = b / c)</b>	USD 7.6 / tCO <sub>2</sub> eq									

111 See earlier table. Note iff the emissions reduced only during the 6 years of the project are considered, the value rises to USD 24 / tCO<sub>2</sub>eq.

	<p>savings) and demonstrates the high cost-effectiveness of the investments. The overall project cost-effectiveness, as measured in terms of the marginal abatement cost, is USD-3.4/tCO<sub>2</sub>eq, demonstrating that the project is highly cost-effective.</p>
	<p>Expected volume of finance to be leveraged by the proposed project and as a result of the Fund's financing, disaggregated by public and private sources (mitigation only)</p>
	<p>The expected volume of finance leveraged, and the sources of this finance, was set out in Section E.6.2. In summary, the total volume of the co-financing is USD 359,990 the volume of co-finance (mitigation only) is USD 105,964.</p> <p><i>Describe the detailed methodology used for calculating the indicators above.</i></p> <p>The methodology for estimating this indicator was set out in Section E.6.2.</p> <p><i>Please describe how the indicator values compare to the appropriate benchmarks established in a comparable context.</i></p>
<p>Other relevant indicators (e.g. estimated cost per co-benefit generated as a result of the project)</p>	<p>The economic benefit of the interventions has also been assessed using a full cost-benefit analysis. These provide a key indicator of the economic efficiency of the adaptation interventions. The benefit to cost ratios are set out in Section E.6.3.</p>

*\* The information can be drawn from the project appraisal document.*

### F.1. Economic and Financial Analysis

*Please provide the narrative and rationale for the detailed economic and financial analysis (including the financial model, taking into consideration the information provided in section E.6.3).*

The results of the economic and financial analysis were set out in Section E.6.3. This presented the economic appraisal. It also presented the financial analysis for the market based mitigation options. Overall, the economic appraisal, and the high benefit to cost ratios, demonstrates that the project has a very high net present value (at a 10% discount rate), and will lead to large net economic benefits in Rwanda. The benefits include direct economic benefits, but also large environmental and social benefits.

The **watershed protection** involves a suite of interventions. This intervention addresses the high current economic costs of climate variability and emerging climate change in Rwanda, and the high costs of soil erosion, landslides and floods, as well as the effects of rainfall variability. The intervention is primarily focused on integrated and sustainable landscape management, which includes agroforestry, protective forests, soil and water conservation, and rain water harvesting. The GCF investment will primarily be in public goods and ecosystem services, using ecosystem based adaptation and climate resilient agriculture. There are some direct financial benefits for some options (notably agroforestry) but the main benefits are economic (non-market), and arise from the combination of reduced impacts of climate change, enhanced ecosystem services and reduced greenhouse gas emissions. The economic analysis shows a high benefit to cost ratio from these interventions, estimated at 2.8:1.

Investments in **climate resilient production of tea and coffee**, target two of the top exports of Rwanda (totalling 25% of exports by value). Interventions primarily address the impact of climate change on these sectors, on both in terms of productivity and quality, which is reducing small-holder incomes as well as affecting exports. The interventions will increase climate resilience, reduce GHG emissions, and increase revenues/incomes. The economic benefits are high (including environmental benefits), and they also show a high financial viability (IRR) to farmers (>25%), but there is a lack of awareness and barriers to their uptake. The GCF finance is being used to provide technical assistance (in the form of farmer field schools) to support climate resilient farming practices as well as investments in tree belts, shade trees, irrigation and up slope planting. The interventions also target new Government agricultural development plans to increase the land area of production under cultivation (for tea and coffee). Current plans for expansion run the risk of locking-in areas for production that will become unsuitable in the future<sup>112</sup>. The project will invest in mainstreaming information (public good) to help Government and external investors plan this expansion so it is climate resilient. The benefits arise from the reduced impacts of climate change, and thus the protection of future production, revenues and exports. Finally,

<sup>112</sup> Given the very long investment lifetimes in these sectors (and the long lifetime of new plantations), these investments will be exposed to future climate change.

the GCF finance is therefore investing in information (the value of information) to help prepare for future risks<sup>113</sup> and improve future decision making as part of an iterative climate risk management framework. Again, tea and coffee involve a longer investment cycle, as these are long lived crops, which is affected by the 10% discount rate used. Nonetheless, the combination of activities in the tea and coffee area show high economic benefits (10%DR), with an overall benefit to cost ratio of 2:1. These benefits (financial and economic) have a positive distributional effect, as they predominantly occur to small-holder and subsistence farmers.

The **forestry investments** will lead to increased revenues through improvements in quality and productivity, and also additional income streams from non-timber forest products. These also lead to large non-market benefits from sequestration (of carbon) and wider ecosystem service benefits, including reduced soil erosion, soil stabilisation, reduced landslides and flooding, reduced sediment loads in water systems and biodiversity benefits. While the investments are potentially financially viable in IRR terms (12-16%) the long period of investment before payback means that GCF finance is targeted to bridging finance. The interventions do generate a positive benefit to cost ratio (1.3:1), though the value is lower than other interventions due to the long-term cycle of forestry and the high discount rate used in the assessment (although the benefits exclude many of the wider ecosystem service benefits, as these could not easily be monetised).

The next area targets the **household energy sector**, looking to reduce biomass consumption through the use of biogas and improved cook stoves. The financial benefits and IRRs of these interventions are generally high, due to the fuel wood savings they can achieve, and the project is focused on creating the markets and awareness to simulate uptake. The interventions have large economic benefits through the combination of direct benefits, but also high non-market benefits, from reduced GHG emissions, health benefits from reduced indoor pollution, and reduced pressure on deforestation (with associated high ecosystem service benefits). The benefit to cost ratio for this intervention is high, at 6.5:1.

Investments in two green **rural settlements** will reduce GHG emissions, from the combination of lower embodied carbon in construction materials and the switch to biogas in homes. The latter has important non-market benefits by reducing wood fuel use, avoiding deforestation, and also leads to health benefits from reductions in indoor air pollution. The development also leads to additional health benefits through the provision of water to cope with rainfall variability and the reduced risk of natural hazards such as landslides and floods. These strengthen the economic case. The combination of activities has an overall benefit to cost ratio of 1:1 (10% DR).

Investments in **improving energy efficiency in the tea factories** of Rwanda also have very large economic and financial benefits. The financial viability of energy efficiency in the sector is high (with an IRR of ~ 50%), but current information failures and lack of awareness hinders uptake: the GCF finance is being used to address these barriers through technical assistance and subsidies on biogas and fuel efficient stoves. The economic benefits of these interventions are very high, primarily due to the large GHG emission reductions that they subsequently achieve, as well as cost savings from reduced energy use. The latter also leads to large environmental benefits, as it reduces fuel wood consumption (the primary energy source for tea processing in the factories) and therefore reduces greenhouse gas emissions. The current levels of wood use from tea factories in Rwanda are very high, and represent one of the largest industrial users: there are therefore large benefits from energy efficiency as this will reduce the current wood deficit in Rwanda, reducing pressure (indirectly) on deforestation and increasing wider ecosystem service benefits. The benefit to cost ratio of the technical assistance energy efficiency measures is high, at 8:1.

The high focus on climate change impacts, public goods and non-market sectors means that the project does not generate a cash flow that returns to the project. However, the financial analysis of the market based interventions shows that they generate sufficient revenues to be self-sustaining and the economic analysis provides a strong overall rationale for the project.

Based on the above analysis, please provide economic and financial justification (both qualitative and quantitative) for the concessionality that GCF provides, with a reference to the financial structure proposed in section B.2.

The accreditation status of the Ministry of Environment (MOE) (direct access, national) limits the financial instruments available to direct grants. However, while the accreditation status means a focus on direct grants, the interventions in the project have been designed (see above) to maximise the efficiency and effectiveness of these grants. For mitigation, grant elements have been tailored to address the incremental cost or the risk premium required to make investment viable, or to cover specific activities such as technical assistance. Mitigation components have also leveraged public and private co-finance. For adaptation, grant elements have

<sup>113</sup> the long-term projections show major changes in the agro-climatic zones of the country from climate change, which could have very significant impacts on the suitability of current areas for production of tea and coffee, and could lead to shifts in the prevalence and incidence of pests and disease

been targeted to provide technical assistance, provide support for public goods, and create the enabling environment to address barriers, leveraging on public – and where possible – private finance.

## F.2. Technical Evaluation

*Please provide an assessment from the technical perspective. If a particular technological solution has been chosen, describe why it is the most appropriate for this project.*

**A range of innovative technologies and best practices will be promoted under the project.** These technologies will be applied based on an understanding of the specific local context of the settlement, land, or infrastructure in the project site, and tailored to the needs of the target beneficiaries. The technologies that will be promoted include:

- watershed protection - agroforestry, gully plugs, soak away pits, protective forests
- sustainable forest management – improved seeds, planting techniques and matching of species to site conditions, improved silviculture, improved cook-stoves (Tier 3 and 4 cook-stoves (the most efficient) are not currently available in Rwanda; their local production will be supported under the project), and rain water harvesting;
- affordable, low carbon building materials, approaches and technologies - soil stabilised compressed earth blocks, appropriate landscaping, biogas as sustainable energy sources.

The application of best practices and technologies is discussed earlier in this proposal in Section E.6.4. The technologies and approaches that are proposed in this proposal have each undergone a rigorous options analysis as part of the feasibility studies that were carried out in support of this design. The options analyses and a detailed description of various technologies and their appropriateness are provided in the three component reports (attached as reports 1, 2 and 3 respectively) that have been prepared with support from the PPF.

## F.3. Environmental, Social Assessment, including Gender Considerations

*Describe the main outcome of the environment and social impact assessment. Specify the Environmental and Social Management Plan, and how the project will avoid or mitigate negative impacts at each stage (e.g. preparation, implementation and operation), in accordance with the Fund's Environmental and Social Safeguard (ESS) standard. Also describe how the gender aspect is considered in accordance with the Fund's Gender Policy and Action Plan.*

**The ESIA and gender analysis are attached as separate reports under Annex 1 respectively.**

Environmental and social impact assessments have been used to assess the project as a whole and to assess each intervention and mitigating changes were made to the proposal in line with the recommendations of the ESIA and the gender analysis.

### Environmental assessment

**The project is expected to have largely positive impacts on the environment** as much of the GCF investment is targeted towards ecosystem based adaptation and interventions that reduce emissions. The main potential adverse environmental impacts of the project is the potential modification of hydrological flows for downstream users of the Mulindi marshland stream from the proposed irrigation investments that are part of the tea resilience measures to be implemented in Mulindi tea plantation. The agriculture feasibility study identified the need to improve the drainage of the Mulindi tea plantation as a resilience measure to cope with the increasing occurrence of flooding in recent years due to erratic and intense rainfall events. Unusually for tea, the plantation is located in an upland marshland valley. The area is also affected by droughts and there is an increasing issue of rainfall variability and extreme dry years with increasing dry spell duration. Irrigation is considered an essential adaptation measure to reduce tea farmer's vulnerability to climate variability and avoid production losses and livelihood deterioration.

**The feasibility study team proposed a marshland irrigation scheme to alleviate flooding and to improve the availability of water.** Controlling water flows in the marshland will mitigate flooding caused by over bank flows of the river or feedback from the Ugandan portion of the marshland during the wet season and will provide a supply of water to tea fields in the dry season. Construction works for the marshland drainage will entail; an open trapezoidal central drain, with lateral drains, which will serve the purpose of both the surface and sub-surface drainage system. Primary and secondary surface drains are also planned which will work as a secondary canal during the dry season and as a drain during the wet season. These interventions, if not well designed, have the potential to destabilise the receiving downstream users and temporarily destabilise the ecosystem dependent on the current river flow. During the dry season, water will be drawn from the stream thereby reducing

flow quantities, changing flood flows and affecting biodiversity downstream. The ESIA has recommended that the irrigation design shall:

- avoid modification of hydrological flows for downstream users of Mulindi river stream;
- cater for ecological flows that can sustain the existing aquatic ecological life in the river stream, specifically diversion structures will incorporate release of ecological flows from the central drain to maintain a specific water level downstream that can sustain the existing aquatic ecological life in the river stream;
- ensure a proper drainage network allowing for return flow from the plantation plots into the stream during the dry season;
- consider measures to avoid destructive flooding events, such as the possibility of occurrence of floods in 20, 50 or 100 years and ensure a proper drainage network allowing for return flow from the plantation plots into the stream during the dry season; and
- cater for measures to minimise water logging, salinization, siltation or scouring of drains or canals.

During implementation, the ESIA recommends that:

- Water Users' Associations (WUA) are established to manage distribution, maintenance of the irrigation infrastructure and resolve arising conflicts over water distribution within the marshland;
- Phytolaca decocandra* is planted along the shores of the river to destroy *Bilharzia* snails that serve as hosts of shistosomiasis; a green buffer zone planted with Bamboo species is established at least 2m from the central drain and primary side canals of the irrigation scheme to prevent destruction of central drain boundaries and open canals by tea farmers; and
- water losses from leakage of open irrigation canals are prevented through, regular canal inspections and lining of Irrigation canals with pervious soils to prevent ground seepage of water into the soil.

These recommendations have been included in the final design, workplan and budget.

### Social assessment

**The ESIA has identified a number of potential social risks and impacts which are all covered in the published report.** The main risk stems from the need to expropriate 20 ha of agricultural land for the Kangia settlement. A comprehensive Abbreviated Resettlement action plan (ARAP or RAP) and livelihood Resettlement action plan (LRP) will be completed to the satisfaction of National laws and GCF E&S safeguard policies. Moreover, compensation at full replacement cost with reference to Resettlement Action Plan (RAP) will be provided for each person before construction works begin and not go beyond the 120 days from cut-off date. In addition, to avoid income losses from missed cultivation due to delays in compensation and construction of the settlement:

- Affected agricultural land owners shall be allowed to cultivate their land with only seasonal crops as they wait for compensation and further as stated in the National expropriation law, an additional 120 days after they have received compensation; and
- Full replacement compensation shall be expedited with 120 days of the cut-off date.

Other social risks include: local resistance against proposed watershed protection interventions on their private land; occupational health hazards during construction and operation of settlements and production facilities; and the potential for poor employment conditions especially child labour and exclusion of women from employment for certain jobs and training.

### Gender analysis

**The gender analysis identified a number of gender barriers and inequalities in Rwanda and Gicumbi District** and has provided entry points and recommendations to address these issues to ensure the interventions are gender-inclusive and –responsive during implementation. Understanding and championing—as opposed to ignoring and underestimating—the tremendous expertise of women is a key aspect of this approach. One of the critical barriers that the project will tackle is that typically men have greater access to, and control over monetary benefits resulting from the livelihoods that the project will support (tree nurseries, woodlots, bee-keeping, brick making, tea plucking etc.) while women's access to these activities are limited and hinder their ability to generate substantial income thus perpetuating their poverty and dependence on men. The project includes a range of costed measures to ensure the equitable participation of women and men in the project, these have been listed separately in a Gender Inclusion and Action Plan and include:

- interventions that prioritise accessible and equal training opportunities for women and men and ensure that they participate equally—fully and effectively, as well as address the differentiated knowledge and experiences of women and men;
- equal access to all employment opportunities created through the project (requests for proposals will ensure that gender parity is a requirement) and enforcement of the relevant provisions of the 2009 labour law;
- specific targeting of women headed households with young children in the allocation of social housing in Kabeza and Kaniga recognising that these households are particularly vulnerable to climate change;
- the introduction of services and amenities in the two settlements to enhance the lives and livelihoods of women and men in the community, in particular biogas and water harvesting that significantly reduce the burden on women and children having to walk long distances for water and fuelwood;

- addressing the multiple barriers to women accessing financial capital;
- integration of specific gender sensitive indicators and targets into the results framework so that progress can be measured during implementation;
- establishing a Community Consultation Committee for the project, which will have the sector and/or cell woman's focal point participating;
- coordination with Rwanda's national level gender machinery and local women's organisations, in particular the National Women's Council and the VSLA, to ensure that gender is mainstreamed throughout the timeline of a project and that women's collective voice is represented;
- gender sensitisation sessions and training for stakeholders, implementing agencies and partners (including District officials) to build the capacity and understanding of women's rights, gender issues, the linkages with climate change.

**The project will use the GCF's Environmental and Social Safeguard (ESS) standard and comply with the GCF's Gender Policy and Action Plan.** The PMU will supplement the Safeguard standard and Gender policy with additional elements where appropriate to improve Project Performance and the performance of individual projects or initiatives. Issues raised in the EIA (attached at Annex 1) will be tracked throughout the life of the project so that the project will be subjected to ongoing periodic review of the issues raised in the EIA. This is in line with the conditions set out by GCF in accrediting MOE. The general and more comprehensive compliance with ESS will rely on equivalence assessments of national ESS standards with IFC performance standards (PS 2- 8) that are planned as a quality assurance measure for Rwanda's ESS standards. Gender disaggregated indicators have been incorporated into the results framework to ensure effective tracking of progress and outcomes in line with GCF's Gender Policy and Action Plan.

**The project includes specific measures to ensure that women benefit from the training and livelihood opportunities and includes gender sensitive indicators in its M&E system.** For example, women and vulnerable groups will be explicitly targeted for participation in capacity development and the establishment and use of the demonstration nurseries and plots, and, from that wider engagement in management planning for protective forest and the forestry roll-out more generally. An annual gender assessment will track progress against targets in the Gender Inclusion and Action Plan and monitor the evolving adaptation strategies of women and men as well as assess the influence of project interventions on changes in gender roles and power relations and how this affects women's vulnerabilities to climate change in Gicumbi. The assessment will also ensure that interventions are gender sensitive using the results from monitoring of the gender disaggregated indicators in the project framework to ensure gender parity in the distribution of project benefits. The mid term and end of project evaluation will also incorporate a vulnerability and gender analysis to assess the performance of the project against specific targets and to build a narrative around the effects of the interventions on different groups. The project will also build the capacity for national evaluators to be involved in the M&E activities to facilitate learning and uptake of best available practices in Environmental and Social Safeguard (ESS) and Gender standards.

#### F.4. Financial Management and Procurement

*Describe the project financial management and procurement, including financial accounting, disbursement methods and auditing.*

##### **Financial Management**

**The GoR has well defined robust, transparent and accountable public financial management systems in place** and these are essential elements for the effective, accountable management of the project. In general the project will follow the Government of Rwanda procedures for planning, budgeting and accounting, which are outlined in:

- Organic law n° 12/2013/ol of 12/09/2013 on state finances and property (Official Gazette n° Special of 05/11/2013);
- Ministerial order n°001/16/10/tc of 26/01/2016 relating to financial regulations (Official Gazette n° Special of 03/02/2016); and
- supporting operational manuals issued by the Ministry of Finance and Economic Planning (MINECOFIN).

**MINECOFIN has adopted the Medium Term Expenditure Framework (MTEF) approach to planning and budgeting:** funds received by MOE are "on budget" as far as the Government is concerned and will be included in the MTEF process, which results in the presentation of the annual budget to Parliament. In its accounting system, the GoR has adopted the International Public Sector Accounting Standard (IPSAS) related to modified cash accounting principles issued by the International Federation of Accountants.

**The primary entities receiving and managing project funds (MOE, FONERWA and the District of Gicumbi) use the Government's financial management systems and procedures** including the computerised Integrated Financial Management Information System (IFMIS) which embeds key internal controls (such as mandatory payments against budget and commitment recording) into operations. The budget classification used within IFMIS facilitates production of Government accounts which are consistent with the internationally recognised UN system of national accounts Classification of the Functions of Government (COFOG). 1. Based

on the under LAW N° 6/2012 of 22/05/2012 FONERWA operated under MOE (the accredited entity) with the Permanent Secretary of MOE as the Chief Budget Manager (CBM). Under the new Law revised in 39/2017 OF 16/08/2017, FONERWA as an autonomous institution will be assessed for financial management capacity. This will also be required for Gicumbi District.

**Project funds from the GCF will be received into a dedicated MOE bank account held at the National Bank of Rwanda (BNR) in US Dollars.** The project intends to make grants to partner institutions to implement some project activities. Accounting for the advance of grants will be managed through IFMIS. Additional reports from the accounting systems of the respective partner institution on the status of such grants and unused balances will be obtained by FONERWA.

**The selection of partner institutions will be managed by FONERWA's Fund Management Committee.** The pre-selection of partner entities to receive grants will include assessment of the capacity of their financial management systems to manage, properly disburse funds and account for grant funds. Legally binding grant management agreements will be prepared and signed in all cases and the accounting arrangements will be on an "open book" basis. All implementing partners will be required to provide quarterly financial reports on grant status and annual audited accounts. No loans will be made under the project. The existing financial management systems for the project will be strengthened by the appointment of a number of key posts for the duration of the project. These include, *inter alia*:

1. An accountant based in the PMU to manage financial accounting and reporting arrangements;
2. An internal auditor (based in MOE) to undertake systematic risk assessment and with the remit to cover funds and systems in all entities – including partner organisations – receiving or using from project funds;
3. A procurement specialist;
4. A financial management specialist with an IFAC-recognised qualification and the requisite experience; and
5. A legal advisor.

**These post holders will work with their institutional counterparts and will ensure that fiduciary risk is identified and managed.** All supporting financial records will be properly filed and retained to facilitate internal control systems and the project will maintain its own asset register of all major items procured for the project. The location, condition and custodianship of assets will be periodically checked on a sample basis. Financial reporting to MOE will take place quarterly although key internal controls (such as production of expenditure reports and bank reconciliations) will be monthly. Consolidated financial reports will be presented to the Project Steering Committee every three months.

**Financial reports will be provided to the GCF in accordance with Clause 17 of the AMA** which states:

- (a) on a semi-annual basis within sixty (60) days after 30 June or 31 December of each year (or such other frequency agreed in the FAA):
  - (i) the dates and amounts disbursed for Funded Activities, for the period reported and cumulative amounts up to the period, broken down by each Funded Activity, and compliance with financial covenants;
  - (ii) the actual expenditures for the Funded Activities for the period reported and cumulative amounts up to the period, broken down by each Funded Activity;
  - (iii) (A) the date on which any Funded Activity is financially closed, (B) the final amount disbursed for such Funded Activity, (C) the amount of any unused funds from such Funded Activity and (D) the amount of such unused funds paid to the Fund, for the period reported, broken down by each such Funded Activity;
  - (iv) the dates and amounts of any Reflowed Funds received by the Accredited Entity from Funded Activities, as well as the amount of such Reflowed Funds paid to the Fund for the period reported and cumulative amounts up to the period, broken down by each Funded Activity; and
  - (v) a statement of Investment Income earned on GCF Proceeds, as well as the amount of such Investment Income paid to the Fund;
- (b) within two (2) months after the end of the GCF Fiscal Year, an unaudited annual financial statement for each of the Funded Activities and the GCF Account containing the information required under Clauses 17.02(a)(i), 17.02(a)(ii) and 17.02(a)(v) with specific Funded Activities listed in a separate annex, and within four (4) months after the end of the GCF Fiscal Year, an audited annual financial statement for each of the Funded Activities and the GCF Account containing the same information;
- (c) within two (2) months after expiration or termination of this Agreement, an unaudited final financial

statement for the GCF Account, and within four (4) months after expiration or termination, an audited final financial statement for the GCF Account, in each case regarding the period since the last period covered by the statements referred to in Clause 17.02(b) above; and

- (d) such other reports related to funds disbursed by the Fund to the Accredited Entity, as may reasonably be requested by the Fund from time to time.

### Internal Audit

An internal auditor is provided for as part of MOE's oversight role. This will be a full time post funded through the AE fee. This person will supplement MOE's and FONERWA's internal audit capacity, with a mandate to assess the internal control systems in any implementing entities in receipt of funds under the project. Project funds will be subject to internal audit, which will be implemented through a compliance based annual Internal Audit (IA) workplan. To ensure that there is regular and sufficient assessment of the internal control environment of the financial management systems used to receive, manage and report on GCF Funds the following activities will be carried out:

- Appoint an Internal Audit Committee in accordance with the Internal Audit Charter included at Annex 18
- An Internal Auditor will be recruited for the duration of the project, in accordance with the terms of reference included in the PIM. The Internal Auditor will be contracted by FONERWA but will report findings to the Internal Audit Committee not to the Project Management Unit to provide the necessary independence;
- The Internal Auditor's scope of work will include the following:
  - The assessment of the financial management systems of all entities receiving GCF funds either for their own use or for onward transmission to third party entities<sup>114</sup>;
  - All procurements carried out under the project, by MOE, FONERWA or other entities receiving GCF Funds;
- In carrying out his work the Internal Auditor will:
  - Prepare an annual internal audit workplan which will be updated on a rolling quarterly basis and which will cover all PFM and Procurement activities and will be designed to assess whether internal controls (as designed and implemented) are likely to prevent or detect errors and whether all procurements are likely to be free and fair and result in value for money;
  - Ensure that the annual workplan responds to priority areas of risk;
  - Where particular areas of concern or increasing risk are found, amend the workplan to respond accordingly; and
  - Present results to the Internal Audit Committee together with recommendations to improve financial management.

Public services entities are required to maintain internal audit functions. All budget entities must comply with the Organic Law and the associated financial regulations providing the legal framework for the management and accounting for State finances and property. The procedures are laid out in the manual of Government Policies and Procedures for Financial Management and Accounting. This framework is the environment for internal control and for the management of all state resources.

The Internal Auditor appointed by the project will be allowed access to internal audit workplans and internal and external audit reports of all public sector entities in receipt of GCF Funds. Key internal audit reports include:

- an annual internal audit report prepared by the Internal FONERWA on project implementation processes for submission to MOE;
- a bi-annual internal audit report prepared by the Internal Audit Committee on project implementation processes for submission to the PSC;
- a consolidated audit report for all project entities prepared by FONREWA, and also including audited financial statements for the activities directly implemented by FONERWA for submission to MOE;
- audited annual financial statements for the project prepared by OAG/External Auditor for submission to

<sup>114</sup> To ensure that this duty can be discharged all Memoranda of Understanding and contracts between the executing and other parties will contain provision for internal Auditor to have access to the financial records of the other parties for the purposes of assessing how well the financial management environment are functioning, whether funds are being used for the intended purpose and whether procurements are complying with the principles set on in Paragraph 9.1 of this manual

MOE;

- an internal audit of the procurement process assesses whether national guidelines are adhered to;
- internal audit of PFM systems and procedures.

#### External Audit

**MINIRENA and the District of Gicumbi are audited annually by the Office of the Auditor General for State Finances (OAG)**, in accordance with internationally recognised auditing principles. FONERWA – which already receives funds from other development partners (KFW and DFID) – is additionally subject to periodic financial audit by independent auditors appointed by these institutions. The OAG presents his reports to the Public Accounts Committee. Provision can be made for additional audits to be commissioned by the GCF and conducted in accordance with GCFs audit policies and procedures. In line with the AMA, the project will be audited annually by independent external auditors.

**The project has defined a transparent grievance mechanism** which allows any direct or indirect beneficiary to submit a complaint or grievance at the local level and which can be escalated through a number of levels to the Office of the Ombudsman if the complainant isn't satisfied by the response at lower levels. Officers working on the project are expected to comply with the Government's Presidential Order N°45/01 of 30/06/2015 which establishes a Code of Professional Ethics for Public Servants. In addition senior management staff are required to disclose and register their valued assets with the Office of the Ombudsman on an annual basis to establish the rate of asset accumulation is commensurate with expected income levels.

#### Project procurement

**Procurements will be conducted under the regulatory regime in Rwanda which applies directly to all Government entities including MOE, FONERWA and the District of Gicumbi.** Relevant regulation includes:

- Law n° 12/2007 of 27/03/2007 on public procurement as amended to date;
- Ministerial order n° 001/14/10/tc of 19/02/2014 establishing regulations on public; and procurement, standard bidding documents and standard contracts.

These regulations embed the principles of fairness, transparency, accountability and the promotion of competition economy and efficiency. In addition, because some procurements will be made by the recipients of grant funds the project is implementing a pre-award due diligence process to ensure partner organisations have in place appropriate procurement systems which ensure that same principles will be applied as exists in the public sector regulations. FONERWA's procurement function will be supplemented by a small procurement function to help deliver services such as technical advisory to project recipients and on-going capacity building sessions that are regularly provided to staff within public institutions.

More details on the project's financial management and procurement, including financial accounting, disbursement methods and auditing are provided in the Project Implementation Manual (Annex 5).

**G.1. Risk Assessment Summary**

Please provide a summary of main risk factors. Detailed description of risk factors and mitigation measures can be elaborated in G.2.

The Team Leader and the Component Leads will assess and update the risk factors and mitigation measures as part of the project reporting. The most significant risks are considered to be associated with low awareness and a lack of capacity of the district authority to engage fully with the project but the project design has incorporated detailed mitigation measures to ensure these do not adversely impact of project implementation. A comprehensive risk assessment with a description of risk factors and mitigation measures is included in the Project Implementation Manual.

**G.2. Risk Factors and Mitigation Measures**

Please describe financial, technical and operational, social and environmental and other risks that might prevent the project objectives from being achieved. Also describe the proposed risk mitigation measures.

Selected Risk Factor 1			
Description	Risk category	Level of impact	Probability of risk occurring
Low capacity of farmers and communities to invest in adaptation actions where public benefits dominate jeopardises project objectives.	Social/ environmental	High	Moderate
Mitigation Measure(s)			
<p>The Community Adaptation Facility is intended to enhance the uptake of the proposed watershed protection measures. The Facility will function as delivery mechanism whereby communities receive grants for either community-level or household investments providing public goods. The CAF<sup>115</sup> will be established through the project and managed (with assistance) by communities themselves, to:</p> <ul style="list-style-type: none"> <li>• provide an incentive for investment and participation in project activities yielding public goods;</li> <li>• instil community ownership in project activities and, through community members active participation; and</li> <li>• build awareness and understanding of the benefits of the project interventions.</li> </ul> <p>The project will also use demonstration plots and learning exchange visits to raise awareness of the benefits of watershed interventions. Moreover, by training and deploying a skilled team of field staff, the project will establish high quality farmer and community engagement from the outset. This risk mitigation measure is expected to reduce the probability of the risk occurring to low.</p>			
Selected Risk Factor 2			
Description	Risk category	Level of impact	Probability of risk occurring
6 years is insufficient time to prove benefits from adaptation.	Operational	Moderate	Moderate
Mitigation Measure(s)			
<p>The focus of the projects is on low-regret options, and these provide immediate benefits in relation to productivity. This will allow several years of data from the initial implementation, although the values may be affected by normal climate variability (e.g. if there is a particularly bad year). This would allow to identify emerging problems and opportunities for enhancing climate change response from both the public and private sectors. This risk mitigation measure is expected to reduce the probability of the risk occurring to low.</p>			
Selected Risk Factor 3			
Description	Risk category	Level of impact	Probability of risk occurring
High costs of improved cooking technologies deter households from investing. This would affect the targets for carbon savings and result in continuing health impacts from indoor pollution.	Financial	High	Moderate
Mitigation Measure(s)			
<p>The investment in the promotional activities will demonstrate the savings that can be achieved with the new technology. The Implementation planning clearly identifies and matches technologies and beneficiary groups available resources. The project will provide grant and subsidy finance and targets appropriate groups. This risk mitigation measure is expected to reduce the probability of the risk occurring to low.</p>			
Selected Risk Factor 4			
Description	Risk category	Level of impact	Probability of risk occurring
Operational targets for each component not included in District Imihigo framework. Project activities then become deprioritised by District staff and activities are not delivered to time/quality, and capacity to manage the activities is not developed.	Institutional	High	Moderate

<sup>115</sup> Community grants for the CAF will be provided by FONERWA (no GCF finance will be used for the grants, GCF finance will only be used to provide the TA to support the set up and operation of the fund)

Mitigation Measure(s)
The project planning will be aligned with GOR systems. Project workplans are communicated to all stakeholders. District staff will be fully engaged in the planning of activities. Activity reporting is included in District Executive Management Meeting. The project will support the recruitment and training of additional district staff to support the delivery of project interventions. This risk mitigation measure is expected to reduce the probability of the risk occurring to low.
<b>Other Potential Risks in the Horizon</b>
<p>The project will also monitor emerging risks that may arise during the lifetime of the project. These include:</p> <ol style="list-style-type: none"> <li><b>Contracted service providers maintain BAU and do not follow best practice.</b> This would severely impact on the adaptation and mitigation potential because many of the results depend on the uptake of improved technologies and approaches. This would also compromise the project's value for money. The component leads and the PMU will ensure that contracts contain necessary standards and conditions and will monitor and enforce these standards. The project will also recruit a high calibre TA team to manage interventions and supervise operations. There is also provision to provide technical training and capacity development for service providers and the project will work closely with key enforcement agencies (RHA, RWFA and REMA) to ensure standards are inherent in all procurement and contractual agreements.</li> <li><b>Women and vulnerable groups do not participate in, or benefit from, project.</b> Women and vulnerable groups will be specifically targeted in awareness raising, capacity development, employment opportunities and demonstration works. The results framework includes gender disaggregated indicators and targets to ensure the equitable distribution of benefits. The project will invest in capacity strengthening for Central and Local Government staff and communities to achieve a gender balance in the value chain. All implementation arrangements and contracts will require suitable facilities for women and vulnerable groups.</li> </ol> <p>A full and comprehensive risk register is included in the Project Implementation Manual and will be updated on a quarterly basis as part of the project reporting cycle.</p>

### H.1. Logic Framework.

Please specify the logic framework in accordance with the GCF's [Performance Measurement Framework](#) under the [Results Management Framework](#).

H.1.1. Paradigm Shift Objectives and Impacts at the Fund level <sup>116</sup>						
Paradigm shift objectives						
<b>Increased climate-resilient sustainable development<sup>1</sup></b>	<p>This proposal addresses existing climate risks, but also implements early actions that start building for future climate change in key economic sectors that are expanding the fastest such as agriculture, energy and construction. GCF finance will restore critical watershed functions that support the majority of Gicumbi's mostly rural population and hence strengthen the climate resilience of those most vulnerable to climate change. It will also invest in climate resilient agriculture to support smallholder farmers and improve the management of forest resources using best practice. This will facilitate a shift away from subsistence farming of marginal lands into more productive and sustainable livelihoods.</p> <p>An explicit objective of the project is to inform scale up. The project has a high potential to cost effectively scale up, replicate and sustain the results of the project interventions beyond project completion due to the strong GoR ownership of the project's design and delivery. By using existing delivery channels and the machinery of GoR institutions such as RAB and Gicumbi District to implement the project along with well established private sector national agencies and charitable foundations such as NAEB and the Wood Foundation, the results of the interventions as well as the knowledge and experience developed during implementation are much more likely to be internalised to GoR's existing and future projects, plans and policies than if this project was executed by a multilateral agency. This investment therefore has the potential to have wide reaching impact across national planning and policy processes. Moreover, because Rwanda will be using it's own climate financing infrastructure, i.e. the national climate fund, FONERWA, to manage the project, there is a huge potential to replicate successful approaches across Rwanda's existing climate change projects and also in the design of future climate investments.</p> <p>The project includes a strong focus on best practice, building local capacity and the technologies promoted by the project are financially viable, utilise local natural resources, are easily transferable, and will be delivered through community based approaches so there is strong potential for these activities to continue beyond the end of the project.</p>					
Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term	Final	
Fund level impacts						
M3.0 Reduced emissions from buildings, cities, industries and appliances	3.1 Tonnes of carbon dioxide equivalent reduced as a result of Fund-funded projects	Project reports	0	31,176 See note 2	133,674 See note 3	District provides the necessary land for building works and competent firms are contracted to deliver best practice in low carbon building design and construction.

<sup>116</sup> Information on the Fund's expected results and indicators can be found in its Performance Measurement Frameworks available at the following link (Please note that some indicators are under refinement): [http://www.gcfund.org/fileadmin/00\\_customer/documents/Operations/5.3\\_Initial\\_PMF.pdf](http://www.gcfund.org/fileadmin/00_customer/documents/Operations/5.3_Initial_PMF.pdf)

						Tea factory provides necessary co- finance and undertakes implementation.  Incentives and take- up at national level effective.
M4.0 Reduced emissions from land use, deforestation, forest degradation, and through sustainable management of forests and conservation and enhancement of forest carbon stocks	4.1 Tonnes of carbon dioxide equivalent (t CO2eq) reduced or avoided (including increased removals) as a result of Fund-funded projects/projects – forest and land-use sub-indicator	Project reports	0	62,362 See note 4	140,046 See note 5	District and private land-owners make land available for project interventions. High uptake of improved practices.
A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions	1.2 Number of males and females benefiting from the adoption of diversified, climate- resilient livelihood options (including fisheries, agriculture, tourism, etc.)	Project reports	0	75,000 (39,225 women)	150,000 (78,450 women) See note 6	Vulnerable groups and women are effectively targeted and are enabled to participate in the project.

**Notes:**

- Proposed assessment based on a combination of quantitative and qualitative information that goes beyond simple aggregation of the results' indicators. Elements to be considered include the overall contribution to low-carbon development pathways, consistent with a temperature increase of less than 2 degrees, the degree to which knowledge and learning are achieved, extent to which the enabling environment is created or enhanced, and extent to which the regulatory framework and policies are strengthened.
- Includes reductions 20,981 t CO2eq for tea factory efficiency at Mulindi and national adoption, 9,118 tCO<sub>2</sub> from cookstoves and biogas 1,077 tCO<sub>2</sub>e from biogas at the IDP villages.
- Includes reductions of 59261 tCO<sub>2</sub>eq for Energy biomass, 70,105 t CO<sub>2</sub>eq for tea factory efficiency, and 4308t CO<sub>2</sub>eq from biogas at the IDP villages
- Includes reductions from 1) Agroforestry 21,557 t CO<sub>2</sub>eq; and 2) Forestry 40,805t CO<sub>2</sub>eq
- Includes reductions from Agroforestry 70,060 t CO<sub>2</sub>eq; Forestry 69,986 t CO<sub>2</sub>eq
- Includes 27,456 people adopting RWH, 49,733 people benefitting from agro-forestry, 9,240 people benefitting from CRA, 14,261 benefitting from off-farm livelihood opportunities, 51,312 people (incl. 26,760 women) engaged in watershed protection and forestry; 880 vulnerable people (incl. 460 women and girls) benefitting from social housing and green infrastructure in Kabeza and Kaniga.

**H.1.2. Outcomes, Outputs, Activities and Inputs at Project level**

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
<b>Project outcomes</b>	<b>Outcomes that contribute to Fund-level impacts</b>					
<i>M9.0 Improved management of land or forest areas contributing to emissions reductions</i>	M9.1 Hectares of land or forests under improved and effective management that contributes to CO <sub>2</sub> emission reductions	Project reports	0	5400	17,895	Communities supportive and adopt improved practices
<i>Increased use of innovative technologies and approaches to support low-emission development</i>	Number of technologies and innovative solutions transferred or licensed to support low-emission development as a result of Fund support. See Note 1.	Project reports	0	11	11	Technologies and approaches applied successfully, yield positive results and stimulate demand
<i>A7.0 Strengthened adaptive capacity and reduced exposure to climate risks</i>	<i>7.1 Use by vulnerable households, communities, businesses and public-sector services of Fund- supported tools, instruments, strategies and activities to respond to climate change and variability. (Households disaggregated by male-headed and female-headed). See Note 2.</i>	Project reports	Very limited use of tools etc. to respond to climate variability	At least 40% of target HH report the adoption of one or more tool, instrument, strategy or activity to respond to	At least 80% of target HH report the adoption of one or more tool, instrument, strategy or activity to respond to	Target groups supportive and adopt tools etc. to respond to climate change and variability

				<i>climate change and variability</i>	<i>climate change and variability</i>	
<b>Project outputs</b>	<b>Outputs that contribute to outcomes</b>					
1. Sub-catchment B of the Muvumba watershed restored and small scale tea and coffee farmers supported to adopt climate resilient practices	Area (ha) under erosion control	Maps Project reports	0	625	1250	Communities commit to soil erosion control measures
	Area (ha) under (i) protective forest cover (ii) agro-forestry	Maps Project reports	0	(i) 450 (ii) 3300	(i) 1375 (ii) 9790	Communities supportive of protective forestry and agro-forestry interventions
	Area (ha) of slope stabilised with napier grass	Maps Project reports	0	1874	1874	Land made available by the tea plantation
	Area (ha) of higher elevations planted with tea/ coffee	Maps Project reports	0	0	50 (tea) /35 (coffee)	Land made available by the tea plantation and supported by tea cooperatives / farmers
	No. of smallholders trained in CRA through farmer field schools	Maps Project reports	0	4900	7430	Smallholders motivated to participate in FFS
2. Communities supported to implement sustainable forest management and adopt fuel-efficient cooking methods	Area (ha) of forest renewed with high quality plants and best practice establishment	Site surveys Project report	0	673	2261	Sufficient high quality seeds and plant material available. Forest owners commit to forest renewal. Forest workers commit to best practice
	Area (ha) of seed stands established and managed	Site surveys Project reports	0	20	30	Suitable sites identified NTSC engage with and support interventions
	No of high quality seedlings raised in time for the start of planting season	Nursery audits Project report	0	180,000	360,000	Sufficient high quality seed available Nursery groups and workers adopt best practice
	No of community members trained in tree nursery management	Project reports	0	1800	3960	Demand for nursery products continues to grow
	No. of Tree Nurseries, Tree Growers and Bee Keeping cooperatives or associations operational. See note 3.	Proof of registration Business plans Members records (disaggregated by gender)	7 (at least 20% of members and 10% of committee members are women)	21 (at least 50% of members and 50% of committee members are women)	40 (at least 50% of members and 50% of committee members are women)	Individuals and communities interested in setting up cooperatives / associations
	No. of households or institutions installing and operating efficient energy technologies for cooking (stoves tier 1 and 2; domestic biogas units; institutional biogas units, gasifier stoves tier ¾; large stoves for institutions)	District and program records	0 stoves tier 1 and 2 800 domestic biogas units 3 institutional biogas units 0 gasifier stoves tier ¾ 0 large stoves for institutions	8000 stoves tier 1 and 2 1200 domestic biogas units 4 institutional biogas units, 1000 gasifier stoves tier ¾ 20 large stoves for institutions	23,400 stoves tier 1 and 2 1700 domestic biogas units 5 institutional biogas units, 3900 gasifier stoves tier ¾ 40 large stoves for institutions	HHs and institutions can be motivated to invest in improved energy for cooking
	Reduced CO <sub>2</sub> emissions from Mulindi tea factory and national dissemination	Energy use audit	0	20,981	70,105	Tea factory owner and managers support and

						invest in efficiency measures
3. Human settlements developed and/or modified to increase climate resilience	<p>No. of rainwater harvesting tanks, cisterns and ponds installed</p> <p>No. of low carbon social housing units developed and occupied by climate vulnerable families (disaggregated by women headed households)</p> <p>No. of storm-water management structures installed (gully plugs/check dams, infiltration ditches, channels planted with trees/shrubs/bamboo)</p>	<p>Project Reports</p> <p>Surveys Project reports M&amp;E reports</p>	<p>0</p> <p>0</p>	<p>(i) 1620 tanks (ii) 15 cisterns (iii) 70 ponds</p> <p>200 (at least 40% WHH with young children)</p> <p>4000 gully plugs/check dams 6000 infiltration ditches 30km channels planted with trees/shrubs/bamboo</p>	<p>(i) 3240 tanks (ii) 30 cisterns (iii) 90 ponds</p> <p>200 (at least 40% WHH with young children)</p> <p>10,000 gully plugs/check dams 13,875 infiltration ditches 100km channels planted with trees/shrubs/bamboo</p>	<p>Subsidies are sufficient to motivate households to invest.</p> <p>The GoR provides the necessary infrastructure to the site</p> <p>Suitably qualified service providers are available and procured in a timely manner</p>
4. Successful adaptation and mitigation approaches communicated and mainstreamed at the national level	<p>Website developed, maintained and promoted to users</p> <p>No. of farmer-to-farmer participatory videos made and viewed by other farmers</p> <p>No. of staff from GoR and NGOs trained in climate resilient forestry, watershed management and green settlements</p> <p>No. of people (women, men) trained in green and climate resilient construction. See note 4.</p> <p>Number of climate resilience plans adopted and implemented</p> <p>No. of tea/coffee policy changes or investment decisions influenced by climate information</p>	<p>Project reports, web statistics</p> <p>Project reports</p> <p>Project reports</p> <p>Project Reports</p> <p>GoR policy and planning documents. Project reports</p> <p>GoR policy and planning documents. Project reports</p>	<p>No website exists</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p> <p>0</p>	<p>Website developed and updated on a monthly basis</p> <p>50</p> <p>200</p> <p>580 (incl. 313 women)</p> <p>1</p> <p>1</p>	<p>Website updated on a monthly basis and accessed regularly</p> <p>100</p> <p>560</p> <p>580 (incl. 313 women)</p> <p>2</p> <p>2</p>	<p>Content is useful and easily accessed</p> <p>Farmers interested and able to share their experiences by video</p> <p>The housing sites developed and people will be interested and available for training</p> <p>GoR and investors concerned and willing to act</p> <p>RAB undertake high quality research and analysis and results communicated effectively.</p> <p>Mulindi and new plantation investors use climate information</p>

- These include technologies and approaches that are either new to or at the early stage development in Rwanda : 1) Compressed Soil Earth Bricks production using high pressure technology in Modulus factory; 2) Diaphragm brick wall technology; 3) Catalan vaulting; 4) slope stabilisation using Vetiver grass (rather than retaining walls); 4) incorporation of structural space 'for incremental infill'; 5) composite eucalyptus and plywood beams (to be made by local carpenters) for use in roof structures in housing; 6) Catalan vaulting; 7) Strawtec panels as ceiling panelling and insulator to protect from radiant heat; 8) install ventilation wood drying floor (tea factory Tier 1); 9) install Variable Speed Drive to boiler fan and dryers and install boiler efficiency controls and insulation (tea factory Tier 1); 10) insulate all condensate pipework (tea factory Tier 1); 11) Trough efficiency improvement
- This indicator is both qualitative and quantitative in nature and country-specific. The qualitative aspects will involve a scorecard approach and an in- depth analysis to determine the extent of progress.
- For tree nurseries, at least 50% members will be women and at least 50% committee members will be women. For beekeeping, at least 65% members will be women and at least 40% committee members will be women. For tree growing, at least 40% members will be women and at least 10% committee members will be women.
- Includes 580 jobs created in constructing houses and infrastructure (incl. 313 for women) in Kabeza and Kaniga.

Sub-components	Description	Activities	Description
----------------	-------------	------------	-------------

<b>1. Watershed protection and climate resilient agriculture</b>			
<p>1.1 Strengthen community based adaptation</p>	<p>Support to increase the understanding by local stakeholders of the impacts of climate change and the value of conserving and protecting steep slopes and riparian buffer zones as well as the benefits of productive agro-forestry and forestry to build support for proposed interventions.</p> <p>Initial surveys and assessments will be participatory and community-based. This will build the capacity of local people to identify the specific interventions for investment in improvements and promote integrated land and water management. The participation of local communities in these initial assessments will foster ownership of the findings and planned interventions. It will also ensure that any interventions are appropriate to local conditions and provide an opportunity for dialogue, consensus building and capacity development on climate adaptation.</p>	<p>1.1.1 Selection of target areas and target groups for support</p> <p>1.1.2 Awareness raising of climate change issues</p> <p>1.1.3 Training of project staff and community volunteers in gender sensitive adaptation planning</p> <p>1.1.4 Community based survey of project area and prioritisation of interventions with communities, water and agricultural experts and other stakeholders</p> <p>1.1.5 Community meetings and planning workshops</p> <p>1.1.6 Development of local adaptation plans with zonation of land for agriculture, pasture, perennial crops/grasses etc. (based on District Land Use Plans and sub-catchment plans) with community and agricultural experts</p> <p>1.1.7 Development of Community Adaptation Facility</p>	
<p>1.2 Reduce slope erosion to sustainable levels</p>	<p>Promotion of soil conservation and stabilisation measures to reduce erosion and land degradation improve soil and water quality, reduce run-off and improve infiltration. This will include terracing as well as other measures. Where slopes are greater than 40°, the project will work with communities to phase out tillage systems and restore permanent vegetative cover to reduce erosion. Where grass cover alone is insufficient to prevent erosion, filter strips or wattling or brush layering will be installed to break the slope into short segments and dissipate the flow of water over the surface.</p> <p>The interventions in each area will take into account climatic information (rainfall variability etc.), soil type (pH, nutrient levels and texture), plant species and competitive ability, aspect and topography (slope stability and angle) as well as an assessment of the local surface erosion. The project will support farmers to assess the appropriate land preparation (contours, contour trenches, ridges, percolation ditches etc.) required before seedling planting.</p>	<p>1.2.1 Consultation with Rwanda Agricultural Board (RAB) and district agronomists, land officers on zoning of land for agriculture, pasture, perennial crops/grasses etc. with community and agricultural experts</p> <p>1.2.2 Awareness campaign on erosion control and improved soil management practices</p> <p>1.2.3 Introduce erosion control measures on 1250ha (850ha of progressive terraces and biological control measures and 400ha of radical terraces)</p> <p>1.2.4 Capacity building of local authorities to support the committees and maintain records of functionality and utilisation of infrastructure</p> <p>1.2.5 Matching crops and permanent vegetation (grasses, shrubs etc.) to soils and farming methods to the terrain</p> <p>1.2.6 Re-planting of steep slopes with perennial grasses and shrubs, wattling, brush layering.</p>	
<p>1.3 Stabilise rivers, roadsides and steep slopes with protective forestry</p>	<p>Support to establish protective forests on river banks, roadsides and steep slopes to stabilise slopes and reduce the riparian degradation and reduce erosion around roads. The aim is to retain permanent cover and avoid clear-felling and focus on tree species that provide a range of benefits including timber, fuel, fodder, fruits etc.</p>	<p>1.3.1 350 ha of steep slopes where plots are greater than 2ha</p> <p>1.3.2 140 ha at Mulindi tea estate which is vulnerable to landslides</p> <p>1.3.3 885 ha on rivers, roadsides and steep slopes (on small plots &lt;2ha)</p>	
<p>1.4 Integrate agro-forestry into farming systems on 9790 ha of the watershed</p>	<p>Support to increase the use of agro-forestry systems to reduce soil erosion and increases organic matter, soil fertility and soil water holding capacity, thereby enhancing climate resilience and productivity. Five agroforestry technologies or practices are proposed: (i) Contour hedgerows on terraces; (ii) Boundary planting; (iii) Trees scattered in crops; (iv) Home gardens; and (v) Fodder banks. Within the farm landscape, trees and shrubs will be planted to stabilise terraces and ditches and reduce soil erosion and storm water run-off as well as providing a range of goods and services for households and farmers, including nitrogen fixation (improving soil fertility), fodder, bean stakes, poles, timber, and medicinal products.</p>	<p>1.4.1 Planting trees/shrubs on existing radical terraces (non-fruit trees) 3700 ha</p> <p>1.4.2 Planting trees/shrubs on progressive terraces (non-fruit trees) 1351 ha</p> <p>1.4.3 Boundary Planting (non-fruit trees) 450 ha</p> <p>1.4.4 Planting trees and shrubs within crops (non-fruit trees) 901 ha</p> <p>1.4.5 Establishing fodder banks with napier grasses 2937 ha</p> <p>1.4.6 Planting trees in home gardens (fruit trees) 450 ha</p>	
<p>1.5 Support 1800 smallholder crop-livestock farmers to adopt agro-ecological approaches to increase climate resilience</p>	<p>Support for 1800 smallholders to adopt agro-ecological approaches to increase climate resilience. The focus will be on techniques which increase soil fertility, reduce soil erosion and maintain moisture content of the soil</p>	<p>1.5.1 Building capacity of sector and district technicians in climate resilient techniques for smallholder farmers</p>	

	making farmers more resilient to prolonged dry seasons, improving crop productivity and ultimately household nutrition and farmer income. The project will work through the existing GoR extension programmes including the Twigire Muhinzi which uses Farmer Promoters to spread the use of improved farming practices across Rwanda. In total, 300 Farmer Promoters across 9 target sectors will receive extensive training on agro-ecological practices which will enable the project to reach 1,800 smallholder farmers with climate-resilient approaches and technologies.	<p>1.5.2 Building capacity of farmer promoters in climate resilient techniques for smallholder farmers</p> <p>1.5.3 Supporting smallholder farmers to adopt climate resilient techniques</p> <p>1.5.4 Establishing on-farm and community demonstration sites and field visits to showcase climate-resilient livestock management techniques.</p> <p>1.5.5 Distribution of disease/drought resilient forage species and animal health inputs</p>	
1.6 Increase climate resilient farming practices with tea cooperatives in Mulindi (with planting for future climate change) - targets 4900 smallholders	<p>Introduction of climate resilient agriculture to 4900 smallholder tea growers to address the current weather-related risks – and start preparing for future climate change - at the Mulindi tea estate.</p> <p>A series of targeted low-regret adaptation interventions are proposed to reduce the exposure of small-holder tea growers to current climate variability and shocks, by enhancing water management, reducing soil erosion and flooding and reducing landslide risks in high risk zones.</p> <p>The first set of activities will introduce low cost low regret adaptation around the plantation, with grass strips, tree belts and culverts to reduce flooding, soil erosion and landslides. The second set of activities aims to make the tea plantation climate-resilient, i.e. looking at more transformational investments for the tea industry.</p>	<p>1.6.1 Improved water management (culverts) and small-scale 'green' irrigation to enhance resilience to flooding and droughts</p> <p>1.6.2 Planting grass strips (napier grass) to reduce erosion and enhance soil stabilisation around the 1874ha tea estate</p> <p>1.6.3 Establishing tree belts on 50ha to reduce flooding and landslide risks</p> <p>1.6.4 Introducing shade trees in tree estate (inter-cropping) in lower (more vulnerable) areas (25 ha)</p> <p>1.6.5 Upslope tea planting at higher elevation (50 hectares) to ensure climate resilient expansion of tea</p> <p>1.5.6 Planting new resilient tea clones</p>	
1.7 Integrate climate resilient practices into local extension services	Strengthening the capacity of local extension services to support tea and coffee farmers to adopt CRA. The project will introduce climate resilient activities into the curriculum of an existing the extension programme and include climate resilient demo plots in the 50 tea farmer schools that currently exist for the two co-operatives. This will provide the training to allow farmers to introduce field interventions.	<p>1.7.1 Farmer field schools (FFS) with Mulindi tea cooperatives (2 coops, 40 ToT, reaches 4900 farmers)</p> <p>1.7.2 Farmer Field Schools – with 2500 Coffee farmers in Gicumbi/Watershed</p>	
1.8 Provide weather and climate services for tea and coffee farmers to increase productivity and reduce losses from weather and climate variability	Development of new weather and climate services (W&CS) for the tea and coffee sectors, with these interventions being developed in Gicumbi. These services will provide critical information to farmers, improving productivity and reducing losses from weather and climate variability, and have extremely high benefit to cost ratios. They include short-term forecasting (daily up to weekly) to help farmers (and government) with farm management activities (planting, ongoing management, harvesting, and post-harvest activities) as well as climate services, i.e. monthly, seasonal and multi-year climate forecasting (through to climate change), and include the supporting infrastructure and activities (climate data sets and monitoring, forecasting and prediction, information systems and dissemination).	<p>1.8.1 Developing the weather and climate metrics of relevance for tea and coffee and including in data sets</p> <p>1.8.2 Undertaking participatory consultation on W&amp;CS with tea and coffee farmers in Gicumbi</p> <p>1.8.3 Developing the farmer field school curriculum to include W&amp;CS</p> <p>1.8.4 Building the capacity and monitoring infrastructure for met services to collect and process relevant information</p> <p>1.8.5 Developing the ICT and approaches for dissemination for farmers and government.</p>	
1.9 Increase capacity for pest monitoring, surveillance and IPM to address current and future climate change	Development of integrated pest management by targeting the key climate relevant pests and diseases for the coffee and tea sectors, and developing new IPM approaches and demonstrating these approaches in Gicumbi.	<p>1.9.1 Surveillance and monitoring of targeted climate sensitive pests and diseases</p> <p>1.9.2 Developing IPM with pest and disease controls</p>	
1.10 Increase climate resilient practices with 1000 coffee growers to reduce susceptibility to climate change and protect slopes in the watershed (planting for future climate change)	Support for climate resilient coffee development in Gicumbi. As well as improving rural incomes, this will provide a template for a paradigm shift for the Rwandan coffee sector	<p>1.10.1 technical assistance to develop new climate resilient coffee in Gicumbi (35 ha)</p> <p>1.10.2 Introducing resilient coffee varieties for this development</p> <p>1.10.3 Introducing succession climate resilient agriculture - 50 ha Gicumbi</p>	
<b>2. Sustainable forest management and sustainable energy</b>			
2.1 Increase forest productivity and sustainable forest management - targets plots >2Ha	Fully transform current forestry practice across forest management and operational processes, transforming the quality and productivity of the forest estate in Gicumbi. Includes importing	2.1.1 Support the provision of nationally available sources of high quality seed and plant material	

	high quality seed and plant material (there is a lack of available high quality seed and plant material in Rwanda) and the use of more drought tolerant species to support forest renewal.	2.1.2 Demonstration /trial forestry plots 2.1.3 Roll-out renewal of forests.	
2.2 Strengthen forest management skills to sustain investments in forestry and watershed management	Development of the necessary capacities and capabilities are developed for the long term maintenance, sustainability and scale up of the forestry and watershed interventions. Includes a comprehensive and extensive suite of capacity strengthening approaches and activities to ensure skills and management competency, raise awareness and build ownership of new species, practices and techniques to support and improve the livelihoods of women and men for a more positive outcome.	2.2.1 Technical skills training 2.2.2 Training of forestry core groups 2.2.3 Learning exchange visits	
2.3 Establish, restore and manage degraded woodlots across 297 ha of the watershed (<2 ha)	For small woodlots (<2ha), the project will support farmers to enhance and diversify tree production by providing high quality germoplasm and training to enable smallholders to develop and implement improved management plans. The work will involve establishing and maintaining improved farmer woodlots over 297ha (approximately 5% of Gicumbi's woodlots) to revitalise degraded Eucalypts woodlots with alternative species.	2.3.1 Technical assistance to improve farmer woodlots 2.3.2 Site identification and validation 2.3.3 Establish and maintain improved farmer woodlots - 297ha	
2.4 Strengthen community capacity to provide forest products and services	Provides support for income generation from forestry. Comprises a series of targeted interventions aimed at supporting livelihoods around forest products and services for poor households living in the target areas.	2.4.1 Establish community tree nurseries and capacity support 2.4.2 Establish woodlot cooperatives 2.4.3 Strengthen bee keeping operations 2.4.4 Increase access to finance	
2.5 Increase the use of biogas and efficient cookstoves to reduce deforestation of the watershed	Support to reduce the harvesting of wood for household cooking and energy use to reduce pressure on forest and wood resources, reducing vulnerabilities associated with deforestation and degraded forest cover. It comprises a series of targeted interventions and subsidies aimed at reducing household demand for biomass in the target areas.	2.5.1 Increase the use of biogas by households engaged in dairy activities 2.5.2 Promotion and provision of cleaner cookstoves and fuels.	
2.6 Reduce the demand for fuelwood and GHG emissions at Mulindi tea factory through energy efficiency measures	Provision of technical assistance (TA) to deliver a series of energy efficiency improvements at the Mulindi factory, with co-financing for the capital costs of energy efficiency equipment provided from The Wood Foundation / Mulindi Factory Company Limited (Tier 1), plus some grant support to demonstrate a series of advanced energy efficiency and PV options (Tier 2).	2.6.1 Technical assistance (TA) to deliver a series of Tier 1 energy efficiency improvements at the Mulindi factory 2.6.2 Technical assistance (TA) and financial support to deliver a series of Tier 2 energy efficiency improvements at the Mulindi factory.	
<b>3. Climate resilient settlements</b>			
3.1 Manage surface water run-off from settlements to reduce gully formation, floods and landslides	Interventions to reduce run-off and increase infiltration on the ridge and the upper slope to reduce climate related risks; and reduce downhill and lowland flooding, siltation and silt damage as well as sediment loads in water courses. All work will be contracted through the cash for work schemes used elsewhere in Rwanda which increase employment opportunities and target the poorest households. Support will also be provided to establish cell watershed management committees and provide training for committees on surface water management techniques and rainwater harvesting	3.1.1 Construct soft drains (5000 m) 3.1.2 Construct soak-away pits (21,324 soak away pits - 1 per HH for 60% HH) 3.1.3 Construct check dams/ gully plugs (10,000) 3.1.4 Establish footpath runoff control (100km) 3.1.5 Establish soil erosion/infiltration ditches (62.5ha ditches with 222 ditches /ha) 3.1.6 Training for community members	
3.2 Increase rainwater capture and storage to counter inter-annual rainfall variability	This includes investments in small-scale water collection and storage structures at the household and community level in upland areas to increase water conservation and reduce run-off and erosion during heavy rainfall. Three methods of rainwater harvesting will be promoted: 1) roof top harvesting, 2) underground cisterns and 3) communal ponds. Roof top harvesting will entail using a subsidy scheme to assist women and men in settlements and on steep slopes to acquire and set up, use and maintain rainwater harvesting	3.2.1 Demand survey of target area 3.2.2 Identification and sensitization of beneficiaries based on social categories 3.2.3 preliminary study and mapping of location for cisterns across the 9 sectors 3.2.4 Subsidise tanks for poor households 3.2.5 construct 300 underground cisterns 3.2.6 Excavation of 90 ponds to manage storm water	

	<p>facilities. To ensure the sustainability of the small-scale infrastructure, the project will establish committees at the sector and cell level to select the sites, manage and maintain the structures.</p>	<p>3.2.7 Formation and support of committees to manage small scale infrastructure</p>	
<p>3.3 Construct green social housing development in Kabeza to reduce the number of vulnerable households living in high risk zones (100 houses + green infrastructure)</p>	<p>Construction of 100 new homes and infrastructure at existing green village site Kabeza. The homes will be available for vulnerable families currently living in areas at risk from flooding and landslides. The “green infrastructure” utilises renewable energy, water and waste recycling strategies designed to work with the Rwandan topography to reduce emissions, increase resilience to climate change and protect the surrounding environment.</p> <p>A modified IDP masterplan (see Annex 1) has been developed for the site which improves on the green infrastructure in the village to promote enhanced climate resilience with gentle sloping, 'soft landscaping' to adsorb water, reduce soil erosion, improve storm water management and irrigate surrounding agriculture, all forms of adaptation to help address the increasing risks of heavy precipitation from climate change. Each dwelling will include rainwater harvesting to cater for 9 months of water supply and reduce vulnerability to changing weather patterns. During the 3 month dry season a communal rainwater collection system will be constructed to collect water from the soft landscaping system via a sand-bed water filter and underground water tanks. A communal biogas chamber (to supply gas for cooking), cow sheds and two cows per household have also been included in the design. The masterplan also includes landscape terraces shared between two houses, the top terrace for trees, the lower for beehives, a wormery and compost and remaining terraces for food production.</p>	<p>3.3.1 Selection of target households and prioritise households for resettlement with community and local authorities</p> <p>3.3.2 Construct 100 low carbon houses</p> <p>3.3.3 Provide 2 cows for each household</p> <p>3.3.4 Site clearance, cut and fill, murrum road, side pavements</p> <p>3.3.5 Install hard storm-water Control - Hard Drains</p> <p>3.3.6 Install soft storm-water Control - Swales along roads and swales with checker dams down road</p> <p>3.3.7 Install waste water biogas treatment system and cooking facilities with gas Pipework to houses</p> <p>3.3.8 Install home water harvesting tank</p> <p>3.3.9 Install communal rain water collection and sand bed filter</p> <p>3.3.10 Landscaping - Terracing for soil stabilisation</p> <p>3.3.11 Construct 21 cow sheds with channels to biogas</p> <p>3.3.12 Construct ponds (for livestock watering - one per village)</p> <p>3.3.13 Establish kitchen garden (one per house)</p> <p>3.3.14 Establish operation and maintenance structure for green infrastructure (incl. establishing O&amp;M committee, O&amp;M training, equipment, travel and allowances, training materials) per green village</p> <p>3.3.15 Facilitation and/or provision of technical support for construction, operation and maintenance</p>	
<p>3.4 Construct green social housing development in Kaniga to reduce the number of vulnerable households living in high risk zones (100 houses + green infrastructure)</p>	<p>Construction of 100 new homes and infrastructure at a new green village site, Kaniga. The homes will be available for vulnerable families currently living in areas at risk from flooding and landslides. The “green infrastructure” utilises renewable energy, water and waste recycling strategies designed to work with the Rwandan topography to reduce emissions, increase resilience to climate change and protect the surrounding environment.</p> <p>A modified IDP masterplan (see Annex 1) has been developed for the site which improves on the green infrastructure in the village to promote enhanced climate resilience with gentle sloping, 'soft landscaping' to adsorb water, reduce soil erosion, improve storm water management and irrigate surrounding agriculture, all forms of adaptation to help address the increasing risks of heavy precipitation from climate change. Each dwelling will include rainwater harvesting to cater for 9 months of water supply and reduce vulnerability to changing weather patterns. During the 3 month dry season a communal rainwater collection system will be constructed to collect water from the soft landscaping system via a sand-bed water filter and underground water tanks. A communal biogas chamber (to supply gas for cooking), cow sheds and two cows per household have also been included in the design. The masterplan also includes a Community Hall, Youth Centre, Health Post and Pharmacy, Early Childhood Centre as well as landscape terraces shared between two houses, the top terrace for trees,</p>	<p>3.4.1 Selection of target households and prioritise households for resettlement with community and local authorities</p> <p>3.4.2 Construct 100 low carbon houses</p> <p>3.4.3 Provide 2 cows for each household</p> <p>3.4.4 Site clearance, cut and fill, murrum road, side pavements</p> <p>3.4.5 Install hard storm-water Control - Hard Drains</p> <p>3.4.6 Install soft storm-water Control - Swales along roads and swales with checker dams down road</p> <p>3.4.7 Install waste water biogas treatment system and cooking facilities with gas Pipework to houses</p> <p>3.4.8 Install home water harvesting tank</p> <p>3.4.9 Install communal rain water collection and sand bed filter</p> <p>3.4.10 Landscaping - Terracing for soil stabilisation</p> <p>3.4.11 Construct 19 cow sheds with channels to biogas</p> <p>3.4.12 Construct ponds (for livestock watering - one per village)</p> <p>3.4.13 Establish kitchen garden (one per house)</p> <p>3.4.14 Establish operation and maintenance structure for green infrastructure (incl. establishing O&amp;M committee, O&amp;M training, equipment, travel and allowances, training materials) per green village</p>	

	the lower for beehives, a wormery and compost and remaining terraces for food production.	3.4.16 Facilitation and/or provision of technical support for construction, operation and maintenance	
<b>4. Knowledge development and transfer</b>			
4.1 Communicate project results and lessons learned	<p>Analysis of project results and production of a range of knowledge products including policy briefs and case studies to demonstrate the benefits of the project interventions. Includes the development of a communications strategy, production of briefing notes for policy makers to create a positive environment for scaling up. The intervention sites will be used to showcase best practice. The aim is to promote dialogue and learning between the project participants and other stakeholder as well as for the ongoing replication of adaptation strategies country-wide.</p> <p>The additional value generated by the approaches to increase climate resilience will be assessed with a cost benefit analysis to determine the value added by the project compared with existing approaches and practices so that scaling up can be justified. Peer-to-peer learning where community representatives meet other community representatives from areas where successful interventions have taken place will be used to support scaling up and replication elsewhere. Dialogue and learning at workshops will ensure horizontal scaling up and the project will use a website, site visits, and the media</p>	<p>4.1.1 Preparation of briefing notes for local and national decision makers (quarterly from mid term international consultant 8 days)</p> <p>4.1.2 Develop a communication strategy</p> <p>4.1.3 Develop a knowledge management strategy</p> <p>4.1.4 Farmer-to-farmer fora (cross visits, community meetings etc. - 1 group from each sector quarterly from Yr 2)</p> <p>4.1.5 Develop participatory videos</p> <p>4.1.6 Prepare media articles in newspapers, journals, newsletters, radio</p> <p>4.1.7 Develop and maintain website</p> <p>4.1.8 Conduct an ex-post cost benefit analysis to determine the value added by the project compared with existing approaches and practices</p> <p>4.1.9 Develop knowledge products including summary of project results, case studies and slides on SFM, watershed protection, CSA and green settlements</p> <p>4.1.10 Disseminate knowledge products on SFM, watershed protection, CSA, green settlements</p> <p>4.1.11 Workshops on SFM, watershed protection, CSA and green social housing and infrastructure approaches for sharing results and lessons learned</p> <p>4.1.12 Document and disseminate results of energy efficiency measures for tea factories</p> <p>4.1.13 Prepare guidelines on best practice on energy efficiency in tea factories</p>	
4.2 Awareness building, promotion and advocacy to support replication and scale up in other districts	<p>Awareness raising to increase understanding of best practice approaches successfully implemented by the project to support the adoption and replication of successful approaches and technologies at scale. It will target other district authorities, and cooperatives and will highlight benefits of successful approach and communicate lessons learned. This will include building awareness of all project interventions including: watershed protection; sustainable forest management; good CRA practice; IPM; and climate risks to settlements and measures to increase resilience. This will be achieved through national and local workshops and the production of guidelines, posters and leaflets.</p>	<p>4.2.1 National workshops, posters, leaflets and guidelines on watershed management</p> <p>4.2.2 National workshops, posters, leaflets and guidelines on sustainable forest management</p> <p>4.2.3 National workshops, posters, leaflets and guidelines on climate resilient agriculture</p> <p>4.2.4 National workshops, posters, leaflets and guidelines on IPM</p> <p>4.2.5 National workshops, posters, leaflets and guidelines on climate resilient settlements</p>	
4.3 Increase capacity of local institutions and communities to sustain investments in watershed protection and climate resilient settlements	<p>Development of local capacity to plan for climate change and to increase resilience through watershed protection. It will also include capacity support for sustainable forest management and green building technologies and settlement design and maintenance to ensure that human settlements are more resilient to climate change. Enhancing capacities for planning, coordination and implementation at the local level is critical to ensure effective climate adaptation. The project will target the training towards key staff in the local authority at District, Sector and Cell levels as local authorities currently have limited capacity to support project beneficiaries.</p>	<p>4.3.1 Capacity building of local institutions to plan and implement climate resilient land and water management regimes and scale up effective adaptation strategies at the national and local levels</p> <p>4.3.2 Building capacity in watershed protection approaches</p> <p>4.3.3 Building capacity in sustainable forest management approaches</p> <p>4.3.4 Building capacity in green construction technologies (CEB, timber roof construction; house construction (for beneficiaries in Kabeza); operation and maintenance of biogas digesters, sand bed water filters, water harvesting)</p>	

<p>4.4 Mainstream climate resilient approaches into existing forestry programmes and practices to support scale up and replication</p>	<p>This sub-component will support RWFA to integrate good forest management practices into existing national planning. It will draw on the lessons learned during implementation of forest renewal and management interventions as well as experience from supporting nursery development and investments in forest products and services. It will also link in closely to the activities under 4.3 building on the strengthened capacity to mainstream best practice into annual planning and programming across the sector.</p>	<p>4.4.1 An Initial analysis of barriers to uptake, identification of entry points and appraise mainstreaming options 4.4.2 Mainstreaming support for integration of new approaches and technologies into plans and programmes 4.4.3 Mobilising funding for scale up and mainstreaming 4.4.4 Assessing and evaluating the mainstreaming actions</p>	
<p>4.5 Mainstream approaches to climate resilient agriculture for smallholders into existing plans and programmes to support scale up and replication</p>	<p>Mainstream evidence generated by the project into policies and plans at the national level to create an enabling environment so farmers are empowered to implement adaptation measures. The agro-ecological approaches and techniques rolled out to 1800 smallholder farmers under 1.5 will also be disseminated via improved extension training materials along with practical and theoretical training with Provincial level technicians.</p>	<p>4.5.1 Developing extension training materials that incorporate climate resilient approaches 4.5.2 Delivering training to extension staff</p>	
<p>4.6 Mainstream climate resilient approaches into existing agriculture extension programmes to support scale up and replication</p>	<p>Mainstreaming of lessons from the Gicumbi tea and coffee interventions into national strategy and programmes, to disseminate knowledge and ensure that the project has a transformational effect. Specifically, the project will integrate climate resilient agriculture into the national farmer field school (FFS) programme for tea, extending the curriculum to include climate information and climate resilient agriculture advice for smallholder farmers. This will be targeted at 12 existing tea co-operatives (8 000 tea farmers), developing the curriculum with climate risk assessments (technical assistance).</p>	<p>4.6.1 Mainstream climate resilient resilience into the tea and coffee extension services and FFS curriculum 4.6.2 Mainstream climate resilient planning into national tea sector development 4.6.3 Mainstream weather and climate services and IPM into the national extension curriculum 4.6.4 Disseminate information through national workshops</p>	
<p>4.7 Mainstream energy efficiency into the tea industry to support scale up and replication</p>	<p>This sub-component will promote the uptake of energy efficiency in the industrial tea sector in Rwanda, using the lessons from the Mulindi tea factory, to ensure green growth is mainstreamed in current and future tea sector development policy. It will undertake existing analysis to assess the potential for energy efficiency in the industry and hold a national workshop (under 4.1) to promote energy efficiency in existing tea factories, using the Mulindi tea factory as a best practice example. It will then introduce a mainstreaming programme into national tea strategy and programmes, using technical assistance to provide advice on energy use and options in tea factories one energy efficiency, to encourage the uptake of Tier 1 (good practice) energy efficiency improvements across the industry.</p>	<p>4.7.1 Current and Potential Technology and Demand Survey 4.7.2 Audits 4.7.3 National Workshop energy efficient tea factories 4.7.4 Promotion of best practice through NIRDA 4.7.5 Prepare energy efficiency standards for new tea factories</p>	

## H.2. Arrangements for Monitoring, Reporting and Evaluation

Besides the arrangements (e.g. semi-annual performance reports) laid out in AMA, please provide project specific institutional setting and implementation arrangements for monitoring and reporting and evaluation. Please indicate how the interim/mid-term and final evaluations will be organized, including the timing.

### Implementation arrangements for Monitoring and Evaluation

The project will utilise and adapt FONERWA's established and operating framework and M&E procedures that have been used for other development funds such as DFID, KfW and UNDP. Detailed workplans are developed under a logical framework structure within which activities are linked to defined and quantified outputs, under outcome themes and connected to higher level impact statement and indicators. Clear and coherent output, outcome and impact statements are developed and key indicators identified for measuring and assessing progress, together with time-bound milestones and targets.

The M&E systems will provide systematic reports of progress against both process and performance objectively verifiable indicators (OVIs) and will be used to identify areas for specific management attention and will result in revision to annual implementation plans and, where necessary in-year plans and budgets. Implementing partners

will be responsible for reporting against the agreed indicators, under the oversight of the dedicated PMU supported by the FONERWA M&E team. Future disbursements will be considered in the light of the assessment of performance against the milestones. The M&E systems will also contribute to learning and review of approaches in light of experience throughout the project lifetime to optimise performance and impact.

FONERWA currently has two M&E Specialists and two additional posts are proposed

1. An internationally experienced M&E professional to design detailed M&E systems, develop detailed operational guidelines, assess progress and to work with technical specialists to develop corrective actions for “at risk” components where necessary and to provide capacity building
2. An M&E officer, based in the District of Gicumbi at the point of service provision. to undertake data collection and first level quality assurance

The M&E Specialists will conduct six-monthly field visits/‘spot-checks’, with a particular focus on ‘at risk’ projects.

### **Progress reporting**

Quarterly physical and financial progress reports against workplan and budget will be developed to ensure continuous monitoring of the project using the existing indicators and to allow for corrective measures in due time. These reports will provide an update on progress on the delivery of work stream and activities outputs contributing to the achievement of the project outcome and can be submitted to the GCF. The progress reports will be used to update work plans and budgets for the next quarter. The reports shall also describe progress on implementation as well as lesson learning, a risk update and management and an ongoing assessment of sustainability and acceptance of project interventions by the stakeholders particularly the beneficiaries.

At the end of each year an Annual Progress Review (APR) or lesson learning exercise to assess provisional impact will be undertaken at programmatic and project level. This is an internal exercise to be carried out by project implementers with support from the M&E Specialists as needed and may be outsourced for some activities (eg an annual gender assessment, for which the Gender Monitoring Office will be approached). The APR is likely to include a stakeholder workshop, site/community visit and case studies and will report on progress made against the indicators and targets in the project logframe, delivery of project outputs, and lessons learned. In line with the AMA, the APR will be submitted to the Secretariat on an annual basis for the period ending on 31 December within sixty (60) days after the end of the relevant annual period. The assessment report will be incorporated into the end of year quarterly report. The PMU will prepare an annual work plan which will include proposed activities, detailed plans, and budgets for the operation of each component. Draft work plans will be submitted to the steering committee for review and approval. The project logframe will provide a complete set of indicators for monitoring project progress against key targets, both in terms of results and impact.

Project evaluations will assess the effectiveness, efficiency and sustainability of interventions and partner institutions. Performance and impact will be assessed through:

- data compiled in the management information systems of implementing partners;
- baseline and follow-up surveys to collect impact data; and
- mid-term and final evaluations that will use a range of indicators to assess the effectiveness, efficiency, relevance, sustainability and impact of interventions.

### **Baseline and Independent Evaluations**

In the first quarter of the project a baseline assessment will be conducted. An independent mid term evaluation will be conducted at the end of Year 3 to assess project performance. It will also determine whether or not the strategy articulated in the project proposal is achieving the project purpose, was appropriate and whether the assumptions made were relevant. It will critically review progress towards the paradigm shift objectives and suggest areas for development. It will focus on the effectiveness of delivery, timelines and efficiency of implementation, and risk management. It will present the initial lessons of project design, implementation and management and make recommendations for greater enhancing the project’s efficiency and effectiveness to maximise value for money. The findings will be used to enhance implementation during the final half of the project’s term and to share lessons across the FONERWA programme. An independent Final Evaluation will be conducted 3 months before project closure and will focus on the impact and sustainability of project results. The report will summarise the results achieved (outcomes, outputs), lessons learned, and make recommendations on any actions needed to ensure sustainability, replicability and scaling up. All monitoring and evaluation activities will align with Monitoring and Accountability Framework.

### **Methodologies for monitoring and reporting of the key outcomes of the project**

The M&E system will track and assess the extent to which supported interventions result in changes that are systemic, large scale and sustainable. The system will include provision for the use of theories of change as well as consideration of unintended negative effects. Monitoring will include internal qualitative and quantitative data collection with external mid term and end of project evaluations, will promote an adaptive and responsive approach and ensure balance between breadth and depth, and bias in selecting only success stories. Monitoring will be

based on the annual work plans, the logic framework, theory of change and results-based indicators. The result measurement will also include a focus on value for money (across economy, efficiency, and effectiveness indicators) as well as impact of supported interventions.

#### **Lesson Learning and Replication**

The results from the M&E system will inform the replication and scaling up of project interventions. Data and quantitative information collected will be transformed into knowledge and learning products linked to organising, reflecting and using information gained. The knowledge management system will generate lessons, best practices, success stories, and other feedback coming from stakeholders and project partners. The results from the M&E system will inform the replication and scaling up of project interventions. Data and quantitative information collected will be transformed into knowledge and learning products linked to organising, reflecting and using information gained. The quantitative data will be combined with qualitative assessment and beneficiary feedback from the knowledge management activities carried out under each component to generate lessons, best practices, success stories, and other feedback coming from stakeholders and project partners.

\* Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.

**I. SUPPORTING DOCUMENTS FOR FUNDING PROPOSAL**

- NDA No-objection Letter
- Feasibility Study
- Integrated Financial Model that provides sensitivity analysis of critical elements (xls format, if applicable)
- Confirmation letter or letter of commitment for co-financing commitment (If applicable)
- Project Confirmation/Term Sheet (including cost/budget breakdown, disbursement schedule, etc.) – *see the Accreditation Master Agreement, Annex I*
- Environmental and Social Impact Assessment (ESIA) or Environmental and Social Management Plan (If applicable)
- Appraisal Report or Due Diligence Report with recommendations (If applicable)
- Evaluation Report of the baseline project (If applicable)
- Map indicating the location of the project
- Timetable of project implementation

**List of all preparatory study reports supporting this proposal**

File Name	Document
<b>1</b> REPORT 1 – component 1—PPF-MINIRENA-Mar-2017.pdf	<b>Component 1 summary report</b>
2 Report 1a SFM feasibility Study – PPF-MINIRENA-Mar-2017.pdf	Annex 6
3 Report 1a.1 SFM Management Model Cashflow and CBA PPF-MINIRENA March 2017 .xls	SFM Management Model Cashflow and CBA
4 Report 1a.2 Eucalyptus One Hectare Model.xls	Eucalyptus One Hectare Model Spreadsheet
5 Report 1a.3 Pine One Hectare Model.xls	Pine One Hectare Model Spreadsheet
6 Report 1a.4 Protection Forest One Hectare Model	Protection Forest One Hectare Model Spreadsheet
7 Report 1a.5 Annex 2 - Tree Plantation Establishment and Management Manual.pdf	Tree Plantation Establishment and Management Manual for Rwanda
8 Report 1a.6 Annex 3 - Tree Harvesting Techniques.PDF	Tree Harvesting Techniques Manual For Rwanda
9 Report 1b Watershed Protection Plan PPF-MINIRENA	Annex 7: Watershed Protection Plan Report
10 Report 1c Business Development Report PPF-MINIRENA	Annex 8: Business Development Report
11 Report 1d Energy Analysis and Action Plan PPF-MINIRENA	Annex 9: Energy Analysis and Action Plan Report
12 Report 1e Capacity Strengthening PPF-MINIRENA	Annex 10: Capacity Strengthening Report
<b>13</b> REPORT No 2 – Component 2- Tea and Coffee resilience – PPF-MINIRENA-Mar-2017	<b>Component 2 summary report</b>
14 Report 2a Component 2 - Tea (and Coffee) Resilience Climate Change Assessment.pdf	Supplementary technical report
15 Report 2b Component 2 -Tea (and Coffee) Technical Analysis.pdf	Weather maps and charts
16 Report 2c Component 2 – Tea (and Coffee) resilience Mulindi Tea Factory Efficiency	Tea Factory energy efficiency technical report
<b>17</b> REPORT 3 – Low carbon climate resilient settlement-PPF-MINIRENA-Mar-2017	<b>Component 3 summary report</b>
18 Report 3a Topographic-PPF-MINIRENA-Mar-2017.doc	Topographic surveys peri-urban and rural low carbon developments
19 Report 3b Geothermal-PPF-MINIRENA-Mar-2017.doc	Geothermal survey for peri-urban and rural low carbon developments
20 Report 3c Masterplan-PPF-MINIRENA-Mar-2017.doc	Masterplans for peri-urban and rural low carbon developments
21 Report 3d Green industry-PPF-MINIRENA-Mar-2017.docx	Engineered Timber production facility
22 Report 3e Options Analysis-PPF-MINIRENA-Mar-2017.pdf	Options Analysis
23 Report 3f Green infrastructure - PPF-MINIRENA-Mar-2017.pdf	Energy, Water and waste options peri-urban and rural low carbon developments
24 Report 3g Detailed Development Plan-PPF-MINIRENA-Mar-2017	Meeting Minutes
25 Report 3h Detailed Cost Plan-PPF-MINIRENA-Mar-2017.xls	Detailed cost plan
26 Report 3i Detailed budget - PPF-MINIRENA-Mar-2017.xls	Budget spreadsheet peri-urban and rural low carbon developments
27 Report 3i.1 Detailed budget-PPF-MINIRENA-Mar-2017.x;s	Carbon savings
28 Report 3J Detailed delivery plan-PPF-MINIRENA-Mar-2017.cls	Detailed delivery plan
29 Report 3k Risk-MINIRENA-PPF-Mar-2017	Risk matrix
<b>30</b> REPORT NO 4 -Economic and Financial Feasibility Analysis- PPF-MINIRENA-Mar-2017	<b>Economic and Financial summary report</b>

File Name		Document
31	Report 4a Technical-PPF-MINIRENA-Mar-2017: Supplementary technical report: Ecosystems.pdf	Supplementary analysis
32	Report 4b Technical-PPF-MINIRENA-Mar-2017: Supplementary technical report.Kabeza.pdf	Supplementary analysis
33	Report 4c Financial and Economic Analysis: Watersheds.xls	2 excel deliverables combined into one file. Full range of analysis
34	Report 4d Financial and Economic Analysis: Kabeza.xls	2 excel deliverables combined into one file. Full range of analysis
35	Report 4e Financial and Economic Analysis: Tea Factory.xls	2 excel deliverables combined into one file. Full range of analysis
36	Report 4f Financial and Economic Analysis: Energy.xls	2 excel deliverables combined into one file. Full range of analysis
37	Report 4f Financial and Economic Analysis: Periurban.xls	2 excel deliverables combined into one file. Full range of analysis
38	<b>REPORT NO 5 Gender study-PPF-MINIRENA-Mar-2017</b>	<b>Gender study and annexes</b>
39	<b>REPORT NO 6 ESIA – PPF-MINIRENA-Mar-2017</b>	<b>ESIA study and Annexes.</b> NB ESIA is not uploaded here but presented in Rwanda (it has been previously uploaded and has not changed)
40	<b>REPORT NO 7 Legal Study – PPF-MINIRENA-Mar-2017</b>	<b>Legal study and annexes.</b> Please note specimen contracts MoA with District, contracts from Developer to new owner of houses and Developer to new owner of self-build plot
41	<b>Emissions Methodology and Estimates Rwanda Gicumbi project 14 Jan 2018</b>	XLS summarizing the method and emission reductions for interventions